ONE UC DAVIS IS YOU, a global network of people connected to our university—students, faculty, staff, alumni, parents, friends, donors and partners. It is the positive impact of our unsung heroes, imaginative research teams and innovative thinkers.

Together we are transforming lives, celebrating humanity and nature, and inspiring breakthroughs in California and beyond—and in the process, we are elevating ourselves and each other to new heights.

FRONT COVER
DNA: "Living" in the Sciences Laboratory Building, the 50-foot-tall Portrait of a DNA Sequence sculpture represents a segment of DNA first deciphered at UC Davis.

Eggheads: The five Egghead sculptures by late art professor Robert Arneson bemuse and captivate visitors and campus community alike.

UC DAVIS UNIVERSITY OF CALIFORNIA

UC DAVIS GENERAL CATALOG • 2014–2015 • 2015–2016

### UC Davis Academic Calendar 2014-2016*

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration appointment times available</td>
<td>May 5</td>
<td>Oct 27</td>
<td>Jan 26</td>
<td>May 4</td>
<td>Oct 26</td>
<td>Jan 25</td>
</tr>
<tr>
<td>Pass 1 Registration (assigned appointments)</td>
<td>May 12</td>
<td>Nov 3</td>
<td>Feb 2</td>
<td>May 11</td>
<td>Nov 2</td>
<td>Feb 1</td>
</tr>
<tr>
<td>Pass 2 Registration (assigned appointments)</td>
<td>Aug 25</td>
<td>Nov 17</td>
<td>Feb 23</td>
<td>Aug 24</td>
<td>Nov 23</td>
<td>Feb 22</td>
</tr>
<tr>
<td>Last day to:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pay fees to avoid classes being dropped</td>
<td>Sep 15</td>
<td>Dec 15</td>
<td>Mar 15</td>
<td>Sep 15</td>
<td>Dec 15</td>
<td>Mar 15</td>
</tr>
<tr>
<td>• Petition for classification to resident status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Quarter begins

- **Fall 2014:** Sep 29
- **Winter 2015:** Jan 2
- **Spring 2015:** Mar 26
- **Fall 2015:** Sep 21
- **Winter 2016:** Jan 4
- **Spring 2016:** Mar 24

### Instruction begins

- **Fall 2014:** Oct 2
- **Winter 2015:** Jan 5
- **Spring 2015:** Mar 30
- **Fall 2015:** Sep 24
- **Winter 2016:** Jan 4
- **Spring 2016:** Mar 28

### Last day to:

- **Make final late payment of registration fees with penalty**
- **Drop 10-day-drop courses**
- **Change student status (part-time/full-time)**
- **Last day to file for PELP**

### Last day to:

- **Add courses**
- **Drop 20-day-drop courses**
- **Opt to take courses on a P/NP or S/U basis**
- **Change units in a variable unit course**

### Instruction ends

- **Fall 2014:** Dec 12
- **Winter 2015:** Mar 16
- **Spring 2015:** Jun 4
- **Fall 2015:** Dec 14
- **Winter 2016:** Mar 14
- **Spring 2016:** Jun 2

### Final examinations

- **Fall 2014:** Dec 13–19
- **Winter 2015:** Mar 17–21
- **Spring 2015:** Jun 6–8, 11
- **Fall 2015:** Dec 7–11
- **Winter 2016:** Mar 15–19
- **Spring 2016:** Jun 4–6, 9

### Quarter ends

- **Fall 2014:** Dec 19
- **Winter 2015:** Mar 21
- **Spring 2015:** Jun 11
- **Fall 2015:** Dec 11
- **Winter 2016:** Mar 19
- **Spring 2016:** Jun 9

### Commencement

- **Fall 2014:** Dec 20
- **Winter 2015:** ----
- **Spring 2015:** Jun 12–14
- **Fall 2015:** Dec 12
- **Winter 2016:** ----
- **Spring 2016:** Jun 10–12

### Academic and Administrative Holidays

- **Fall 2014:** Nov 11, Nov 27–28, Dec 23–26, Dec 31-Jan 1
- **Winter 2015:** Jan 19, Feb 16, Mar 27, May 25
- **Spring 2015:** Nov 11, Nov 26–27, Dec 24–25, Dec 31-Jan 1
- **Fall 2015:** Jan 18, Feb 15, Mar 25
- **Winter 2016:** ----
- **Spring 2016:** May 30

### Filing for Candidacy (Graduation)

- **Fall 2014:** Aug 1–Sep 12
- **Winter 2015:** Nov 8–Dec 12
- **Spring 2015:** Feb 1–Mar 16
- **Fall 2015:** Aug 1–Sep 11
- **Winter 2016:** Nov 8–Dec 4
- **Spring 2016:** Feb 1–Mar 14

### Last day to file minor with the Dean’s Office or the Biology Academic Success Center

- **Fall 2014:** Oct 15
- **Winter 2015:** Jan 16
- **Spring 2015:** Apr 10
- **Fall 2015:** Oct 7
- **Winter 2016:** Jan 15
- **Spring 2016:** Apr 8

### Undergraduate Admission

- **Fall 2014:** Nov 30, 2013
- **Winter 2015:** Jul 31, 2014
- **Spring 2015:** Oct 31, 2014
- **Fall 2015:** Nov 30, 2014
- **Winter 2016:** Jul 31, 2015
- **Spring 2016:** Oct 31, 2015

### Last day to file an application for admission scholarships; usually closed for winter and spring

- **Fall 2014:** Nov 30, 2013
- **Winter 2015:** Jul 31, 2014
- **Spring 2015:** Oct 31, 2014
- **Fall 2015:** Nov 30, 2014
- **Winter 2016:** Jul 31, 2015
- **Spring 2016:** Oct 30, 2015

### Last day to file a readmission application with return to undergraduate status

- **Fall 2014:** Jul 31, 2014
- **Winter 2015:** Oct 31, 2014
- **Spring 2015:** Jan 30, 2015
- **Fall 2015:** Jul 31, 2015
- **Winter 2016:** Oct 30, 2015
- **Spring 2016:** Jan 29, 2016

### Summer Sessions 2014

- **Jun 23–Aug 1
- **Aug 4–Sep 12

### Summer Sessions 2015

- **Jun 22–Jul 31
- **Aug 3–Sep 11

### Financial Aid Filing Period

- **Fall 2014:** Jan 1–Mar 2, 2015
- **Winter 2015:** May 8–Jun 4
- **Spring 2016:** Jul 7–Aug 11

### Symbol Key

- Dates are subject to change without notice.
- **†** Filing period for students graduating:
  - **Sep 2014:** May 8–Jun 5
  - **Sep 2015:** May 8–Jun 4
  - **Sep 2016:** May 9–Jun 2
- **‡** Deadline to file a minor program with the Dean’s Office or the Biology Academic Success Center for students graduating:
  - **Sep 2014:** Jul 7
  - **Sep 2015:** Jul 7
  - **Sep 2016:** Jul 7
THE PROVISIONS OF THIS CATALOG REFLECT INFORMATION AS OF THE DATE OF PUBLICATION.

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IT IS THE RESPONSIBILITY OF THE INDIVIDUAL STUDENT TO BECOME FAMILIAR WITH THE ANNOUNCEMENTS AND REGULATIONS OF THE UNIVERSITY PRINTED IN THIS GENERAL CATALOG.

The University of California, Davis, will provide assistance to the visually impaired regarding the information contained in this catalog. Questions should be directed to the office or department concerned.

The General Catalog may be purchased from UC Davis Repro Graphics; see http://catalog.ucdavis.edu/.

Credits

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Randall Larson-Maynard, Office of the University Registrar

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Office of Public Communications

Photography:
Mediaworks
FROM THE CHANCELLOR

Welcome to UC Davis. We're delighted you've chosen our campus as the place to pursue your academic goals. All of us—faculty, staff and alumni—are committed to helping you toward their successful attainment.

In the time you spend at UC Davis, you will acquire knowledge and skills that will help you shape the rest of your life. In whatever program you study, you will receive an exceptional education and a degree that is respected by graduate schools and employers around the world. Our philosophy of learning, discovery and engagement means that you will graduate with a very strong academic foundation that will serve you well whatever you do next in life. It also ensures that you will understand how your learning is relevant to the greater world. UC Davis has a century of commitment to public service and seeking solutions to today's critical issues, and we encourage you to integrate these goals into your education.

Students who take advantage of what the university has to offer love UC Davis! While you're here, you'll make lifelong friends and have experiences that will help you reach your full potential and also serve the larger community in which you live. Your passion, intellectual curiosity and vision give our campus the energy and inspiration that make UC Davis special and your time here meaningful.

We are extremely proud of UC Davis. Our alumni have made significant and lasting contributions to society as leaders in government, business, technology, media and the arts. They share their knowledge and resources with the campus and help students build social and career networks before they graduate. Members of our faculty have won MacArthur genius grants, Pulitzer prizes, Fulbright scholarships and election to the nation's top academies of the arts and sciences. They connect with students in the classroom, during freshman seminars and through research, arts and honors activities.

UC Davis continues to grow and offer new and exciting opportunities to learn and progress. Residence halls and dining facilities, a multipurpose stadium, new math and sciences buildings and the Mondavi Center for the Performing Arts are a few of the developments that reflect our commitment to offering the best educational experience available.

Together, we are using our talents and ingenuity to build a community that honors our diversity as individuals and reflects our belief in a shared set of values and mutual respect. I am delighted you have chosen to join our community.

Congratulations on becoming an Aggie!

Linda Katehi
Chancellor
ADDRESS DIRECTORY

University of California
One Shields Avenue
Davis, California 95616
530-752-1011; main campus number
http://www.ucdavis.edu

Visitor Services Office
UC Davis Welcome Center
530-752-8111
(Campus tours, maps and information)

Campus Information Center
Memorial Union
530-752-2222

Offices of the Chancellor and Provost
Mrak Hall, fifth floor
530-752-2065

College of Agricultural and Environmental Sciences
150 Mrak Hall
530-752-0108

College of Biological Sciences
202 Life Sciences
530-752-6764

College of Engineering
1030 Kemper Hall
530-752-0553

College of Letters and Science
200 Social Sciences and Humanities Building
530-752-0394
Academic Counseling: 530-752-0392

Graduate Studies
250 Mrak Hall
530-752-0650

Graduate School of Management
Gallagher Hall
530-752-7658

School of Law
2020 King Hall
530-752-0243

School of Medicine
4610 X Street, Sacramento
916-734-7131

School of Veterinary Medicine
Surge IV
530-752-1360

Office of Summer Sessions
1330 Surge III
530-752-7611

University Extension
1333 Research Park Drive
530-757-8777

News Service
334 Mrak Hall
530-752-1930

Legal Analyst—Residence Matters
University of California Office of the President
1111 Franklin Street, 8th Floor
Oakland, CA 94607-5206

Admissions

Undergraduate
Undergraduate Admissions
178 Mrak Hall
530-752-2971
Education Outreach Program (EOP)
Corner of East Quad and Shields Avenue
530-752-2971

Graduate
Office of Graduate Studies Admissions
250 Mrak Hall
530-752-0650

Law
School of Law Admissions
1380 King Hall
530-752-6477

Management
Graduate School of Management Admissions
Gallagher Hall
530-752-7658

Medicine
School of Medicine Admissions and Outreach
4610 X Street, Suite 1202, Sacramento, CA 95817
916-734-4800

Veterinary Medicine
School of Veterinary Medicine Admissions
114 Haring Annex
530-752-1383

Office of the University Registrar
12 Mrak Hall
530-752-3639

Financial Aid Office
Dutton Hall, first floor
Undergraduate: 530-752-2390
Graduate: 530-752-9246
Student Employment: 530-752-0520

Undergraduate Education
Mrak Hall, 5th Floor
530-752-6068

Undergraduate Scholarship Office
Dutton Hall, second floor
530-752-2804

Fellowships and Graduate Scholarships
250 Mrak Hall
530-752-0650

Teaching and Research Assistantships
Write to department or group concerned.

Associated Students of the University of California, Davis (ASUCD)
Memorial Union, third floor
530-752-3632

Student Disability Center
54 Cowell Building
530-752-3184
TTY: 530-752-6833

Student Health & Wellness Center
Student Health & Wellness Center
530-752-2300

Student Housing Office
160 Student Housing
530-752-2033
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Undergraduate majors are administered by the colleges of Agricultural and Environmental Sciences (A&ES), Biological Sciences (CBS), Letters and Science (L&S), and Engineering. Professional studies are administered by the schools indicated. All graduate programs are administered by the Office of Graduate Studies. The list below indicates the major or discipline, the degree(s) offered and the school or college offering the major.


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<tr>
<th>Major Area</th>
<th>Degree(s) Offered</th>
<th>School(s)</th>
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<tbody>
<tr>
<td>Aerospace Science and Engineering</td>
<td>B.S.†</td>
<td>Engineering</td>
</tr>
<tr>
<td>African American and African Studies</td>
<td>A.B.</td>
<td>L&amp;S</td>
</tr>
<tr>
<td>Agricultural and Environmental Chemistry</td>
<td>M.S.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Agricultural and Resource Economics</td>
<td>M.S., M.S./M.B.A. Ph.D.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Agricultural and Environmental Education</td>
<td>B.S.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>American Studies</td>
<td>A.B.</td>
<td>L&amp;S</td>
</tr>
<tr>
<td>Animal Behavior</td>
<td>Ph.D., M.S.**</td>
<td>CBS</td>
</tr>
<tr>
<td>Animal Biology</td>
<td>B.S., M.S., Ph.D.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Animal Science</td>
<td>B.S.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Animal Science and Management</td>
<td>B.S.</td>
<td>A&amp;ES</td>
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<tr>
<td>Anthropology</td>
<td>A.B. or B.S., M.A., Ph.D.</td>
<td>L&amp;S</td>
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<tr>
<td>Applied Mathematics</td>
<td>M.S. Ph.D.</td>
<td>L&amp;S</td>
</tr>
<tr>
<td>Applied Physics</td>
<td>B.S.</td>
<td>L&amp;S</td>
</tr>
<tr>
<td>Art History</td>
<td>A.B., M.A.</td>
<td>L&amp;S</td>
</tr>
<tr>
<td>Art Studio</td>
<td>A.B.</td>
<td>L&amp;S</td>
</tr>
<tr>
<td>Asian American Studies</td>
<td>A.B.</td>
<td>L&amp;S</td>
</tr>
<tr>
<td>Atmospheric Science</td>
<td>B.S., M.S., Ph.D.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Avian Sciences</td>
<td>M.S.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Biochemical Engineering</td>
<td>B.S.</td>
<td>Engineering</td>
</tr>
<tr>
<td>Biochemistry, Molecular, Cellular, and Developmental Biology</td>
<td>M.S., Ph.D.</td>
<td>CBS</td>
</tr>
<tr>
<td>Biotechnology</td>
<td>B.S.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Classical Civilization</td>
<td>A.B.</td>
<td>L&amp;S</td>
</tr>
<tr>
<td>Clinical Nutrition</td>
<td>B.S.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Clinical Research</td>
<td>M.A.S. School of Medicine</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Comparative Literature</td>
<td>A.B., M.A., Ph.D.</td>
<td>L&amp;S</td>
</tr>
<tr>
<td>Comparative Pathology</td>
<td>M.S., Ph.D. School of Veterinary Medicine</td>
<td>CBS</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>B.S.†</td>
<td>Engineering</td>
</tr>
<tr>
<td>Environmental Policy Analysis and Planning</td>
<td>B.S.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Entomology and Nematology</td>
<td>B.S., M.S., Ph.D.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Environmental Science and Management</td>
<td>M.S., Ph.D. School of Veterinary Medicine</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Environmental Toxicology</td>
<td>B.S.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Epidemiology</td>
<td>M.S., Ph.D.</td>
<td>A&amp;ES</td>
</tr>
<tr>
<td>Evolution, Ecology, and Biodiversity</td>
<td>A.B. or B.S.</td>
<td>CBS</td>
</tr>
<tr>
<td>Exercise Biology†‡</td>
<td>A.B. or B.S.</td>
<td>CBS</td>
</tr>
<tr>
<td>Exercise Science</td>
<td>M.S.*</td>
<td>CBS</td>
</tr>
<tr>
<td>Degree</td>
<td>Program/Department</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>B.S.</td>
<td>A&amp;ES</td>
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<tr>
<td>M.S., Ph.D.</td>
<td>School of Medicine</td>
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<td>B.S.</td>
<td>Hydrology</td>
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<td>M.S., Ph.D.</td>
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<td>B.S.</td>
<td>Forensic Science</td>
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<td>M.S.</td>
<td>UC Davis Extension</td>
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<td>A.B.</td>
<td>Managerial Economics</td>
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<td>A.B. or B.S., M.S., Ph.D.</td>
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<td>A.B.</td>
<td>German</td>
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<td>B.S.</td>
<td>Nutrition Science</td>
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<td>M.S., Ph.D.</td>
<td>Betty Irene Moore School of Nursing</td>
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<td>A.B.</td>
<td>International Relations</td>
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<td>A.B.</td>
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<td>A.B.</td>
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<td>B.S.</td>
<td>Landscape Architecture</td>
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<td>B.S.</td>
<td>Law</td>
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<tr>
<td>J.D., LL.M.</td>
<td>School of Law</td>
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<td>A.B., M.A., Ph.D.</td>
<td>Linguistics</td>
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<td>B.S.</td>
<td>Marine and Coastal Science</td>
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<td>A.B.</td>
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<td>A.B.</td>
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<td>A.B.</td>
<td>Materials Science and Engineering</td>
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<td>B.S., M.S., M.Engr., Ph.D.</td>
<td>Engineering</td>
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<td>A.B.</td>
<td>Mathematical Analytics and Operations Research</td>
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<td>B.S.</td>
<td>Maternal and Child Nutrition</td>
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<td>M.S.</td>
<td>Mechanical and Aeronautical Engineering</td>
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<td>M.S., Ph.D.</td>
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<td>B.S.</td>
<td>Molecular, Cellular, and Integrative Physiology</td>
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<td>M.S., Ph.D.</td>
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<td>A.B.</td>
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<td>A.B., M.A., Ph.D.</td>
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<td>A.B.</td>
<td>Native American Studies</td>
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<td>A.B.</td>
<td>Natural Sciences</td>
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<td>B.S.</td>
<td>Neurobiology, Physiology, and Behavior</td>
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<td>A.B.</td>
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<td>B.S.</td>
<td>Nutritional Biology</td>
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<td>M.S., Ph.D.</td>
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<td>A.B.</td>
<td>Performance Studies</td>
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<td>M.A.** , Ph.D.</td>
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<td>B.S.</td>
<td>Pharmaceutical Chemistry</td>
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<td>M.S., M.Engr., Ph.D.</td>
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<td>B.S.</td>
<td>Pharmacology and Toxicology</td>
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<td>M.S., Ph.D.</td>
<td>School of Veterinary Medicine</td>
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<td>A.B.</td>
<td>Philosophy</td>
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<td>Physics</td>
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<td>A.B. or B.S., M.S., Ph.D.</td>
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<td>A.B. or B.S., M.S., Ph.D.</td>
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<td>A.B.</td>
<td>Plant Pathology</td>
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<td>M.S., Ph.D.</td>
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<td>B.S.</td>
<td>Plant Sciences</td>
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<td>B.S.</td>
<td>Political Science</td>
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<td>A.B., M.A.**, M.A./J.D., J.D., Ph.D.</td>
<td>L&amp;S</td>
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<td>B.S.</td>
<td>Political Science—Public Service</td>
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<td>A.B.</td>
<td>Population Biology</td>
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<td>M.S.**, Ph.D.</td>
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<td>M.P.V.M.</td>
<td>Preventive Veterinary Medicine</td>
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<td>A.B.</td>
<td>Psychology</td>
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<td>A.B. or B.S., M.A.** , Ph.D.</td>
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<td>M.P.</td>
<td>Public Health</td>
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<td>M.P.H.</td>
<td>Religious Studies</td>
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<td>A.B.</td>
<td>Russian</td>
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<td>A.B.</td>
<td>Science and Technology Studies</td>
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<td>A.B.</td>
<td>Sociology</td>
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<td>A.B., M.A.**, Ph.D.</td>
<td>L&amp;S</td>
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<tr>
<td>A.B.</td>
<td>Sociology—Organizational Studies</td>
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<td>A.B.</td>
<td>Study of Religion</td>
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<td>A.B. or B.S., B.S./M.S., M.S., Ph.D.</td>
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<tr>
<td>M.S., Ph.D.</td>
<td>Sustainable Agriculture and Food Systems</td>
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<td>B.S.</td>
<td>Sustainable Environmental Design</td>
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<td>B.S.</td>
<td>Technocultural Studies</td>
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<td>A.B.</td>
<td>Textiles</td>
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<td>M.S.</td>
<td>Textiles and Clothing</td>
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<td>A.B.</td>
<td>Viticulture and Enology</td>
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<td>B.S., M.S.</td>
<td>Wildlife, Fish, and Conservation Biology</td>
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<td>B.S.</td>
<td>Women's Studies</td>
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<td>A.B.</td>
<td>L&amp;S</td>
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## MINOR PROGRAMS OFFERED BY UC DAVIS

Minor programs are offered by the College of Agricultural and Environmental Sciences (A&ES), the College of Biological Sciences (CBS) and the College of Letters and Science (L&S). The College of Engineering (ENGR), the School of Education (SOE) and the Graduate School of Management (GSM) each offer one undergraduate minor. The list below indicates the minor program, the offering department (if the department name is different than the name of the minor) and the college offering the minor.

### African American and African Studies
- L&S

### Aging and Adult Development (Human & Community Development)
- A&ES

### Agricultural Pest Management
- A&ES

### Agricultural Systems and Environment (Plant Sciences)
- A&ES

### American Studies
- L&S

### Animal Science—Animal Biology
- A&ES

### Animal Science—Animal Genetics
- A&ES

### Animal Science—Aquaculture
- A&ES

### Animal Science—Dairy/Livestock
- A&ES

### Animal Science—Equine
- A&ES

### Anthropology
- L&S

### Applied Computing & Information Systems (Plant Sciences)
- A&ES

### Arab Studies
- L&S

### Art History
- L&S

### Art Studio
- L&S

### Asian American Studies
- L&S

### Atmospheric Science (Land, Air, and Water Resources)
- A&ES

### Biological Sciences
- CBS

### Biomedical Engineering
- ENGR

### Chemistry
- L&S

### Chicanica/Chicano Studies
- L&S

### Chinese (East Asian Languages and Cultures)
- L&S

### Classical Civilization (Classics)
- L&S

### Coaching Principles and Methods
- L&S

### Communication
- L&S

### Community Development (Human & Community Development)
- A&ES

### Community Nutrition (Nutrition)
- A&ES

### Comparative Literature
- L&S

### Computational Biology
- ENGR

### Computer Science
- L&S

### Construction Engineering and Management (Civil Engineering)
- ENGR

### Contemporary Leadership
- A&ES

### Dramatic Art (Theatre and Dance)
- L&S

### East Asian Studies
- L&S

### Economics
- L&S

### Education
- SOE

### Energy Efficiency (Biological and Agricultural Engineering)
- ENGR

### Energy Science & Technology (Biological and Agricultural Engineering)
- ENGR

### Energy Policy (Biological and Agricultural Engineering)
- ENGR

### English
- L&S

### Environmental Geology (Geology)
- L&S

### Environmental Horticulture
- A&ES

### Environmental Policy Analysis & Planning (Environmental Science and Policy)
- A&ES

### Environmental Toxicology
- A&ES

### Evolution, Ecology and Biodiversity
- CBS

### Exercise Biology (Neurobiology, Physiology, and Behavior)
- CBS

### Fiber and Polymer Science (Textiles and Clothing)
- A&ES

### Film Studies
- L&S

### Food Service Management (Nutrition)
- A&ES

### Forensic Entomology
- A&ES

### Forensic Entomology (Entomology)
- A&ES

### French
- L&S

### Fungal Biology and Ecology
- A&ES

### Geographic Information Systems (Biological & Agricultural Engineering)
- A&ES

### Geographic Studies (Environmental Design)
- A&ES

### Geology
- L&S

### Geophysics (Geology)
- L&S

### German
- L&S

### Global and International Studies (Humanities)
- L&S

### Greek (Classics)
- L&S

### History
- L&S

### History and Philosophy of Science (Science & Technology Studies)
- L&S

### Human Development (Human & Community Development)
- A&ES

### Human Physiology (Neurobiology, Physiology, and Behavior)
- CBS

### Human Rights (Religious Studies)
- L&S

### Hydrology (Land, Air, and Water Resources)
- A&ES

### India and South Asia Studies
- L&S

### Insect Biology (Entomology)
- A&ES

### Insect Ecology and Evolution (Entomology)
- A&ES

### International Agricultural Development (Human & Community Development)
- A&ES

### International Science Studies (Land, Air, and Water Resources)
- A&ES

### Iran & South Asia Studies
- L&S

### Italian
- L&S

### Japanese (East Asian Languages and Cultures)
- L&S

### Jewish Studies (Humanities)
- L&S

### Landscape Restoration (Plant Sciences)
- A&ES

### Latin (Classics)
- L&S

### Latin American and Hemispheric Studies
- L&S

### Linguistics
- L&S

### Linguistics for Language Teachers
- L&S

### Luso-Brazilian Studies (Spanish and Portuguese)
- L&S

### Materials Science
- ENGR

### Mathematics
- L&S

### Medical-Veterinary Entomology
- A&ES

### Medieval and Early Modern Studies
- L&S

### Middle East/South Asia Studies
- L&S

### Music
- L&S

### Native American Studies
- L&S

### Nematology
- A&ES

### Neuroscience (Neurobiology, Physiology, and Behavior)
- CBS

### Nutrition and Food (Nutrition)
- A&ES

### Nutrition Science (Nutrition)
- A&ES

### Oceanography (Geology)
- L&S

### Philosophy
- L&S

### Physics
- L&S

### Plant Biology
- CBS

### Political Science
- L&S

### Precision Agriculture (Biological and Agricultural Engineering)
- A&ES

### Professional Writing (University Writing Program)
- L&S

### Public Health
- L&S

### Quantitative Biology and Bioinformatics (Biological Sciences)
- CBS

### Religious Studies
- L&S

### Russian
- L&S

### Science and Society
- A&ES

### Sexuality Studies
- L&S

### Social and Ethnic Relations (African American and African Studies, Asian American Studies, Native American Studies, Women and Gender Studies)
- L&S

### Sociology
- L&S

### Soil Science (Land, Air, and Water Resources)
- A&ES

### Spanish
- L&S

### Statistics
- L&S

### Sustainability in the Built Environment
- ENGR

### Technology Management
- GSM

### Textiles and Clothing
- A&ES

### War-Peace Studies (International Relations)
- L&S

### Watershed Science (Land, Air, and Water Resources)
- A&ES

### Wildlife, Fish and Conservation Biology
- A&ES

### Women's Studies
- L&S
INTRODUCTION
INTRODUCTION

As one of the leading institutions of higher education in the world, the University of California, Davis, is committed to serving a broad student population and society at large through the generation and advancement of knowledge and discovery. Over its 100-year history, the University of California, Davis, has grown from its early beginnings as an agricultural college into a world-class comprehensive research university. Originally founded as the University Farm in 1905, UC Davis was formally designated an independent University of California campus in 1959. U.S. News & World Report ranks UC Davis ninth among public universities nationally, and the campus is among only 62 universities admitted into the prestigious Association of American Universities (AAU).

Advancing Knowledge

A comprehensive research university, UC Davis offers 101 undergraduate majors and 94 graduate and professional degrees across four colleges and six professional schools. One-third of the 51 UC Davis doctoral programs participating in the National Research Council's 2010 Assessment of U.S. Doctoral Programs ranked in the top 25 percent in their respective fields, with six programs ranking in the top five percent. With students from across California, the nation and the world, UC Davis is home to a diverse student body numbering more than 34,000 students.

The campus’ reputation has attracted a distinguished faculty of scholars and scientists in all fields. Honors received by UC Davis faculty include five U.S. Presidential Awards, 279 National Academy memberships, 13 Fulbright Senior Scholars and two Pulitzer Prizes.

A Place for Discovery

Research at UC Davis works toward solving the world’s most difficult problems and supports California’s economic, intellectual and social development. Over the last decade, annual research funding at UC Davis increased by 150 percent, from $300 million to over $750 million. The campus’ varied research programs explore the intellectual frontiers across the sciences, humanities and arts, with particular global leadership in agricultural science and environmental sustainability.

Research is an integral part of teaching at UC Davis. Faculty members share their research findings in the classroom, and students learn firsthand about discovery while working with professors in the laboratory and field. A number of undergraduate research programs offer students the opportunity to work on a research project in a faculty laboratory, in some cases as early as their freshman year.

Leader in Public Service

In the tradition of land-grant universities, UC Davis uses knowledge and discovery in addressing the needs of the region, state, nation and globe.

The UC Davis Health System serves the needs of 6 million people in 33 counties and operates the region’s only Level 1 trauma center as well as a National Cancer Institute-designated cancer center, a comprehensive children’s hospital and a world-renowned telemedicine network. The UC Davis Veterinary Medical Teaching Hospital cares for more than 45,000 small and large animals each year. The School of Law offers community support in the areas of immigration, prison law, civil rights litigation and family protection. And since its inception in 2002, the School of Education has prepared nearly 6,000 teachers for California classrooms. The University’s most recent school, the Betty Irene Moore School of Nursing, was founded in 2009 and uniquely serves the role of increasing patient safety and creating interprofessional opportunities for nurse leaders.

Life at UC Davis

Life at UC Davis is as diverse as the members of our university community. Students enjoy sports, community internships, public service, outdoor activities, concerts and clubs.

UC Davis is known for its student-run facilities; the Coffee House, the radio station KDVS and the Unitrans bus service provide paid employment and real-world experience to hundreds of students each year. Some 70 percent of UC Davis students interested in gaining work experiences participate in internships locally, nationally and globally through the Internship and Career Center, among the largest university-based academic internship programs in the country.

A cultural center in the region, the Robert and Margrit Mondavi Center for the Perforing Arts features internationally known artists and speakers and showcases the university’s music and theatre and dance departments. Museums and galleries house valuable teaching, research and general interest collections that range from the Bohart Museum of Entomology’s insects to contemporary Native American art at the C.N. Gorman Museum. In 2014, the University broke ground for a way to showcase its art collections with the construction of the Jan and Maria Manetti Shrem Art Museum.

In 2007, UC Davis made the transition to Division I of the National Collegiate Athletic Association. UC Davis sponsors 14 varsity sports for women and nine for men. Thirty-seven club sports, organized by students, compete against other area colleges. Intramural sports annually draw some 19,000 students who participate in 60 different men’s, women’s and coed activities.

A city of more than 65,000 people, Davis is known as an environmentally aware, physically fit and socially innovative community. The city was named best bicycle community in the U.S. by the League of American Bicyclists (the only city ever to receive platinum recognition) and has more than 103 miles of dedicated bike lanes and paths and nearly 500 acres of parks and greenbelts. Davis’ proximity to the state capital, Lake Tahoe and the San Francisco Bay Area makes it easy to take advantage of big-city attractions while enjoying the lifestyle of a university town.
THE UNIVERSITY OF CALIFORNIA

UC Davis is one of 10 campuses of the University of California, which was chartered as a land grant college in 1868 and has become the country’s premier system of public higher education. Together, the campuses have an enrollment of more than 240,000 students, with more than 1.7 million alumni living and working around the world. Some 150 laboratories, extension centers, research and field stations strengthen teaching and research while providing public service to California and the nation. The collections of the more than 100 UC campus libraries are surpassed in size in the United States only by that of the Library of Congress.

VISITING THE CAMPUS

UC Davis Welcome Center
530-752-8111; http://visit.ucdavis.edu

Welcome Center operating hours are 8:00 a.m.-5:00 p.m., Monday-Friday and 9:00 a.m.-3:00 p.m. Saturday and Sunday. Monday-Friday campus tours are offered at 9:00 a.m. and 1 p.m. Saturday and Sunday tours are offered at 11:00 a.m. Over-the-counter admissions advising is offered seven days per week at the Welcome Center. To register for a tour, visit http://visit.ucdavis.edu or call 530-752-8111. If you have questions regarding application procedures or entrance requirements, write or visit the UC Davis Welcome Center at 550 Alumni Lane, Davis, CA 95616.

THE UNDERGRADUATE COLLEGES

The College of Agricultural and Environmental Sciences

The College of Agricultural and Environmental Sciences offers a diverse program of majors and courses and is committed to education that emphasizes a spirit of discovery. Based on the premise that tomorrow’s citizens will need to anticipate, understand and solve emerging societal problems and contribute to the discovery and application of new knowledge, the college fosters:

• Critical thinking and an appreciation for diversity in thought and approaches to problem solving
• An ethos of lifelong learning—of teaching oneself and others while confronting challenges and solving problems
• An ability to move beyond either/or thinking and to pursue innovative and integrative understanding of the agricultural sciences, environmental sciences and human sciences
• Intellectual skills that prepare individuals to secure a life-affirming physical and cultural environment based on sound, respectful management of resources
• A commitment to serve the public with informed and open-minded dedication to understanding, critiquing and addressing complex societal needs and interests

The college is proud of its rich agricultural history. From this foundation, it has expanded its educational offerings to encompass programs that highlight interconnections among the environment, plant and animal sciences, biological sciences and human sciences. Through a wide array of major programs, the college prepares high-potential students for advanced studies in diverse disciplines and leadership in such arenas as public policy; research and development; managerial and natural resource economics; agricultural systems; environmental protection, safety and design; human nutrition, health and development; and the food, fiber, textile and apparel industries.

Undergraduate students enjoy early contact with faculty advisers, graduate students and postgraduate researchers, enriching and broadening the educational experience of all.

Several levels of academic advising are available that are designed to enhance your undergraduate experience. Advisers help you plan your courses, meet degree requirements and take maximum advantage of the resources available at UC Davis. You are encouraged to meet regularly with your assigned faculty adviser and with the Advising Associates and departmental peer advisers. Through a shared commitment to education for service to society, college faculty, staff and students work together to improve the relationship between humanity and the natural world.

The College of Biological Sciences

Biology Academic Success Center
1023 Sciences Laboratory Building
530-752-0410; http://biosci.ucdavis.edu/BASC

The mission of the College of Biological Sciences is to prepare students to fully engage and actively participate in all areas of the exciting and rapidly expanding field of biology. Courses offered by the college span the basic biological disciplines of biochemistry, behavior, cell biology, evolution, ecology, genetics, physiology and neurobiology and apply these concepts to the study of microbes, plants and animals ranging from genetic model organisms to humans. Recent additions to the curriculum, including courses in genomics, bioinformatics and computational biology, reflect the profound changes sweeping biology as new technologies enable new areas of research.

Coursework in the college’s majors is rich in hands-on laboratory instruction as well as lectures and seminars. Every department in the College offers laboratory courses in the Sciences Laboratory Building—a state-of-the-art facility featuring advanced instrumentation and a student-friendly environment. In addition, many students in the college participate in laboratory research and internships that enable them to bridge classroom experiences to life beyond the university.

Biology is integral to a multitude of career options. Whether interested in a professional career in the health sciences, research, education, environmental work, business, law, administration, pharmaceutical sales or communications, students in the College of Biological Sciences receive the attention and preparation they need to excel in their chosen field.

To learn more about the nine majors offered through the College of Biological Sciences, see our website at http://biosci.ucdavis.edu/BASC, select Students, then Undergraduate Students, and then select Learn about the Majors Offered.
Introduction

University of California, Davis

Principles of Community

The UNIVERSITY OF CALIFORNIA, DAVIS, is first and foremost an institution of learning and teaching, committed to serving the needs of society. Our campus community reflects and is a part of a society comprising all races, creeds, and social circumstances. The successful conduct of the University’s affairs requires that every member of the University community acknowledge and practice the following basic principles:

WE AFFIRM THE DIGNITY inherent in all of us, and we strive to maintain a climate of justice marked by respect for each other. We acknowledge that our society carries within it historical and deep-rooted misunderstandings and biases, and therefore we will endeavor to foster mutual understanding among the many parts of our whole.

WE AFFIRM THE RIGHT of freedom of expression within our community and also affirm our commitment to the highest standards of civility and decency towards all. We recognize the right of every individual to think and speak as dictated by personal belief, to express any idea, and to disagree with or counter another’s point of view, limited only by University regulations governing time, place, and manner. We promote open expression of our individuality and our diversity within the bounds of courtesy, sensitivity, and respect.

WE CONFRONT AND REJECT all manifestations of discrimination, including those based on race, ethnicity, gender, age, disability, sexual orientation, religious or political beliefs, status within or outside the University, or any of the other differences among people which have been excuses for misunderstanding, dissension, or hatred. We recognize and cherish the richness contributed to our lives by our diversity. We take pride in our various achievements, and we celebrate our differences.

WE RECOGNIZE that each of us has an obligation to the community of which we have chosen to be a part. We will strive to build a true community of spirit and purpose based on mutual respect and caring.

The “Principles of Community” were prepared and adopted after extensive discussion within the campus community about the need for a statement that reflects UC Davis’ commitment to a learning environment characterized by diversity, understanding and the acceptance of all people. This statement of common principles was published on April 20, 1990, carrying the endorsement of Chancellor Theodore L. Hullar and the leadership of the Davis Division of the Academic Senate, the Academic Staff Organization, the UCD Staff Assembly, the UCDMC Staff Assembly, the Associated Students of UC Davis (ASUCD), and the Graduate Student Association.
Mission Statement:

Philosophy of Purpose

The core purpose of UC Davis as a comprehensive research university is the generation, advancement, dissemination and application of knowledge. To that end, UC Davis is committed to offering leading programs throughout the academic disciplines and in its professional schools. These programs integrate three purposes: teaching students as a partnership between faculty mentors and young scholars; advancing knowledge and pioneering studies through creative research and scholarship; and applying that knowledge to address the needs of the region, state, nation and globe. UC Davis is committed to the land-grant tradition on which it was founded, which holds that the broad purpose of a university is service to people and society.

UC Davis offers its undergraduates an experience which comprises the central elements of a liberal education—a broad general education with specialization in a scholarly discipline—and opportunities for personal development and academic enrichment through undergraduate research, work-learn experiences and extracurricular student life. To its post-baccalaureate students, UC Davis offers an array of programs which draw upon its wide range of specialized academic fields. By stimulating cross-disciplinary approaches and using its distinctive graduate groups, UC Davis continues to follow and redefine the mandate of a major research university.

The campus is committed to advancing teaching and scholarly work in the arts, humanities and the social sciences—studies that enrich the life of each person and society as a whole, and infuse the pursuit of careers in education, law, management and medicine. UC Davis’ prominence in the STEM fields, including distinguished programs in agricultural and environmental sciences, make the campus a leader in solving critical issues in local, state, national and global health and sustainability.

UC Davis extends service to the region, state, nation and the world in many forms, such as cooperative extension to agriculture and education; medical services to central California and beyond through the multifaceted UC Davis Health System in Sacramento; University Extension programs that share knowledge with the region; the emerging work of the World Food Center; voluntary contributions of faculty, staff and students; and athletic and cultural programs for the campus and community at large.

UC Davis is surrounded by vibrant, local communities and its proximity to the state capital gives this outreach urgency and opportunity. Collaborative studies and cooperation between UC Davis and state agencies and the Legislature are both a special responsibility and a unique opportunity. UC Davis is characterized by a distinguished faculty, a dedicated and high-achieving staff and students of great potential and accomplishment. As we move forward, we recognize that our continued excellence is dependent upon our ability to diversify our university community, consonant with the citizenry of California.
Educational Objectives for Students

The Educational Objectives for Students were adopted by the Academic Senate in April 2002. They articulate our aspirations for student learning; help to establish campus priorities and guide decision making related to student development; and guide academic programs in the review of how their classes and course requirements interact with the goals to demonstrate educational effectiveness.

- **Develop effective communication skills:**
  Written, oral, interpersonal, group

- **Develop higher cognitive skills:**
  Critical thinking, creativity, analytical ability

- **Cultivate the virtues:**
  Ethics, responsibility, honor, tolerance, respect for others, empathy

- **Develop focus and depth in one or more disciplines**

- **Develop leadership skills:**
  Ability to stimulate and direct collaborative learning and collaborative action

- **Develop a global perspective:**
  Broad intellectual and cultural experience through active engagement, an understanding of the interactions among the individual, society, and the natural world

- **Prepare for lifelong learning:**
  Independent thinking and learning, learning to find information, asking the right questions
The College of Engineering

Dean’s Office
1050 Kemper Hall
http://www.facebook.com/UCEEEngineering

The College of Engineering at UC Davis is among the top engineering colleges in the nation.

With a strong record of academic excellence, a rich tradition of interdisciplinary research and a diverse and distinguished faculty, the College's undergraduate program has earned a place among our nation's top twenty public undergraduate colleges of engineering and among the top forty public university graduate engineering programs.

With an enrollment of 3,460 undergraduates and 1,130 graduate students, the College is one of the largest undergraduate engineering colleges in the University of California system.

We have 198 engineering faculty, with 16 current and emeriti members named to the National Academies of Engineering, Science and Medicine.

The Engineering Accreditation Commission of ABET (http://www.abet.org) accredits the following ten programs:

- Aerospace Science and Engineering
- Biochemical Engineering
- Biological Systems Engineering
- Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Materials Science and Engineering
- Mechanical Engineering

The Engineering Accreditation Commission and the Computing Accreditation Commission of ABET accredit the following program:

- Computer Science and Engineering

The College maintains a long-standing commitment to undergraduate students, preparing them to contribute to the engineering professions as well as ongoing engineering research. To that end, our academic programs balance the fundamentals of engineering theory with practice, visionary research with practical application—preparing students for entry into engineering practice and graduate-level research.

Undergraduate research experiences and mentoring services smooth the transition from undergraduate to graduate study at UC Davis. Undergraduates are able to interact with faculty and graduate students from ten graduate engineering programs as well as researchers from a broad spectrum of disciplines university-wide. Award-winning faculty researchers strive to develop more effective, real-world solutions to society's most complex problems in the uniquely friendly, open-society of collaborative, cross-disciplinary and rigorous scholarship for which UC Davis is widely known. Undergraduates have opportunities to be contributing members of this rich learning environment.

In the proud tradition of America's great land-grant research universities, the UC Davis College of Engineering integrates teaching, research and service to society. While advancing the leading edge of engineering knowledge, the College trains the next generation of engineers who will make a difference in our world.

The Department of Biological and Agricultural Engineering combines study in engineering with instruction in the biological sciences to solve challenging environmental and technical problems.

The Department of Biomedical Engineering educates students in a highly interdisciplinary combination of the biological sciences and engineering as this combination applies to medicine.

The Department of Chemical Engineering and Materials Science offers curricula integrating knowledge of chemistry, biological sciences or materials science and engineering that enable students to solve problems in both current and future manufacturing technologies or to analyze the structure, properties and behavior of materials.

The Department of Civil and Environmental Engineering educates students to plan and design safe and sustainable infrastructure systems that have a direct impact on the quality of human life and on health and human productivity.

The Department of Computer Science offers programs in all aspects of the design and use of computer hardware and software systems. The department also plays a significant service role for programs throughout the campus.

The Department of Electrical and Computer Engineering offers programs in research and education crucial for the continued success of high technology industries in California and the nation, preparing students to design, analyze and use electronic and computer systems effectively.

The Department of Mechanical and Aerospace Engineering educates students in the design and manufacture of complex engineering systems for transport, industry or energy and in the design, manufacture and operation of aircraft and aerospace structures.

Every effort has been made to provide engineering students with the maximum flexibility consistent with rigorous professional education standards. The key to flexibility is academic advising. You are expected to attend the New Student Orientation program, held the summer before your first quarter on campus. New Student Orientation sessions can give you the information you need to make your academic experience both rewarding and effective. As an incoming student, you will be given the name and office hours of your departmental staff adviser; you should arrange to meet with your adviser before you register for courses for the first time. Academic and peer advisers in the Undergraduate Advising Office in 1050 Kemper Hall supplement departmental advisers.

Undergraduate education in engineering at UC Davis serves as a sound basis for beginning professional practice in engineering design and development, as a preparation for careers in corporate or governmental operations and as a foundation for graduate study. To these ends, the College emphasizes fundamental sciences to give students the maximum postgraduate flexibility. In order to remain relevant in a quickly changing technical world, engineering education must be based on fundamentals or rapidly become obsolete.
Engineers will continue to face new challenges in the race to improve the quality of life for everyone and keep our state and nation competitive in the global marketplace.

As part of one of the nation's 76 land-grant institutions, UC Davis Engineering's mission is to help maintain the United States' technical leadership and advance technology for the benefit of everyone.

**The College of Letters and Science**

Undergraduate Education and Advising Office
200 Social Sciences and Humanities Building
530-752-0392; [http://www.ls.ucdavis.edu](http://www.ls.ucdavis.edu)

The College of Letters and Science provides students with the opportunity to actively engage the central academic disciplines of the university. The largest of the four undergraduate colleges at UC Davis, the College of Letters and Science offers the majority of the campus' general education courses, more than 50 major programs of study and thousands of courses per year across a broad range of subject areas. Its nearly 500 faculty members are organized into three Divisions—Humanities, Arts and Cultural Studies; Mathematical and Physical Sciences; and Social Sciences. The college confers Bachelor of Arts (A.B.), Bachelor of Science (B.S.) and Bachelor of Arts and Science (B.A.S.) degrees.

The College of Letters and Science is a community of scholars and students sharing a commitment to liberal education rather than to specialized, vocationally-oriented training. The college exposes you to the worlds of human experience, of ideas, of artistic accomplishments and of matter and things. Within this curriculum you are able to explore a variety of academic fields, engage in the pursuit of fundamental knowledge and gain the capacity for independent study and thought. By learning to think carefully and critically, you will be able to continue the ongoing process of education that begins in the classroom but continues over a lifetime. You will have learned how to learn—the ultimate objective of a liberal arts education.

The educational goals of the college are reflected in the three primary groups of requirements established by the faculty: the English Composition Requirement, the Foreign Language and Area Requirements and the Major Requirements.

The English Composition Requirement ensures that you are well versed in written communication skills.

The Foreign Language and Area Requirements provide you with a broad background of knowledge, guide you in an exploration of the interdependencies of knowledge and acquaint you with other cultures.

The College of Letters and Science acknowledges the value of language learning and encourages students to acquire proficiency in a foreign language before graduating from UC Davis. The goals of language learning are the following: communicating complex ideas in the target language; acquiring understanding of a variety of cultural perspectives and differences; fostering intercultural communicative competence; gaining access to cultural production from another time and place; enhancing knowledge of other disciplines through the target language; recognizing the nature and structure of languages, including one's own; and developing the capacity to participate actively in multilingual communities both at home and abroad.

The Major Requirements provide you with intellectual depth and competence in a selected area of study.

The college has a well-developed system of faculty advisers, professional staff advisers and student peer advisers who are available for individual consultations with undergraduates in a variety of settings, from the college undergraduate education and advising office to departmental offices to campus residence halls.

The strength of the college lies in the faculty's commitment to advancing the frontiers of human knowledge through research, artistic expression and other creative endeavors and to the effective communication and application of that knowledge through teaching and public service. Together, faculty and students in the College of Letters and Science create a climate that enables students to achieve their highest potential.

**GRADUATE STUDY**

Office of Graduate Studies
250 Mrak Hall
530-752-0650; [http://gradstudies.ucdavis.edu](http://gradstudies.ucdavis.edu)

Graduate students at UC Davis have the opportunity to work with and learn from accomplished faculty, recognized for their contributions to research in their fields. The Office of Graduate Studies oversees nearly 100 graduate programs leading to master’s and doctoral degrees, which together enroll approximately 4,800 graduate students. Many graduate programs are offered through graduate groups, an interdisciplinary concept that allows students to study and work with faculty in interrelated areas to broaden their intellectual experiences; see Graduate Studies, on page 110.

**PROFESSIONAL STUDY**

UC Davis has six professional schools—the School of Law (J.D.), the School of Medicine (M.D.), the School of Veterinary Medicine (D.V.M., M.P.V.M.), the School of Education (M.A., Ph.D., Ed.D.), the Betty Irene Moore School of Nursing (M.S., Ph.D.), and the Graduate School of Management (M.B.A.). These schools and programs are described in later chapters.
**ACADEMIC RESOURCES**

**The University Library**
530-752-8792; [http://www.lib.ucdavis.edu](http://www.lib.ucdavis.edu)

The University Library is an integral part of the University of California, Davis, one of the top 100 research university libraries in the U.S. It also participates in and benefits from the collective activities of the University of California's system of libraries and the California Digital Library. The library's omnidisciplinary and highly regarded collections and research services have long supported the faculty, students and researchers of the university, as well as the health care professionals of the UC Davis Health System and the citizens of California.

The Library's vision is to be the academic hub of UC Davis, advancing research, education and innovation in a networked world. The Library will be an interdisciplinary resource for the entire community that enables transformative research and education through its provision of critical scholarship, tools, and services.

The University Library is comprised of four facilities: the Peter J. Shields Library, the Physical Sciences & Engineering Library, the Loren D. Carlson Health Sciences Library, and the F. William Blasdell Medical Library in Sacramento. The combined collections of the various University Library facilities total more than 4 million volumes. An extensive variety of journal titles, government documents, maps, microfilms, media, and other formats are also part of the collection, including over 600,000 ebooks. The law library, administered by the School of Law, is located in King Hall.

Library services and resources information is available at the Library's website; [http://www.lib.ucdavis.edu](http://www.lib.ucdavis.edu). In addition, the library's online catalogs identify library collections at UC Davis and at the other nine UC campuses which include full-text electronic journals and ebooks. The Library provides classes on the use of the online catalogs, as well as subject specific electronic journals and databases. Librarians are available for consultation to effectively and efficiently identify and use information resources for research projects and dissertations. Research workstations are available for patron use in all library facilities. The campus wireless network is available within all libraries and connects authorized laptop users to library and campus resources and services.

**UC Davis Arboretum and Public Garden**

Arboretum and Public Garden Headquarters
530-752-4880; [http://arboretum.ucdavis.edu](http://arboretum.ucdavis.edu)

UC Davis—already known for its heritage trees and park-like atmosphere—elevated the profile of its outdoor spaces by launching the UC Davis Arboretum and Public Garden in 2011. Through close partnerships with students, academic departments, and community members, the UC Davis Arboretum and Public Garden seeks to provide a visitor-friendly, living museum complete with educational and sustainable landscapes that showcase our campus’ academically-diverse expertise hand-in-hand with programs that allow for a wide-range of community participation including student internships, volunteer opportunities, and all-ages programming highlighting the arts and sciences.

One of the gems of the campus landscape is the 103-acre UC Davis Arboretum, founded in 1936, which contains a documented collection of more than 50,000 trees, shrubs and perennials from Mediterranean-climate areas throughout the world. Here visitors enjoy winding paths for walking, jogging, and bicycling, benches for enjoying the views, and picnic tables for casual gatherings. Demonstration gardens of drought-tolerant flowering perennials and collections of California native plants, oaks, acacias, conifers, and eucalyptus are resources for teaching and research; these landscapes also serve as a backdrop for a diverse array of events in addition to operating as an outdoor gallery for student and community-created art.

Students are integral to the Arboretum and Public Garden’s vision for transforming our campus grounds into an engaging outdoor experience through internship opportunities in sustainable horticulture, arts in the environment, education, and museum science. Students gain leadership skills and expertise in areas including nursery management, landscape design, geographic information systems (GIS), project management, exhibit development, and sustainable farming. Students, as well as community members, are also invited to volunteer for short-term projects ranging from event management to garden planting.

Although still in its infancy, the UC Davis Arboretum and Public Garden is gaining national attention for its sustainable landscape management as well as its practice of harnessing community collaboration to enhance the visitor experience.

**Information and Educational Technology**

IT Express
530-754-HELP (4357); [ithelp@ucdavis.edu](mailto:ithelp@ucdavis.edu)

Information and Educational Technology (IET) provides a wide range of services and support to undergraduate and graduate students. For more information, and to access those services, see the Student Computing Guide at [http://studentcomputing.ucdavis.edu/](http://studentcomputing.ucdavis.edu/).

**Taking Care of Business Online**

- Enroll in classes, add or drop courses, view and print your class schedule
- Access course grades
- View and print your unofficial academic record
- Check balances, view bills, make payments, and manage your student account
- Apply for and view financial aid awards
- Chart and plan your degree; see [http://sisweb.ucdavis.edu/](http://sisweb.ucdavis.edu/)
- Make campus bookstore purchases; see [http://ucdavisstores.com](http://ucdavisstores.com)

**Learning and Teaching with Technology**

- Manage coursework and collaborate online with SmartSite. You can use it to communicate with your instructors and fellow students; collaborate on papers and projects; manage assignments and study with classmates; or just set up your own project site; see [http://smartsite.ucdavis.edu](http://smartsite.ucdavis.edu)
- Searchable electronic databases. Find them at Shields Library. You’ll have free, easy access from on- or off-campus; see [http://www.lib.ucdavis.edu](http://www.lib.ucdavis.edu)
- iTunes, YouTube and podcasting. Digital audio recording equipment is installed in several lecture halls, and portable digital recorders are available for rental from IET-Academic Technology Services (Surge II). Audio and video podcasting services are available to all instructors and campus groups; see [http://podcasting.ucdavis.edu & http://itunes.ucdavis.edu](http://podcasting.ucdavis.edu & http://itunes.ucdavis.edu)
• Classroom technology. All 128 general assignment classrooms have audio, network and projection capabilities, and include a projector, CD player, DVD player, VCR, built-in microphone and laptop hook-up. Classrooms with more than 30 seats also have assistive hearing systems; see http://iet.ucdavis.edu/rooms/classrooms.cfm

The Essentials: Computers, Email, Software, Labs

• Email. Every student has a free Gmail-based email account; see http://davis.ucdavis.edu

Computer purchases. Our recommendations can help guide your purchases. Financial aid is available for qualified applicants; see http://computerownership.ucdavis.edu. To buy computers and accessories at the campus bookstore, see http://ucdavisstores.com

• Software. Various programs are available free of charge or at a discount; see http://software.ucdavis.edu

• The Virtual Lab lets you remotely log on to software in IET's computer labs after hours; see http://virtuallab.ucdavis.edu

• Multimedia. You'll want to check out the video, audio, and graphic design software, as well as printers, scanners, etc., in the IET Media Lab; see http://clm.ucdavis.edu/rooms/rooms.html#medialabs

• Computer rooms. Computer classrooms and labs distributed around the campus provide access to PCs, Macs and printers. Some labs have both Mac and PC computers, and many have extended hours during the week; see http://iet.ucdavis.edu/rooms

• Printing. All computer rooms are equipped with printers, and seven rooms also have color printing; see http://clm.ucdavis.edu/rooms/printing. You may also send a print job from your computer, over the Internet, to any printer in five locations; see http://wirelessprinting.ucdavis.edu

Networking

• Wireless Internet. MoobilenetX is the campus secure wireless network. You can access it throughout much of the central campus, including Shields Library and the Memorial Union. For access requirements and instructions, see http://wireless.ucdavis.edu

• Wired Internet. Students living on campus can connect to the Internet by using ResNet, the high-speed residence hall network. Each residence hall also has a computer center with computers, printers, and scanners; see http://www.housing.ucdavis.edu/computers/

Security

Computer security. Blocking computer viruses and preventing unauthorized access to computing systems are important parts of campus computing life. Keep up with campus security efforts, review instructions on how to maintain your computer system, and guard against security problems, including compromised passwords and identity theft; see http://security.ucdavis.edu.

Technical Support


RESEARCH PROGRAMS AND RESOURCES

Organized Research Units

Organized Research Units (ORUs) are campus-wide interdisciplinary research programs that further the university's missions of teaching, research and public service, but do not offer courses of instruction. Members of an ORU come from more than one department and normally from more than one school, college division.

Air Quality Research Center (AQRC)

3050 Bainer Hall 530-754-6558
Anthony Wexler, Director; awexler@ucdavis.edu http://airquality.ucdavis.edu/

The Air Quality Research Center provides support for teams of collaborative researchers to conduct scientific, engineering, health, social and economic research to inform planning and regulations for air quality and climate change. The AQRC educates through conferences, outreach, scholarly publications, and training grants. Researchers at UC Davis employ theoretical approaches, mathematical models, measurements in the field and in laboratories, and policy analysis to tackle state, federal and intercontinental air quality problems. The center is composed of over 60 faculty and research staff members from six schools and colleges across campus. This breadth of expertise allows us to take a broad, interdisciplinary approach to air-quality problem solving.

Bodega Marine Laboratory and Reserve

Bodega Marine Laboratory
P.O. Box 247
Bodega Bay, CA 94923
707-875-2211; Fax 707-875-2009
ucbml@ucdavis.edu, http://bml.ucdavis.edu

The Bodega Marine Laboratory is dedicated to research and teaching in marine science. Research areas include: Ecology and Evolution—invasive species, biodiversity, community ecology, etc., Coastal Oceanography—upwelling, estuaries and land runoff, nearshore hydrodynamics, ocean observing, Ocean Health—developmental and reproductive toxicology, shellfish health, environmental assessment, Physiology—comparative physiology and biochemistry, reproductive physiology, seagrass and seaweed physiological ecology, Conservation—fisheries management, marine protected areas, endangered species restoration, Climate Change—ecological impacts, ocean acidification, paleoceanography. Well-equipped facilities feature running seawater in two classrooms and many laboratories, a marine science library, lecture hall, housing facilities, computer labs, state of the art microscopy imaging facility, experimental climate change facility, greenhouses, experimental freshwater system for anadromous/estuarine invertebrate and fish studies, network of automated environmental sensors on marine and terrestrial habitats, 42-foot research vessel and various small boats, and a dive locker and air station. Faculty teach a number of undergraduate and graduate courses during the academic year and summer session. The laboratory is located in Bodega Bay, Sonoma County, 100 miles west of Davis.
The Bodega Marine Reserve, part of the UC Natural Reserve System, is 362 acres of remarkably diverse habitats, including an excellent rocky intertidal zone, sand beaches, saltmarsh, lagoon tidal flats, freshwater marsh, coastal prairie and dunes. The reserve also administers adjacent subtidal sand and rock habitats in a marine life refuge. Areas of research include a broad spectrum of field studies of plants and animals in coastal marine, intertidal and terrestrial ecosystems.

**California National Primate Research Center**

Primate Center
530-752-0447; [http://www.cnprc.ucdavis.edu](http://www.cnprc.ucdavis.edu)

The California National Primate Research Center (CNPRC) investigates selected human health problems for which the nonhuman primate is the animal model of choice. Research programs include brain, mind and behavior, reproductive sciences and regenerative medicine, respiratory diseases, infectious diseases, immunology, stem cell biology, gene therapy, genetics and a variety of biomedical collaborative research projects. Self-sustaining breeding colonies of macaques are available for study of behavior and spontaneously occurring disorders.

**Center for Health and the Environment**

530-752-1340; [http://che.ucdavis.edu/](http://che.ucdavis.edu/)

The Center for Health and the Environment (CHE) coordinates and engages in interdisciplinary research on environmental agents, including chemicals and radiation, and health outcomes in humans, animals and other organisms. Researchers conduct epidemiologic studies in human populations, as well as experiments in whole animals, organisms, cells and molecules. Research on the development of agents for population control of humans and wildlife seek to mitigate the adverse effects of overabundance on the environment. Studies on toxic, radioactive, mutagenic, carcinogenic and teratogenic compounds are carried out in special animal holding facilities. Laboratories are equipped for studies in analytical chemistry, biochemical toxicology, cell and molecular biology, endocrinology, inhalation toxicology, morphology and reproductive and developmental biology. The Center houses a major university-wide program and federally funded center in occupational and agricultural medicine, nanotechnology and, a School of Medicine program in reproductive biology.

**Crocker Nuclear Laboratory**

530-752-1460; [http://crocker.ucdavis.edu](http://crocker.ucdavis.edu)

The Crocker Nuclear Laboratory is an interdepartmental laboratory for the application of nuclear science to a variety of disciplines, including air pollution and visibility, nuclear physics and chemistry, medical therapy with proton beams, material damage studies, and the effect of background and extraterrestrial radiation on electronic components.

**Institute for Data Analysis and Visualization**

2343 Academic Surge 530-752-0481
Kenneth Joy, Director; kjoy@ucdavis.edu
[http://idav.ucdavis.edu](http://idav.ucdavis.edu)

The mission of the Institute is the integration of research efforts at UC Davis in data analysis and visualization. The Institute draws students and faculty from a variety of departments and colleges, allowing researchers to work together on real-world, applied problems that deal with the massive data analysis and visualization problems encountered in science, engineering, and other fields. The integration of the two fields, especially in biological applications of high throughput biological assay data such as gene expression arrays, proteomics, metabolomics and NMR spectroscopy, produce methods that impact a substantial number of scientific fields. In neuroscience, computer science, computational science, computational physics, and engineering applications, the Institute contributes data exploration and problem-solving methods through visualization, computer graphics, data analysis, and expressive interfaces that enable discovery and analysis from massive information streams. The collaborative efforts of the faculty and students of the Institute enable the University to address a wide-variety of application areas and contribute methods that enable scientists and engineers to make decisions from their data.

**Institute of Governmental Affairs**

469 Kerr Hall 530-752-0966; Fax 530-752-8666; [http://www.iga.ucdavis.edu](http://www.iga.ucdavis.edu)

The Institute of Governmental Affairs (IGA) serves as a research base for social science faculty at UC Davis. IGA serves approximately 60 faculty from 10 campus departments as well as scholars visiting from throughout the United States and around the world.

Located in the center of the UC Davis campus, IGA houses eight formal research programs: Center for International Data; Center for State and Local Taxation; Center for the Evolution of the Global Economy; Conflict Processes Group; Economy, Justice and Society (EJS); Migration Dialogue; the Network Sciences Group; the Public Opinion Workshop, and the Rural Economies of the Americas Program (REAP).

Specialized services include grant advising, preparation and administration; research program development; library and data services; social science computing, programming and statistical consulting; seminar, workshop and conference organization; and much more. The institute sponsors an active public affairs program and enhances the education of students by providing research opportunities. IGA serves as the UC Davis liaison to the system-wide program, Institute on Global Conflict and Cooperation (IGCC) and the All-UC Group in Economic History.

**Institute of Transportation Studies**

West Village, 1605 Tilia St, Suite 100; 530-752-6548
Dan Sperling, Director; dsperling@ucdavis.edu
[http://www.its.ucdavis.edu](http://www.its.ucdavis.edu)

The Institute of Transportation Studies conducts multidisciplinary research on complex problems related to the transportation system and disseminates research results to the broader academic and professional community. Research priorities are travel behavior, alternative-fueled vehicle technology and policy, energy and environmental projects and advanced vehicle and highway systems. About 60 faculty members and 130 graduate students from more than 13 academic disciplines, including four Engineering departments, Economics, Environmental Science and Policy, Ecology, Agricultural and Resource Economics, and the Graduate School of Management, participate in the research activities of the Institute. The Institute administers a graduate program in Transportation Technology and Policy, and a number of research centers, including the National Center for Sustainable Transportation, the UC Davis Energy Efficiency Center (EEC), the UC Davis Plug-In Hybrid Electric Vehicle (PH&EV) Center, the Sustainable Transportation Energy Pathways (NextSTEPS) program, the UC Davis Western Cooling Efficiency Center (WCCE), the China Center for Energy and Transportation (C-CET), and the Urban Land Use and Transportation Center (ULTRANS).
John Muir Institute of the Environment
Mark Schwartz, Director 530-754-9135
The John Muir Institute of the Environment (JMIE) supports innovation and discovery aimed at solving real-world environmental problems. The Institute’s faculty are committed to strengthening the scientific foundation for environmental decision making through collective entrepreneurship, a team-oriented approach that recognizes the complexities of environmental problems and the societal context in which they occur. JMIE champions science and technological innovation, provides campus-wide leadership, hosts centers and projects, and seeds research and educational initiatives to solve real-world environmental problems. The Institute links science and technology to policy by providing the intellectual setting for interactions between researchers, regulatory agencies, policy-makers and the public.

Nanomaterials in the Environment, Agriculture and Technology (NEAT)
4415 Chemistry Annex 530-752-3292
Alexandra Navrotsky, Director; anavrotsky@ucdavis.edu
http://neat.ucdavis.edu/
NEAT is a multidisciplinary research and education program linking the fundamental physics, chemistry, and engineering of small particles and nanomaterials to several challenging areas of investigation, including applications in ceramic, chemical, electronic, environmental, and agricultural technology; environmental transport and transformation and the resulting factors of environmental pollution and remediation; and interactions with the biosphere, especially microorganisms and the consequential effects on health.

Program in International and Community Nutrition
Kathryn G. Dewey
3283 Meyer Hall
530-752-1992; Fax 530-752-3406; hgdewey@ucdavis.edu
http://picn.ucdavis.edu
Faculty members of the Program in International and Community Nutrition are studying the epidemiology and causal mechanisms of the major nutritional problems of human populations in low-income countries and in disadvantaged ethnic minority groups in the United States, with the ultimate objective of planning, implementing and evaluating programs to ameliorate these problems. Current areas of research include maternal and child nutrition, control of micronutrient deficiencies, determinants of food intake, nutrition and infection, nutritional assessment, and food and nutrition programs and policy.

Additional Research Centers and Resources

Adult Fitness Program
UC Davis Sports Medicine Program
916-734-6805
The UC Davis Adult Fitness Program is designed to help individuals improve their health and physical fitness to prevent disease and improve quality of life. Our team of exercise specialists includes sports medicine physicians, exercise physiologists and nutritionists trained by UC Davis Sports Medicine, Exercise Biology and Nutrition Faculty in exercise testing and prescription and sports nutrition. This program exists to provide a public health service to the university and surrounding communities; to provide clinical learning opportunities for UC Davis students; to provide opportunities to study the benefit of exercise and proper nutrition in the prevention of disease and assist individuals in evaluating their progress through discounted repeat testing and evaluation.

Advanced Highway Maintenance & Construction Technology (AHMCT) Research Center
Academic Surge 1003 530-752-5981
Steve Velinsky, Director; savelinsky@ucdavis.edu
Bahram Ravani, Director; bravani@ucdavis.edu
http://www.ahmct.ucdavis.edu/
In cooperation with state, federal, and private agencies, the Center for Advanced Highway Maintenance and Construction performs applied and basic research to develop innovative technologies in the areas of highway and civil infrastructure construction, maintenance, and operations. Our ultimate goal is the deployment of these technologies. Our efforts center on safety, mobility, lean operations, reliability, and the minimization of environmental impacts. To achieve these aims, we combine and leverage advanced automation and robotics, information technology, sensing and mechatronics, design and sustainability, life-cycle analysis, and advanced communication and computer technologies.

The Center also helps Caltrans access university and industry research, maintain a leadership position in maintenance and construction technology, access federal and pooled funds for research, test and evaluate new technologies, improve the Caltrans public image as a technology-oriented organization, and train students and professionals in transportation operations and technology.

Advanced Materials Characterization and Testing Laboratory (AMCaT)
Kemper Hall, lower level
Lab Manager: Fred Hayes; fahayes@ucdavis.edu
The AMCaT labs place their major emphasis on analytical electron microscopy (micro analysis) in the material sciences. The vision and goal of AMCaT is to embrace and support a multi-disciplinary user base of students (undergraduate and graduate), post doctoral fellows, and faculty researchers at UC Davis. The facility also offers its users a variety of sample preparation equipment, a light microscopy lab with image analysis, an x-ray lab, and a materials testing lab. AMCaT supports numerous lab classes in engineering.

Advanced Transportation Infrastructure Research Center Facility (ATIRC)
West Campus
John Harvey, Director (UCPRC); jtharvey@ucdavis.edu
The UC Davis Advanced Transportation Infrastructure Research Center (ATIRC) project provides a facility for two research programs: the UC Pavement Research Center (UCPRC) and the Advanced Highway Maintenance and Construction Technology Research Center (AHMCT). Research at the UCPRC at ATIRC includes accelerated pavement testing of new types of materials and pavement structures using the Heavy Vehicle Simulators, laboratory specimen preparation and testing, and analyses. ATIRC houses the UC Davis staff of the UCPRC.
Agricultural Sustainability Institute
Thomas P Tomich, Director
143 Robbins Hall
530-752-3913; Fax 530-752-2829; asi@ucdavis.edu
http://asi.ucdavis.edu/

The Agricultural Sustainability Institute (ASI) provides a hub that links initiatives and education in sustainable agriculture and food systems across all divisions of the College of Agricultural and Environmental Sciences at UC Davis, across the University of California, and with other partners across the state, nation, and planet. ASI includes:

- Advising and internship coordination for the UC Davis undergraduate major in Sustainable Agriculture and Food Systems
- UC Davis Student Farm
- UC Davis Russell Ranch Sustainable Agriculture Facility
- UC ANR statewide Sustainable Agriculture Research & Education Program (SAREP)
- The Inter-institutional Network on Food, Agriculture and Sustainability (INFAS), a national academic network

California Agricultural Experiment Station
College of Agricultural and Environmental Sciences
530-752-1610

The California Agricultural Experiment Station has branches on the UC Davis, UC Riverside and UC Berkeley campuses. The UC Davis branch includes approximately 400 faculty and CE Specialists, mostly in the College of Agricultural and Environmental Sciences, but also in the College of Biological Sciences and the School of Veterinary Medicine. In addition to laboratory facilities, it has approximately 3,000 acres devoted to field research in the environmental and crop sciences, as well as facilities to support animal and long-term experimental research. The Experiment Station supports faculty in research involving agricultural production, food processing, nutrition, animal care and disease prevention, consumer sciences and community development and in natural resources and ecosystem science management, with an emphasis on maintaining and improving environmental quality of both natural and managed ecosystems.

Center for Advanced Laboratory Fusion Science and Engineering (CALFUSE)
3001 Ghausi Hall 530-754-9069
Neville Luhmann, Director; ncluhmann@ucdavis.edu
David Hwang, Director; dqhwang@ucdavis.edu
http://calfuse.ucdavis.edu/

The purpose of Center for Advanced Laboratory Fusion Science and Engineering (CALFUSE) is to promote interaction between research and educational entities within the University and among the University, the national laboratories, and industrial laboratories. Fusion research is an extremely broad field, encompassing topics that cut across numerous engineering, science, and policy disciplines. The initial set of topics includes plasma accelerators, high-energy particle accelerators, plasma diagnostics (specifically, millimeter wave and Terahertz technology developments), advanced computing, advanced materials, and energy policy. The Center invites participation from all fields that may have relevance to fusion education and research.

Center for Biophotonics (C4B)
2700 Stockton Blvd., Suite 1400
Sacramento, CA 95817 916-734-8600
Dennis Matthews, Director; dtmatthews@ucdavis.edu
http://cbst.ucdavis.edu/

The Center for Biophotonics applies biophotonics—the science of light interaction with biological matter—to solve problems in biology and medicine. Work at C4B advances the research, development, and application of new optical/photonic tools and technologies in medicine and the life sciences, enabling engineers to collaborate with basic scientists and physicians at the UC Davis Medical Center to translate new technologies from the benchtop to the bedside. Center projects are highly diverse and include superresolution optical microscopies, advanced imaging and manipulation of living cells and other biological systems, engineered fluorescent proteins, label-free cell analysis by Raman spectroscopy and second harmonic generation, molecular sensors and assays, in vitro and in vivo devices and assays for diagnosis, monitoring and treatment of disease.

C4B is the successor of the NSF Center for Biophotonics Science and Technology, which was funded by the National Science Foundation and participating institutions between 2002-2013.

Center for Child and Family Studies
Center for Child and Family Studies (main office in West House) 530-752-2888; http://ccfs.ucdavis.edu
The Center for Child and Family Studies (CCFS) houses the Early Childhood Laboratory (ECL), a research, teaching and demonstration laboratory of the Division of Human Development and Family Studies in the Department of Human Ecology. At the ECL, students enrolled in human development courses learn observational techniques and participate with peers, children, parents and professionals in developmental programs for infants through preschoolers. Students study early development in a naturalistic setting, linking research and theory to principles of interaction and learning about developmental differences. Selected undergraduate students participate in faculty and graduate student research at the laboratory. The CCFS also houses several research and outreach facilities, including the Eichhorn Family House.

Center for Geotechnical Modeling
2655 Brooks Road 530-752-7929
Ross W. Boulanger, Director; rwboulanger@ucdavis.edu
http://cgm.engineering.ucdavis.edu/

The Center performs research in the broad area of geotechnical engineering, with a focus on earthquake engineering problems such as dynamic site response, liquefaction, ground failure, and soil-foundation-structure interaction for buildings, bridges, dams, tunnels, and port facilities. The Center emphasizes physical modeling using one of the world’s largest and most advanced geotechnical centrifuge facilities, but also performs numerical simulations using advanced computational tools, develops design procedures, and develops new techniques for site characterization. The centrifuge is available for shared use by researchers from around the country and is supported by the George E. Brown, Jr., Network for Earthquake Engineering Simulation.
Introduction

Center for Information Technology in the Interest of Society (CITRIS)

3179 Kemper Hall 530-752-7063
Nina Amenia, Director;
http://ucdavis.citris-uc.org

The Center for Information Technology Research in the Interest of Society (CITRIS) is one of the California Institutes of Science and Innovation. The Center involves a partnership among four UC campuses: UC Davis, UC Berkeley, UC Merced and UC Santa Cruz.

CITRIS creates information technology solutions for many of our most pressing social, environmental, and health care problems. CITRIS was created to ‘’shorten the pipeline’’ between world-class laboratory research and the creation of start-ups, larger companies, and whole industries.

CITRIS facilitates partnerships and collaborations involving faculty members and students from numerous departments at the four UC campuses with industrial researchers from corporations. Current initiatives include i4Energy (using information technology, sensors, and controls for stable and sustainable energy); the delivery of quality health care everywhere for Californians; intelligent infrastructure for water, transport, and cities; and data and democracy.

Center for Mind and Brain

267 Cousteau Place, Davis, CA 95618 530-297-4651
Steven J. Luck, Director;
http://mindbrain.ucdavis.edu/

The Center for Mind and Brain is an interdisciplinary research center that is dedicated to understanding the nature of the human mind. Our scientists probe the mind using state-of-the-art approaches from the social, biological, engineering, and medical sciences. Our core research areas include attention, development and aging, memory, multisensory integration, music, and disorders of mind and brain. We focus on both discovering the fundamental principles of the healthy human mind and understanding and treating conditions such as autism, schizophrenia, and Alzheimer’s disease.

Center for Molecular Genomic Imaging (CMGI)

451 Health Sciences Drive 530-754-8960
Simon Cherry, Director; srcherry@ucdavis.edu
http://imaging.bme.ucdavis.edu

The Center for Molecular Genomic Imaging (CMGI) offers the research community dedicated, state-of-the-art imaging technologies for in vivo and specimen imaging. Imaging modalities include PET, SPECT, CT, MRI, ultrasound, autoradiography, and optical (fluorescence and bioluminescence). The CMGI has become a core facility serving a wide range of campus investigators and is integrated in many major centers, programs, and institutes.

Imaging studies can provide new insights in many areas of biomedical research, including oncology, cardiology, neuroscience and pharmacology. Molecular and genomic imaging can play an important role in advancing basic science investigations and in the development of new diagnostic and therapeutic approaches for use in the clinical setting. CMGI staff provide services that include consultation, protocol planning and experimental design, animal handling and physiologic monitoring, injection of contrast agents and radiopharmaceuticals, scanning, data reconstruction and visualization, image analysis and data backup. CMGI facilities are open to all researchers at UC Davis, and are also open, on a space-available basis, to external researchers.

Center for Nano and Micromanufacturing

The Center for Nano and Micromanufacturing (CNM2) includes a 10,000 square-foot Class 100 cleanroom, offering a broad line of lithography tools with resolution capabilities down to 50nm, metal and dielectric thin-film deposition, dry etching, as well as numerous characterization tools to support device manufacturing for a variety of industries and applications. The facility has capabilities to accommodate a wide variety of substrate materials including: Si, SiO2, borosilicate glass, InP, GaAS as well as biocompatible polymer materials such as PDMS. External to the cleanroom we have an additional 3000+ square feet of research space which houses both a high-resolution SEM and FIB system used for sample characterization and TEM sample preparation. The staff is available from 9:00 a.m.-5:00 p.m. (PST) to assist internal and external users with process development and training to help streamline research projects.

Center for Neuroscience

530-752-7063; Fax 530-752-7065
http://neuroscience.ucdavis.edu

The Center for Neuroscience is an interdisciplinary unit that serves as the focal point for the study of the neurosciences at UC Davis. Faculty affiliated with the Center are from 13 departments and sections. The center sponsors a seminar series, conferences and symposia, provides research space for center members and supports graduate students, postdoctoral scholars and distinguished visitors.

Faculty and students are engaged in the study of brain mechanisms responsible for normal human cognitive and perceptual processes and in the study of fundamental aspects of nerve cell function and development. A core group of cognitive neuroscientists uses various imaging techniques and electrophysiological techniques to study both the normal and lesioned cerebral cortex to understand how the normal brain controls behavior. Other faculty members use either animal models to understand how information is processed in the brain or simple systems to study the fundamental biology of nerve function and development and disorders affecting them.

Center for Population Biology

Storer Hall 530-752-1274
Jay Stachowicz, Director; jstachowicz@ucdavis.edu
http://cpb.ucdavis.edu

The UC Davis Center for Population Biology (CPB) aims to advance understanding of the fundamental ecological and evolutionary processes that control the origins and maintenance of biological diversity, at all levels of organization ranging from molecules to ecosystems. Our activities promote integrative, multidisciplinary research in population biology through collaborations, mentorships, workshops and meetings. Faculty in the Center are drawn from nine academic departments and three colleges (Biological Sciences, Agriculture and Environmental Sciences, and Letters and Sciences).
Center for Science and Innovation Studies

1246 Social Sciences and Humanities Building & 1127 King Hall
Mario Biagioli, Ph.D., Program Director
http://cson.ucdavis.edu/

The Center for Science and Innovation Studies (CSIS) studies the many dimensions of the process of technoscientific innovation. We focus predominantly on the upstream spectrum of innovation—from the design, articulation, and funding of research programs to the patenting and publication of their outcomes—paying particular attention to the process, practices, instruments, and techniques of innovation and to the conceptual and practical problems of knowledge transfer. Through detailed case studies (contemporary as well as historical), CSIS analyzes the role that training, cultural background, and cross-disciplinary mobility play in the emergence of innovation, as well as the new institutional, technical, and social arrangements that sustain it (from innovative laboratory architecture and university-industry configurations, to distributed and cyberinfrastructure-based collaborations, to alternative systems of publication and new metrics of quality and performance assessment). Intellectual property (both traditional regimes and more recent platforms like free software, open source, science commons, and norm-based reward systems) is a central focus of CSIS, as are issues pertaining to bioprospecting and the access to and reward of traditional knowledge.

Coastal and Marine Sciences Institute

Storer Hall 530-752-1274
Rick Grosberg, Founding Director; rkgrosberg@ucdavis.edu
http://csmi.ucdavis.edu

The UC Davis Coastal and Marine Sciences Institute (CMSI) aims to catalyze and foster innovative partnerships for discovering, understanding, and communicating science for effective stewardship of ocean and coastal environments in California and beyond. We especially strive to build collaborations with diverse stakeholders, including private-sector organizations and corporations that have significant economic, social, and environmental interests in the coastal ocean and at the land-sea interface. We believe that such partnerships can lead to the development of sustainable policies that protect biodiversity, nurture ecosystems, and enhance beneficial uses of the ocean in parallel with socio-economic development. With its focus on humans and the coastal oceans, the institute assembles globally-recognized experts from more than 20 academic units on the main campus and Bodega Marine Laboratory. CMSI also coordinates research and academic programs across campus, including a new major in Marine and Coastal Sciences, as well as emerging graduate and professional programs.

Computer Security Laboratory

2063 Kemper Hall; seclab-contact@cs.ucdavis.edu
Matt Bishop, Hao Chen, Karl Levitt, Felix Wu, Directors; bishop@cs.ucdavis.edu, levitt@ucdavis.edu, wu@ucdavis.edu, hchen@ucdavis.edu
http://seclab.cs.ucdavis.edu/

The mission of the UC Davis Computer Security Laboratory is to improve the current state of computer and information security and assurance through research and teaching. The Security Lab investigates security problems in the network infrastructure, in computer security, and in information assurance in general. Current projects include research into the balance between privacy and analysis in data sanitizing, vulnerabilities analysis, social links, the provision of a secure programming clinic, forensic logging and auditing, e-voting research, and biology-inspired security techniques. The Security Laboratory also researches and detects malicious code (viruses, worms, time bombs, etc.) in programs and detects attempts to penetrate or misuse computer systems. Research projects are supported by corporate and government organizations.

Genome Center

4303 Genome and Biomedical Sciences Facility 530-754-9648
Richard Michelmore, Director; rwmichelmore@ucdavis.edu
http://genomecenter.ucdavis.edu

The UC Davis Genome Center integrates experimental and computational approaches to address questions at the forefront of genomics and bioinformatics. The Center is housed in a purpose-built research building with state-of-the-art computational and laboratory facilities. The Center has recruited 16 research faculty and established five technology cores that serve the whole campus. The five service cores are DNA Technologies, Expression Analysis, Proteomics, Metabolomics, and Bioinformatics. These technology service cores have been established to provide researchers with access to the latest technologies on an at-cost, as-needed basis. Further details are available from the website.

Health Sciences Research Laboratory—Animal Surgery

Buildings H and J, Center for Laboratory Animal Science
530-752-7756; latalken@ucdavis.edu, jesdavis@ucdavis.edu

This unit is a surgical research facility in compliance with NIH, AAALAC and USDA standards. Instruction in surgical techniques is available including multiple training stations for larger groups. Surgical instruments, drapes, anesthesia machines, scrub suits, and equipment for monitoring vital signs and physiologic parameters are available. Assistance with animal procurement is available. Staff are available to perform or assist with both survival and non-survival surgical procedures depending on the investigator's requirements. Staff are also available for post-operative care, data and sample collection as required, and assistance with preparation of the IACUC Protocol for Animal Care and Use.

Human Performance Laboratory

164 Hickey Gym 530-752-0965

The Human Performance Laboratory (HPL) was founded in 1963 and has a long history of basic and applied research and outreach in exercise physiology, biomechanics and sports psychology. The HPL has been involved in a variety of research areas since its inception including metabolism, heat stress, fluid balance, injury prevention, body composition and health benefits of physical activity and fitness. The HPL is represented by full-time and adjunct faculty members with varying research backgrounds and scientific interests. The HPL facilities allow measurement of a comprehensive list of human performance characteristics. Investigators have access to advanced data acquisition systems for evaluation in the areas of biomechanics, motor learning, environmental physiology, cardiopulmonary and thermoregulatory physiology, human nutrition and exercise and muscle metabolism. Specific technologies and capabilities include extensive computing facilities, high speed 3-D video motion analysis, ground reaction force measurement, ultrasound imaging, a temperature and humidity controlled environmental chamber and systems for measurement of oxygen consumption, body composition and psychomotor performance. The HPL meets the needs of today's creative researcher and has the capacity to assist in answering tomorrow's research questions.
Humanities Institute

David Biale, Director
Molly McCarthy, Associate Director
227 Voorhies Hall 530-752-1254; Fax 530-752-4263

The UC Davis Humanities Institute (DHI) is an interdisciplinary research center that fosters intellectual collaborations and facilitates access to resources for faculty and graduate students who are actively engaged in research and teaching in the humanities, the arts, cultural studies and the humanistically oriented social sciences. It advocates for the humanities within the UC Davis community and works with funding agencies to secure individual and programmatic resources for faculty. To explore emerging research areas and provide collaborative opportunities for faculty and graduate students, the Institute sponsors faculty and graduate research fellowships, interdisciplinary research clusters, and administers the Mellon Research Initiatives in the Humanities. The Institute also organizes conferences, workshops and lectures and provides partial funding for events that serve humanities scholars at UC Davis.

Institute for Ultra-Scale Visualization

2121 Kemper Hall;
530-734-8579
Kwan-Liu Ma, Director; http://www.scidac.gov/viz/ultraviz.html

The SciDAC Ultra-Scale Visualization Institute is a research, education, and outreach effort sponsored by the DOE SciDAC program. The Institute’s mission is to address the upcoming peta and exa-scale visualization challenges facing computational science and engineering. The Institute fosters the exchange of knowledge between universities, DOE laboratories, and industry to make advanced visualization an integrated component in scientific discovery. The Institute revolutionizes the very process of scientific discovery by equipping scientists with tools that shed light on the knowledge hidden in previously incomprehensible datasets.

Mann Laboratory

105 Mann Laboratory
Trevor Suslow, Faculty Contact
Lee Ann Richmond, Facility Manager and Safety Officer
530-754-8313; Fax 530-752-4554

Plant scientists in the Louis K. Mann Laboratory study the physiology, biochemistry, microbiology and molecular biology of pre-harvest and harvested fruits, ornamentals, and vegetables to improve and maintain their quality and safety during harvest, storage, processing, distribution and marketing. The three current faculty and two Emeritus Faculty housed in this facility are members of the Department of Plant Sciences and one USDA/ARS research scientist. Research and extension activities are supported by students, postdoctoral researchers and visiting scientists. Research includes basic plant molecular biology, plant physiology, applied postharvest biology and technology, produce safety microbiology, and practical storage technologies for horticultural crops, including whole and lightly processed products. Results are of interest to other researchers in the plant sciences and food science as well as to growers, shippers, transportation and logistics providers, marketers and consumers of fresh fruit and vegetables. This Special Postharvest Facility is a CAES resource and is equipped with 18 controlled-temperature rooms, eight research laboratories, specialized postharvest analytical equipment, advanced rapid test equipment for human pathogens, and a small conference room for up to 25 with a 60” wall-mounted flat-screen monitor.

Natural Reserve System

John Wingfield, Director
Virginia Boucher, Associate Director
The Barn
530-752-6949; http://bhrs.ucdavis.edu; http://nrs.ucop.edu

The UC Davis campus administers five reserves that are available for teaching and research.

- Bodega Marine Reserve, located at Bodega Bay, 100 miles west of campus, consists of both terrestrial and coastal marine habitats including grasslands, dunes, fresh water and brackish marshes, mudflats, sandy beaches, rocky intertidal and subtidal areas. There are facilities for overnight and longer stays.
- Jepson Prairie Reserve, located in Solano County 13 miles south of Dixon, consists of native California bunchgrass grasslands, vernal pools, playas and freshwater sloughs.
- Donald and Sylvia McLaughlin Reserve, located near Clear Lake about 70 miles northwest of campus, consists of Inner Coast Range habitat with a mix of serpentine and non-serpentine soils. The reserve has a facility for overnight and longer stays and a camping area for class groups.
- Quail Ridge Reserve consists of Inner Coast Range habitat located about 30 miles west of campus on a peninsula jutting into Lake Berryessa. The reserve has facilities for overnight and longer stays and tent cabins for class groups.
- Stebbins Cold Canyon Reserve, located about 24 miles west of campus, has representative populations of several different plant communities found in California’s Inner and Outer Coast Ranges. A five mile loop trail is popular with recreational hikers. The University of California maintains 39 reserves throughout the state, many of which are available for teaching and research.

Nuclear Magnetic Resonance Facility

Medical Sciences 1D
530-752-7677; http://www.nmr.ucdavis.edu

The Nuclear Magnetic Resonance Facility provides access to state-of-the-art NMR instrumentation for spectroscopy and imaging to researchers in the biological, medical and physical sciences. At present, the facility operates ten spectrometers of varying purposes and capabilities at field strengths from 300 to 800 MHz. Applications include structural characterization of organic molecules, determination of protein structure and dynamics, metabolomics, imaging and in vivo spectroscopy of small animals, plants, and materials, and spectroscopy of solids. The Facility also has workstations for off-line data processing. Three full-time staff members are available to assist campus researchers in utilizing the instrumentation. A training course, Biological Chemistry 230, is offered in the fall quarter.

UC Pavement Research Center

2001 Ghausi Hall;
530-734-6409
John Harvey, Director, UC Davis Site; jharvey@ucdavis.edu
http://www.ucprc.ucdavis.edu

The UC Pavement Research Center (UCPRC) uses innovative research and sound engineering principles to improve pavement structures, materials and technologies. Work at the UCPRC focuses on asphalt and concrete pavements, including design, materials, rehabilitation, life cycle, maintenance and reconstruction; pavement cost analysis and strategy selection; the effects of
pavement activities on traffic in urban areas; pavement performance modeling; and environmental life-cycle assessment for pavements.

**Social Science Data Service**
105 Social Sciences and Humanities Building
530-752-4009; http://www.ssd.s.ucdavis.edu
The Social Science Data Service (SSDS) is a unit in the Division of Social Sciences. SSDS provides quantitative computing and consulting services in support of faculty and graduate students involved in social science research on the UC Davis campus. SSDS provides consulting services for the wide range of software used by social scientists and assists with questions regarding the use of SSDS computers and statistical and data-related programming. SSDS manages a UNIX system and a PC research lab used for quantitative social science computing.

**Sustainable Transportation Energy Pathways (NextSTEPS)**
Institute of Transportation Studies, UC Davis
Joan Ogden, Director; jmo@ucdavis.edu
Paul Gruber, Manager; pgruber@ucdavis.edu
http://steps.ucdavis.edu

NextSTEPS is a four-year (2011-2014) research consortium that addresses the technical, operational, logistical, and strategic issues related to the transition to an alternative fuel-based economy. The program comprises 100+ interdisciplinary research projects addressing the potential transportation energy pathways: electricity, hydrogen, biofuels, and fossil fuels. These pathways are analyzed and compared across program threads: consumer demand and travel behavior; innovation and business strategy; infrastructure system analysis; environmental, energy and cost analysis; vehicle technology evaluation; policy analysis; and integrative scenarios and transition strategies.

The program draws upon research methods from a broad range of academic fields including: vehicle engineering and design, systems analysis and operations research, chemical and mechanical engineering, lifecycle cost and emissions analysis, market research, sociology and anthropology, economics and business strategy, and policy analysis.

The overarching program goal of NextSTEPS is to generate new insights about the transitions to a sustainable transportation energy future and disseminate that knowledge to decision-makers in the private sector and governmental agencies so that they can make informed technology, investment, and policy choices.

**Tahoe Environmental Research Center (TERC)**
UC Davis Administration Office; Watershed Sciences Building; 530-754-8372
TERC site Laboratories in Incline Village, NV 775-881-7560
Geoffrey Schladow, Director; jschladow@ucdavis.edu
http://terc.ucdavis.edu

The Tahoe Environmental Research Center is dedicated to research, education and public outreach on lakes and their surrounding watersheds and airsheds. Lake ecosystems include the physical, biogeochemical and human environments, along with the interactions among them. The Center is committed to providing objective scientific information for the restoration and sustainable use of the Lake Tahoe Basin and for freshwater ecosystems worldwide.

**UC Agricultural Issues Center**
252 Hunt Hall; 530-752-2320; agissues@ucdavis.edu
http://www.aic.ucdavis.edu

The UC Agricultural Issues Center is a university-wide research and outreach unit with core competencies in economics while drawing on expertise from many disciplines. The Center focuses on California’s agricultural issues related to science and technology, international trade and markets, agribusiness trends, rural-urban issues, natural resources and the environment, human resources and agricultural policy.

**UC Davis Center for Plant Diversity**
Formally the UC Davis Herbarium
Dr. Dan Potter, Director; Ellen Dean. Curator
1026 Sciences Laboratory Building, Department of Plant Sciences
530-752-1091; http://herbarium.ucdavis.edu

The UC Davis Center for Plant Diversity provides information on the names, uses, toxicity and distribution of plants. Anyone can visit the Herbarium to use its dried plant collections (300,000 specimens), botanical library and microscopes, but a phone call is suggested to make sure staff will be available to assist you. The collections are used most commonly to check plant identifications, but they are also used by campus faculty and students for teaching and research in plant systematics and ecology. Herbarium staff answer hundreds of public service requests each year (especially identification of weeds and poisonous plants). Collections include vascular plants, bryophytes, lichens and algae. The majority of these specimens are angiosperms (flowering plants), mainly from California, but the collections are worldwide in scope, with strong holdings from North America, Ecuador, Baja California and regions with Mediterranean climate regimes. The Herbarium is well known for its collection of weeds and poisonous plants, although it also has world-class collections of grasses, oaks and spurge. The Herbarium’s support group, the Davis Botanical Society, hosts a wide range of botanical events, workshops and trips each year.

**UC Davis Energy Institute**
West Village, 1605 Tilia St, Suite 100; 530-752-4909
Dan Sperling, Director; energy@ucdavis.edu
http://energy.ucdavis.edu

The Energy Institute at UC Davis is home to energy research and education programs of the University of California, Davis. It was established to accelerate the global transformation to a sustainable energy future and is structured to coordinate the world-class strengths of UC Davis in energy research, education and outreach to foster new innovations, expand public service and inform decision-making about new energy solutions. The Energy Institute encompasses critical areas of energy research at UC Davis—including renewable and sustainable energy systems, energy efficiency, fuels and transportation, infrastructure, environment, and economics. The Institute actively targets the demand for well-trained energy professionals.
The research areas at the UC Davis J. Amorocho Hydraulics Laboratory include engineering hydraulics, fisheries protection, and ecological and environmental hydraulics. UC Davis JAHL was built to perform hydraulic modeling studies for the California State Water Project and has been conducting hydraulic investigations through scaled physical, prototype and numerical models to provide modeling services to federal, state, and local water agencies and private entities. With the recently constructed large flume, which has a circulation capacity of 200 cfs, it is now possible to perform prototype physical modeling studies at the laboratory. Recent research projects have included the assessment of hydraulics, fish behavior, and swimming, near unscreened diversions; studies of sturgeon passage; and investigations of the effects of California riparian vegetation on flow, roughness, and erosion. With the help of the state and federal agencies, researchers have actively participated in the development of solutions to fish protection for the Bay Delta river system and are developing a better understanding of the hydraulic and biological issues in the Sacramento River and Bay Delta system. Fish biologists, hydraulic engineers and other UC Davis JAHL researchers have many years of experience in testing Sacramento River and Bay Delta fish species under various hydraulic and environmental conditions and in handling invasive water plant species that occur in the Delta fish facilities.

**X-Ray Crystallographic Laboratory**

James C. Fettinger, Ph.D.
Department of Chemistry
530-754-7822

The X-Ray Crystallographic Laboratory, located in the Department of Chemistry, provides crystal structure determinations for researchers. Single crystals from all branches of chemistry are studied. The laboratory is equipped with three single crystal Bruker X-ray diffractometers, an APEX Duo equipped with both Cu and Mo anode sources, and two Mo source systems, an APEXII and a SMART1000. The laboratory also possesses a stereo-microscope. All instruments have variable low temperature systems including the capability of cooling the crystal to 5K. Consultation and collaboration on a variety of single crystal related projects can be arranged.
UNDERGRADUATE ADMISSIONS
Undergraduate Admissions
One Shields Avenue
University of California
Davis, CA 95616-8507
530-752-2971; Fax 530-752-3712
http://admissions.ucdavis.edu
Visit our Welcome Center
550 Alumni Lane
Advising: Monday-Friday, 8 a.m.–5 p.m. (PST)

APPLYING TO UC DAVIS
Apply for admission online at http://universityofcalifornia.edu/apply.
The initial filing periods to apply for undergraduate admission and scholarships at UC Davis are:

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Initial Filing Period (prior year)</th>
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<tbody>
<tr>
<td>Fall</td>
<td>November 1-30</td>
</tr>
<tr>
<td>Winter*</td>
<td>July 1-31</td>
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<tr>
<td>Spring*</td>
<td>October 1-31</td>
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</tbody>
</table>

*UC Davis is rarely open to applicants for winter and spring quarters.

For up-to-date details regarding winter and spring quarter admission, and tips on completing the UC application and writing your personal statement, see http://admissions.ucdavis.edu/apply.

After applying, transfer students are required to update their grades and course records online using the UC Transfer Academic Update (TAU). This ensures that campuses have current academic information. For details and deadlines, see http://admission.universityofcalifornia.edu/how-to-apply/after-you-apply/update-transfer-application.

APPLICATION FEES
The domestic filing fee for each University of California campus you apply to is $70. For international applicants, the filing fee is $80 per campus.

Fee waivers are available to students who meet strict eligibility guidelines based on household size and family income. When you apply online, you can fill out the fee waiver form included with the online application. If, after review by UC staff, you are not eligible for a fee waiver, you will be billed for all application fees. For current information on application fees and waivers, see http://admission.universityofcalifornia.edu/how-to-apply/application-fees.

ADMISSION AS A FRESHMAN
UC Freshman Applicant Definition
The University of California defines a freshman applicant as one who is either currently enrolled in, or has graduated from, a high school and has not registered in a regular session at any collegiate-level institution since high school graduation. An applicant who has completed college courses while in high school or in a summer session immediately following high school graduation is considered a freshman applicant.

UC Freshman Admission Requirements
To be considered for admission to UC Davis, freshman applicants must earn a high school diploma or equivalent* and satisfy the following UC admission requirements:

1. Subject Requirement,
2. Scholarship Requirement, and
3. Examination Requirement

* The University of California will accept the California High School Proficiency Examination or the General Education Development (GED) Certificate awarded by any state's Department of Education in lieu of a regular high school diploma. However, you must also meet all other university entrance requirements: subject, scholarship and examination.

1. Subject Requirement: “a-g”

Subject requirement courses must be completed with a C grade or better and, for California residents, must be on your high school’s UC-approved course list. See your school’s UC-approved course list at http://ucop.edu/doorways. At least 11 of the 15 units (one unit equals one year of study) defined by the “a-g” requirements must be taken prior to your senior year.

a. History/Social Science—2 years required
b. English (or Language of Instruction)—4 years required
c. Mathematics—3 years required; 4 years recommended
d. Laboratory Science—2 years required; 3 years recommended
e. Language other than English (LOTE)—2 years required; 3 years recommended
f. Visual and Performing Arts (VPA)—1 year required
g. College Preparatory Electives—1 year required

2. Scholarship Requirement

The Scholarship Requirement is satisfied if you earn a GPA of 3.000 or higher. All courses must be completed with a C grade or higher. Out-of-state applicants must earn a GPA of 3.400 or higher in the 15 college-preparatory “a-g” courses with no grade lower than a C.

3. Examination Requirement

Freshman applicants are required to take the:
• ACT Plus Writing
OR
• SAT Reasoning Test
Highest scores from one sitting will be used.
SAT Subject Tests are no longer required and UC Davis will consider SAT Subject Tests only if they benefit the applicant; some UC campuses recommend that applicants take certain SAT Subject Tests.

Applicants for fall must take the required test no later than December of the previous year—official scores must be received by the end of January. You are responsible for making sure that testing agencies send your scores to the University of California.

Make arrangements to take the required ACT Plus Writing exam with your high school or at the ACT website at http://act.org. The UC Davis ACT code is 0454. You may make arrangements to take
the required SAT Reasoning Test or optional SAT Subject Tests through the College Board website at http://collegeboard.org. The UC Davis College Board code is 004834.

**UC Pathways for California Residents**

For the highest-achieving California applicants, UC has two paths:

- Statewide Path
- Local Path, also known as Eligibility in the Local Context (ELC)

Learn more at http://admission.universityofcalifornia.edu/freshman/california-residents.

**UC Freshman Admission Requirements for Out-of-State Applicants**

For additional information, see http://admission.universityofcalifornia.edu/freshman/out-of-state.

**Campus Selection vs. UC Admission Requirements**

The University of California, Davis is a highly selective public research university with a strong reputation around the world. To prepare for admission and the academic rigor necessary to be successful at our campus, make sure you meet or exceed the UC admission requirements. Simply meeting these requirements does not guarantee admission to UC Davis—applicants who are admitted typically exceed them by a considerable margin. The selection criteria that UC Davis considers as part of its comprehensive review process for each UC applicant are available at http://admissions.ucdavis.edu/admission/freshmen/fr_selection_process.cfm.

**Transfer Credit for College Courses**

Freshman applicants taking UC-transferable college courses while in high school may receive transfer credit upon receipt of an official final college transcript.

**Advanced Placement (AP) Examinations**

Transfer credit is granted for each College Board Advanced Placement (AP) examination completed with an official score of 3, 4 or 5. The credit will be part of the minimum 180 quarter units you need in order to receive a bachelor’s degree. The credit from the AP examinations may also be used to satisfy specific degree requirements.

To learn how many units you may receive for an AP examination, see College Board Advanced Placement (AP) Examination Credit, on page 35—under the column heading, Credit Toward Degree. How those units will be applied toward specific degree requirements in each college is explained for each exam category. Please note that the courses for which AP credit has been granted may not be used as a substitute for courses required as part of the UC Davis General Education Requirement; see General Education Requirement, on page 97.

In general, you may not earn university credit for college courses or International Baccalaureate (IB) transfer credits that duplicate credits already earned through AP. There are, however, a few exceptions to this general rule. Since it is often difficult to know exactly which UC Davis course you should take when you have earned AP credit, you should speak with an academic adviser in your major department, dean’s office, or the Biology Academic Success Center before selecting and enrolling in classes.

A Guide for Students with Advanced Placement (AP) Credit for a UC Davis Course

In general, you may not earn university credit for college courses that duplicate credit already earned through Advanced Placement (AP). There are, however, a few exceptions to this general rule, indicated in the chart College Board Advanced Placement (AP) Examination Credit, on page 35 and summarized here.

<table>
<thead>
<tr>
<th>If you have AP credit for the following UC Davis course:</th>
<th>Can you take the same course at UC Davis?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art History (AH1) 1A, 1B, 1C</td>
<td>No</td>
</tr>
<tr>
<td>Art Studio (ART) 2</td>
<td>No</td>
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<tr>
<td>Biological Sciences (BIS) 10</td>
<td>No</td>
</tr>
<tr>
<td>Chemistry (CHE) 2A</td>
<td>Yes</td>
</tr>
<tr>
<td>Chemistry (CHE) 10</td>
<td>No</td>
</tr>
<tr>
<td>Economics (ECN) 1A, 1B</td>
<td>No</td>
</tr>
<tr>
<td>Engineering, Computer Science (ECS) 30</td>
<td>No</td>
</tr>
<tr>
<td>English (ENL) 3</td>
<td>No</td>
</tr>
<tr>
<td>Environmental Science and Policy (ESP) 10</td>
<td>No</td>
</tr>
<tr>
<td>French (FRE) 3, 21, 22</td>
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</tr>
<tr>
<td>German (GER) 3, 20, 21</td>
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</tr>
<tr>
<td>History (HIS) 4A, 4B</td>
<td>Yes</td>
</tr>
<tr>
<td>History (HIS) 4C</td>
<td>No</td>
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<tr>
<td>History (HIS) 17A, 17B</td>
<td>Yes</td>
</tr>
<tr>
<td>Italian (ITA) 5, 4, 3</td>
<td>No</td>
</tr>
<tr>
<td>Latin (LAT) 2</td>
<td>No</td>
</tr>
<tr>
<td>Mathematics (MAT) 12</td>
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<tr>
<td>Mathematics (MAT) 16A, 17A, 21A</td>
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<tr>
<td>Mathematics (MAT) 16B, 17B, 21B</td>
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<tr>
<td>Music (MUS) 10</td>
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<tr>
<td>Physics (PHY) 1A, 1B</td>
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<tr>
<td>Political Science (POL) 1, 2</td>
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<tr>
<td>Psychology (PSC) 1</td>
<td>No</td>
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<tr>
<td>Spanish (SPA) 21, 22, 23, 24</td>
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</tr>
<tr>
<td>Statistics (STA) 13</td>
<td>Yes</td>
</tr>
<tr>
<td>University Writing Program (UWP) 1</td>
<td>No</td>
</tr>
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</table>

**NOTE:** Courses for which AP credit has been granted may not be used as substitutes for courses required as part of the UC Davis General Education Requirement.

**International Baccalaureate (IB) Examinations**

UC Davis recognizes the International Baccalaureate (IB) examinations for college credit. Higher Level examinations presented with official scores of 5, 6 or 7 receive 8 quarter units (5.3 semester units) of degree credit and, in specific instances, are deemed comparable to various lower-division courses. Students completing the International Baccalaureate (IB) diploma with a score of 30 or above will receive a maximum of 30 quarter units (20 semester units). The credit will apply toward the minimum 180 quarter units needed to receive a bachelor’s degree.

To learn how many units you may receive for an acceptable IB examination, see International Baccalaureate (IB) Higher Level Examination Credit, on page 39—under the column heading, Credit Toward Degree. The chart also specifies which UC Davis
## College Board Advanced Placement (AP) Examination Credit

<table>
<thead>
<tr>
<th>Examination</th>
<th>Score</th>
<th>UC Transfer</th>
<th>UC Davis Course Equivalencies</th>
<th>UC Transfer Eligibility Area</th>
<th>IGETC Area</th>
<th>Duplicate Credit Allowance *</th>
<th>Continuing UC Davis Course</th>
<th>Comment *</th>
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<tbody>
<tr>
<td>Art History</td>
<td>5</td>
<td>UCH 3A or 3B</td>
<td>No</td>
<td>Art History 1A, 1B, 1C</td>
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<td>4, 3</td>
<td>UCH 3A or 3B</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<td>Biology</td>
<td>5, 4, 3</td>
<td>UCS 5B w/lab</td>
<td>Biological Sciences 10</td>
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<td>–</td>
<td>–</td>
<td>–</td>
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<td>Chemistry</td>
<td>5</td>
<td>UCS 5A w/lab</td>
<td>Chemistry 2A</td>
<td>Yes*</td>
<td>Consult w/adviser</td>
<td>–</td>
<td>–</td>
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<td>UCS 5A w/lab</td>
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<td>No</td>
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<td>–</td>
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<td>Chinese Language and Culture</td>
<td>5, 4, 3</td>
<td>UCH 3B and 6A</td>
<td>–</td>
<td>–</td>
<td>Consult w/adviser</td>
<td>–</td>
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<tr>
<td>Computer Science A</td>
<td>5, 4, 3</td>
<td>UCB 4H</td>
<td>Political Science 2</td>
<td>No</td>
<td>–</td>
<td>–</td>
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<td>5, 4</td>
<td>UCB 4H</td>
<td>Engineering Computer Science 30</td>
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<td>Engineering Computer Science 40*</td>
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<td>Computer Science AB</td>
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<td>UCB 4H</td>
<td>–</td>
<td>–</td>
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<td>UCE / H 1A or 3B</td>
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<td>c</td>
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<td>UC-H 3B and 6A</td>
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<td>Human Geography</td>
<td>5, 4, 3</td>
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<td>UC-H 3B and 6A</td>
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<td>8</td>
<td>UC-H 3B and 6A</td>
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<td>Japanese Language and Culture</td>
<td>5, 4, 3</td>
<td>8</td>
<td>UC-H 3B and 6A</td>
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<td>Latin</td>
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<td>UC-H 3B and 6A</td>
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<td>Latin (Vergil)</td>
<td>5, 4, 3</td>
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<td>Latin 2</td>
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<td>UC-H 3B and 6A</td>
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<td>Macroeconomics</td>
<td>5, 4, 3</td>
<td>4</td>
<td>UC-B 4B</td>
<td>Economics 1B</td>
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<tr>
<td>Mathematics - Calculus AB</td>
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<td>4*</td>
<td>UC-M 2A</td>
<td>Mathematics 12, 16A, 17A, 18A, 21A</td>
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<tr>
<td>Mathematics - Calculus BC</td>
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<td>8*</td>
<td>UC-M 2A</td>
<td>Mathematics 12, 16A, 17A, 18A, 21A</td>
<td>–</td>
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</table>
### College Board Advanced Placement (AP) Examination Credit

<table>
<thead>
<tr>
<th>Examination 1</th>
<th>Score</th>
<th>Credit Toward Degree</th>
<th>UC Transfer Admissions Eligibility Area</th>
<th>IGETC Area</th>
<th>UC Davis Course Equivalencies</th>
<th>Full Credit Allowed for UC Davis Course Equivalencies</th>
<th>Continuing UC Davis Course</th>
<th>Comment *</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mathematics - Calculus BC</strong></td>
<td>4, 3 B*</td>
<td>UC-M 2A</td>
<td>Mathematics 12, 16A, 17A or 21A</td>
<td>12, No; 16A, 17A, 21A Yes</td>
<td>Mathematics 16B, 17B or 21B</td>
<td>–</td>
<td>–</td>
<td>b</td>
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<tr>
<td>Microeconomics</td>
<td>5, 4, 3 4</td>
<td>UC-B 4B</td>
<td>Economics 1A</td>
<td>No</td>
<td>Economics 100</td>
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<tr>
<td>Music Theory</td>
<td>5, 4, 3 8</td>
<td>UC-H –</td>
<td>Music 10</td>
<td>No</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>a</td>
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<tr>
<td>Physics B</td>
<td>5, 4 B*</td>
<td>UC-S 5A w/lab</td>
<td>Physics 1A, 1B</td>
<td>No</td>
<td>–</td>
<td>–</td>
<td>b</td>
<td>* 8 transferable unit max. for all three Physics exams.</td>
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<td>Physics B</td>
<td>3 B*</td>
<td>UC-S 5A w/lab</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>b</td>
<td>* 8 transferable unit max. for all three Physics exams.</td>
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<tr>
<td>Physics C1—Mechanics</td>
<td>5, 4 A*</td>
<td>UC-S 5A w/lab</td>
<td>Physics 1A</td>
<td>No</td>
<td>–</td>
<td>–</td>
<td>b</td>
<td>* 8 transferable unit max. for all three Physics exams.</td>
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<td>Physics C1—Mechanics</td>
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<td>–</td>
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<td>–</td>
<td>–</td>
<td>b</td>
<td>* 8 transferable unit max. for all three Physics exams.</td>
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<tr>
<td>Physics CII—Electricity/Magnetism</td>
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<td>UC-S 5A w/lab</td>
<td>–</td>
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<td>–</td>
<td>–</td>
<td>b</td>
<td>* 8 transferable unit max. for all three Physics exams.</td>
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<td>UC-S 5A w/lab</td>
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<td>b</td>
<td>* 8 transferable unit max. for all three Physics exams.</td>
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<td>–</td>
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<td>4, 3 4</td>
<td>UC-B 4I</td>
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<tr>
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<td>UC-H 3B and 6A</td>
<td>Spanish 23</td>
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<td>UC-H 3B and 6A</td>
<td>Spanish 22</td>
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<td>Spanish 21</td>
<td>No</td>
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<td>Spanish Language and Culture</td>
<td>3 B*</td>
<td>UC-H 3B and 6A</td>
<td>Spanish 21</td>
<td>No</td>
<td>Spanish 22 or consult w/adviser</td>
<td>–</td>
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<td>Spanish Literature</td>
<td>5, 4 B*</td>
<td>UC-H 3B and 6A</td>
<td>Spanish 24</td>
<td>No</td>
<td>Spanish 100 or consult w/adviser</td>
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<tr>
<td>Spanish Literature</td>
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<td>UC-H 3B and 6A</td>
<td>Spanish 23</td>
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<td>Spanish Literature and Culture</td>
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<td>UC-H 3B and 6A</td>
<td>Spanish 24</td>
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<td>Spanish 100 or consult w/adviser</td>
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<td>Spanish Literature and Culture</td>
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<td>UC-H 3B and 6A</td>
<td>Spanish 23</td>
<td>No</td>
<td>Spanish 24 or consult w/adviser</td>
<td>–</td>
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<tr>
<td>Statistics</td>
<td>5, 4 4</td>
<td>UC-M 2A</td>
<td>Statistics 13</td>
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<td>–</td>
<td>b</td>
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<tr>
<td>Statistics</td>
<td>3 4</td>
<td>UC-M 2A</td>
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<td>–</td>
<td>–</td>
<td>–</td>
<td>b</td>
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</table>

* Comment: *8 transferable unit max. for all Mathematics-Calculus exams. *Credit for Mathematics 15A, 17A or 21A equivalents may fulfill prerequisite for Mathematics 16B, 17B or 21B. *If student elects to register in Mathematics 12, 16A, 17A or 21A, s/he is subject to the Mathematics Placement Requirement (MPR). For details, visit math.ucdavis.edu/undergrad/math_placement.
<table>
<thead>
<tr>
<th>Examination ¹</th>
<th>Score</th>
<th>Credit Toward Degree</th>
<th>UC Transfer Admissions Eligibility Area ²</th>
<th>IGETC Area ³</th>
<th>UC Davis Course Equivalencies</th>
<th>Full Credit Allowed for UC Davis Course Equivalencies</th>
<th>Continuing UC Davis Course</th>
<th>Comment ⁴</th>
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</thead>
<tbody>
<tr>
<td>Studio Art [Drawing Portfolio]</td>
<td>5, 4</td>
<td>8*</td>
<td>–</td>
<td>–</td>
<td>Art Studio 2</td>
<td>No</td>
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</tr>
<tr>
<td>Studio Art [Drawing Portfolio]</td>
<td>3</td>
<td>8*</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<tr>
<td>Studio Art [2D Design Portfolio; 3D Design Portfolio]</td>
<td>5, 4, 3</td>
<td>8*</td>
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<td>–</td>
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<tr>
<td>United States Government and Politics</td>
<td>5, 4, 3</td>
<td>4</td>
<td>UCB</td>
<td>4H</td>
<td>Political Science 1</td>
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<td>5, 4, 3</td>
<td>8</td>
<td>UCB / H</td>
<td>3B or 4F</td>
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<tr>
<td>World History</td>
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<td>8</td>
<td>UCB / H</td>
<td>3B or 4F</td>
<td>–</td>
<td>–</td>
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</tbody>
</table>

Note: This is not a comprehensive list as new tests are possible. If your exam is not listed, it will be determined in consultation with an adviser.

¹ Examining:
- Last test administration for discontinued exams:
  - May 2009—Computer Science AB, French Literature, Italian, Latin Literature
  - May 2011—French Language, German Language
  - May 2013—Spanish Literature, Latin (Wright)
  - May 2014—Physics B

² UC Transfer Admissions Eligibility Areas:
- UCB—Behavioral and Social Sciences, UCE—English, UC+H—Humanities, UCM+Math, UC+BP—Biological and Physical Sciences
- UCE: If English AP test score of 3, 4, 5 was achieved prior to completing any transferable English composition coursework, 8 quarter units of transfer credit are awarded for the AP exam, and one of two English Composition requirements (UCE) is satisfied. UC Davis articulates AP English Language and Composition, and English Literature and Composition, with scores of 4 or 5 as WUP 1 and English 3; therefore we will not allow transfer credit for any duplicated English courses.
- See www.assist.org. Help Topic: UC Transfer Admissions Eligibility, for details related to UC transfer admission courses.

³ IGETC Areas:
- Each AP exam may be applied to one IGETC area as satisfying one course requirement, with the exception of Language other than English (LOTE).
- There is no equivalent AP exam for the Area 1B—Critical Thinking/Composition requirement.
- For details regarding IGETC certification, see your California community college adviser and www.assist.org. Help Topic: IGETC. Students entering UC Davis with partial IGETC certification should contact their dean's office.

⁴ Duplicate Credit Allowance for Coursework/Exams:
- Students who take the Calculus BC exam and earn a sub-score of 3 or higher on the Calculus AB portion will receive credit for the Calculus AB exam, even if they do not receive a score of 3 or higher on the BC exam. The Calculus BC/AB sub-score satisfies IGETC Area 2A.

¹ Examination: Last test administration for discontinued exams:
- May 2009—Computer Science AB, French Literature, Italian, Latin Literature
- May 2011—French Language, German Language
- May 2013—Spanish Literature, Latin (Wright)
- May 2014—Physics B

² UC Transfer Admissions Eligibility Areas:
- UCB—Behavioral and Social Sciences, UCE—English, UC+H—Humanities, UC+M—Math, UC+BP—Biological and Physical Sciences
- UCE: If English AP test score of 3, 4, 5 was achieved prior to completing any transferable English composition coursework, 8 quarter units of transfer credit are awarded for the AP exam, and one of two English Composition requirements (UCE) is satisfied. UC Davis articulates AP English Language and Composition, and English Literature and Composition, with scores of 4 or 5 as WUP 1 and English 3; therefore we will not allow transfer credit for any duplicated English courses.
- See www.assist.org. Help Topic: UC Transfer Admissions Eligibility, for details related to UC transfer admission courses.

³ IGETC Areas:
- Each AP exam may be applied to one IGETC area as satisfying one course requirement, with the exception of Language other than English (LOTE).
- There is no equivalent AP exam for the Area 1B—Critical Thinking/Composition requirement.
- For details regarding IGETC certification, see your California community college adviser and www.assist.org. Help Topic: IGETC. Students entering UC Davis with partial IGETC certification should contact their dean's office.

⁴ Duplicate Credit Allowance for Coursework/Exams:
- Students who take the Calculus BC exam and earn a sub-score of 3 or higher on the Calculus AB portion will receive credit for the Calculus AB exam, even if they do not receive a score of 3 or higher on the BC exam. The Calculus BC/AB sub-score satisfies IGETC Area 2A.

² UC Transfer Admissions Eligibility Areas:
- UCB—Behavioral and Social Sciences, UCE—English, UC+H—Humanities, UC+M—Math, UC+BP—Biological and Physical Sciences
- UCE: If English AP test score of 3, 4, 5 was achieved prior to completing any transferable English composition coursework, 8 quarter units of transfer credit are awarded for the AP exam, and one of two English Composition requirements (UCE) is satisfied. UC Davis articulates AP English Language and Composition, and English Literature and Composition, with scores of 4 or 5 as WUP 1 and English 3; therefore we will not allow transfer credit for any duplicated English courses.
- See www.assist.org. Help Topic: UC Transfer Admissions Eligibility, for details related to UC transfer admission courses.

³ IGETC Areas:
- Each AP exam may be applied to one IGETC area as satisfying one course requirement, with the exception of Language other than English (LOTE).
- There is no equivalent AP exam for the Area 1B—Critical Thinking/Composition requirement.
- For details regarding IGETC certification, see your California community college adviser and www.assist.org. Help Topic: IGETC. Students entering UC Davis with partial IGETC certification should contact their dean's office.

⁴ Duplicate Credit Allowance for Coursework/Exams:
- Students who take the Calculus BC exam and earn a sub-score of 3 or higher on the Calculus AB portion will receive credit for the Calculus AB exam, even if they do not receive a score of 3 or higher on the BC exam. The Calculus BC/AB sub-score satisfies IGETC Area 2A.
**International Baccalaureate (IB) Higher Level Examination Credit**

<table>
<thead>
<tr>
<th>Course</th>
<th>Score</th>
<th>UC Course Equivalent</th>
<th>UC Core Course Equivalents</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agricultural and Environmental Sciences</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Africas History</strong></td>
<td>5, 6, 7, 8</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td><strong>Americas History</strong></td>
<td>5, 6, 7, 8</td>
<td>3B or 4F</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Arabic</strong></td>
<td>5, 6, 7, 8</td>
<td>3B and 6A</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Biology</strong></td>
<td>5, 6, 7, 8</td>
<td>5B w/o lab</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Chemistry</strong></td>
<td>5, 6, 7, 8</td>
<td>5A w/o lab</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Classical Greek</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Computer Science</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>East/South Asia and Oceania History</strong></td>
<td>5, 6, 7, 8</td>
<td>3B or 4F</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Economics</strong></td>
<td>5, 6, 7, 8</td>
<td>4B</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>English</strong></td>
<td>5, 6, 7, 8</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<tr>
<td><strong>Environmental Systems</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Europe</strong></td>
<td>5, 6, 7, 8</td>
<td>3B</td>
<td>–</td>
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<tr>
<td><strong>Filipino</strong></td>
<td>5, 6, 7, 8</td>
<td>3B</td>
<td>–</td>
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<tr>
<td><strong>French</strong></td>
<td>5, 6, 7, 8</td>
<td>3B</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Geography</strong></td>
<td>5, 6, 7, 8</td>
<td>3B</td>
<td>–</td>
<td>–</td>
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<tr>
<td><strong>Greek</strong></td>
<td>5, 6, 7, 8</td>
<td>3B</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>History</strong></td>
<td>5, 6, 7, 8</td>
<td>3B</td>
<td>–</td>
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<tr>
<td><strong>International Baccalaureate (IB) Higher Level Examination Credit</strong></td>
<td></td>
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</table>
### International Baccalaureate (IB) Higher Level Examination Credit

<table>
<thead>
<tr>
<th>Language/Subject</th>
<th>A2 (second language, for English, see &quot;English&quot; above)</th>
<th>A1 (native language, for English, see &quot;English&quot; above)</th>
<th>B (non-native language, for English, see &quot;English&quot; above)</th>
<th>Determined by dept. or major adviser</th>
<th>UC Davis Course Equivalencies and Credit Allowance for Duplicate Coursework/Exams</th>
<th>IGETC Area</th>
<th>UC Davis Pattern of General Education: Courses for which IB credit may not be used as a substitute for courses required as part of the UC Davis GE Requirement; see International Baccalaureate (IB) Examinations on page 34 and page 42</th>
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<tbody>
<tr>
<td>German A2</td>
<td>5, 6, 7, 8</td>
<td>3B and 6A</td>
<td>German 1, 2</td>
<td>No</td>
<td>Determined by dept. or major adviser</td>
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<td>German B</td>
<td>5, 6, 7, 8</td>
<td>6A</td>
<td>German 1, 2</td>
<td>No</td>
<td>Determined by dept. or major adviser</td>
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<tr>
<td>Islamic World History</td>
<td>5, 6, 7, 8</td>
<td>3B and 4F</td>
<td>History 6</td>
<td>Yes</td>
<td>Determined by dept. or major adviser</td>
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<tr>
<td>Italian A1</td>
<td>5, 6, 7, 8</td>
<td>3B and 6A</td>
<td>Italian 4, 5</td>
<td>No</td>
<td>Determined by dept. or major adviser</td>
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<tr>
<td>Italian A2</td>
<td>5, 6, 7, 8</td>
<td>3B and 6A</td>
<td>–</td>
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<td>Determined by dept. or major adviser</td>
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<tr>
<td>Italian B</td>
<td>5, 6, 7, 8</td>
<td>6A</td>
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<tr>
<td>Japanese A1</td>
<td>5, 6, 7, 8</td>
<td>3B and 6A</td>
<td>–</td>
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<td>Determined by dept. or major adviser</td>
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<tr>
<td>Japanese B</td>
<td>5, 6, 7, 8</td>
<td>6A</td>
<td>–</td>
<td>–</td>
<td>Determined by dept. or major adviser</td>
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<tr>
<td>Latin</td>
<td>Classical languages</td>
<td>5, 6, 7, 8</td>
<td>Latin 1, 2</td>
<td>Yes</td>
<td>Determined by dept. or major adviser</td>
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<td>Mathematics</td>
<td>6, 7, 8</td>
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<td>Math 21A, 21B</td>
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<td>Determined by dept. or major adviser</td>
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<tr>
<td>Mathematics</td>
<td>5, 6, 7, 8</td>
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<td>Math 17A, 17B</td>
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<td>Determined by dept. or major adviser</td>
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<td>Music</td>
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<td>Music 10</td>
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<td>Philosophy</td>
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<td>Philosophy 1</td>
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<tr>
<td>Physics</td>
<td>5, 6, 7, 8</td>
<td>5A w/o lab</td>
<td>Physics 1AB or 10</td>
<td>No</td>
<td>Determined by dept. or major adviser</td>
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<tr>
<td>Portuguese A1</td>
<td>5, 6, 7, 8</td>
<td>3B and 6A</td>
<td>–</td>
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<td>–</td>
<td>–</td>
<td>d</td>
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<tr>
<td>Portuguese A2</td>
<td>5, 6, 7, 8</td>
<td>3B and 6A</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>d</td>
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<td>Portuguese B</td>
<td>5, 6, 7, 8</td>
<td>6A</td>
<td>–</td>
<td>–</td>
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<tr>
<td>Psychology</td>
<td>5, 6, 7, 8</td>
<td>4I</td>
<td>Psychology 1</td>
<td>No</td>
<td>Determined by dept. or major adviser</td>
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<tr>
<td>South Asia and the Middle East History</td>
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<td>3B and 4P</td>
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<td>Spanish A1</td>
<td>5, 6, 7, 8</td>
<td>3B and 6A</td>
<td>Spanish 28</td>
<td>No</td>
<td>Determined by dept. or major adviser</td>
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<tr>
<td>Spanish A2</td>
<td>5, 6, 7, 8</td>
<td>3B and 6A</td>
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<td>Spanish B</td>
<td>5, 6, 7, 8</td>
<td>6A</td>
<td>–</td>
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<tr>
<td>Theatre Arts</td>
<td>5, 6, 7, 8</td>
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<td>Visual Arts</td>
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<td>IB Diploma</td>
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<td>–</td>
<td>–</td>
<td>–</td>
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</tbody>
</table>

**Note:** This is not a comprehensive list as new tests are possible. If your exam is not listed, it will be determined in consultation with an adviser.

**Examination:**
- English A1 last offered in 2012; name changed to English Literature in 2013.
- All Language A2 exams eliminated as of May 2012: English A2, French A2, German A2, Italian A2, Portuguese A2, Spanish A2.

**IGETC Area:**
For details regarding IGETC certification, see your California community college adviser and http://assist.org. Help Topics: IGETC. Students with partial IGETC certification should contact their dean’s office or Biology Academic Success Center to determine any restrictions and courses that will provide the greatest benefit.

**UC Davis Pattern of General Education:**
Courses for which IB credit may not be used as a substitute for courses required as part of the UC Davis GE Requirement; see International Baccalaureate (IB) Examinations on page 34 and page 42.

**UC Davis Course Equivalencies and Credit Allowance for Duplicate Coursework/Exams:**
The university does not generally award full credit for college courses that duplicate credit already earned through IB exams, whether taken before or during enrollment in the university. Exceptions to this policy are indicated in the column. We encourage students who have IB credit to speak with an academic advisor in their major department, dean's office or Biology Academic Success Center to determine any restrictions and courses that will provide the greatest benefit.

**UC Davis College Area Requirements:**
- UC Davis College Area Requirements: a. Satisfies first half of English Composition requirement.
- UC Davis College Area Requirements: b. Satisfies 4 lower-division units of the English Composition requirement.
- UC Davis College Area Requirements: c. Satisfies first course toward English Composition requirement.
- UC Davis College Area Requirements: e. Music major partially satisfies Area (Breadth) requirement for A.B. degree.
- UC Davis College Area Requirements: f. Credit or preparatory coursework allowed for science majors for each Natural Sciences exam passed, except 8 units of credit allowed for Mathematics and Physics exams.
- UC Davis College Area Requirements: g. Credit or preparatory coursework allowed for science majors for each Natural Sciences exam passed, except 8 units of credit allowed for Mathematics and Physics exams.
selecting and enrolling in classes. Please note that the courses for which IB credit have been granted may not substitute courses required as part of the UC Davis General Education Requirement; see General Education Requirement, on page 97.

In general, you may not earn university credit for college courses that duplicate credit earned through IB. There are, however, a few exceptions as indicated in the chart International Baccalaureate (IB) Higher Level Examination Credit, on page 39. Similarly, students will not receive duplicate credit for comparable AP examinations if granted IB transfer credit. Each college may have special restrictions on the use of IB examinations—please check with your dean's office, department adviser or the Biology Academic Success Center to determine any restriction in their use toward breadth requirements and lower-division major course requirements before selecting and enrolling in classes.

ADMISSION AS A TRANSFER STUDENT

UC Transfer Applicant Definition

The University of California defines a transfer applicant as a student who has been a registered student in a regular term at a college, university or in college-level extension classes since graduating from high school. Summer session attended immediately following high school graduation is excluded in this determination. If you are a transfer applicant, you may not disregard any of your college records and apply for admission as a freshman.

Campus Selection and Priority

UC Davis gives highest priority to junior-level transfer applicants from California community colleges. To apply to majors in the Colleges of Biological Sciences, Engineering and Letters and Science, students must be junior-level applicants with a minimum of 90 quarter units (60 semester units) of UC-transferable coursework, including courses in progress or planned. In the College of Agricultural and Environmental Sciences, junior-level applicants will be given highest priority, but lower-division applicants may be considered if space allows.

Meeting transfer admission requirements for the University of California does not guarantee admission to UC Davis. Due to limited enrollment space, transfer applicants who are admitted generally well exceed UC admission criteria. Foremost is the applicant's academic performance and preparation for the selected college and major. To be competitive, you must maintain a GPA of 2.800 or higher. In some cases, personal characteristics, experiences and circumstances will also be considered.

Applications far exceed the number of spaces available in majors such as biotechnology, communication, international relations, psychology, viticulture and enology and all majors in the Colleges of Biological Sciences and Engineering. Applicants must complete specific lower-division major preparation courses with a specific GPA in the major and an overall required GPA.

To view our selective majors and their specific requirements for admission, see http://admissions.ucdavis.edu/admission/transfers/tr_selection_process.cfm.

UC Transfer Admission Requirements for California Residents

To be eligible for admission to UC as a junior transfer student, you must fulfill both of the following criteria:

1. Complete 90 quarter units (60 semester units) of UC-transferable credit with a minimum 2.400* GPA. No more than 21 quarter (14 semester) units may be taken Pass/No Pass.

2. Complete the following seven UC-transferable college courses, earning a grade of C or better in each course:
   - Two courses in English composition;
   - One course in mathematical concepts and quantitative reasoning;
   - Four courses chosen from at least two of these subject areas: arts and humanities, social and behavioral sciences, and physical and biological sciences.

Each course must be worth at least 4-5 quarter (3 semester) units. Completing the Intersegmental General Education Transfer Curriculum (IGETC) before transferring to UC may satisfy the required seven-course pattern for UC admission, depending on the courses you take. For more information, see http://www.assist.org.

*Please note that meeting UC admission requirements does not guarantee admission to UC Davis. To be a competitive candidate for admission, you must have an overall GPA of 2.800 or higher.

Alternatives for Satisfying UC Transfer Admission Requirements

If you were eligible for admission to UC when you graduated from high school—meaning you satisfied the subject, scholarship and examination requirement—or were identified by UC during your senior year as Eligible in the Local Context (ELC) and completed the Subject and Examination Requirements by your senior year, you are eligible to transfer with a minimum C (2.000)* average in your UC-transferable college coursework.

If you met the Scholarship Requirement in high school, but did not satisfy the 13-course Subject Requirement, you must take UC-transferable college courses in the missing subjects, earn a C or better in each required course and maintain a 2.000 GPA to be eligible to transfer.

*Please note that meeting UC admission requirements does not guarantee admission to UC Davis. To be a competitive candidate for admission, you must have an overall GPA of 2.800 or higher.

UC Transfer Admission Requirements for Out-of-State Applicants

The UC transfer admission requirements for transfer applicants from out-of-state are very similar to those for California residents. Applicants must have a GPA of 2.800* higher in all UC-transferable college coursework.

*Please note that meeting UC admission requirements does not guarantee admission to UC Davis. To be a competitive candidate for admission, you must have an overall GPA of 2.800 or higher.
Transfer Credit

Coursework from other colleges and universities is considered UC-transferable if the applicant completed the course at an institution that is recognized by the University of California. In addition, the coursework must be comparable to courses and levels offered within the University of California.

A total of 105 quarter (70 semester) UC-transferable units toward a university degree may be earned for lower-division coursework completed at any institution or combination of institutions. Lower- or upper-division units earned at UC (Extension, summer, cross/concurrent, UC-EAP, and regular academic year enrollment) are added to the maximum lower-division credit allowed and might put applicants at risk of being denied admission due to excessive units. For more information, see http://admission.universityofcalifornia.edu/counselors/files/uc-transfer-maximum-limitation-policy-chart.pdf. You can find information about transferable credit from California community colleges at http://assist.org. Only subject credit will be granted for courses taken in excess of this amount.

If, after applying UC lower-division unit limitations and exclusions, you have completed 120 quarter units (80 semester units) or more of UC-transferable units, your admission is subject to approval by the respective dean for majors in the Colleges of Agricultural and Environmental Sciences, Biological Sciences and College of Letters and Science.

Advanced Placement (AP) Examinations

Transfer credit is granted for each College Board Advanced Placement (AP) examination completed with an official score of 3, 4 or 5. To learn more, see Advanced Placement (AP) Examinations, on page 34.

International Baccalaureate (IB) Examinations

UC Davis recognizes the International Baccalaureate (IB) examinations for college credit. Higher Level examinations presented with official scores of 5, 6 or 7 receive 8 quarter (5.3 semester) units of degree credit and in specific instances are deemed comparable to various lower-division courses. Students completing the International Baccalaureate (IB) diploma with a score of 30 or above will receive a maximum of 30 quarter (20 semester) units. The credit will apply toward the minimum 180 quarter units needed to receive a bachelor’s degree. To learn more, see International Baccalaureate (IB) Examinations, on page 34 and International Baccalaureate (IB) Higher Level Examination Credit, on page 39.

Limited Status

Students in limited status are those whose special achievements qualify them to take certain university courses toward a definite and limited objective.

Currently the Colleges of Agricultural and Environmental Sciences, Biological Sciences, Engineering and Letters and Science do not consider limited status applicants. As an alternative, you may wish to consider enrolling in our UC Davis Extension Open Campus program.

Second Baccalaureate

Applicants who have a bachelor’s degree substantially equivalent to one granted by the University of California, are considered as undergraduates seeking a second bachelor’s degree. Admission under this status will require a superior academic record and clear evidence of a change in objective. The College of Engineering will consider applicants if their first degree is not in engineering and if they complete the lower-division engineering program at a California community college. Admission to the College of Engineering requires approval of the Associate Vice Chancellor of Undergraduate Admissions and dean of the college. You must submit the online UC undergraduate application for admission and scholarships during the appropriate UC filing period. The Colleges of Agricultural and Environmental Sciences, Biological Sciences and Letters and Science do not consider second baccalaureate applicants.

UC Intercampus Transfer

If you are an undergraduate student who is currently or was previously registered at another UC campus and have not since registered at a non-UC institution, you may apply for transfer to the UC Davis campus. Filing dates, application, fees and admission and selection requirements are the same as those listed for new transfer applicants. Current UC students who wish to attend UC Davis as intercampus visitors and plan to return to their home UC campus should refer to the Intercampus Visitor Program, on page 79.

ADMISSION AS AN INTERNATIONAL STUDENT

International students and researchers from countries around the world are part of the UC Davis community. During the 2011 academic year, the campus community represented more than 100 countries, including 1,600+ international students and nearly 1,000 international scholars.

International Freshman Applicants

Non-immigrants studying in the United States must meet the same requirements as domestic California and non-California residents. Students studying outside the United States must complete secondary school, earn superior marks in academic subjects, sit for the UC-required exam and may be required to demonstrate English proficiency. For more information, see http://admissions.ucdavis.edu/international.

International Transfer Applicants

International students applying to transfer to UC Davis from California or U.S. colleges or universities are considered for admission using the same transfer admission criteria as domestic students. Applicants who have attended international colleges or a combination of international and domestic colleges and universities will be evaluated using courses and grades from both institutions.

Priority admission consideration is given to prospective California community college transfer students, including international students, who are prepared to begin their junior or third year of study. Coursework from other colleges and universities is considered UC-transferable if the applicant completed the course at an institution that is recognized by the University of California and when the coursework is comparable to courses offered within the University of California. For more information, see http://admissions.ucdavis.edu/international.
**Required International Academic Records**

International students are responsible for providing UC Davis with official academic transcripts and/or certificates beginning with secondary school records. College and university records should indicate subjects taken; grades or marks earned; rank in class; number of academic terms per year; number of weeks in each academic term; and number of hours per week devoted to lecture and laboratory. Certifications must be provided for any university or government examinations the student has undertaken. Note: It is not possible to disregard any college or university coursework undertaken within the United States or abroad.

**English Proficiency**

Applicants must demonstrate English proficiency if they have been studying in the United States for less than two years, English is not their native language, and/or the language of instruction prior to study in the United States was not English. Applicants may demonstrate proficiency in one of the following ways:

- Complete two UC-transferable college courses (3 semester or 4–5 quarter units each) in English composition with C grades or better at an accredited U.S. college or university.
- Achieve a minimum score of 550 on the paper-based Test of English as a Foreign Language (TOEFL) or 80 on the Internet-based TOEFL. For more information, see [http://toefl.org](http://toefl.org).
- Achieve a minimum score of 7 (academic module) on the International English Language Testing System (IELTS).
- Achieve a minimum score of 560 on the Writing component of the SAT Reasoning Test.

**AFTER YOU APPLY FOR ADMISSION**

A few weeks after you apply, the University of California will notify you that your application has been received and processed. UC Davis will also notify you once the application has been received at our campus. At this time, you can create a MyAdmissions account at [http://myadmissions.ucdavis.edu](http://myadmissions.ucdavis.edu), using your UC Davis Student ID. You will be able to use this secure website to check your application and admission status at the UC Davis campus.

Students admitted to UC Davis can use MyAdmissions to view upcoming events for admitted students, check deadlines and complete pre-enrollment tasks, review their financial aid and scholarship awards (MyAwards) and accept our offer of admission. Admitted students who wish to officially accept our offer of admission must submit their Statement of Intent to Register (SIR) and complete all pre-enrollment tasks related to:

- MyAwards—Financial Aid Notice and Scholarships
- Student Housing
- Orientation (fall admits only)
- Statement of Legal Residence (SLR)
- High School Transcripts
- College/University Transcripts

- AP/IB Examination Results
- Test Scores
- Requests for I-20 or DS-2019
- International Records
- Accommodation for a Disability (if applicable)
- Health Insurance Requirement
- Hepatitis B Statement

After applying, transfer students are required to update their grades and course records using the online UC Transfer Academic Update (TAU) to ensure that the campuses have the most current academic information before making admission decisions. For details and deadlines, see [http://admission.universityofcalifornia.edu](http://admission.universityofcalifornia.edu).

**Required Academic Records for All Students**

You must accurately report all examination scores, as well as high school and any college/university work undertaken within the United States or abroad.

If you are admitted to UC Davis, you are expected to arrange to have all of your official final transcripts sent to Undergraduate Admissions by deadlines indicated on MyAdmissions. You do not need to submit official transcripts before this time, unless requested. All students must provide official final:

- High school transcripts
- College transcripts

All students completing the following examinations will be required to submit official scores:

- Advanced Placement (AP)
- International Baccalaureate (IB)

International applicants will be required to submit official scores for the following examination:

- TOEFL
  OR
- IELTS

Freshman applicants are also required to submit official scores for the following examinations:

- ACT Plus Writing
  OR
- SAT Reasoning Test
  and
- SAT Subject Tests (if taken)

For more information regarding ACT, see [http://act.org](http://act.org); the UC Davis ACT code is 0454. For more information regarding SAT, see [http://collegeboard.org](http://collegeboard.org); UC Davis College Board code is 004834.

Submit official documents and test scores to:

Undergraduate Admissions
University of California
One Shields Avenue
Davis, CA 95616-8507
SPECIAL PROGRAMS

Deferred Enrollment

The Deferred Enrollment program allows newly admitted undergraduate students to postpone their initial enrollment at UC Davis for up to one year. The purpose is to allow time to pursue other non-academic activities and opportunities that will assist students in clarifying their educational goals; e.g., travel, job opportunities, non-collegiate experience, time to resolve personal or medical problems. Students are not allowed to enroll in any coursework at another college or university during this time.

To be eligible for Deferred Enrollment, you must submit your Statement of Intent to Register (SIR) and deposit by the stated deadline, satisfy all university admission and entrance requirements and provide all official transcripts and examination scores. After submitting the SIR, you can browse our deferred enrollment FAQs and apply for deferred enrollment through the MyAdmissions website. You must also submit a $70 processing fee within seven days of submitting your deferred enrollment application.
FEES, EXPENSES AND FINANCIAL AID
FEES AND EXPENSES

Given the careful consideration to the total financing of your university education. If you will need funds beyond those that you and your family can provide, you should apply for financial aid well in advance of enrollment. The deadlines for applying for financial aid (grants, loans, Work Study and scholarships) are listed on the following pages.

The most up-to-date student fee information is available at http://budget.ucdavis.edu/studentfees. Every student must pay the quarterly fees, and any amounts charged to the student account, in full by the fee payment deadline listed in the Fees and Billing calendar at http://registrar.ucdavis.edu/calendar/. A Deferred Payment Plan (DPP), which allows students to pay quarterly student and housing fees in three monthly installments, or semester fees in four monthly installments, is available.

Course Materials and Services Fees

Students may be charged fees in some courses for the use, rental or consumption of materials, tools or equipment, or for the costs of materials or services necessary to provide a special supplemental educational experience. For example, course materials fees may cover the purchase of chemicals and glassware for a science laboratory or art supplies for an art studio class. They might also cover film rentals, field trips, or the purchase or rental of specific equipment. Courses that may be subject to the course materials fee are listed in the Class Schedule at http://registrar.ucdavis.edu/faculty-staff/.

Part-Time Students

Students approved for enrollment on a part-time basis pay the same fees as full-time students, but pay only one-half of Tuition. Part-time nonresidents pay one-half of the Nonresident Supplemental Tuition. The Part-Time Petition should be filed with the Office of the University Registrar in 12 Mrak Hall. The petitions must be filed on or before the 10th day of instruction for the term in which the reduction is to be applied. Petitions are also available at the Office of the University Registrar's website at http://registrar.ucdavis.edu.

UC Employee-Student Fees

Reduced fees are available to UC career employees and certain UC retirees who are qualified for admission to the university. The employee-student must file a petition, the Employee-Student Reduced Fee Authorization Form, with the Office of the University Registrar in 12 Mrak Hall for the reduction of fees. The form must be filed on or before the 10th day of instruction for the term in which the reduction is to be applied. Employee-students pay one-third of the full-time Registration Fee and one-third of the full-time Tuition. Employee-students also pay the Memorial Union Fee and the Student Facilities Safety Fee.

Employee students may enroll for up to nine units or three courses per quarter or semester, whichever is greater. Information is in Personnel Policies for Staff Members (section 51), available in department offices, at Shields Library, the Staff Development and Professional Services Office, and on the Internet. Petitions are also available at the Office of the University Registrar's website at http://registrar.ucdavis.edu.

Motor Vehicle Parking Permit and Bicycle Licensing Fees

Parking permit information and rates are available from TAPS at http://taps.ucdavis.edu or call 530-752-8277.

A California State bicycle license sticker is required on all bicycles operated on campus (new license, $10.00; renewals, $5.00—both valid through December 31 of the second year after purchase). For more information, call 530-752-2453 or see http://taps.ucdavis.edu.

Costs for a Year at UC Davis

Cost of living expenses are adjusted annually and fees are subject to change without notice. For the most recent Cost of Attendance figures, please refer to the Financial Aid Office's website for undergraduate and graduate and professional students at http://financialaid.ucdavis.edu.

International Student Expenses

International students are responsible for all of their expenses while studying at UC Davis. The expenses include nonresident supplemental tuition, system-wide tuition and fees, campus-based fees, room and board, books and a modest amount for personal expenses. For the 2013-2014 academic year, costs for international undergraduates living on campus were $55,951. Because the exact cost for tuition and fees is not determined until just before the beginning of the academic year, this amount is likely to increase without advance notice. For the latest costs, see http://financialaid.ucdavis.edu/undergraduate/cost/UGBudgets.html.

During the admission process, most international undergraduate students are required to complete the “Confidential Financial Statement” form certifying that support funds are available for twelve months. It is very important that students have adequate, reliable and continuing financial support for the whole time they are here. After students arrive in the United States, it is extremely difficult to obtain additional funding. The university does not offer grants or financial aid to international undergraduate students.

It is extremely important that you arrive on campus with sufficient funds for the entire academic year to cover all fees, tuition and expenses such as room and board, health insurance, books, supplies, transportation and other miscellaneous expenses. Careful budgeting is essential for international students.

FEE REFUNDS

Cancellation, Withdrawal and Fee Refunds

To cancel your registration before the first day of instruction or to withdraw from the university on or after the first day of instruction, you must complete a Cancellation/Withdrawal Form and return the form to the Office of the University Registrar. If you do not submit a Cancellation/Withdrawal Form, you will be liable for tuition and student fees according to university policy (below). No exceptions will be made to this policy.

If you are enrolled in classes, you will be dropped from all of your courses automatically when the Cancellation/Withdrawal Form is processed.

For students who pay fees and then cancel or withdraw with official approval before the end of any quarter, fees may be refunded according to the Schedule of Refunds, on page 48.
**Student Fees**

Unless otherwise noted, these are the estimated quarterly fees for Fall, Winter and Spring the 2014-15 academic year. The tuition, fees, and charges posted here are estimates based on currently approved amounts. These figures may not be final. Actual tuition, fees, and charges are subject to change by the Regents of the University of California and could be affected by State funding reductions. Accordingly, final approved levels (and thus a student's final balance due) may differ from the amounts shown. For up-to-date fee information, see [http://budget.ucdavis.edu/studentfees/](http://budget.ucdavis.edu/studentfees/). Programs and courses may have fees that are not listed here, check with your advisor.

<table>
<thead>
<tr>
<th>Program</th>
<th>Undergraduate</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Resident</td>
<td>Nonresident</td>
</tr>
<tr>
<td>Student Services Fee</td>
<td>$324.00</td>
<td>$324.00</td>
</tr>
<tr>
<td>Tuition</td>
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<td>$3,740.00</td>
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<tr>
<td>ASUCD Fee</td>
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<td>UGA Fee</td>
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<tr>
<td>USA Fee</td>
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<tr>
<td>Facilities and Campus Enhancements Fee</td>
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<td>$134.83</td>
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<tr>
<td>Legal Education Enhancement Fee</td>
<td></td>
<td>$100.14</td>
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<tr>
<td>Legal Education Access Program Fee</td>
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<td>$100.14</td>
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<tr>
<td>Campus Expansion Initiative</td>
<td>$114.26</td>
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<tr>
<td>Student Services Maintenance Fee and Student Activities and Services Initiative Fee</td>
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<td>$22.00</td>
</tr>
<tr>
<td>Student Facilities Safety Fee</td>
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<td>$22.00</td>
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<tr>
<td>Student Health Services Fee</td>
<td>$22.00</td>
<td>$22.00</td>
</tr>
<tr>
<td>Tuition</td>
<td>$3,740.00</td>
<td>$3,740.00</td>
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<tr>
<td>Professional Degree Supplemental Tuition</td>
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<td>$4,978.50</td>
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<td>Disability Insurance Fee</td>
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<td>Course Materials and Services Fee</td>
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<td>$134.00</td>
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<tr>
<td>Total Full-Time Student Fees, CA Resident</td>
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<td>$4,369.54</td>
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<tr>
<td>Nonresident Tuition</td>
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<td>$9,403.54</td>
</tr>
<tr>
<td>Total Full-Time Student Fees, Nonresident (Excludes Health Insurance)</td>
<td>$12,257.89</td>
<td>$9,403.54</td>
</tr>
<tr>
<td>Total Full-Time Student, CA Resident</td>
<td>$12,257.89</td>
<td>$9,403.54</td>
</tr>
<tr>
<td>Nonresident Tuition</td>
<td>$12,257.89</td>
<td>$9,403.54</td>
</tr>
<tr>
<td>Total Full-Time Student Fees, Nonresident (Excludes Health Insurance)</td>
<td>$12,257.89</td>
<td>$9,403.54</td>
</tr>
<tr>
<td>Total Full-Time Student, Nonresident (Excludes Health Insurance)</td>
<td>$12,257.89</td>
<td>$9,403.54</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>$618.00</td>
<td>$618.00</td>
</tr>
</tbody>
</table>

* All new Undergraduate, Graduate Academic, and Graduate Professional students admitted will be charged a one-time, life-time document fee of $150.00. Graduate students in the strictly professional degrees (M.D., J.D., D.V.M. and M.B.A.) are excluded and will continue with pay-per-service charges. More information about the document fee is available at [http://registrar.ucdavis.edu/local_resources/docs/disclaimer/document_fee.pdf](http://registrar.ucdavis.edu/local_resources/docs/disclaimer/document_fee.pdf).  
1 The Disability Insurance Fee is assessed annually fall quarter at $41.00. This fee applies only to medical students, not interns, residents or health science academics.  
3 The fees above exclude students enrolled in self-supporting degree programs. Students enrolled in self-supporting degree programs pay a program fee in lieu of the fees above. Fees for self-supporting programs are available at [http://budget.ucdavis.edu/studentfees/current/index.html](http://budget.ucdavis.edu/studentfees/current/index.html).  
4 The Law School operates on the semester system. Nonresident law students pay a Professional Degree Supplemental Tuition of $15,594.00 per semester.  
5 Students in these programs must attend the summer quarter and pay fees the summer. For fee information, see [http://budget.ucdavis.edu/studentfees/documents/special/course-materials-fees.pdf](http://budget.ucdavis.edu/studentfees/documents/special/course-materials-fees.pdf).  
6 The fees above reflect fees for students in the Graduate School of Management (GSM) full-time MBA program. Students enrolled in the GSM part-time MBA programs (Bay Area MBA and Sacramento MBA) and Master of Professional Accountancy (MPAC) program are self-supporting programs and students pay a program fee in lieu of the fees above. For fee information, see [http://budget.ucdavis.edu/studentfees/current/index.html](http://budget.ucdavis.edu/studentfees/current/index.html).  
7 Full-time MBA students are only required to pay the quarterly course materials and services fee in their first year of instruction.  
8 School of Veterinary Medicine operates on the semester system. 4th year Veterinary Medicine D.V.M. students also attend during summer and pay $4,822.08 in fees the summer prior to their final academic.  
9 Nonresident Master of Public Health students pay a Professional Degree Supplemental Tuition of $2,532.00 per quarter and nonresident Master of Preventive Veterinary Medicine students pay a Professional Degree Supplemental Tuition of $2,066.00 per quarter.  
10 The Betty Irene Moore School of Nursing at UC Davis offers a Nursing and Healthcare Leadership - Master of Science (for Nurse Practitioners) degree program. The students in this M.S. Nurse Practitioner track must attend the summer quarter and pay additional summer fees. For fee information, see [http://budget.ucdavis.edu/studentfees/current/index.html](http://budget.ucdavis.edu/studentfees/current/index.html).  
11 Undergraduate and Graduate students are automatically in the Student Health Insurance Plan (SHIP) unless they are able to prove comparable coverage under another insurance plan. For more information, see [http://shs.ucdavis.edu/insurance](http://shs.ucdavis.edu/insurance).
The effective date for determining a refund of fees is the date you file a completed Cancellation/Withdrawal Form with the Office of the University Registrar and it is presumed that no university services will be provided to you after that date. The percentage of tuition and student fees that may be refunded is determined by the number of calendar days (not school days) elapsed, beginning with the first day of instruction.

If you are enrolled but have not paid fees in full by the tenth day of instruction, you will be administratively withdrawn and fees for the first 10 days of instruction will be charged to your account.

**New Undergraduate Students**

The nonrefundable $100 deposit paid when you accepted admission and returned your Statement of Intent to Register (SIR) is withheld from tuition and the Schedule of Refunds is applied to the balance of tuition and student fees assessed.

Therefore, on or before the first day of instruction, tuition and student fees paid are refunded in full minus $100. After the first day of instruction, the nonrefundable $100 deposit is withheld from tuition and the Schedule of Refunds is applied to the balance of tuition and student fees assessed.

**All Continuing Students, Readmitted Students and New Graduate Students**

On or before the first day of instruction, registration fees are refunded in full minus a $10 service charge for cancellation/withdrawal. After the first day of instruction, the Schedule of Refunds is applied to tuition and student fees. The Schedule of Refunds does not apply to the Health Insurance Fee.

**Planned Educational Leave Program (PELP)**

The Schedule of Refunds also applies to students who participate in the Planned Educational Leave Program (PELP). Thus, for a full refund of tuition and student fees paid, you must file a completed approved PELP Form with the Office of the University Registrar before or on the first day of instruction; see Leave of Absence: Planned Educational Leave Program (PELP), on page 86 in the Academic Information chapter.

**Schedule of Refunds**

The Schedule of Refunds applies to all new, continuing and readmitted students who do not receive federal financial aid.*

The Schedule of Refunds refers to calendar days—not school days—beginning with the first day of instruction. The number of days elapsed is determined from the date the completed Cancellation/Withdrawal Form or PELP Form is returned to the Office of the University Registrar. Percentages listed (days 1-35) will be applied respectively to Tuition, Nonresident Supplemental Tuition, and all student fees except the Health Insurance Fee.

<table>
<thead>
<tr>
<th>Elapsed Calendar Days</th>
<th>Percentage of Fees Refunded</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–1</td>
<td>100% less $10.00</td>
</tr>
<tr>
<td>2–7 days</td>
<td>90%</td>
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<tr>
<td>8–18 days</td>
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</tr>
<tr>
<td>19–35 days</td>
<td>25%</td>
</tr>
<tr>
<td>36 days and over</td>
<td>0%</td>
</tr>
</tbody>
</table>

*New students who receive federal financial aid and withdraw during their first academic term may be refunded fees according to a Modified Fee Refund Schedule, available at the Financial Aid Office.

**UC Davis Student Health Insurance Plan (Davis SHIP) Coverage and Refund of Davis SHIP Fees**

The University of California requires that all students have health insurance. To help students meet this requirement, UC Davis automatically enrolls all registered students in the UC Davis Student Health Insurance Plan (Davis SHIP). Fees for Davis SHIP coverage are automatically charged to the student’s account each term along with registration fees: for

- Students who want to be enrolled in Davis SHIP, enrollment is automatic-no action is required.
- Students with comparable insurance, who do not want to be enrolled in Davis SHIP, must submit a Davis SHIP waiver application at http://shcs.ucdavis.edu/insurance by the published deadline; see the Academic Calendar, on page 1. If a waiver is approved, Davis SHIP enrollment will be waived through the end of the academic year. An approved waiver is effective for the duration of the current academic year only. Waiver applications must be filed each academic year.

On campus medical and mental health care is available to all students at SHCS, even if Davis SHIP is waived.

More waiver information or information regarding benefits, eligibility, deadlines, or insurance coverage if your registration status changes, can be found at http://shcs.ucdavis.edu/insurance or by visiting the SHCS Insurance Services office at the Student Health & Wellness Center.

**FINANCIAL AID**

Financial Aid Office
1100 Dutton Hall
530-752-2390 530-754-6073 (Hearing Impaired)
http://financialaid.ucdavis.edu

The Financial Aid Office provides financial assistance in the form of grants, scholarships, loans, and work-study employment. To apply, undergraduates and graduate students are required to file the Free Application for Federal Student Aid (FAFSA), available at http://www.fafsa.ed.gov or the California Dream Act Application at http://dream.csac.ca.gov.

The priority-filing period is January 1 to March 2 each year; however, students are encouraged to apply even if the deadline has passed. Although state and university funding may be depleted, Federal Pell Grants and Direct Loans are available throughout the year for eligible applicants.
UC Education Finance Policy for Undergraduates

UC Davis uses the University of California Education Financing Model to determine financial aid awards for undergraduates. The policy looks at four factors to choose the type and amount of aid for each student:

1. Cost of Attendance
2. Expected Family Contribution (EFC) as determined by the information on your application
3. Federal, State, and University grant eligibility
4. Undergraduate Self-Help and Loan Contribution, which is the amount that undergraduates are expected to contribute toward their cost of education at UC Davis

The Financial Aid Office can assist students with dependents or child care costs that exceed the standard student budgets.

Undergraduates with outstanding academic records are encouraged to apply for scholarships. For information about scholarship application process, see Undergraduate Scholarships and Awards, on page 51.

Graduate Student Funding

Graduate students and students in the professional schools at UC Davis (Medicine, Law, Veterinary Medicine and the School of Management) apply for financial aid by completing the Free Application for Federal Student Aid (FAFSA), available at http://www.fafsa.ed.gov or the California Dream Act Application at http://dream.csac.ca.gov. Financial need is based on the information provided on your application. FAFSA applicants will receive a Student Aid Report (SAR) with the Student Contribution (SC) assigned by the federal processor, while Dream Act applicants will receive their SC from CSAC. The SC is subtracted from the UC Davis Cost of Attendance (for the student’s graduate program) to determine need-based eligibility. Graduate scholarships, fellowships and teaching and research assistantships are administered through the Office of Graduate Studies.

Satisfactory Academic Progress

Federal regulations require that undergraduate and graduate student financial aid recipients meet the published Standards for Satisfactory Academic Progress (SAP) for Financial Aid concerning units and maximum quarters of attendance allowed to obtain a degree. A copy of our SAP standards is available at http://financialaid.ucdavis.edu/undergraduate/students/SAP.html. Review the policy in detail and discuss it with your academic adviser.

For more information, contact the Financial Aid Office. Regulations and deadlines are subject to change.

Types of Financial Aid

Grants

A grant is an award that does not have to be repaid as long as the student remains eligible. Whenever criteria and funding levels permit, a student’s financial aid award includes grants.

Federal Pell Grants. All undergraduate financial aid applicants are required to apply for a Federal Pell Grant each year by filing the FAFSA. Recipients must be enrolled at full time to receive the full amount of awarded Pell Grant and must maintain good academic standing and make satisfactory academic progress. Eligibility is determined by the federal government according to a formula developed by the Department of Education and approved annually by Congress. The UC Davis electronic financial aid notice (MyAwards) informs the student of the Pell Grant award amount.

Cal Grants. All undergraduate financial aid applicants who are California residents are encouraged to apply for a Cal Grant by submitting the FAFSA or California Dream Act Application and a GPA Verification form before March 2. Cal Grants are awarded by the California Student Aid Commission (CSAC) and may be renewed each year for four years, see http://www.csac.ca.gov.

• Cal Grant A Awards are based on financial need and academic achievement and can be extended for one year for students entering a teaching credential program. Cal Grant A pays partial registration fees.

• Cal Grant B Awards are based on financial need and are for undergraduate students primarily from low-income backgrounds. Recipients are required to complete at least 12 units each quarter. Cal Grant B pays a quarterly stipend for living expenses for first-year students and a portion of the registration fees plus a quarterly stipend for living expenses for students in their second through fourth years.

Cal Grant A and B recipients who plan to enroll in a Teaching Credential Program (TCP) may be eligible to renew their Cal Grant award for an additional year. The additional year of payment is provided to students who are seeking an initial teaching credential and cannot be used for other graduate level courses of study.

University Grants (UC Grant). The university determines grant eligibility for undergraduates by subtracting a student and parent contribution, any federal or state resources the student receives, and a standard work and loan contribution from the cost of attendance. Any remaining eligibility would be funded with UC Grant. UC Grant funding for graduate students is awarded by the Office of Graduate Studies. Students in the professional schools and the School of Education are awarded grant by their academic departments.

Loans

Financial Aid almost always includes a long-term loan. Awards are dependent on funding available. Some loan fund sources do not receive allocations each year. Repayment of these loans (with the exception of Federal Direct PLUS loans) begins after graduation or withdrawal from school. Students are encouraged to work as much as possible (while remaining full-time students) and to develop modest personal budgets to keep final loan indebtedness within a manageable range.
Health Profession Student Loans (HPSL) are awarded to students in the School of Veterinary Medicine who demonstrate financial need. Parental income information is required for HPSL applicants regardless of age and dependency status.

- $2,500 plus fees maximum
- 5% interest
- Repayment begins twelve months after receipt of the degree or withdrawal

Federal Direct Subsidized and Unsubsidized Student Loans (Direct Loans) are available through the Financial Aid Office. Subsidized loans are based on financial need and interest accrued while the student is in school is paid by the federal government. Unsubsidized loans are available to students regardless of income and assets, and there is no interest subsidy.

- Undergraduates may borrow up to annual maximums of $3,500 subsidized plus $2,000 unsubsidized = $3,500 for freshmen, $4,500 subsidized plus $2,000 unsubsidized = $6,500 for sophomore, and $5,500 subsidized plus $2,000 unsubsidized = $7,500 for juniors and seniors, up to a maximum aggregate indebtedness of $23,000 for subsidized loan and $31,000 in combined subsidized and unsubsidized loan
- Independent undergraduates may borrow unsubsidized Direct Loans up to annual maximums of $9,500 for freshmen, $10,500 for sophomores, and $12,500 for juniors and seniors, up to a maximum aggregate amount of $57,500, of which $23,000 can consist of subsidized loans
- Graduate and professional students may borrow subsidized Direct Loans up to an annual maximum of $8,500. Health professionals students may borrow higher amounts dependent on the length of their academic year
- Graduate and professional students may borrow unsubsidized Direct Loans up to an annual maximum of $12,000
- For the most current interest rates on Direct Loans, see https://studentloans.gov
- A minimal loan fee is charged on all Direct Loans, which varies by loan type. The fee is deducted proportionately from each disbursement
- For Direct Loans, repayment begins six months after graduation or withdrawal from school

Federal Direct Parent Loans for Students (Direct PLUS) are government-insured loans that are made to parents of dependent students.

- Direct PLUS loans are available up to the cost of education minus other financial aid received during the years if the dependent student is an undergraduate
- There is no interest subsidy for this loan
- A loan fee is charged and deducted proportionately from each disbursement
- For the most current interest rate and loan fee information, see https://studentloans.gov
- Repayment begins within 60 days after loan disbursement

Direct Grad PLUS Loans. The Grad PLUS Loan is provided by the William D. Ford Direct Loan Program. (Students in Teaching Credential programs are not eligible for Graduate PLUS loans.)

- Credit checks are required to be eligible for the Grad PLUS. Students who do not meet the credit requirements for a Grad PLUS may still obtain the loan with an endorser who does meet the credit requirements
- An origination fee is deducted from the loan amount
- For the most current interest rate and loan fee information, see https://studentloans.gov
- Repayment begins 60 days after loan disbursement

Federal Perkins Loans are for U.S. citizens or permanent U.S. residents. Loans may be limited to a percentage of student's need because of demand and limited funds. This is a subsidized loan, which means the federal government pays the interest on the loan while the student is enrolled in school. Repayment starts nine months after graduation or withdrawal from school and may be extended over 10 years. Additional deferments are possible for temporary total disability or volunteer service in a private, non-profit organization, VISTA or the Peace Corps. Some teachers of students from low-income families and full-time teachers of handicapped children may also qualify for partial loan cancellation.

Annual Federal Perkins Loan Limits
- $4,000 for undergraduate students
- $6,000 for graduate/professional students

Aggregate (Maximum) Loan Limits
- $8,000 for a student who has not completed the first two years of undergraduate work and for programs that are less than two years in length
- $20,000 for a student who has successfully completed two years of a program of education leading to a bachelor's degree but who has not completed degree work
- $40,000 for a graduate/professional student (includes loans borrowed at the undergraduate level)

Emergency, Short-Term and Assistant Loans meet temporary or emergency financial needs of currently enrolled students. Please visit the financial aid website for requirements, instructions and the online application. Loan funds are provided by UC Davis alumni, ASUCD, the Cal Aggie Foundation, the Regents of the University of California and private donors.

- Emergency Loans. $500 maximum. The maximum repayment period is 30 days
- Short-Term Loans. $500 or higher. Assistant Loans: graduate students who are in the teaching assistant, research assistant, readership, associate-instructor or postgraduate researcher classifications can apply for a maximum of one month's salary. The maximum repayment period is six months or the end of the academic year, whichever occurs first
- Assistant Loans. Graduate students who are in the teaching assistant, research assistant, readership, associate-instructor or postgraduate researcher classifications can apply for a maximum of one month's salary. The maximum repayment period is six months or the end of the academic year, whichever occurs first

For applications and more information about applying, see http://financialaid.ucdavis.edu.

Work-Study

Student Employment
1100 Dutton Hall
530-752-0520; sec@ucdavis.edu; http://jobs.ucdavis.edu

Undergraduate Work-Study

Work-Study allows students to earn part of their financial aid through part-time employment. Federal Work-Study is available
for students eligible to complete the Free Application for Federal Student Aid Form (FAFSA), and the FAFSA must be completed by March 2 annually to be considered. Institutional Work-Study is available to international and AB 540 students who are eligible to work and is also based on need. For AB 540 students that are also undocumented, need is determined by the California Dream Act Application, which must be completed by March 2 annually to be considered. Dream Act applicants must also meet Deferred Action for Childhood Arrivals (DACA) requirements to be eligible. International and other AB 540 students must complete a separate application to be considered for Institutional Work-Study. Please see our office for details. Work-Study awards offer both money for education and work experience. Work-Study recipients should obtain a Work-Study job or ask to defer the Work-Study before December 1 or the award will be canceled. Student Employment coordinates Work-Study for undergraduates at UC Davis.

Community Service. A wide variety of community service jobs are available for students who apply for Work-Study funding. These jobs provide educational and rewarding work experience and help students connect with the community at large. Students applying for community service jobs also receive priority consideration for Work-Study funding.

Work-Study for Graduate Students

Work-Study funds for graduate students are allocated directly to the chairpersons of the graduate programs. Graduate students seeking Work-Study funding should contact their respective departments for further information. Students must file a FAFSA or California Dream Act application and have financial need to be considered for Work-Study funding.

Undergraduate Scholarships and Awards

Undergraduate and Prestigious Scholarships Office: 2128 Dutton Hall 530-752-2804; scholarships@ucdavis.edu; http://scholarships.ucdavis.edu/scholarships/

Mailing address: Undergraduate and Prestigious Scholarships Office University of California One Shields Avenue Davis, CA 95616-8606

UC Davis recognizes outstanding students with scholarships awarded on the basis of academic excellence and exceptional promise. The Scholarship Office administers approximately 220 different undergraduate scholarships. Many more scholarships are handled through outside agencies.

Committees made up of faculty and staff determine scholarship eligibility. In addition to academic records (a minimum grade point average of 3.250 is required), selection may be based on letters of recommendation, test scores and a personal essay in which your university goals and objectives are stated. Some awards are limited to students in specific majors or colleges, residents of certain geographical areas, students of a particular class standing, or students with demonstrated financial need. Most scholarships are not renewable and you must reapply each year for scholarship aid.

Students applying to the university are considered for scholarships using the same forms completed for admission purposes. The undergraduate scholarship application for continuing students becomes available online in October and is due in early January. See the Scholarship Office website for instructions and the application. Scholarship recipients will be notified beginning in April and continue through late summer.

Regents Scholarships, among the highest honors that undergraduates at the university can receive, are granted to exceptionally promising freshmen or juniors enrolling in the fall quarter. Awards may be honorary (honorarium) or may be accompanied by a stipend (for students demonstrating financial need), which generally covers the difference between family resources and yearly educational costs. These scholarships are renewable as long as students maintain a 3.250 cumulative grade point average.

• 2-year and 4-year renewable scholarships

Prestigious Scholarships and Fellowships are highly competitive, merit-based awards open to all UC Davis students. These awards have an extensive application process, and our office is available to assist you. Please visit the Undergraduate or Graduate Prestigious Scholarships & Fellowships section of our website for more details.

Special Prizes at UC Davis recognize outstanding performance, achievement and promise in special programs or majors. The most prestigious prize is the University Medal, presented to the most outstanding graduating senior.

• Plaques or certificates and cash awards

• College and school medals to outstanding graduates

Alumni Scholarships provided by the Alumni Association in cooperation with the university, are based primarily upon leadership and scholastic achievement. Your financial need and extracurricular activities may also be considered. For more information, see http://alumni.ucdavis.edu/s/787/index.aspx?id=787&gid=1&pgid=322.

• $1,000 minimum

• New undergraduates only

• Selection by local alumni association chapters

Military Scholarships are awarded to outstanding high school seniors without regard to financial need, as well as to UC Davis students who have demonstrated exceptional leadership and scholastic achievement during their freshman and/or sophomore years. Eligible high school seniors apply for the full 4-year scholarship and must file applications by November. UC Davis scholarship students participate in the Military Science (ROTC) Program. Information and applications are available from the Department of Military Science in 125 Hickey Gymnasium 530-752-5211.

• Full fees, books and supplies

• $1,000 per year for miscellaneous expenses

• 1-, 2-, 3- or 4-year scholarships

Other Scholarships are made possible by individual donors, private corporations and various agencies. Many organizations and groups conduct their own scholarship programs. In most cases, you apply directly to these sponsoring groups. Information on available outside scholarships and scholarship search services are available at http://financialaid.ucdavis.edu/scholarships/outside.html.

• Graduate students are also eligible for various scholarships and fellowships; see Fellowships, Assistantships and Loans, on page 113.
**STUDENT LIFE**

As a UC Davis student, you are part of a diverse student community that fosters academic and career exploration as well as personal growth. The campus offers assistance with the practicalities of student life such as finding housing, staying healthy and affording a university education. Faculty members, staff and peer advisors are here to support your academic goals by helping you master concepts, study effectively, manage time and apply classroom material to careers. Whatever your academic and career aspirations, you’ll find opportunities to enrich your student experience through internships, research, community service, student clubs and study abroad. UC Davis students also enjoy myriad recreational choices, from impromptu Frisbee games on the Quad to intercollegiate athletics, craft classes, backpacking trips and more.

**LIVING AT DAVIS**

**On-Campus Housing**

Student Housing Office  
330-752-2033; studenthousing@ucdavis.edu; http://housing.ucdavis.edu  
Living on campus adds a measure of convenience to your life and helps familiarize you with the campus. Over 6,000 students live in Student Housing each year, including over 90 percent of incoming freshman students.

All incoming fall quarter freshmen and transfer students are guaranteed housing in Student Housing, provided they meet eligibility requirements and all Student Housing and university deadlines. Freshmen are guaranteed two years of housing. Transfer students are guaranteed one year of housing. See the Student Housing website for more information about the housing guarantee. All other students should contact Student Housing to inquire about their housing options.

**Residence Halls**

There are many residence halls at UC Davis, located in three different Student Housing areas: Segundo, Tercero, and Cuarto. In each of the residence hall complexes, students and staff create and maintain an environment conducive to personal growth and educational achievement. Academic and social events are held many times throughout the year. An Academic Advising Center, a Computer Center, and a dining hall (dining commons) are located in each area.

Rooms are furnished with a bed and mattress, desk and chair, bookcase, chest of drawers, study lamp, and wastebasket and recycling basket for each resident. Furnished common rooms in each residence hall are available for studying, relaxing and hanging out with friends.

Cost is based on room occupancy (single, double, or triple) and meal plan choice. Rates are available at http://housing.ucdavis.edu/fees. Each year’s rates are subject to approval by the UC Regents, are typically finalized in May, and are effective for the following academic year.

Incoming first-year freshmen students are eligible to live in the residence halls. Some years, as space allows, incoming first-year transfer students may also live in the residence halls. Student Housing will send housing offers to incoming freshmen students (and incoming transfer students in years where space is available) after they submit their Statement of Intent to Register (SIR). All other students are encouraged to call Student Housing to inquire about housing availability.

Students who require a special accommodation or consideration, including a medical condition, disability, dietary requirement or other circumstance will be able to submit their request and supporting documentation as a part of the residence hall application process.

Visit the Student Housing website to learn more about the residence halls and how and when to apply for housing. Call or email Student Housing with any questions.

**Apartments**

There are several apartment properties on the UC Davis campus that provide housing to students with families, graduate and professional students, and undergraduate students. There is a dedicated transfer student apartment community. And in the next 2-3 years, multiple housing projects will bring many new apartments to the UC Davis campus with an emphasis on graduate students and students with families.

**Student Housing Apartments (SHA)—Transfer Student Communities**

Student Housing created a special community for transfer students called “Student Housing Apartments,” or SHA. SHA is comprised of multiple apartment complexes both on and very close to campus. SHA residents have access to academic support and tutoring, as well as access to on-campus computer centers and optional dining plans.

Rooms are furnished with a bed and mattress, desk and chair, bookcase, chest of drawers, study lamp, and wastebasket and recycling basket for each resident. Living and dining rooms are also furnished, and all apartments feature full kitchens.

Cost is based on room occupancy and meal plan choice. Rates are available at http://housing.ucdavis.edu/fees. Each year’s rates are subject to approval by the UC Regents, are typically finalized in May, and are effective for the following academic year.

Incoming first-year transfer students are eligible to live in SHA. Student Housing will send housing offers to incoming transfer students after they submit their Statement of Intent to Register (SIR).

Students who require a special accommodation or consideration, including a medical condition, disability, dietary requirement or other circumstance will be able to submit their request and supporting documentation as a part of the Student Housing Apartments application process.

Visit the Student Housing website to learn more about SHA and how and when to apply for housing. Call or email Student Housing with any questions.

**Solano Park Apartments**

Solano Park offers over 130 university-operated, unfurnished one- and two-bedroom apartments surrounded by green lawns and shade trees that create a serene family-friendly atmosphere. Priority is given to students with families, and then to graduate students, but all UC Davis students are eligible to live at Solano Park.

Students may submit an application to live at Solano Park before being admitted to UC Davis, and should apply for housing several months in advance to ensure housing is available. Solano Park
rates are available at http://housing.ucdavis.edu/fees. Each year’s rates are subject to approval by the UC Regents, are typically finalized in May, become available after approval, and are effective on August 1.

Students who require a special accommodation or consideration, including a medical condition, disability, dietary requirement or other circumstance will be able to submit their request and supporting documentation as a part of the application process.

Visit the Student Housing website to learn more about Solano Park Apartments and how and when to apply for housing. Call or email Student Housing with any questions.

8th & Wake Apartments

8th & Wake is a new complex for graduate students. It is scheduled to open for fall 2014. 8th & Wake is a privately-owned and managed on-campus complex. For more information, call 8th & Wake at 530-298-7777.

The Atriums at La Rue

The Atriums offers studio and two-bedroom unfurnished units for single graduate students. The Atriums is a privately-owned and managed on-campus complex. For more information, call The Atriums at 530-753-7322.

Russell Park Apartments

Russell Park offers one-, two-, and three-bedroom unfurnished units for students with families. Russell Park is a privately-owned and managed on-campus complex. For more information, call Russell Park at 530-753-7322.

West Village

West Village is a neighborhood featuring three apartment complexes as well as a park, retail and dining space, a community college, and single family homes. The apartment complexes offer housing for UC Davis students, as well as faculty and staff. West Village is a privately-owned and managed on-campus complex. For more information, call the West Village Leasing Center at 530-759-0661.

Cooperatives

Cooperatives present unique and independent living opportunities to their residents. Communities share daily chores, including cooking, cleaning, and gardening, and host a variety of dinner parties and events. There are two Cooperatives at UC Davis: the university-operated Tri-Cooperatives and the privately-owned and managed Baggins End.

For more information about the Tri-Cooperatives, call or email Student Housing. To learn more about Baggins End, see the Solar Community Housing Association website at http://schadavis.org.

Off-Campus Housing

The majority of UC Davis students live off campus. The City of Davis has ample apartments for rent, from one-person studio apartments to five- or six-person suites. Townhouses, duplexes and houses throughout the city are also available for student rental. ASUCD maintains a list of available community housing at http://chl.ucdavis.edu. And every February ASUCD hosts “Housing Day,” an event that brings dozens of local housing managers to campus to introduce their communities to UC Davis students.

TRANSPORTATION AND PARKING

Transportation and Parking Services (TAPS)

Located on North Dairy Road
Office hours: M-F, 7:30 a.m.-4 p.m. (PST)
Enforcement hours: 7 a.m.-10 p.m. (PST)
530-752-8277; http://taps.ucdavis.edu
Motorist Assistance Program: 530-752-8277
Bicycle Program: 530-752-BIKE (2453)

The central campus is closed to unauthorized motor vehicles. Walking and bicycling are the most common ways to traverse the campus.

Bicycles. All bicycles ridden or parked on campus must have a current California state bicycle license. You may buy a license or renewal tag at TAPS. Bicycle traffic and parking regulations are strictly enforced. Bikes may be parked only in designated parking areas and may only be secured to bike racks. The Bicycle Program rents bicycle lockers on a quarterly or annual basis for storage of bicycles only. The ASUCD Bike Barn, at the Silo, offers repairs and rentals, and sells new and used bikes, bicycle parts and accessories.

Parking. Vehicles (including motorcycles and mopeds) parked on campus are required to display a valid UC Davis parking permit or pay for time at a meter. Parking is permitted in marked spaces only, with permits displayed so all information is visible through the front window. All permit types may be purchased at TAPS. Daily visitor permits may also be purchased from permit dispensers located at entrances to most visitor parking lots. Visitor permits are valid in areas posted for visitor or “C” permits. After 5 p.m. (PST), they are also honored in “A” permit areas and at meters.

Motorist Assistance Services. TAPS provides complimentary off-campus motorist assistance services including vehicle lock-outs, battery jumps, gasoline retrieval and tire inflation services.

Alternative Transportation. UC Davis encourages the use of alternative transportation through the goClub. The goClub provides incentives for those who carpool, vanpool, walk, bike, or ride the train or bus to campus on a regular basis. For more information, see http://goclub.ucdavis.edu or call 530-752-6453.

The UC Davis/UC Davis Medical Center Shuttle provides hourly service Monday through Friday between the UC Davis campus and the medical center in Sacramento. The shuttle is available to all members of the UC Davis community. You may purchase shuttle passes at Transportation & Parking Services or the Cashier’s Office (cash or check only).

The Davis/Berkeley Shuttle provides transportation between the UC Davis campus and the UC Berkeley campus for university employees, registered students and other university affiliates. Advanced reservations are required. For schedule information and reservation, visit Fleet Services at http://fleet.ucdavis.edu or call 530-752-8287.

Buses

Unitrans
5 South Hall
530-752-BUSS; http://www.unitrans.com

Unitrans, operated entirely by undergraduate students, provides year round public transit service on 16 lines on the UC Davis campus and the City of Davis. Unlimited access is provided to undergraduate students with a valid UC Davis registration card; others may ride by paying the single-ride cash fare or by purchasing discounted multi-ride passes from TAPS or at the Unitrans business office.
office. Full service is provided each UC Davis school day (Monday-Friday; 7:00 a.m.-8:30 p.m.) and at nights (Monday-Thursday; 8:30 p.m.-11:00 p.m.) during the regular school year. Reduced schedule service operates during the summer, finals week, and all academic break periods. Unitrans operates seven of its primary lines on Saturdays, Sundays, and designated holidays. Schedules are available at the MU Campus Information Center, bus terminals, Davis City Hall, the Unitrans office and at http://www.unitrans.com. Real-time bus location information is available by phone, text, and website via the Nextbus automated system.

**STUDENT EMPLOYMENT**

Many employment opportunities are available at UC Davis and with private employers. Full-time or part-time students, students on PELP and students with a letter of acceptance for the following quarter who have not yet registered are eligible. With a part-time job students are able to borrow less and still meet their Self-Help Contributions. Most students work 10-12 hours a week while attending school, many in jobs on campus. There are also a wide variety of community service jobs, which can be both educational and personally rewarding.

To research available jobs, please see [http://iccweb.ucdavis.edu/students/jobsandcareers.htm](http://iccweb.ucdavis.edu/students/jobsandcareers.htm).

**WORKLIFE**

Heitman Staff Learning Center
530-754-8791; worklife@ucdavis.edu; http://www.hr.ucdavis.edu/worklife-wellness

WorkLife is the principal resource on campus for referrals, outreach, education and programming that enable students, faculty and staff to meet commitments and pursue interests both in and outside of the university. Services address child care, elder care, breastfeeding support, health and wellness, and workplace flexibility. The unit serves as the university’s liaison with the on-campus child development centers.

**On-Campus Child Care Programs and Resources**

- **Hutchison Child Development Center** 530-752-3455; hutchison@brighthorizons.com; [http://www.hr.ucdavis.edu/worklife-wellness/Life/childcare/hutchison-child-development-center](http://www.hr.ucdavis.edu/worklife-wellness/Life/childcare/hutchison-child-development-center)
- **LaRue Park Developmental Center** 530-753-8716; laruecde@ucdavis.edu; [http://www.davischildcare.org/](http://www.davischildcare.org/)
- **Russell Park Child Development Center** 530-753-2487; russellcde@ucdavis.edu; [http://www.davischildcare.org/](http://www.davischildcare.org/)
- **Early Childhood Lab School at The Center for Child and Family Studies** 530-752-2888; worklife@ucdavis.edu [http://ccfs.ucdavis.edu/EarlyChildhoodLaboratory.html](http://ccfs.ucdavis.edu/EarlyChildhoodLaboratory.html)
- **The UC Davis Breastfeeding Support Program** 530-754-8791; [http://www.hr.ucdavis.edu/worklife-wellness/Life/breastfeeding-support-program-1](http://www.hr.ucdavis.edu/worklife-wellness/Life/breastfeeding-support-program-1)

- **The Student Employment Center** 530-752-0520; [http://jobs.ucdavis.edu/](http://jobs.ucdavis.edu/)

  Posts listings for parents seeking child care providers.

**Community Child Care Programs**

City of Davis Child Care Services
600 A Street
Davis, CA 95616

City of Davis Child Care Services offers many services relating to child care and parenting to residents of Davis, West Sacramento, Woodland and Yolo County. Services are divided into Resource and Referral to child care providers and parent support programs and Child Care Subsidy to assist low-income parents in paying for care.

**HEALTH AND COUNSELING SERVICES**

**Student Health and Counseling Services (SHCS)**


SHCS provides a wide variety of medical, mental health and wellness services to all registered UC Davis students regardless of insurance coverage. Most services are provided through scheduled appointments, however urgent care (services without appointments) for acute medical and mental health needs are also available.

Services are provided at two primary locations: The Student Health and Wellness Center and North Hall.

To make an appointment for SHCS services contact our appointment desk at 530-752-2349.

SHCS supports students’ academic goals by providing highly accessible wellness, counseling, illness and injury care at affordable rates. Student fees subsidize SHCS services so students pay small fees for most medical services, with most advice and mental health counseling services at no charge.

**Advice Nurse and Urgent Medical and Mental Health Care Services** 530-752-2349.

SHCS offers both medical and mental health urgent care services on the first floor of the Student Health and Wellness Center. Appointments are not required for Urgent Care Services, but students are encouraged to call the Advice Nurse before coming in. The nurse will discuss your concerns and determine if urgent care is appropriate. Patients are seen according to severity and urgency. In addition, our Advice Nurse service is free for all UC Davis students to discuss health concerns and the need for care. Some issues may be resolved through self-care or over the counter treatment.

**Primary Care Clinics & Specialty Clinics** 530-752-2349.

Medical professionals are available by appointment five days a week for primary care treatment and referrals. Appointments can be made to fit around class and work schedules. To ensure continuity of care, students are assigned a primary care provider and are asked to schedule with this provider when requesting an appointment. For convenience, appointments may be scheduled on the same day that a student calls. Appointments can be scheduled for routine primary care, nutrition and fitness, men's/women's health and physical exams, allergy care, sports medicine, travel immunizations and other services. Physician specialists are available upon referral from a primary care provider. Services include acupuncture.
ture, dermatology, endocrinology, internal medicine, neurology, orthopedics, physical medicine & rehabilitation, podiatry, and psychiatry.

**Other SHCS Services** at the Student Health and Wellness Center include Insurance Services, Laboratory, X-ray, Pharmacy, over the counter products, Physical Therapy, Massage Therapy, Alcohol and Drug Abuse prevention and intervention education and Dietitian services.

**Health Insurance Requirement.** The University of California requires that all students have health insurance. To help students meet this requirement, UC Davis automatically enrolls all registered students in the UC Davis Student Health Insurance Plan (Davis SHIP). Fees for Davis SHIP coverage are automatically charged to the student's account each term along with registration fees.

- For students who want to be enrolled in Davis SHIP, enrollment is automatic-no action is required.
- Students with comparable insurance, who do not want to be enrolled in Davis SHIP, must submit a Davis SHIP waiver application at [http://shcs.ucdavis.edu/insurance](http://shcs.ucdavis.edu/insurance) by the published deadline; see the Academic Calendar, on page 1. If a waiver is approved, Davis SHIP enrollment will be waived through the end of the academic year. An approved waiver is effective for the duration of the current academic year only. Waiver applications must be filed each academic year.

On campus medical and mental health care is available to all students at SHCS, even if Davis SHIP is waived.

More waiver information or information regarding benefits, eligibility, deadlines, or insurance coverage if your registration status changes, can be found at [http://shcs.ucdavis.edu/insurance](http://shcs.ucdavis.edu/insurance) or by visiting the SHCS Insurance Services office at the Student Health & Wellness Center.

**SHCS Counseling Services**

219 North Hall
530-752-2349; Appointments: 530-752-2349

SHCS Counseling Services offers short term counseling services to all registered students with liaison to off campus community resources. Students often seek individual or group counseling for issues such as depression, anxiety, stress, relationships, isolation, academic issues, life stressors, family problems, cultural issues, and many others. Additionally, staff can assist with educational concerns such as coping with university life, academic performance, test anxiety and reentry adjustment.

To make a counseling appointment, you can either make an appointment in-person at 219 North Hall or call 530-752-2349 during normal hours of operation and speak with one of our appointment desk staff.

- Be sure to have your class and work schedule with you before calling.
- Please check in 15 minutes prior to your scheduled appointment time.
- Registration stations are located in each waiting area.
- If you are late for your scheduled appointment time, you may be asked to re-schedule. Please keep this in mind when scheduling your appointment.

- If you cannot make your appointment, please call our appointment cancellation message line at 530-752-8821 to cancel your appointment.

**For 24-Hour Consultation.** After normal hours of operation call SHCS Counseling Services at 530-752-0871 and follow the prompts to reach a mental health counselor (press 55).

Students, faculty or staff who are concerned about a student or desire consultation or assistance in making a referral are encouraged to contact SHCS Counseling Services at 530-752-2349. Parents who are concerned about their UC Davis student's emotional reactions or behavior can also call to discuss their concerns.

**The House**

Note: For the 14-15 academic year, The House program services will be provided at North Hall on the south side of the first floor while Temporary Building 16 (two-story house by Student Housing) is undergoing renovations. TB-16 is projected to be back on line for Fall 2015.

530-752-0871; [http://shcs.ucdavis.edu/thehouse](http://shcs.ucdavis.edu/thehouse)

The House is a professionally supervised mental health Peer Advocate program of Student Health and Counseling Services. UC Davis Students receive confidential support, information and referrals regarding personal, emotional or social problems. Well-trained student volunteers assist fellow students through individual peer advocacy services and a wide variety of workshops held in an informal setting. Stress reduction and wellness resources include facilitated meditation and yoga classes, audio and video stations with relaxation and educational compact discs, and an automatic massage chair. No appointment is necessary and services are offered on a drop-in basis Monday-Friday from 9:00 a.m.-4:00 p.m. (PST) during fall, winter and spring quarters. The House program is closed during the summer quarter and quarter breaks.

Volunteers for Peer Advocate positions at the House are selected during winter quarter. Students are trained in basic listening and peer education skills and can receive units for training. Transcript notation is also available for quarters working as a peer volunteer.

**Health Education and Promotion**

A Department of Student Health and Counseling Services

UC Davis Student Health and Wellness Center
530-752-9652; [http://shcs.ucdavis.edu/hep](http://shcs.ucdavis.edu/hep)

Health Education and Promotion (HEP) helps students stay healthy, thrive and enhance their academic and personal success through the creation of health-promoting campus and community environments and student-centered health education. HEP focuses on promotion of healthy eating, physical activity, sexual health, alcohol, tobacco, other drug risk reduction, wellness, sleep, and other wellness issues.

**Anonymous HIV Counseling and Antibody Testing Program.** In partnership with the LGBTQIA Resource Center, HEP facilitates anonymous HIV counseling and antibody testing to registered UC Davis students. Free, oral, rapid testing is available weekly during the academic year at the LGBTQIA Resource Center; for more information, see [http://shcs.ucdavis.edu/services/hiv-testing.html](http://shcs.ucdavis.edu/services/hiv-testing.html).

Sexual health services also include the “Love Lab” mobile cart offering safer sex supplies and educational information at no charge to students. More sexual health resources can be found at [http://shcs.ucdavis.edu/hep/sh/index.html](http://shcs.ucdavis.edu/hep/sh/index.html).
Equestrian Center
Craft Center
Activities and Recreation Center (ARC)
Campus Recreation and Unions:
The following facilities are managed through the Department of University and enhance the quality of life for the campus. These programs complement the academic mission of the university by creating opportunities to build community, cultivate friendships and enhance learning.

The UC Davis Department of Campus Recreation and Unions may participate in extracurricular activities sponsored by the campus. Some activities have additional eligibility criteria, so you are encouraged to inquire about the particular requirements of the groups and programs that interest you.

EXTRACURRICULAR ACTIVITIES

By participating in extracurricular activities at UC Davis, you can benefit from numerous opportunities for educational, personal, cultural and social enrichment. In general, registered and enrolled UC Davis students may participate in extracurricular activities offered through the Department of University. Faculty in locating resources related to the various aspects of wellness. This “one stop shop” for wellness includes campus resources, as well those in the City of Davis and the larger Web community; see http://mywellness.ucdavis.edu.

Outreach Presentations 530-752-9652. Peer Health Educators and professional staff are available to facilitate small and large group presentations and workshops for residence halls, fraternities, sororities and other student organizations. For a complete list of programs offered or to schedule a program, see http://shcs.ucdavis.edu/hep/presentations.html.

Student Positions. HEP offers paid and volunteer opportunities for students. The positions provide an excellent opportunity to develop skills in: conducting group presentations, changing health-related policies and influencing media. Transcript notation and/or academic credit are available. All positions require a three quarter commitment. See our website beginning winter quarter regarding student opportunities at http://shcs.ucdavis.edu/hep/student-positions.html.

EXTRACURRICULAR ACTIVITIES

By participating in extracurricular activities at UC Davis, you can benefit from numerous opportunities for educational, personal, cultural and social enrichment. In general, registered and enrolled UC Davis students may participate in extracurricular activities sponsored by the campus. Some activities have additional eligibility criteria, so you are encouraged to inquire about the particular requirements of the groups and programs that interest you.

CAMPUS RECREATION AND UNIONS

The Department of Campus Recreation and Unions

The Activities and Recreation Center (ARC)
232 ARC, One Shields Ave, Davis CA 95616
530-752-1730; http://cru.ucdavis.edu

The UC Davis Department of Campus Recreation and Unions manages the following programs and facilities, which serve the campus by creating opportunities to build community, cultivate friendships and enhance learning.

These programs complement the academic mission of the university and enhance the quality of life for the campus.

The following facilities are managed through the Department of Campus Recreation and Unions:

- Activities and Recreation Center (ARC)
- Craft Center
- Equestrian Center
- Hickey Pool
- Memorial Union
- Memorial Union Games Area
- Outdoor Adventures Center
- Pavilion
- Putah Creek Lodge
- Recreation Fields
- Recreation Pool
- UCDHS Student Fitness Center

The following programs are offered through the Department of Campus Recreation and Unions:

Campus Recreation and Unions Memberships, Informal Recreation and Fitness & Wellness Programs

Activities and Recreation Center (ARC) 530-752-1730; http://cru.ucdavis.edu/arc; http://cru.ucdavis.edu/fitnessandwellness

The ARC, the region’s premier full-service fitness facility, offers a variety of features, such as four indoor basketball courts (convertible to volleyball and badminton), eight four-wall courts, a multi-use activity center (MAC), an indoor track, large fitness/weight areas, and an indoor climbing wall. In addition, the complex includes group exercise, dance and martial arts studios, a student lounge with computer terminals and wireless access points, a large ballroom, a small conferencing center, a full-service Starbucks, and a Pro Shop. Currently enrolled UC Davis students may use the ARC at no additional cost. Programming within the ARC—including group exercise, dance classes, martial arts classes, personal training, rock climbing, and intramural sports—may require an additional fee. UC Davis faculty, staff, alumni, and retirees may enjoy the ARC by purchasing an affordable membership. For more information on the ARC, see http://cru.ucdavis.edu.

Cal Aggie Marching Band

Activities and Recreation Center (ARC) 530-752-8069; http://cru.ucdavis.edu/calaggiemarchingband

The California Aggie Marching Band is a student-run volunteer organization dedicated to providing support for UC Davis and is committed to student development and camaraderie through excellence in musical entertainment and the embodiment of Aggie Pride. Known by many as the “Band UH!,” the band celebrates campus traditions and entertains participants and spectators at athletic, campus and community events.

Aquatics

Recreation Pool

Corner of La Rue Road and Hutchison Drive
530-752-1730; http://cru.ucdavis.edu/aquatics

Located near the ARC, the Recreation Pool’s distinctive shape allows for a wide variety of water activities. The pool includes lap lanes, diving boards, an island, a large grass area for sunbathing and a shallow wading pool. Picnic tables and a barbecue are also available on a first-come, first-served basis. The Rec Pool also offers swim lessons for all ages. The pool opens for the season in mid-April and closes on the last day in September.
**Hickey Pool**

Hickey Gymnasium Building, central campus
530-752-1730; http://cru.ucdavis.edu/aquatics

Hickey Pool is a seven-lane, 33-and-1/3 yard pool with a movable bulkhead previously used as the competitive pool on campus, housing six intercollegiate athletic teams, as well as physical education classes, intramural sports, sport clubs, and University Extension classes. Today, the heated Hickey Pool is available to students and ARC members for lap swimming hours during the year.

**Craft Center**

South Silo
530-752-1475/1730; http://cru.ucdavis.edu/craftcenter

The Craft Center is an ideal place to channel your creative energy, offering more than 90 affordable and fun classes each quarter. The center’s 10 well-equipped studios are available for informal use on a daily or quarterly basis. Workshops and classes are offered each quarter in woodworking, weaving, jewelry making, art and graphics, computer imaging, ceramics, photography, silk-screen printing, welding, leather working, stained glass and other crafts.

**Equestrian Programs**

Garrod Drive; southwest of Veterinary Medical Teaching Hospital
530-752-2372; http://cru.ucdavis.edu/equestriancenter

The 25-acre Equestrian Center is open year round, offering horse riding instruction in both English and Western riding. Group lessons are available for beginning through advanced levels, along with training in horse care and stable management. The Equestrian Center sponsors clinics, horse shows, and special events. The center is also home to the UC Davis Equestrian Club.

**Intramural Sports and Sport Clubs**

Activities and Recreation Center (ARC)
530-752-1730; http://cru.ucdavis.edu/arc

The Activities and Recreation Center (ARC) hosts many recreational activities for the UC Davis community. The building itself has four indoor basketball courts (convertible to volleyball and

Griffin Lounge serves as a comfortable space for studying and getting together with friends. The Art Lounge, on the second floor, provides a comfortable and relaxed space that is popular for studying.

**Memorial Union Games Area**

Games Area; located below the UC Davis Bookstore
530-752-2580; 530-752-1730; http://cru.ucdavis.edu/gamesarea

The Games Area features bowling lanes, billiards, video game consoles, lounge space and storage lockers. Bowling leagues, classes, clinics and tournaments are offered for all ages from beginning through advanced skill levels. The facility is fully accessible to those with disabilities.

**Outdoor Adventures**

Located between the Colleges at La Rue Apartments and the Recreation Pool on La Rue and Hutchinson Barn; corner of California and Hutchison
530-752-1995; http://cru.ucdavis.edu/outdooradventures

Outdoor Adventures will help you develop your outdoor skills and plan your outdoor excursion. You can rent professional quality equipment and arrange custom-designed trips. An up-to-date library contains topographic maps, trail guides and other materials. Outdoor Adventures offers classes, excursions and clinics for backpacking, rock-climbing, whitewater rafting, sea kayaking, mountaineering, cross-country skiing and more. Outdoor Adventurers also offers health care training classes in wilderness first aid, EMT, CPR, and AED and swift water rescue.

**The Buzz**

530-752-2027; http://studentlife.ucdavis.edu/thebuzz

The campus kicks off the school year on the first Friday of Fall Quarter with The Buzz, a festival filling the entire Quad. Part of Fall Welcome week, The Buzz welcomes new and returning students to campus with a night of live entertainment, games, prizes, free food and campus resources.

**UC Davis Stores**

530-752-6846; http://ucdavisstores.com

The UC Davis Stores are full-service stores owned and operated by the university. They provide goods and services for the campus community to support the university’s academic mission, as well as UC Davis-branded apparel, general merchandise and gifts.

**Silo Union**

The Silo Union houses food services, meeting/conference facilities, lounges and the campus pub. Students will enjoy favorite programs like Trivia Night. Silo food services include both quick, popular and familiar fast food, such as Taco Bell, Carl’s Jr. and Pizza Hut, as well as a large selection of fresh and healthy prepared items, Starbucks Coffee and a custom sandwich line. Located in the South Silo are the ASUCD Experimental College, Craft Center, Graduate Student Association, and the Silo Bookstore serving the School of Law.

**The UC Davis Activities and Recreation Center (ARC)**

530-752-1730; http://cru.ucdavis.edu/arc

The Activities and Recreation Center (ARC) hosts many recreational activities for the UC Davis community. The building itself has four indoor basketball courts (convertible to volleyball and
hadminton), eight four-wall courts, a multi-use activity center (MAC), an indoor track, large fitness/weight areas and an indoor climbing wall. In addition, the complex includes group exercise, dance and martial arts studios, student lounges with computer terminals and wireless access points, a large ballroom, a small conferencing center, a full-service Starbucks, and a Pro Shop. The building is separated into three distinct areas: the controlled area, the conference and event area and The Pavilion. All fitness related activities comprise the controlled area that is open to all students with a valid UC Davis identification card. Faculty, staff, alumni, retirees and others may purchase membership to the ARC for an annual or monthly fee. The conference area is accessible through the main entrance to ARC or through a smaller corridor on the Northeast side of the building that leads into the conferencing area.

The UC Davis Pavilion, formerly Recreation Hall, hosts athletic competitions, concerts, trade shows, conferences and miscellaneous spectator events each year. The Pavilion houses approximately 149,000 square feet of space and encompasses the home court of the UC Davis Aggies volleyball team, gymnastics team, and men’s and women’s basketball teams. The Pavilion hours and access vary depending upon the event being hosted. More information regarding the ARC can be found at the ARC website, calling the number listed or by stopping by the ARC member services desk located in the lobby area.

**UC DAVIS INTRAMURAL SPORTS AND SPORT CLUBS**

330-752-1730; [http://cru.ucdavis.edu/intramuralsports](http://cru.ucdavis.edu/intramuralsports)

The UC Davis Intramural Sports and Sport Clubs programs offer many different competitive sports activities ranging from the traditional team sports like football, basketball and soccer to individual or dual sports such as racquetball, table tennis and golf. Additionally, we offer some non-traditional activities like inner tube water polo, floor hockey and dodgeball. All UC Davis students are eligible to participate in intramural activities. Our Sport Clubs program offers many opportunities for intercollegiate competition. Each club is formed, developed, directed and controlled by its members within University guidelines. Stop by the office or see our website for a complete list of clubs.

**INTERCOLLEGIATE ATHLETICS**

264 Hickey Gymnasium
330-752-1111

The Intercollegiate Athletics (ICA) program is an integral part of the total educational process and a vital part of the human development of young men and women.

Intercollegiate athletics attempts to strengthen the integration of its objectives with the academic and developmental objectives of the university while maintaining a program of academic and athletic excellence; where students are supported in their efforts to reach the highest level of performance by providing them with adequate to outstanding facilities, quality coaching, appropriate support of health and wellness needs, and competitive opportunities with students from similar institutions.

Currently, the program consists of varsity teams in 14 women’s and 9 men’s sports. UC Davis is an active member of Division I. A majority of the varsity sports compete in the Big West Conference. Approximately 600 students compete on varsity teams each year.

**ARTS**

Whether you want to participate, be entertained or be inspired, an abundance of musical, theater, art, design and dance offerings take place on campus all year long.

**Robert and Margrit Mondavi Center for the Performing Arts | UC Davis**

Mondavi Center Administration Building
530-754-5000; [http://www.mondaviarts.org](http://www.mondaviarts.org)

The Mondavi Center is the premier performance venue in Northern California and the regional destination for the best in music, dance, distinguished speakers, jazz, theater, and world music. UC Davis students receive 50% off every Mondavi Center Presents event ticket, while UC Davis Staff and Faculty enjoy 10% off their ticket purchases. Tickets are available through the Mondavi Center Ticket Office at 530-754-2787 or at [http://www.mondaviarts.org](http://www.mondaviarts.org).

**Music**

Department of Music
330-752-5537; [http://music.ucdavis.edu](http://music.ucdavis.edu)

The Department of Music sponsors the UC Davis Symphony Orchestra, the University Chorus, Early Music Ensemble, Concert Band and Wind Ensemble, Jazz Band, several world music ensembles, and chamber music groups. Music majors and other interested students can receive credit for participating in these groups, which perform at concerts and recitals open to the university community. The department sponsors artists-in-residence who give concerts, recitals and lectures. Free noon concerts featuring individual performers and ensembles—both professional musicians and music students—are a favorite weekly event during the school year. The Empyrean Ensemble is in residence on campus. The Department of Music sponsors nearly 100 public concerts each year.

**Theatre and Dance**

Department of Theatre and Dance
Wright Hall; [http://arts.ucdavis.edu/theatre-dance](http://arts.ucdavis.edu/theatre-dance)

The Department of Theatre and Dance has one of the finest theatre facilities in California, with an unusually good stock of scenery, props, costumes, and state-of-the-art lighting and sound equipment. Facilities are complemented by an excellent faculty and production staff, as well as the Granada-Artist-in-Residence program, which brings a major director, choreographer or playwright to the department three times a year. Students, both majors and non-majors, can audition for department productions or apply to the Institute for Exploration in Theatre, Dance and Performance. Each year’s schedule includes opportunities to work with professional directors and choreographers in three Granada Artists-in-Residence productions; the Main Stage Dance/Theatre Festival; the UC Davis Film Festival; projects generated through the Institute for Exploration in Theatre, Dance and Performance; and workshops and performance projects developed by M.F.A and Ph.D. students. These productions are staged in our prosenium (Main), thrust (Wyatt), black box (Arena), performance studio (Nelson Hall) and intimate laboratory theatre (Lab A), as well as in the Mondavi Center’s Vanderhoef Studio Theatre and Jackson Hall. These productions are part of the academic program of the department and serve an important purpose in the study of theatre and dance. Participation is open to all students.
Art Galleries

**UC Davis Design Museum**
124 Cruess Hall 530-752-6150; [http://designmuseum.ucdavis.edu](http://designmuseum.ucdavis.edu)

The UC Davis Design Museum and Collection enhances and supports the teaching and research activities of the Department of Design, exploring how design shapes, improves and makes economically viable the objects, technology and environments we use, inhabit and experience every day. The museum exhibits national and international design-related materials including architecture, fashion, textiles, graphics, new media, product, furniture and lighting, and serves as a laboratory for experimental exhibition design and interpretation.

**Richard L. Nelson Gallery**
Nelson Hall 530-752-8500

The Richard L. Nelson Gallery was dedicated in memory of the first Chairperson of the Art Department at UC Davis. Established as an exhibition venue and teaching resource for the Art Department, the gallery program also serves the campus population, art communities, and general public of Northern California and the Central Valley. The Fine Arts Collection contains over 5,000 objects representing diverse historical periods and cultures, as well as significant holdings in contemporary art, most notably artists associated with the Davis faculty of the “Funk” period: Arneson, Wiley, Thiebaud, Gilhooley, de Forest, Hudson, et. al.

**Fine Arts Collection**
Art Building, adjacent to the Nelson Gallery 530-752-8500

The Fine Arts Collection, representing various historical periods and cultures, is the UC Davis campus’ major collection of art.

**Basement Gallery**
Art Building basement

The Basement Gallery is a student-directed gallery that exhibits the artwork of advanced UC Davis art majors. The Basement Gallery is a vital alternative space for seeing important new work and for experiencing interesting and innovative art shows. There are approximately three shows per quarter. For more information, see [http://ucdbasementgallery.com/informaion/](http://ucdbasementgallery.com/informaion/).

**C.N. Gorman Museum**
1316 Hart Hall 530-752-6567; [http://gormanmuseum.ucdavis.edu](http://gormanmuseum.ucdavis.edu)
Monday-Friday, 12-5 p.m.; Sun: 2-5 p.m. (PST), closed holidays and holiday weekends.

The C.N. Gorman Museum is committed to the creative expressions of Native American artists, and artists of diverse cultures and histories. Changing exhibits feature contemporary artwork in a wide range of media, reflecting the canon in which Indigenous artists are working today. Founded in 1973 by the Department of Native American Studies, the museum is named in honor of retired faculty member, Carl Nelson Gorman, Navajo artist, WWII code-talker, cultural historian, and advocate for Native peoples.

**STUDENT GOVERNMENT**

**Associated Students (ASUCD)**

Student Government Administrative Office
348 Memorial Union 530-752-3632

ASUCD Student Services Office
347 Memorial Union 530-752-1990; [http://asucd.ucdavis.edu](http://asucd.ucdavis.edu)

The Associated Students of the University of California, Davis (ASUCD), authorized by the regents and the chancellor, represents all undergraduate students and is responsible for over $11 million used to enhance the student experience. Graduate and law students also have access to all ASUCD commercial activities. Funds allocated to ASUCD provide for activities and services that make life as a student a little easier, less expensive and/or simply more fun.

ASUCD operates more than 40 activities, including the Unitrans bus system, The California Aggie newspaper, the Bike Barn repair services, free legal advice for undergraduate students, Campus Copies, Classical Notes, Project Compost, Cal Aggie Camp, U.S. Post Office and the Coffee House, among others.

The ASUCD-sponsored Experimental College offers a variety of nontraditional classes each quarter for students interested in diversifying their educational experience. The community garden is available to students and non-students alike. Radio KDVS stereo 90.3 FM, the student-run campus radio station, broadcasts at 5,000 watts. Other ASUCD activities include Entertainment Council and the Whole Earth Festival.

Picnic Day, a UC Davis tradition since 1909, is the largest student-run event in the nation. This annual spring open house features more than 100 exhibits and cultural displays, including a parade, a fashion show, sports, sheep dog trials, dachshund races, food, music and dancing.

You can find information about ASUCD programs at [http://asucd.ucdavis.edu](http://asucd.ucdavis.edu), in the Student Directory, which combines details about ASUCD services and organizations with the ASUCD student telephone directory or by visiting the ASUCD Student Services Office in the Memorial Union.

Allocated funds are budgeted through the ASUCD Senate. Based on a modified form of the U.S. Senate, the ASUCD senate consists of 12 elected senate members and the ASUCD president and vice president. The senate is the policy-making body for ASUCD and supervises all aspects of the association. The ASUCD president is the chief administrative officer and is assisted by the vice president. ASUCD is the liaison for the undergraduate student body and represents the students with other universities, the UC Office of the President and the regents.

The ASUCD Senate is the policy-making body of the student government and are responsible for allocating funds through their annual budget hearings. The Senate consists of 12 members who serve year-long terms with elections held during the fall and winter quarters.

Seven commissions and one committee advise the senate and assist the governing board with its decisions by researching legislation and making recommendations. Commission chairs are ex-officio members of the senate. Each commission also involves itself with various projects that relate to its specific area.
• Academic Affairs advocates students’ rights in the area of academics, including dealing with the Academic Senate and with issues such as grading policies, tenure and teacher evaluations. Academic Affairs also sponsors the popular “Last Lecture Series.”

• Business and Finance makes recommendations to the Senate on all financial matters and conducts audits on ASUCD commercial units.

• Environmental Policy and Planning addresses all issues and concerns that pertain directly to the environment.

• Ethnic and Cultural Affairs makes recommendations on policies and programs concerning UC Davis’ ethnic community, acts as a liaison between on-campus and off-campus bodies affecting ethnic students and their quality of life at the university.

• External Affairs deals with off-campus concerns including the regents, UC Office of the President, and the Davis City Council.

• Internal Affairs recommends policies to improve ASUCD operations and the quality of nonacademic student life on campus.

• The Gender and Sexuality Committee actively promotes awareness of gender and sexuality issues, and prevention of sexual assault through outreach efforts and education programs.

• The Elections Committee ensures the fair administration of ASUCD online elections. The Committee coordinates candidate and ballot measure forums and provides unbiased election information.

The ASUCD President is the chief administrative officer and is assisted by the Vice President. ASUCD is the liaison for the undergraduate student body and represents the students with other universities, the community, the UC Office of the President and the regents.

The judicial branch consists of the ASUCD Student Court. The nine member court has the responsibility to carry out all rules designated to it in the ASUCD Constitution and its bylaws. ASUCD Court Members serve “life” terms, lasting four years or their entire academic career at UC Davis.

UC Davis Administrative Advisory Committees
Office of the Chancellor, /http://aac.ucdavis.edu/
The Office of the Chancellor encourages students to participate in issues affecting the campus community by applying for membership on an administrative advisory committee. Each committee focuses on a specific area, such as childcare, disability issues, diversity, Regents’ scholarships or student services and fees. The committees respond to requests for advice, identify needs or concerns within the charge of the committee and recommend action to the campus administration.

Applications are accepted each winter for service on committees the next academic year. Undergraduate students should contact ASUCD Student Advocacy. Graduate students should contact the Graduate Student Association.

Graduate Student Association (GSA)
Graduate Student Association (GSA)
Room 253, South Silo
530-752-6108; Fax 530-752-5158; gsa@ucdavis.edu; http://gsa.ucdavis.edu

The Graduate Student Association (GSA) is the officially recognized student government for UC Davis graduate students. GSA provides a forum for addressing the concerns of graduate students and promotes communication with campus administrators. GSA also serves as an advocate at all levels of the university on behalf of graduate students. Funded by graduate student fees, GSA provides services to all academic graduate students and to professional students in both the Graduate School of Management and the School of Education. Services include new student orientation, legal service, travel awards, announcements and assorted social events. Other professional students are eligible to join GSA by paying a fee.

GSA General Assembly representatives are usually designated by other students in their department or graduate group but can be selected through other processes determined by their department or graduate group. General Assembly meetings are held once a month and are open to all graduate and professional students. Each year the General Assembly elects the members of the Executive Council, who serve in a variety of positions to carry out the policies and functions of the organization.

CENTER FOR STUDENT INVOLVEMENT (CSI)
4th floor, Memorial Union
530-752-2027; http://csi.ucdavis.edu

Studies show that college students involved in campus life through activities and organizations are more connected to campus, more satisfied with their college experience and more likely to graduate than non-involved students. The Center for Student Involvement (CSI) provides opportunities for campus involvement, leadership development, learning, exploration, community service, cross-cultural competence and collaboration by supporting a wide variety of student organizations and campus programs.

Student Organizations

Over 600 student organizations are registered and supported at UC Davis through Center for Student Involvement. They consist of cultural, political, religious, service, ethnic, academic, professional, international, social, recreational, performing arts, fraternity/sorority and advocacy groups that are at the heart of student life and provide students and the entire campus with important educational experiences. More information about each registered student organization and how to start a club is available at http://csi.ucdavis.edu.

Activities Fair
530-752-2027; http://csi.ucdavis.edu

The Activities Fair, held every October, is an ideal opportunity to learn how to get involved, meet new people, try new activities and find a place to belong, with 200 student organizations and campus programs providing information and recruiting members.
**Sorority and Fraternity Life**

530-752-4606 or 752-3828; [http://osfl.ucdavis.edu/](http://osfl.ucdavis.edu/)

Affiliation with fraternities and sororities provides a connection to campus through friendships, a support group for academic and personal growth, leadership opportunities and involvement in campus activities and traditions.

**Student Retention and Recruitment Center**

1100 Student Community Center
530-754-6836; [http://srrc.ucdavis.edu](http://srrc.ucdavis.edu)

The Student Recruitment and Retention Center (SRRC) offers student-run and student-initiated programs that foster holistic academic and personal development, raise political and cultural awareness. We aim to empower students to act as dynamic leaders in their communities. SRRC programs include peer mentoring, academic/study support, leadership development, transfer student support, community building, self-awareness, K-12 enrichment, transfer outreach/support and funding for services and activities complementary to the SRRC’s mission.

**Cal Aggie Student Alumni Association (SAA)**

Walter A. Buehler Alumni Center
530-752-0286; [http://www.alumni.ucdavis.edu/saa](http://www.alumni.ucdavis.edu/saa)

Student Alumni Association (SAA) follows the mission of “advancing student-alumni relations” by building community through networking events, providing student leadership opportunities, upholding Aggie traditions, and offering benefits and services, such as 10% off textbooks from the UC Davis Bookstore. Programs include Aggie Diner, Interview with an Aggie, Take an Aggie to Work, Pajamarino, and community service opportunities. You may join SAA at any time during the academic year. SAA membership fees are applied to your Cal Aggie Alumni Association life membership after graduation. For more information about joining SAA, see [http://saaform.ucdavis.edu](http://saaform.ucdavis.edu).
ACADEMIC ADVISING AND STUDENT SERVICES
ACADEMIC ADVISING

UC Davis offers many different types of academic advising to help you get the most from your education. College advisers can assist you in meeting degree requirements and taking maximum advantage of the resources available at the university. A conference at least once a quarter with your faculty or staff adviser is especially desirable during your first year and during your final quarters preceding graduation. A meeting with a faculty or staff adviser is required each year for engineering students. Matriculating students in their first year at UC Davis in the College of Biological Sciences are required to meet with a staff adviser in the Biology Academic Success Center.

COLLEGE ADVISING

College of Agricultural and Environmental Sciences

Office of the Dean
150 Mrak Hall
530-752-0108; http://www.caes.ucdavis.edu

In the dean's office you will find:

- Staff advisers who can help with university and college rules, regulations and policies and procedures that affect students
- Academic advising; in-depth advice regarding probation/dismissal status, admission to the college, readmission, second baccalaureate options, and limited status enrollment requirements
- Advice and action on petitions
- Other services including college English requirement check, release of holds on registration and final evaluation for graduation

Associate Dean of Undergraduate Academic Programs

Associate Dean
150 Mrak Hall
530-752-0108

The college has an associate dean of undergraduate academic programs and advising staff who welcome the opportunity to become acquainted and to talk with individual students. They can also help you with academic problems if you are placed on probation or subject to dismissal.

Faculty Advisers/Staff Advisers. You will be assigned a faculty adviser to help you plan a program that corresponds to your individual educational interests. The master advisers coordinate advising within a major. Staff advisers in the department can advise you on courses, specific requirements of majors and career opportunities. You are strongly urged to consult with your faculty adviser or staff adviser each quarter before selecting your courses.

As educational objectives evolve, you may, in consultation with the master adviser for your major, choose a new faculty adviser whose area of expertise corresponds more directly to your specific objectives.

Undeclared/Exploratory Program (non-degree program)

150 Mrak Hall
530-752-0610

Are you unsure what major you really want to pursue? If so, you may want to register in the Undeclared/Exploratory Program. With the help of staff in the dean's office and the major advisers, you can explore specialized options, develop your decision-making abilities and select the major best suited to your needs. For registration purposes, indicate “Undeclared/Exploratory” on your admissions materials. You must declare a major before you complete 90 units; see Declaration of Major, on page 75, in the Academic Information chapter.

College of Biological Sciences

Biology Academic Success Center
1023 Sciences Laboratory Building
530-752-0410; http://biosci.ucdavis.edu/BASC

The College of Biological Sciences offers complete academic advising services at the Biology Academic Success Center (BASC) for all students working on, or interested in, a major administered by the College. Students who declare or intend to declare majors in Biochemistry and Molecular Biology; Biological Sciences, Cell Biology; Evolution, Ecology and Biodiversity; Genetics and Genomics; Microbiology; Neurobiology; Physiology; and Behavior; Plant Biology; or are Undeclared Life Sciences should meet with their BASC adviser for program planning. At the BASC, academic advisers advise on all major, college and university requirements, policies, and procedures, including PELP, withdrawal, readmission, change of major or college, multiple majors and late actions. We evaluate transfer work, discuss petitions for variance and provide degree checks for graduation purposes.

The BASC is responsible for the academic progress of all students majoring in the college. If you have any problems (personal, medical, financial) that are affecting your academic performance, or if you are on academic probation, we invite you to make an appointment to see your academic adviser in BASC. You may schedule an appointment using the website located above.

Peer Advisers. Peer advisers are College of Biological students who are pursuing, but have not yet completed, a degree at UC Davis. Students may meet with a peer adviser in the BASC on a daily, drop-in basis.

College of Engineering

Undergraduate Advising Office
1050 Kemper Hall
530-752-1979; http://engineering.ucdavis.edu
Facebook: UC Davis College of Engineering

Information and assistance on academic, career and personal matters is available in the Undergraduate Advising Office, either through direct assistance from one of the staff advisers or through referral to other offices on campus. The Undergraduate Advising Office handles student petitions, transfer evaluation, articulation of transfer coursework, and degree certifications, and it also advises students who are not in good academic standing.

Advising. Before registering for courses your first quarter, consult with your departmental staff adviser, whose name and office hours you can obtain at the department office or at http://engineering.ucdavis.edu/undergraduate/advisors/. The departmental staff adviser is aware of the requirements for your major and will assist you with planning your program.

Mandatory Advising. The College has implemented a mandatory advising system, enforced through SISWeb and myucdavis Schedule Builder. You are required to meet with your adviser once a year, during a specific quarter, which is determined by the first letter of your last name (A-G = Fall; H-N = Winter; O-Z = Spring). Students are notified of the hold by checking SISWeb or Schedule Builder at the time of registration. If you fail to clear your hold during your specified period, you may be unable to make changes to your current registration and to register for future quarters. If you meet
with your adviser during this quarter and have your hold released, there should be no difficulties with subsequent registration. For more information on mandatory advising, talk to your major adviser or call the Undergraduate Advising office at 530-752-1979. Students seeking information about graduate school preparation or undergraduate research opportunities in engineering can participate in the Gearing up for Grad School (Winter Quarter) seminar series offered by the College of Engineering. Additional advising about graduate school preparation and undergraduate research opportunities is available from faculty or staff advisers in the program you are interested in from the Undergraduate Advising Office in 1050 Kemper Hall 530-752-1979 or through the Pre-Graduate School advising unit of the Student Academic Success Center; see http://advisingservices.ucdavis.edu/advising/grad/.

Peer Advisers. A well-developed peer advising system complements faculty and staff advising. Peer advisers are available in 1050 Kemper Hall. They are also available during designated hours in the residence halls. To speak with a peer adviser, call the Undergraduate Advising Office at 530-752-0553.

**College of Letters and Science**

Undergraduate Education and Advising Office
200 Social Sciences and Humanities Building
530-752-0392; http://www.ls.ucdavis.edu/advising/
The Associate Dean and staff in the Undergraduate Education and Advising Office can help you with issues relating to your academic goals and experiences. You can consult the Advising Office on matters such as program planning, selection of a major, exceptions to regulations and academic enrichment opportunities. To find answers to your questions and other useful information, including contact information and how to arrange to meet with an adviser, see http://www.ls.ucdavis.edu/advising/.

The Undergraduate Education and Advising Office also provides a number of additional services:
- Determines how your transfer credits from other institutions apply towards completion of university, campus, and college requirements for the bachelor’s degree. Applicability of transfer credit toward the major is determined by your major faculty adviser
- Performs degree checks to identify remaining university, campus, and college requirements, and certifies graduation
- Acts on petitions requiring the dean’s approval
- Reviews the records of students who are subject to disqualification and determines whether such students may continue at UC Davis

Advisers. All new students who have selected a major will be assigned an adviser within that major department. New students should contact their department or program office during the first quarter of residence on the UC Davis campus to meet with their adviser. If your adviser is not available when you need assistance, or if you wish to consult an adviser in a major program other than the one represented by your assigned adviser, contact the department or program office for help.

New students are encouraged to see their faculty adviser at least once every quarter during their first year on campus to discuss their educational goals, course program and progress.

Continuing students who have completed three quarters in residence in the college should consult with an adviser at certain important checkpoint stages in their academic careers. You are urged, however, to maintain regular contact with an adviser in your major to avoid program errors that may delay graduation.

Seniors should maintain close contact with their advisers to ensure that they are meeting the major requirements.

**Academic Options Program.** Students who have not yet selected a major are automatically placed in the L&S Academic Options Program which provides academic advising to lower division students. Residence Hall Advising Team sites are located in on-campus residence hall areas. Each site is staffed by a team of L&S Peer Advisers who will be available to Academic Options Program students living in that residence hall complex. Through individual advising, group sessions, and programs, this team will work with you over the next several quarters. They will help you with your academic planning, ensuring progress toward your educational goals and satisfaction of degree requirements. They also can assist you in exploring your options before you select your major.

L&S Academic Options Program students not living in a university residence hall complex will receive academic advising from the L&S Undergraduate Education and Advising Office. Advisers there also are available to provide academic assistance to all students in the College of Letters and Science.

**Advising Checkpoints.** At a minimum, you should consult with your faculty adviser at two, possibly three, critical stages in your academic career:
- Before you complete 90 units of degree credit, including transfer work, you must develop in consultation with your faculty adviser, a proposal for a quarter-by-quarter program of courses showing how you will meet your educational goals and graduation requirements. You must also have declared a major by this time. Filing this plan with your adviser does not preclude subsequent modifications of the plan or a change of major.
- When you complete 90 units of degree credit, including transfer work, and have a declared major you may request a Degree Check from the Letters and Science Undergraduate Education and Advising Office and should consult your faculty adviser concerning course selection and satisfaction of requirements in the major.
- Before you complete 200 units of degree credit, including transfer work, you must develop in consultation with your faculty adviser, a firm study plan in the form of a quarter-by-quarter program that will satisfy all remaining degree requirements as expeditiously as possible. This plan will be filed with your adviser. If the plan indicates that you will have to register beyond the 225-unit limit in order to meet degree requirements, you must contact the Undergraduate Education and Advising Office immediately. Exceptions to the 225-unit limit are granted by the dean only rarely. Typically, approval is granted only to allow completion of minimum degree requirements.

If you have not met with your faculty adviser before these established checkpoints, a hold may be placed on your registration as a reminder.

**Peer Advisers.** Student-to-student advising is an important part of the university advising services. The College of Letters and Science deans’ office peer advisers are available in the Undergraduate Education and Advising office, in 200 Social Sciences and Humanities Building, and on a weekly basis in the campus residence halls to talk with students about their academic concerns.
ACADEMIC ADVISING SERVICES

Academic Peer Advising 530-752-1736, places Peer Advisors in over 70 departments, Dean's offices or the Biology Academic Success Center to help students find the answers to their questions about major requirements, courses and university regulations. The Academic Peer Advisor complements faculty advising by providing a student perspective. The Academic Peer Advising program is managed by the Academic & First-Year Transition Services office in Student Housing, and the peer advisors are trained by the major departments to provide information and assistance about graduate schools, career opportunities and college requirements.

Educational Opportunity Program (EOP)


Educational Opportunity Program (EOP) 530-752-9711, offers an array of services to support students both academically and socially. EOP provides a caring and supportive environment for students to meet with peer and staff advisers for help with course selection, registration procedures, campus processes and resources, choosing a major, social challenges and other general advising questions.

Students interested in learning more about EOP may inquire at eop@ucdavis.edu or see http://eop.ucdavis.edu. Visitors are always welcome and no appointment is necessary.

The EOP Guardian Scholars Program (GSP) provides academic and personal support to former foster youth. The program offers services to help students transition to the University and increase their potential to succeed. The staff adviser serves as the liaison between students and various campus units, providing assistance with academic planning, financial aid, housing and other campus resources. The Guardian Scholars office is located in the EOP Building.

Student Disability Center

54 Cowell Building 530-752-3184, http://sdc.ucdavis.edu

As part of UC Davis' commitment to providing students with disabilities equal access to educational programs, the Student Disability Center (SDC) facilitates academic accommodations and promotes accessibility of instruction and classrooms. SDC advises students on their rights and responsibilities, as well as strategies and tools for managing their disabilities. The SDC specialists assist students with clinically documented disabilities in identifying accommodations needed for their classes. SDC also provides information and guidance to faculty and staff about working with students with disabilities. SDC provides information to current, entering, and prospective students with disabilities about available services, resources, and the accommodations process.

Student Housing

160 Student Housing 530-752-1736, http://housing.ucdavis.edu

The First-Year Experience Program 530-752-4546, is one component of the Student Housing Academic & First-Year Transition Services office, which includes the new student Orientation program and the academic year First-Year Experience Peer Advising program. All first-year and transfer students living in Student Housing and second year students have access to an extensive network of academic support services referred to as the “Residence Hall Advising Team,” a partnership between Student Housing, the four Colleges and the Student Academic Success Center. Included are residential Academic Advising Centers, which offer drop-in peer advising provided by peer advisers from the four Colleges and the FYE Program. The peer advisers are able to assist with registration procedures, course selection, choosing a major or other general advising questions. The peer advisers can either answer your questions or put you in contact with others who can. Peer tutors from the SASC provide drop-in tutoring services during the evenings in the Academic Advising Centers for new students enrolling in common first-year courses such as Math, Chemistry, Writing and Statistics. Upper-division students should visit their major department adviser. College Dean's office or the Biology Academic Success Center for academic advising and support services.

New Student Orientation 530-752-4443, orientation@ucdavis.edu, http://orientation.ucdavis.edu, assists new students and their families with the transition to UC Davis. Orientation includes assistance with academic advising, course registration, information for campus resources and social integration. The staff will introduce you to the campus environment, procedures and opportunities, and offers programs relevant to your changing needs. Your contribution to orientation programs, through ideas and assistance, is always welcome.

STUDENT CONDUCT AND GRIEVANCES

Student Judicial Affairs 3200 Dutton Hall 530-752-1128; http://sja.ucdavis.edu

Student Judicial Affairs (SJA) upholds campus standards of academic honesty and student conduct by resolving alleged violations of university policies or campus regulations. SJA also provides information about campus grievance options and addresses student complaints of prohibited discrimination or harassment, arbitrary treatment, or unfair policies or practices. SJA can also help with conflict resolution and provide interpretations of university policies and regulations.

Misconduct and Discipline

Students enrolling or seeking enrollment in the university have an obligation to act honestly, ethically and responsibly. As members of our academic community and of society at large, students have both rights and responsibilities and are expected to comply with the general law, University policies and campus regulations. Standards for student conduct include but are not limited to the University of California Policies Applying to Campus Activities, Organizations and Students and the UC Davis Code of Academic Conduct. The UC Davis Administration of Student Discipline explains the student conduct process. These policies may be found on the SJA website. Most referrals are resolved through mutual agreement with a focus on honesty, education, and accountability. If unresolved, a student has the right to a formal hearing process with appropriate due process.

In summary, students may be subject to discipline for the following behaviors: academic dishonesty or misconduct; disruption or obstruction of University activities; providing false information, forgery, theft, misuse of any University property, documents or resources; sexual assault, relationship violence, or other physical assault; threats of violence or conduct that threatens health and safety or is intended to terrorize; possession of weapons; harassment, including stalking and sexual harassment; possession, use, distribution or sale of drugs or alcohol that is illegal or against
University policy; hazing; preparing, selling, or distributing course materials or notes for commercial purposes without the consent of the course instructor; or recording, photographing, or viewing a person in a private location without express consent.

If admitted or found in violation, disciplinary sanctions may range from censure to probation, suspension or dismissal from the university. Additional requirements may include but are not limited to community service, educational programs, or restitution. Suspected violations of campus or university standards by students should be reported to Student Judicial Affairs. Online reports can be submitted on the SJA website.

Student Responsibilities

Students are responsible for complying with the announcements and regulations printed in this catalog and with all policies, rules and regulations of the university and this campus. Students will not be able to register or receive transcripts of record or diplomas until they have met all university obligations.

Discrimination/Harassment

If students believe that they have been discriminated against or harassed, they may contact Student Judicial Affairs at 530-752-1128 or the Campus Chief Compliance Officer at 530-752-9466, for information and assistance. It is important to seek assistance as soon as possible, as time limits may apply to some grievance processes. Advice is also available from the Harassment and Discrimination Assistance and Prevention Program. Individuals may use an Anonymous Call Line at 530-752-2255 or the HDAPP Office at 530-752-9255.

RESOLVING ACADEMIC PROBLEMS

Grade Changes

Grades may not be changed once they have been submitted to the Office of the University Registrar unless (1) a clerical error has been made (e.g., homework score was added incorrectly) or (2) a procedural error has affected the student's grade (e.g., misapplication of grading procedures). Students who believe they received an incorrect grade due to a clerical or procedural error should ask their instructor to file a Request for Grade Change form with the Office of the University Registrar. If the instructor does not agree, the student should discuss the matter with the chair of the department. If at that point the matter is still unresolved, the student may request a change of grade by filing a Request for Grade Change form with a Deputy to the Academic Senate Committee in the Office of the University Registrar in 12 Mrak Hall. Requests must be made by the end of the following quarter.

The Academic Senate Committee on Grade Changes reviews requests for grade changes and, like the instructor, has no authority to reevaluate student work but can change the grade if it finds a documented clerical or procedural error. In the case of a challenged grade, the student will be expected to bear the burden of proving that a clerical or procedural error occurred and caused the incorrect grade to be assigned. If a student believes that the grading error was the result of prohibited discrimination or arbitrary treatment, the student may file a complaint with Student Judicial Affairs. For more information, contact the Office of Student Judicial Affairs at 530-752-1128.

For more details, see the http://registrar.ucdavis.edu/records/grades/changes.cfm. See guidelines for the Committee on Grade Changes at http://academicsenate.edu/GCC. Questions regarding this process should be directed to the Deputy to the Committee on Grade Changes at GradeChanges@ucdavis.edu.

Other Academic Problems

If you need a requirement waived or any other type of variance, contact your faculty adviser or the appropriate dean's office or the Biology Academic Success Center for information on your college's procedures. If you cannot get satisfaction through normal channels, contact the ASUC Student Advocacy Grievance Center or the Committee on Student-Faculty Relationships; see ASUC Student Advocacy Grievance Center, below.

ASUCD Student Advocacy Grievance Center

349 Memorial Union
530-754-4131/6101/3339
The ASUCD Student Advocacy Grievance Center advocates students' academic and nonacademic concerns to the faculty and administration. Grievance counselors assist students one-on-one, directing them to appropriate channels through which to state their academic grievances (e.g., student-faculty relations, sexual harassment, grade change problems, pre-judicial treatment in the classroom and problems with academic procedure and policy) and nonacademic grievances (e.g., campus facilities, campus safety, ASUCD and any other nonacademic concerns). All information discussed between counselors and students is completely confidential. Students can get counseling, referrals and support to aid in the resolution of these matters.

STUDENT ACADEMIC SUCCESS CENTER

Academic Resources

2205 Dutton Hall
530-752-2013; http://success.ucdavis.edu
At the Student Academic Success Center, you can receive help with general study skills, math and science concepts, writing essays and term papers, reading efficiency, English as a second language, and test anxiety reduction.

Learning specialists can help you in small groups, during office hours, drop-in, or you may participate in workshops covering specific areas of study. Undergraduate tutors provide drop-in tutoring in specific BIS, Chemistry, Math, Physics, Statistics courses, and writing across the curriculum.

The Student Academic Success Center (SASC) offers pre- and co-classes in mathematics and physics for EOP students. Pre-classes help prepare students for the regular university class they usually take the following quarter. Co-classes provide supplementary instruction for students enrolled in the regular class. The SASC offers pre-classes for Mathematics 16A, 21A and Physics 9A. The SASC also offers co-classes for the Mathematics 16 and 21 series and the Physics 9 series. All pre-classes carry three workload units and co-classes carry one workload unit. These units count toward minimum progress and financial aid eligibility, but do not count toward graduation.
Educational Opportunity Program (EOP) Services

EOP Building
530-752-9366; http://eop.ucdavis.edu

Educational Opportunity Program (EOP), offers an array of services to help students adapt both academically and socially to the University setting and successfully achieve their educational goals. EOP provides a caring and supportive environment for students to meet with peer and staff advisers and network with other students.

Services include:
- Orientation and welcome activities to introduce new students to UC Davis
- First-year seminars
- Summer bridge program
- Academic advising and pre-enrollment assistance
- Personal and social support from trained peers and staff counselors
- General study skills and graduate school preparation advising
- Supplemental instruction in math and science
- Online EOP newsletter
- Guardian Scholars Program (GSP); a support network for former foster youth

Guardian Scholars Program (GSP)

EOP Building
530-752-1211

The mission of the Guardian Scholars Program (GSP) is to empower foster youth at UC Davis to reach their potential by providing a community network that supports their academic progress and personal growth. The GSP is a one-stop center where students can get help from professionals who understand the challenges of former foster youth and where students can meet other students who have a similar background. In addition to the services available through EOP, Guardian Scholars offers one-on-one mentoring with faculty and staff and a network of off-campus resources specifically intended for former foster youth.

Mentorships for Undergraduate Research in Agriculture, Letters and Science (MURALS)

EOP Building
530-752-9931

Mentorships for Undergraduate Research in Agriculture, Letters and Science (MURALS) is designed to enrich the research experience of students situationally disadvantaged in their access to graduate school. The program aims to encourage students to further their education beyond the baccalaureate. By working with a faculty mentor, students not only have an opportunity to participate in academic research, but their experience may give them an incentive to pursue graduate work leading to a master's or doctoral degree. Students must be a junior or senior with a GPA of 3.000 and 90 units and meet additional eligibility requirements.

For more information, please see the MURALS website at http://murals.ucdavis.edu.

Transfer Reentry Veterans (TRV) Center

1210 Dutton Hall
530-752-2200 Transfer Reentry

If you transferred to UC Davis, are a reentry student, the TRV Center is here to serve you. Reentry refers to undergraduate students who are 25 or older, graduate students who are 30 or older, married students or student parents.

If you or your parent(s) served in the U.S. military and you are unsure of what benefits you may be eligible for, the TRV Center can help.

TRV Center services include: drop-in academic peer advising, Osher Reentry Scholarship program, access to the TRV Resource Network, Veteran educational benefit certifications and fee waivers, resources for commuting students, computer access, study space and networking with the community of TRV students through events and activities.

Linda Alexander Scholars Program (LFA)

123 South Hall
530-752-2430

LFA is a partnership between SASC and the African Continuum. The program is a comprehensive student retention and success program for students of the African Diaspora. LFA supports the academic, social, and personal growth of its participants. Students enter the program as new freshmen or transfers, and remain through graduation.

Program goals are to:
- Increase the recruitment and retention of students from the African Diaspora,
- Increase student engagement in campus academic and social domains,
- Provide integrated network of resources for success and
- Provide culturally sensitive events programming that increase student satisfaction with overall UC Davis experience

Pre-Graduate/Pre-Professional Services

South Hall, 1st Floor
530-752-4475

Pre-Professional/Pre-Graduate School Advising offers individualized advice and information to students interested in admission to professional and graduate schools (medical, dental, vet med, law, Masters and Ph.D. programs, etc.) including prerequisite course planning, exam preparation, evaluation of competitiveness and assistance with all aspects of the application process such as writing the personal statement, getting good letters of recommendation, selecting schools/programs and strategies for becoming the most competitive applicant possible. In addition, the program offers small group advising and informative workshops, and hosts visits from admissions officers from various professional schools.

Graduate School Information Day is held on campus each October to give students an opportunity to speak with representatives from Universities across the country in preparation for entrance to graduate school. Similarly, Law School Information Day is held each fall where students have an opportunity to speak with law school admissions representatives from law schools around the United States.
Special Transitional Enrichment Program (STEP)
2205 Dutton Hall
530-752-2013
Freshman EOP students are invited to participate in the Special Transitional Enrichment Program (STEP). The program begins in summer and continues through the first two academic years, offering preparatory course work, academic assistance and advising. It helps students adjust academically and socially to the campus by strengthening their learning skills and study habits, and by providing an extensive orientation to campus life.

Study Skills Assistance
111 South Hall
530-752-4475
Advising and workshops are offered to help students strengthen skills that have significant impact on college achievement and academic success. Students may attend a workshop or meet with an adviser to get help with time management, test preparation, success strategies, note taking and other study skills. The workshop schedule is available each quarter at http://success.ucdavis.edu.

INTERNSHIPS AND CAREER SERVICES

Internship Programs
The Internship and Career Center
1st, 2nd and 3rd Floors, South Hall 530-752-2855;
http://icc.ucdavis.edu
You can take advantage of one of the hundreds of organized internships through the Internship and Career Center or initiate your own.

An internship may be full time or part time, credit or non-credit, voluntary or involving a stipend, depending on your needs and interests and the availability of openings. Internship experiences must emphasize learning rather than routine activities, must include field supervision by a qualified professional and, where appropriate, the faculty member responsible for giving credit. Academic credit is awarded only for experiences planned and approved in advance by the sponsoring faculty member.

The Internship and Career Center (ICC)
1st, 2nd and 3rd Floors, South Hall 530-752-2855;
http://icc.ucdavis.edu
If you are an undergraduate, graduate or alumnus, ICC can help you identify your abilities and interests and relate them to jobs; gain access to practical experience to increase your competitiveness in the job market; and find out how and where to look for the jobs you want. ICC staff present workshops and seminars each quarter on finding an internship, beginning a job search, developing a resume and preparing for an interview. Webshops on these topics are also available at the ICC website.

The ICC Career Library (2nd floor, South Hall) contains materials that can help you learn how your major field of study can be translated into job opportunities and provides data concerning types of employment graduates have obtained. Useful to job-seekers-and available free of charge in print and at the ICC website is ICC's Career Resource Manual, which provides guidelines for preparing a resume, tips on being interviewed and information on employment in government, business and education.

The ICC coordinates Aggie Job Link, an online compilation of internship opportunities, part time student jobs and career vacancies that are augmented daily and accessible through the ICC website. ICC's Career Recruiting Programs, located on the 3rd floor South Hall, arranges employment interviews and schedules on-campus recruiting by employers.

Graduate Student and Postdoctoral Career Services
The Internship and Career Center
2nd floor, South Hall
530-752-8342
Students pursuing a master's or doctoral degree or enrolled in the teaching credential program should visit the Graduate Student and Postdoctoral Career Services offices in South Hall.

Services include special workshops on writing teaching resumes, curriculum vitae, and preparing for interviews for positions within and outside of academia. Individual advising is available by appointment.

Advisers provide resources to graduate students and postdoctoral scholars on career opportunities. The office sponsors the Graduate Career Options Program for advanced degree candidates considering career options outside of academia, and hosts the Pathways Symposium, a day-long career services event for graduate students and postdoctoral scholars.

Community Service Resource Center
The Internship and Career Center
1st floor, South Hall
530-752-3813
If you are interested in providing community service please visit the UC Davis Community Service Resource Center (CSRC) coordinated through the ICC. Public service work can be a rewarding and satisfying experience that may also improve your qualifications for the job market. Community service may involve compensation or stipend, academic credit or transcript notation and can vary from a one-day activity to a long-term commitment. The Community Service Resource Center is a referral program for students who want to perform community service and a resource for agencies and campus units with service opportunities. The office has a database and directories with information about non-profit agencies in California, community service opportunities throughout the world and employment in the non-profit or public sectors after graduation. The CSRC assists in coordination of the Community Service Fair which is a part of ICC's Fall Internship and Career Fair; plans quarterly Weekends of Service; and hosts the annual Community Service Awards event that honors individual students and student groups for their commitment to community service.

ACADEMIC RESOURCES

UC Davis Study Abroad
207 Third Street, Suite 120
530-207-4633; Fax 530-207-4695;
studyabroad@ucdavis.edu
http://studyabroad.ucdavis.edu/

Study abroad is one of the richest educational experiences a student can have. When students return from study abroad in places like Italy or Hong Kong, they describe their time abroad as an experience that changed their lives. Students study abroad to explore their academic interests in a global context, to learn a language, to gain practical field work or lab experience, to prepare for a job in the global economy and to add distinction to an application for graduate or professional school.
UC Davis Study Abroad advisors can help students decide which program is best for them, whether to study abroad for a summer, quarter, semester or a full year and when to go abroad (freshmen through senior years). UC Davis Study Abroad also provides freshman seminars, advising sessions for new and transfer students, information sessions for particular majors, countries or regions, and financial aid workshops to assist with funding study abroad programs. Staff also advise on programs that have internship opportunities. UC Davis Study Abroad also administers the Global and International Studies (GIS) minor, which is sponsored by the Humanities Program in the College of Letters and Science.

UC Davis Study Abroad is home to UC Davis Quarter Abroad, UC Davis Summer Abroad, UC Davis Seminars Abroad and the University of California Education Abroad Program (UCEAP). UC Davis Study Abroad also provides advising for students interested in non-UC “independent” programs and administers the non-UC study abroad leave program, and provides student services for international UCEAP Reciprocal Exchange students.

First-Year Seminar Program
1350 Surge III
cell@ucdavis.edu; http://cell.ucdavis.edu/courses-and-events/first-year-seminars/
The UC Davis First-Year Seminar Program gives first-year students the opportunity to study with faculty members in small groups, meeting in settings more informal than the ordinary classroom. The seminars focus on a current intellectual interest of the faculty member. All seminars emphasize student participation, providing intense intellectual exchange among students and between student and teacher.

Mathematics and Science Teaching Program (MAST)
104 Everson Hall
530-754-9621; mast@ucdavis.edu; http://mast.ucdavis.edu
The UC Davis Mathematics and Science Teaching Program (MAST) program helps students explore mathematics and science teaching careers while working on their math, science, or engineering degree. Part of the statewide University of California Science and Mathematics Initiative, MAST offers seminars on education, internships in K-12 classrooms, and academic advising to help students choose coursework compatible with multiple goals, including preparing for a teaching credential program.

Student Farm
530-752-7645; http://studentfarm.ucdavis.edu
The Student Farm offers students diverse hands-on learning and research opportunities in sustainable agriculture through internships, formal courses (e.g., in organic crop production, sustainable agriculture, environmental education) and research projects. Students grow and sell organic vegetables in the Market Garden, develop diverse horticultural skills in the Ecological Garden, operate and maintain tractors and equipment, make compost, and provide hands-on farm tours for school children. Students may also create specialized projects in related areas. The Student Farm is a part of the Agricultural Sustainability Institute and is located on the west edge of the campus core, near the Rec Pool. The Student Farm is open to all students, regardless of major or background.

Undergraduate Research Center
2300 Student Community Center
530-752-3390; http://urc.ucdavis.edu
The Undergraduate Research Center serves as the home to several campus programs and represents a campus-wide collaborative to encourage and facilitate faculty-sponsored undergraduate research, scholarship and creative activity opportunities for UC Davis undergraduates. These experiences serve as a vehicle to help students understand what it means to attend a premier research university, enhance the quality of students’ interactions with faculty, and learn first-hand that knowledge is not just learned, but discovered. Programs and services are available to all majors and all class levels and include advising, coaching and academic planning; referrals to sponsored research programs and faculty research projects; and educational programs, seminars and workshops related to the student researcher’s professional development and training; and funding and awards for student researchers.

Washington, D.C. Program
230 South Hall
530-752-6652; http://washingtonprogram.ucdavis.edu
The University of California hosts a system-wide academic and residential program for undergraduate students attending from each of the UC campuses. Housed within the UC Washington Center (UCDC), an 11-story, state of the art facility, convenient to public transportation, and located in downtown D.C., the programs provide undergraduates an opportunity to enrich their education while in residence for one quarter in the nation's capital. The program's principal activities include enrollment in credit-bearing courses, participation in academic internships, and opportunity to explore the many educational, cultural and historical activities in the Washington area.

UCDC is open to undergraduates from all majors who will have upper-division standing by the start of the quarter in which they plan to participate. A GPA of at least 3.000 is recommended for admission although not required. Applicants are also evaluated based on overall relevant experience, a written statement, and letters of recommendation.

The program offers both an 11 week academic year component, where students earn academic credit and continue to be registered as full-time UC Davis students during the quarter in which they participate; and a 10-week summer component with a credit or non-credit option. The academic component includes an internship that requires students to work three to four days per week as interns in Congress, federal agencies, interest groups, trade associations, research institutions, media corporations, museums, or in other organizations related to the interests and objectives of individual students; a research seminar that requires students to write a research paper in consultation with Washington Program faculty and graduate fellows; and an upper division seminar chosen from elective courses that vary each quarter but typically include international relations, history, political science, public policy and other social sciences; the arts and humanities; and science policy. In addition to regular instruction, seminars often include guest speakers, observations of congressional committees and federal agencies, and other relevant Washington experiences. Courses are taught by UCDC faculty appointed by the various UC campuses, or visiting faculty from the Washington area.
STUDENT RESOURCE AND INFORMATION CENTERS

Campus Violence Prevention Program

Police/TAPS Building
200 Dairy Road Bikeway
530-752-3299

The goals of the UC Davis Campus Violence Prevention Program (CVPP) are to reduce the incidence of sexual assault, intimate partner violence, stalking and bias related incidents in the campus community and at the UC Davis Medical Center by increasing the knowledge and awareness of students, staff and faculty about such offenses; to provide crisis intervention, advocacy, support, counseling and referrals to victims of such offenses, their families and friends; to serve as a resource for information regarding sexual assault, intimate partner violence, stalking and bias related crime; and to cooperate with other campus units and community agencies to provide a safer campus community and a concerted integrated effort.

The Program’s primary mission is to eliminate all forms of violence and in the interim, to ensure that comprehensive and appropriate support services are available for survivors. The Violence Prevention Program provides confidential and supportive responses to victims and offers one on one advocacy with initial medical evaluation, legal and police procedures, and academic and housing issues. Confidential crisis intervention, problem-solving and advocacy is also available to recent survivors and to those working to recover from past incidents, as well as short-term intervention and support being available for friends, family, housemates and co-workers. With the overall purpose of providing for a comprehensive model program of support, education, training and outreach.

Center for Leadership Learning

Surge III Room 1350
530-752-6908; http://cll.ucdavis.edu/

The Center for Leadership Learning (CLL) offers a variety of co-curricular programs and activities to help undergraduate students develop their leadership and professional skills. The CLL provides students a unique opportunity to formally learn about leadership and professionalism, while receiving invaluable, hands-on training that will assist them for a lifetime.

The CLL’s programs and services are open to all UC Davis undergraduate students and are free of charge. Undergraduates from all majors, class levels, degrees of leadership and professional experience are welcome to participate. Students may elect to participate in our quarterly workshops, complete any of our optional certificate programs, attend our special events, or all the above! The CLL embraces all students who wish to enhance their personal and professional lives and you get to choose the degree of involvement that works for you!

Cross-Cultural Center

Steven Baissa, Director
Student Community Center, First Floor
530-732-4287; Fax 530-752-5067;
ccc@ucdavis.edu; http://ccc.ucdavis.edu

The mission of the Cross-Cultural Center (CCC) is to foster a multi-cultural community through education and advocacy regarding systematic group oppressions, ethnic and cultural diversity, and establishing an environment of cross-cultural learning and exchange for the entire campus. The CCC advocates for a campus environment free of racism, classism, sexism, heterosexism, ableism, body image oppression, religious/spiritual oppression and any other forms of oppression.

The CCC strives to build an inclusive and welcoming campus community through the annual Culture Days programs that raise awareness and celebrate our cultural diversity. Programs include Asian Pacific Culture Week, Black Family Week, La Raza Cultural Days and Native American Culture Days and Powwow. Everyone is invited to share in these programs featuring speakers, workshops, films, entertainment and family events.

The center features much more, as well. It is home to Danzantes del Alma, a popular student folklórico dance troupe that celebrates the culture and heritage of Mexico through performances on campus and throughout northern California. All students are invited to participate and no prior dance experience is required. Peer Education and Community Empowerment (PEACE), is a student-to-student train the trainer program dedicated to undoing racism, sexism, homophobia, and to promoting a welcoming, respectful, living and learning environment. The CCC also puts on the REACH Retreat, Mixed Heritage Week and the Asian Pacific Islander Leadership Retreat, and has an affiliate program for registered campus student organizations called SoDA.

Lesbian Gay Bisexual Transgender Queer Intersex Asexual Resource Center

Elizabeth Coté, Interim Director
Student Community Center, 397 Hutchison Drive
530-752-2452; http://lgbtqia.ucdavis.edu

The LGBTQIA Resource Center provides a comprehensive range of education, information and advocacy services and works to create and maintain an open, safe and inclusive environment for lesbian, gay, bisexual, transgender, queer, intersex, and asexual students, staff, faculty, their family and friends and the entire campus community. The LGBTQIA Resource Center offers a library of over 1,500 books, most of which can be borrowed for two weeks for personal use. The Center can also serve as a meeting space for local organizations or support groups. Our focus is respect, pride and unity with regard to all individuals. The LGBTQIA Resource Center is open Monday-Thursday, 10 a.m.-6 p.m. and Fridays 9 a.m.-5 p.m. (PST).

Services for International Students and Scholars (SISS)

Services for International Students and Scholars
530-752-0864; siss@ucdavis.edu

Services for International Students and Scholars assists international students, faculty and researchers in gaining and maintaining an appropriate immigration status while at UC Davis. SISS provides orientation and other information and assistance as part of its mission to build a campus community that is fully inclusive of international students and scholars.

All new and transfer international students must attend a special orientation program held just before each quarter begins. The orientation helps new students with immigration regulations and finding campus services and community resources, and is a vital addition to campus and departmental orientation programs. Orientation for new J-1 international scholars is held every two weeks. Students and scholars should report to SISS as soon as possible after arriving in Davis.

Academic Advising and Student Resources

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Estimated Costs for 2014-2015

International students are responsible for all of their expenses while studying at UC Davis. The expenses include Nonresident Supplemental Tuition, Tuition, room and board and a modest amount for personal expenses. For the 2014-2015 calendar year (12 months), we estimate the cost will be $53,000 for undergraduates, and $54,700 for graduate students. Because the exact cost for tuition and fees is not determined until just before the beginning of the academic year, these are only preliminary figures. This minimum allowance may be increased without advance notice.

Women’s Resources and Research Center (WRRC)

North Hall, First Floor
530-752-3372; http://wrrc.ucdavis.edu

The Women’s Resources and Research Center (WRRC) promotes gender equity and aspires for a campus where students, faculty, and staff of all genders can thrive. All are welcome to visit the WRRC and learn about gender equity, connect with community, and find resources and support.

The WRRC focuses on four areas:

• Leadership for Gender Equity: Training and skills-building opportunities to develop leaders that promote gender equity across campus, such as the EDGE Peer Education Program, Volunteer Program, Internship Program, and the Women in Science and Engineering Program

• Community Empowerment: Student-led initiatives and coalitions that foster self-empowerment and strengthen communities, including: Semana de la Xicana, the Empowerment Conference, International Womyn’s Day, Vagina Our Stories, and Gender Equity Awareness Week

• Research & Scholarship: Conferences and scholarships to encourage critical inquiry of feminisms, intersectional systems of oppression, and equity

• Resources & Support: Confidential information and referrals on a broad range of topics, such as: gender bias, harassment and violence, health, self-esteem, childcare, and more
REGISTRATION AT UC DAVIS

Registration

Office of the University Registrar
12 Mrak Hall

Registration is the way you become a student at the university. To be a continuing UC Davis student, you must register each quarter. Registration includes enrolling in classes, the financial obligation to pay tuition, fees and all other charges on your student account, filing your current address with the Office of the University Registrar, and completing and filing any forms pertaining to your registration status.

If you are a new or reentering student you must also:

- Submit a Statement of Legal Residence; see Residence for Tuition Information, on page 594.
- California Health and Safety Code requires first time enrollees who are 18 years of age or younger to provide a statement of immunization status for the Hepatitis B virus prior to enrollment. For more information, see Student Health and Counseling Services (SHCS) at http://healthcenter.ucdavis.edu/newstudent/hep-b.html.
- Have a student ID card produced; see the AggieCard website at http://aggiecard.ucdavis.edu or information on how to upload your photo and obtain your AggieCard.

New graduate students who have been registered previously at UC Davis as undergraduates are considered to be new students.

Change of Name. Your legal name must be on file with the Office of the University Registrar. If your name has changed since the time of your application, please complete the Name Change Form and submit it with the legal documentation for verification to the Office of the University Registrar in 12 Mrak Hall or use the form at https://registrar.ucdavis.edu/records/changes-personal-information.cfm.

Change of Address. Be sure to inform the Office of the University Registrar of any change of address. Failure to file your current addresses can result in a hold on your registration. You can update your address using SISWeb; see http://sisweb.ucdavis.edu.

Late Registration

Late registration privileges extend through the 10th day of instruction, but you are assessed a late fee to defray the extra administrative costs. Registration after the deadline is allowed only if action or inaction on the part of the university delays registration. A recommendation from an appropriate administrative unit is required and tuition and registration fees must be paid with cash, cashier's check, credit union check, university check or fee credit.

ENROLLING IN COURSES

Online Registration. Students enroll in courses by using SISWeb; see http://sisweb.ucdavis.edu or myucdavis Schedule Builder; see https://students.myucdavis.edu/schedulebuilder/.

The Class Search Tool and other registration information are available at http://registrar.ucdavis.edu.

Undergraduate Registration Priority. Access to registration is by priority groups. The groups are established according to student class level, as determined by the number of units completed. Undergraduate Class Level is determined as follows:

- Freshman Level 0–44.99 units
- Sophomore Level 45–89.99 units
- Junior Level 90–134.99 units
- Senior Level 135 units and above

You are officially registered in all courses listed on your individual class schedule. Once registered, you are financially liable for all tuition and fees associated with the term and responsible for completing each of the courses. View your class schedule using SISWeb or myucdavis Schedule Builder.

Adding and Dropping Courses

You can adjust your schedule by adding or dropping courses until the deadlines published in the Quarter Dates and Deadlines calendar at http://registrar.ucdavis.edu/calendar/.

The last day to add courses is the 12th day of instruction. The last day to drop courses without dean’s permission or fee is the 20th day of instruction, except for those courses designated by departments as 10-day-drop courses. You need to obtain the permission of your dean and pay the processing fee to drop a designated 10-day-drop course after the 10th day of instruction or to drop any other courses after the 20th day of instruction.

See Adding and Dropping Courses, at http://registrar.ucdavis.edu/registration/schedule-adjustments/add-drop.cfm, on how to adjust your schedule and what add/drop procedures and fees apply after the published deadlines. The Quarter Dates and Deadlines calendar, at http://registrar.ucdavis.edu/calendar/, also lists the course add and drop deadlines.

Late Add

To add a course after the deadline, but on or before the last day of instruction, you need approval of the department. A processing fee applies to late adds.

Late Drop

To drop a course after the deadline, but on or before the last day of instruction, you need approval of the dean of your college or school. Graduate students must have their adviser’s approval in order to drop courses. A processing fee applies to late drops. Permission to drop courses after the deadline may be granted only in exceptional circumstances.

Retroactive Drop

Occasionally, in exceptional circumstances, students are allowed to drop a course after the course is completed. Reasons for seeking a retroactive drop are very specific: medical problems, severe emotional difficulties, or recent death or severe illness in the immediate family. Retroactive Drop petitions must also include an explanation as to why the class being petitioned was more affected than other classes completed during the term. Petitions are subject to approval by the Academic Senate Committee on Grade Changes. Petitions for Retroactive Change are available from the Office of the University Registrar and should include a detailed account of the problem, appropriate documentation and an adequate explanation of why an I grade or late drop was not taken during the quarter in which the problem occurred. Retroactive
drop petitions should be submitted by the student to the instructor of the course, who will then submit the petition on the student’s behalf to the Office of the University Registrar. A processing fee is applicable on all retroactive drops.

**Retroactive Add**

In some rare circumstances, students are allowed to add a course after the course is completed. Petitions are subject to approval by the Academic Senate Committee on Grade Changes. Petitions for Retroactive Change are available from the Office of the University Registrar. Each petition must include the reason for the student’s failure to add the course during the quarter in which it was offered. Retroactive add petitions should be submitted by the student to the instructor of the course, who will then submit the petition on the student’s behalf to the Office of the University Registrar. A course grade must be assigned by the instructor. A processing fee is applicable on all retroactive adds.

**COURSE LOAD**

**Expected Progress.** Undergraduate students are expected to graduate in 12 quarters (four years). To do so, students should plan to complete an average of 15 units per quarter (15 units per quarter for 12 quarters totals 180 units). Because occasions arise which prevent students from achieving expected progress towards the degree, the campus has established minimum progress requirements, to which students must adhere.

**Minimum Progress Requirements.** To meet minimum progress, a full-time regular undergraduate is required to maintain an average of at least 13 units passed over all quarters of enrollment. Minimum progress is calculated at the end of every Spring Quarter for the preceding three quarters (Fall, Winter, Spring) comprising the academic year. Undergraduate students falling below this requirement are not in good minimum progress and may be disqualified from further enrollment at the University. Quarters for which a student was officially approved for part-time status are omitted from the minimum progress calculation. For more information, see Probation and Dismissal, on page 83.

**Certification of Full-Time Status.** Undergraduate students must carry a study load of at least 12 units (including workload units) each quarter in order to be certified as full-time students for insurance and financial aid purposes or to compete in intercollegiate athletics. Graduate students must carry a study load of at least 12 units each quarter in order to be certified as full-time students.

**Course Load Limits in the College of Letters and Science.** Freshman students in their first year and transfer students in their first quarter of residence may not take more than 17 units each quarter. For all other Letters and Science students, the class schedule may not exceed 21 units each quarter. These unit limitations include non-credit remedial courses and repeated courses, but not make-up work to remove incomplete grades.

**Course Loads in the College of Engineering.** Because of the large number of required units in engineering programs, many students must take more than 15 units per quarter and/or attend summer session to finish in four years.

**Part-Time Student Status**

If, for reasons of occupation, family responsibility, health or, graduating-senior status (one term only), you are unable to attend the university on a full-time basis, you may qualify for enrollment in part-time status. Undergraduate students must file for part-time status each quarter. Graduate students with approved part-time status will remain part-time until the student enrolls full-time. To be considered eligible, undergraduate students must be registered in 10 units (including workload units) or fewer by the tenth day of instruction that quarter and graduate students must be registered in 6 units or fewer by the tenth day of instruction. Minimum progress requirements are waived for part-time students. The Part-Time Petition is available at the Office of the University Registrar’s website or at the Office of the University Registrar in 12 Mrak Hall. Part-time students have use of the same facilities and are eligible for the same services, including student health services, as full-time students.

**THE MAJOR**

You will find a complete list of the majors offered at UC Davis under Degrees Offered by UC Davis, on page 11.

**Declaration of Major**

**College of Agricultural and Environmental Sciences.** Students must declare a major by the time they have completed 90 units. Failure to declare a major at this point may result in a hold on further registration. In order to declare a major, you must meet with your faculty adviser and/or advising associate, fill out a Change of Major petition available at the Office of the University Registrar website (http://registrar.ucdavis.edu) or dean’s office and file the petition with the dean’s office. If you have completed 90 units, you must prepare a study plan with your adviser and/or advising associate at the same time. You are accepted into a major only after your major department and the dean’s office have approved the Change of Major petition. With the approval of the College Executive Committee, additional requirements, such as completion of a particular set of required courses with a specified grade point average (usually well above a C average), may be introduced as conditions for acceptance into any major at any time.

**College of Biological Sciences.** Students must declare a major by the time they have completed 90 units. A hold will be placed on your registration if you are still undeclared after completing 90 units. Students can obtain a Change of Major petition from the Biology Academic Success Center website or the Office of the University Registrar website at http://registrar.ucdavis.edu. They must meet with an academic adviser for the major, discuss a projected plan of studies, obtain the adviser’s signature and return the signed petition to the Biology Academic Success Center. The minimum requirement for entry into a major is a C average in all courses used to satisfy major requirements. Students are accepted into the major when their adviser and the dean have approved the petition. Students who fail to maintain a 2.000 GPA in courses required for their major over two consecutive quarters may be required to withdraw from the major.

**College of Engineering.** Students must declare a major when they apply to the College of Engineering. The ability to change majors is subject to meeting the requirements set forth by the faculty of the College of Engineering. Requirements for changing to a College of Engineering major can be found at http://engineering.ucdavis.edu/undergraduate/advising/answers.html#1 or by contacting the Undergraduate Advising Office 530-752-1979.

**College of Letters and Science.** Students must declare a major by the time they have completed 90 units. If you have not declared a major by this point, a hold may be placed on your registration.
Such a hold would be removed only when your Change of Major petition is filed in the Undergraduate Education and Advising Office. Petitions can be obtained from department offices or the Office of the University Registrar’s website at http://registrar.ucdavis.edu. As a part of the declaration procedure, you must, in consultation with a faculty adviser, prepare a projected plan of study. You are accepted into the major when your adviser and the Undergraduate Education and Advising Office have approved the petition.

To be accepted into a major, you must have a C average in all courses you have completed that are required for that major. With the approval of the College Executive Committee, additional requirements, such as completion of a particular set of required courses with a specified grade point average (usually well above a C average), may be introduced as conditions for acceptance into any major at any time.

If your performance is unsatisfactory after you have declared a major program, you may be required by the dean to withdraw from that major, upon written recommendation from the chair of the department or the curriculum committee that administers the major.

**Change of Major Within a College**

To change from one major to another within a college, you need the consent of the department or committee in charge of your proposed new major and the approval of the dean. Admission into a major program may be denied by the program or by the dean if your grade point average (GPA) in courses required for the selected major is less than 2.000.

Procedures for change of major within a college are the same as for declaration of major and the same conditions apply. If you wish to change to a major that has admission restrictions, you must comply with the special procedures and requirements for that major.

Except under unusual circumstances, no change of major will be permitted after you attain senior standing (135 units). Students wishing to petition for such an exception should consult in advance with the relevant dean's office or Biology Academic Success Center regarding additional restrictions and requirements.

It is not possible to change or declare a major in the quarter in which you file to graduate.

**College of Biological Sciences.** Students who wish to change their major after completing 135 units should include a quarter-by-quarter graduation plan with the change of major petition. Changes of major will not be permitted by the Dean after the beginning of the quarter of the student's graduation.

**College of Engineering.** Requirements for changing to a College of Engineering major can be found at http://engineering.ucdavis.edu/undergraduate/advising/answers.html#a1 or by contacting the Undergraduate Advising Office 530-752-1979.

**College of Letters and Science.** Requirements for changing to a College of Letters and Science major can be found at http://www.ls.ucdavis.edu/advising/faq.html.

**Multiple Majors**

**College of Agricultural and Environmental Sciences.** A student choosing to major in multiple majors must petition the departments/programs/divisions responsible for the major(s) and the dean of the college. The dean's approval of declaration for multiple majors is subject to the following:

1. Eighty percent of the upper division units offered in satisfaction of course and unit requirements of each major must be unique; that is, they may not be offered in satisfaction toward the upper division unit requirements of any of the other selected majors. Courses with substantial overlap in content will not count as part of the eighty percent. Departmental advisers may approve only one course for substitution when considering the eighty percent in upper division courses and units required for each major.

2. When unit requirements of the majors included in a request differ, the major with the smaller number of upper division units required should be used to compute the minimal unit difference that must be met.

3. A student in good academic standing and with a minimum of a C average in the upper division courses taken toward the major may elect to declare simultaneously more than one major within the college or a combination of majors offered by the college and other undergraduate colleges on campus.

**College of Biological Sciences.** Admission into multiple majors is subject to the approval of offices in charge of the majors involved and the Dean of the College. Departments, curriculum committees and other teaching units, singly or collectively, as well as faculty advisers have the right to disapprove a student's request for a multiple major.
Approval of a request to declare more than one major is subject to the following:

1. Eighty percent of the upper division units used to satisfy requirements in each major must be unique; that is, they may not be offered in satisfaction of requirements of any of the other majors involved.
2. If the major programs differ in the number of upper division units required, the major program requiring the smaller number of upper division units will be used to compute the minimum number of units that must be unique.
3. In determining that the eighty percent requirements have been satisfied, advisers and the Dean must count both specific courses and courses with substantial overlap of content as common to the majors involved.
4. Students must complete all majors within the 225-unit limit.
5. Students may only petition for a multiple major after completing two Depth Subject Matter courses in each major.

A student who completes all requirements for approved multiple majors in which one major normally leads to an B.A. degree and another normally leads to a B.S. degree, will receive a B.A.S. degree. A single degree is granted to students who graduate with multiple majors.

**College of Engineering.** Students may choose to complete two engineering majors. Enrollment in an engineering major and a non-engineering major may be possible. Double-major students must satisfy the requirements for both majors. Degree requirements for such double majors ordinarily cannot be completed within four academic years. A change of major petition is required for all requests and appropriate approvals from all applicable departments and dean's offices are necessary.

The Department of Computer Science does not allow double majors of Computer Science and Engineering and Computer Engineering, or Computer Science and Engineering and Electrical Engineering, or Computer Science and Engineering and Computer Science (L&S).

Triple majors will not be approved.

If you want to double major in any over-subscribed engineering major, you will be subject to the additional restrictions for changing into those majors and must satisfy the requirements of both majors.

**College of Letters and Science.** Students choosing to major in multiple subjects must notify the Undergraduate Education and Advising Office of their decision by submitting for approval a petition endorsed by faculty advisers in the majors. The dean's approval of the declaration of more than one major is subject to the following conditions:

1. At least 80 percent of the upper division units used to satisfy course and unit requirements in each major selected must be unique and may not be counted toward the upper division unit requirements of any other major undertaken. Courses with substantial overlap in content will not count as part of the 80 percent.

2. At the time of request, a substantial part of the preparatory subject matter in each major must have been successfully completed.

3. All degree requirements must be completed within the 225-unit limit.

Combination proposals that cannot be approved are two or more majors offered by the same discipline, except art history and art studio.

A student who completes all requirements for approved multiple majors in which one major normally leads to an A.B. degree and another normally leads to a B.S. degree, will receive a B.A.S. degree. A single degree is granted to students who graduate with multiple majors.

**Cross-College Majors**

**College of Agricultural and Environmental Sciences.** The College does encourage multiple majors between colleges whenever your academic interests and abilities indicate this to be the best route. After endorsement of the Change of Major petition by the appropriate faculty or staff adviser in the colleges involved, each dean may approve the petition if there are sufficient differences between the requirements for the major programs you wish to study.

At least 80 percent of the upper division units used to satisfy course and unit requirements in each major selected must be unique and not duplicate those of the other major. In planning for multiple majors, you should determine the total requirements needed for each major as well as for graduation from each college involved.

All degree requirements must be completed within the 225-unit limit.

The same conditions apply for cross-college majors as for multiple majors.

**College of Biological Sciences.** The same conditions apply for cross-college multiple majors as for multiple majors within the college. In addition, approval of the deans of all involved colleges are required for cross-college multiple majors.

**College of Engineering.** Enrollment in a combination of an engineering major and a non-engineering major may be possible. A change of major petition is required for all requests and appropriate approvals from all applicable departments and deans' offices are necessary. Such double-major students must satisfy the requirements for both majors. Degree requirements for such double majors ordinarily cannot be completed within four academic years.

**College of Letters and Science.** The same conditions apply for cross-college majors as for multiple majors. Cross-college programs will not be approved if the majors involved are available within a single college as well.

**Individual Major**

Students with academic interests not covered by an established major have the opportunity to develop an individual major. Such a major requires the selection of interrelated courses totaling a minimum of 45 upper division units from two or more areas of study. If you choose this option you will work closely with faculty advisers to develop a coherent and rigorous academic program. This program is then submitted to a faculty committee for review and
If you want to have completion of a minor certified on your transcript, you must have any courses in common. Your minor. If you elect more than one minor, the minors may not be approved by the department or program. For minors offered by the College of Agricultural and Environmental Sciences, at least half of these units and courses must be completed in residence on the UC Davis campus. You are also expected to complete all courses that are prerequisite to the upper division courses required for the minor. Minors offered by the College of Letters and Science do not require that a portion of the units be completed at UC Davis.

Students in the College of Biological Sciences may not complete a minor in the same field as the student’s major. This includes any minor offered by the department or curriculum committee in charge of the student’s major. All major and minor requirements must be completed within the 225 total unit limit.

With the exception of interdisciplinary minors approved by the College Executive Committee, students in the College of Letters and Science may not complete a minor offered by the department or program in charge of the student’s major.

To request certification of a minor, you must have a grade point average of 2.000 in all courses required for the minor. At most, one course used in satisfaction of your major may be applied to your minor. If you elect more than one minor, the minors may not have any courses in common.

If you want to have completion of a minor certified on your transcript, you must obtain a minor petition from your dean’s office or Biology Academic Success Center and file it no later than the deadline for filing for graduation. You can elect only one minor in a subject area. Requirements for the minor must be met by the time of graduation.

College of Engineering. Students in Engineering who plan to complete a minor must file a minor petition, available on the College of Engineering website at http://engineering.ucdavis.edu/undergraduate/advising/answers.html#a14. The completed petition must be approved by the minor adviser and then turned into the Undergraduate Advising Office of the College of Engineering for certification at least one quarter prior to graduation. Not more than one course applied to the satisfaction of requirements in the major program shall be accepted in satisfaction of the requirements of the minor.

There are currently nine approved minor programs in the College of Engineering. Information about these minors can be obtained by contacting the undergraduate adviser in the home department of each minor:

- Department of Biological and Agricultural Engineering:
  - Energy Efficiency
  - Energy Science & Technology
  - Energy Policy
- Department of Biomedical Engineering:
  - Biomedical
- Department of Chemical Engineering & Materials Science:
  - Materials Science
- Department of Civil and Environmental Engineering:
  - Construction Engineering and Management
  - Sustainability in the Built Environment
- Department of Computer Science:
  - Computational Biology
- Department of Electrical and Computer Engineering:
  - Electrical Engineering

In addition, the Department of Computer Science offers a minor in Computer Science. For information, contact the Undergraduate Adviser in the Department of Computer Science 530-752-7036.

School of Management. The minor offered by the Graduate School of Management requires that students apply and be admitted to the program prior to taking courses. There is a quarterly admission process. Students who are not admitted to the minor will not be allowed to take courses. Students who have not been admitted to the minor program and enroll in these courses will be dropped.

ACADEMIC CREDIT

Units of Credit

Academic work at the university is measured by “units of credit.” In conjunction with the letter grade you receive from the course instructor, units of credit give a fairly accurate evaluation of the amount of time you have devoted to a given subject. Units of credit also make it possible to anticipate the amount of work involved in a particular course and enable you to transfer from one campus or university to another without undue difficulty. To convert quarter units to semester units, multiply by 0.66; from semester to quarter units, multiply by 1.5.

Units of credit are assigned to courses based on 1 unit of credit for three hours of work by the student per week. Usually this means one hour of lecture or discussion led by the instructor and two hours of outside preparation by the student. In laboratory courses, two or three hours of work in the laboratory are normally assigned 1 unit of credit.

In most courses at UC Davis, the standard procedure prevails, so that a 3-unit course meets for three hours a week, a 4-unit course for four hours and so on. Courses that are an exception to this pattern may require additional class time or give more demanding assignments. If you have questions about the number of units assigned to a course, you should check the expanded course descriptions (available at your college, department, or on the
Internet) or ask the instructor what is required in terms of outside reading, term papers, problem sets or field trips. These are not always spelled out completely in the General Catalog. By knowing the amount of work that will be required, you can plan your course load more systematically and realistically.

Credit by Examination

Under certain prescribed conditions, currently registered students in good standing may receive course credit by taking an examination without formally enrolling in a course. You may obtain a petition and a copy of the prescribed conditions from the Office of the University Registrar. The petition is subject to the approval of the instructor giving the examination and the department involved.

The completed petition, accompanied with the processing fee, must be presented for final approval to the dean of your college or school, or if you are a graduate student, to the dean of Graduate Studies. The completed petition must be submitted to the Office of the University Registrar no later than the business day before the date of the scheduled examination; petitions that are submitted after this date will be denied. Students who are approved by the Office of the University Registrar to take credit by examination shall be issued a permit to take the examination, which the student will present to the instructor at the time of the examination.

The credit received for the examination may not duplicate any credit you have already earned toward your degree. You may not use credit by examination to repeat any course you have taken previously, regardless of the grade you received in that course. Credit earned by examination may not be applied towards satisfaction of the General Education requirement. The final examination results will be reported to the Office of the University Registrar, which will assign the appropriate grade and grade points to you. Since failure to pass the examination will be recorded as an F, you are encouraged to prepare fully for such an examination before attempting it. Optional P/NP or S/U grading is subject to approval by the appropriate dean.

You may also receive credit for learning in nonacademic settings through credit by examination.

To earn credit through the credit by examination process, the examination must be given by a UC Davis instructor and be for a course listed in the current General Catalog. Students are not eligible to take a credit by examination in a quarter in which they are not currently enrolled.

Concurrent Credit from Another Institution

A student may not obtain transfer credit for courses taken at a non-University of California campus in a term during which the student is registered as a full-time student at UC Davis. A variance can be obtained only by petitioning the dean of your college well in advance of the desired registration. When a variance is granted, units earned are counted toward minimum progress for the term in which the dual registration occurs. Summer Session courses are exempt from this regulation.

Students may gain credit for courses taken during the summer at other institutions, provided the courses parallel those given in the University of California. Assurance that such credit will be accepted, however, can be given only after the courses have been completed. You should arrange to have the transcripts of your Summer Session grades sent to Undergraduate Admissions for evaluation.

Intercampus Visitor Program

Qualified undergraduates may take advantage of educational opportunities on other University of California campuses as an Intercampus Visitor (ICV). This program enables students who have completed at least one year in residence on their home campus and have maintained a grade point average of at least 2.000 to take courses not available on their home campus, to participate in special programs, or to study with distinguished faculty members on other campuses of the university. Students who meet the above requirements should complete an application available in the Office of the University Registrar or at http://registrar.ucdavis.edu.

Summer Sessions

1350 Surge III 530-752-7622; http://summer-sessions.ucdavis.edu

Every summer, many students earn units, complete their undergraduate degrees, expand their knowledge, do research, take special study courses, meet prerequisites or take courses that are often over-enrolled during the academic year by participating in Summer Sessions at UC Davis. Per unit course fees are equivalent to academic year tuition based on the standard 15-unit quarter.

Summer Sessions offers more than 600 lower and upper division course sections in a wide range of subject areas that provide full university credit transferable to most campuses. Since admission is open to virtually all adults, Summer Sessions traditionally attracts students from US and international universities and colleges, high school graduates and many other qualified applicants. Admission to a summer session, however, does not guarantee or imply admission to the university’s regular academic quarters.

Summer offerings include Special Sessions that either occur off-campus or take place outside the normal six-week terms.

Summer Sessions dates are listed at the bottom of the Academic Calendar, on page 1, and at http://summer-sessions.ucdavis.edu.

UC/CSU/Community College Cross Enrollment

If you are interested in taking a particular class at a nearby California State University or community college campus, you may now do so through the Intersegmental Cross Enrollment program. Enrollment is limited to one course per term and participating students need the approval of both the home and the host campus. Please note that the Los Rios Community College district is not participating in the program.

Senate Bill 361 requires that UC, CSU and the California Community Colleges permit students to enroll in one course per term at a campus of either of the other two systems on a space available basis at the discretion of the two campuses. This program aims to encourage community college students to enroll concurrently in courses offered at local universities, potentially increasing the number of community college transfers, including students from underrepresented groups.

Students must meet certain qualifications and be certified by their home campus as to eligibility, residence, fee, financial aid and health status. Generally, students will be allowed to add a class, if space is available, after the add/drop period on the host campus. To add a course, students must obtain the faculty member’s approval and signature on a Cross-Enrollment form, available at their home campus Registrar’s Office. The student takes the signed
form to the Registrar's Office at the host campus for processing. If you are interested in participating, come to the Office of the University Registrar in 12 Mrak Hall for more information.

**Open Campus (Concurrent) Program**

UC Davis Extension
1333 Research Park Drive
(800) 752-0881 or 530-757-8777
http://www.extension.ucdavis.edu/opencampus

Most of the classes taught at UC Davis are available to members of the public through the Open Campus (Concurrent) Program on a space available basis. The enrollment limitations, deadlines and fee schedule are provided in the Open Campus brochure-available online, by mail or from the UC Davis Extension office. Students previously registered at UC Davis who have not graduated may not enroll through Open Campus (Concurrent) until twelve months after withdrawing from UC Davis except with permission of the student's College Dean's Office or the Biology Academic Success Center. Upon admission or readmission to regular student status at UC Davis, the units and grade points earned when enrolled in Open Campus courses will count toward both the 180-unit undergraduate degree requirement and the UC GPA.

**UC Davis Extension**

1333 Research Park Drive
(800) 752-0881 or 530-757-8777
http://www.extension.ucdavis.edu/

As the outreach arm of UC Davis, UC Davis Extension provides continuing education in numerous professional and academic fields. Details on Extension courses are available by visiting the Extension website, calling or coming to the Extension office. Students enrolled at UC Davis who wish to use UC Davis Extension courses, other than those offered through Open Campus (Concurrent), towards degree requirements must obtain written approval from the dean's office of their college or the Biology Academic Success Center before enrolling in the Extension courses. Upon approval students may apply a limited number of credits towards the undergraduate or graduate degree requirement.

**EXAMINATIONS**

**Midterms**

In undergraduate courses for which a midterm examination is required, each student has the right to take the midterm (or submit the take-home examination as opted by the instructor) during one of the regularly scheduled meetings of the class. The scheduling of a midterm examination at a time other than a regularly scheduled class meeting requires mutual written consent of the instructor and each student registered in the course. A student who does not consent in writing to the different time must be permitted to take the examination (or submit the take-home examination) at the officially scheduled time. A student who consents in writing to the change of examination time waives the right to take the midterm at the officially scheduled time.

**Final Examinations**

**Scheduling.** The quarterly final examinations schedule is listed at http://registrar.ucdavis.edu/registration/schedule/finals.cfm. Exams are set according to the day-and-start time of the classes offered during the quarter. This information is available so that you can avoid final examination conflicts. A student who has multiple exams on the same day may discuss the situation with the instructor receiving credit. The writing time (in undergraduate courses) of a take-home and an in-class final examination together should not exceed three hours. In each course in which a final examination is required, the students have the right to take the final examination (and/or submit the take-home examination) at the time published in the quarterly final examinations schedule at http://registrar.ucdavis.edu/registration/schedule/finals.cfm.

An instructor may release each student's original examination, or a copy, at any time. Otherwise, the instructor will keep the exams, or copies thereof, until the end of the next quarter and students may pick up their exams during this period.

For on-line courses, the instructor of each on-line class will be provided the option to have the final in the last time slot on the last day of finals or at a time on dead day. Students shall be notified of the time and place of the final on or before the first day of instruction.

**Changing a Final Examination Date.** An in-class final examination may not be rescheduled for a date earlier than the first day of finals week. The due date for a take-home final examination may not be rescheduled for a date earlier than the first day of finals week. The scheduling of an examination at a time other than the specified time requires the written mutual consent of the instructor and each student involved in the change. Any student who does not consent in writing to a different time will be permitted to take an examination (or submit the instructor-opted take-home examination) at the officially scheduled time. A student who consents in writing to the change in the final examination time waives the right to take the examination as originally scheduled. Departures from the published examination schedule should be carried out so as not to disadvantage students who are unable to accept the changed schedule.

A student who is improperly denied the right to take a required final examination on the published date (or submit the take-home examination as opted by the instructor) may file a petition with the Executive Council of the Davis Division of the Academic Senate by the end of the next regular term for appropriate action.

**Disabilities.** Students with documented disabilities may be entitled to in-class accommodations. The student shall provide the instructor with a letter from the Student Disability Center (SDC) recommending those academic accommodations that the instructor is responsible for providing. Students must request accommodation as soon as possible, to allow the university reasonable time to evaluate the request and offer necessary adjustments. No accommodations shall alter the nature of the academic demands made of the student nor decrease the standards and types of academic performance, nor require facilities or personnel that cannot
reasonably be provided. SDC coordinates with the Office of the University Registrar to reserve a classroom for examinations for students with documented disabilities during finals week. The instructor should consult with the student and SDC on any questions or concerns.

**Religious Observances.** UC Davis seeks to accommodate any student who, in observance of a religious creed, encounters an unavoidable conflict with a test or examination schedule. The student is responsible for providing, in writing no later than the beginning of the quarter, notification of a potential conflict to the individual responsible for administering the examination and requesting accommodation. Instructors will consider such requests on a case-by-case basis and determine whether such conflicts can be resolved without imposing on the instructor or the other students in the class an undue hardship, which cannot be reasonably avoided. If so, the instructor will determine, in consultation with the student, a time during which the student can take the test or examination without incurring a penalty or violation to the student’s religious creed.

**GRADES**

Every instructor is required to assign a grade for each student enrolled in a course. The following grades are used to report the quality of a student’s work at UC Davis:

- **A** — excellent
- **B** — good
- **C** — fair
- **D** — barely passing
- **F** — not passing (work so poor that it must be repeated to receive recognition)
- **P** — passed (grade C– or better)
- **NP** — not passed
- **S** — satisfactory
- **U** — unsatisfactory
- **I** — incomplete (work is satisfactory but incomplete for a good cause)
- **IP** — in progress

The grades A, B, C and D may be modified by a plus (+) or minus (–).

**Grade Points**

Grade points are assigned each letter grade as follows:

- **A+ = 4.000**
- **B+ = 3.200**
- **D+ = 1.300**
- **A = 4.000**
- **C+ = 3.000**
- **D = 1.000**
- **A– = 3.700**
- **C = 2.000**
- **F = 0.000**
- **B+ = 3.300**
- **C– = 1.700**
- **P/NP = n/a**
- **B = 3.000**
- **D+ = 1.300**
- **S/U = n/a**

**Grade Point Average (GPA)**

The grade point average is computed on courses taken at the University of California. The value of grade points over units attempted determines your grade point average. The grade point balance represents the number of grade points above or below a C average. The grades IP, E, S, NP and U carry no grade points and are not included in grade point computations. Incomplete (I) grades are not included in the GPA at the end of the quarter, but are counted as F in determining if a bachelor’s degree candidate has earned the minimum 2.000 GPA required for graduation.

A student at UC Davis is expected to maintain a C (2.000 GPA) or better in all work undertaken in the university. If you fall below a C average, you are considered “scholastically deficient;” see Probation and Dismissal, on page 83.

**Passed/Not Passed (P/NP) Grading**

Subject to regulation by the faculties of the colleges and schools, an undergraduate student in good standing may request to take specific courses on a Passed/Not Passed basis. Such requests must be submitted and confirmed before the 25th day of instruction.

The grade P is assigned for a grade of C– or better. Units thus earned are counted in satisfaction of degree requirements but are not counted in determining your grade point average.

The intent of this option is to encourage exploration in areas in which you have little or no previous experience by alleviating grading pressures. The maximum number of units graded P that will be accepted for degree credit is one third of the units completed in residence on the UC Davis campus. Consequently, at least two thirds of the units completed in residence at UC Davis and presented in satisfaction of degree requirements must be in courses taken for a letter grade.

In specific approved courses, instructors will assign only Passed or Not Passed grades. Such courses count toward the maximum number of units graded P allowable toward the degree. If you are planning to take courses on a P/NP basis, you should also familiarize yourself with the requirements of your particular school or college, which may have placed conditions or restrictions in addition to the university requirements. If you plan to attend graduate or professional school, you should consult with Pre-Graduate/Pre-Professional Advising Services regarding Passed/Not Passed grading.

If you elect the P/NP grading option for courses graded upon completion of a two- or three-quarter sequence (in-progress grading), a petition must be submitted before half of the time covered by the IP grading has elapsed. The P/NP grading will then be in effect for the entire course sequence.

If you receive a D or an F in a course, you may not repeat it using the P/NP option. If you receive an Incomplete in a course you took for a letter grade, you may not complete the course on a Passed/Not Passed basis.

**College of Agricultural and Environmental Sciences.** The Passed/Not Passed option should be used only for elective courses, not for courses taken to fulfill major requirements. An NP grade in a course required by the major could prevent graduation. When in doubt, check with your faculty adviser before electing to take a course on a Passed/Not Passed grading basis.

**College of Biological Sciences.** All courses used to satisfy major requirements must be taken on a letter-graded basis, unless courses are only offered on a Passed/Not Passed basis. Courses taken before Fall 2006 on a Passed/Not Passed basis will be accepted in fulfillment of major requirements.

**College of Engineering.** Students in the College of Engineering may not take any course used to satisfy a degree requirement, or any course offered by the College of Engineering, on a P/NP basis. College of Engineering students are unable to select the P/NP option in SISWeb or myucdavis Schedule Builder. Engineering students wishing to take a non-engineering course that is not needed to satisfy a degree requirement can obtain a P/NP petition in the Undergraduate Advising Office in 1050 Kemper Hall.
College of Letters and Science. Students in the College of Letters and Science are subject to an additional limitation on the number of units that may be completed employing the Passed/Not Passed grading option; see Bachelor's Degree Requirements for the college in the Undergraduate Education chapter. Graduating seniors and other students planning to undertake graduate or professional studies, should consult an adviser before electing for Passed/Not Passed grading in courses required for the major program.

Satisfactory/Unsatisfactory (S/U)

The grade of S is awarded to graduate students for work in graduate courses that otherwise would receive a grade of B– or better and for work in undergraduate courses that otherwise would receive a grade of C– or better.

Graduate students, under certain circumstances, may be assigned grades of S or U, but units earned in this way will not be counted in calculating the grade point average. Petitions to elect S/U grading are available from the Graduate Studies Office and must be signed by your graduate adviser. Graduate students may petition to take no more than one course per quarter on an S/U grading basis. A graduate course in which a C, D or F grade is received may not be repeated with the S/U option.

In specific approved courses, instructors will assign only Satisfactory or Unsatisfactory grades. Such courses count toward the maximum number of units graded S allowable toward the degree, as specified by each degree program.

In-Progress (IP) Grading

For a course extending over more than one quarter (designated “deferred grading only; pending completion of sequence” in course descriptions), evaluation of student performance is deferred until the end of the final quarter. Provisional grades of IP are assigned in the intervening quarters and are replaced with the final grade at the completion of the sequence. In order to gain credit toward graduation, a student must successfully complete the entire sequence. For electing P/NP grading for a course graded in-progress, see Passed/Not Passed (P/NP) Grading, on page 81.

Incomplete Grades

The grade of I may be assigned when a student’s work is of passing quality and represents a significant portion of the requirements for a final grade, but is incomplete for a good cause as determined by the instructor; good cause may include current illness, serious personal problems, an accident, a recent death in the immediate family, a large and necessary increase in working hours or other situations of equal gravity.

In courses listed in the General Catalog as being letter graded, “passing quality” means “of D– quality or better.” This standard holds in such courses whether or not the student has elected to take the course on a Passed/Not Passed or Satisfactory/Unsatisfactory basis. For courses listed in the General Catalog as being graded on a Passed/Not Passed or Satisfactory/Unsatisfactory basis only, the completed work must be of a quality consistent with a grade of Pass or Satisfactory, respectively.

You may replace an I grade with a passing grade and receive unit credit (and grade points if the instructor assigns a letter grade) provided you satisfactorily complete the course work as specified by the instructor. In order to change your records, you must obtain a petition from the Office of the University Registrar and present it to your instructor for completion and mailing.

An I grade must be replaced with a letter grade (or P or S grade) before the end of the third succeeding quarter (excluding summer sessions) of the student’s academic residence, or the grade will revert to an F (or NP or U). If a student’s degree is conferred before the expiration of the time limit for an I-grade conversion, the graduated student shall have until the end of the third quarter succeeding the quarter in which the I grade was assigned to replace the I grade. If the grade is not replaced by then, the I grade will remain on the student’s record.

You may not re-enroll for credit in a course for which an I grade has been assigned. An undergraduate student whose record shows more than 16 units of I grades will be subject to disqualification. A graduate student who accumulates more than eight units of I grades will be subject to probation.

Incomplete grades will not be included in your grade point average at the end of a quarter. However, at the time of graduation, any remaining I grades are included when your grade point average is computed in order to determine whether you have achieved the 2.000 average required for the bachelor’s degree. An Incomplete grade, in these computations, has the same effect as a grade F, NP or U, depending on which option you have exercised. Therefore, it is recommended that students not delay the clearance of incomplete grades so as not to jeopardize graduation.

Retroactive Grade Changes

All grades except I and IP are final when filed by an instructor at the end of the quarter. No final grade except I may be revised by examination or the submission of additional work after the close of the quarter.

If a clerical or procedural error in the reporting of a grade by the instructor can be documented, you may request a change of grade with a petition available from department offices. The request must be made by the fifth week of the following quarter.

Grade changes for “clerical” errors (such as incorrect addition of points), upon documentation, may be approved by the Office of the University Registrar without requiring review by the Academic Senate Committee on Grade Changes. Requests to interchange P, NP, S or U grades with normal letter grades based upon student need (such as to allow graduation or to meet entrance requirements for professional school) do not involve clerical or procedural errors and are automatically denied. Thus, students should exercise the Passed/Not Passed or Satisfactory/Unsatisfactory grading options with caution.

Students are reminded of their responsibility to be aware of the procedures and regulations contained in the General Catalog, to verify their class schedules, and to familiarize themselves with the expectations of their instructors. No changes, except completion of an I grade as noted above, can be made to the student’s record once he or she has graduated.

Repeating Courses

Undergraduate students may only repeat courses in which they received a D, F or NP. Courses in which students received a grade of D or F may not be repeated on a P/NP grading basis. (Courses in which a grade of NP was received may be repeated on a P/NP grading basis.)

Degree credit for a repeated course will be given only once, but the grades assigned for both the first and second time a course is taken will appear on the student’s transcript. In computing the GPA of
undergraduates who have received a grade of D or F, only the grade and corresponding grade points earned the second time a course is taken will be used, up to a maximum of 16 units for all repeated courses. After the 16-unit maximum is reached, the GPA shall be based on all grades assigned and total units attempted.

Repeating a course more than once requires approval by the appropriate college dean if the student has already completed the course with a grade of C or better.

Graduate students, with the consent of the appropriate graduate adviser and the dean of Graduate Studies, may repeat any course in which they received a C, D, F or U, up to a maximum of 9 units for all courses repeated. Courses in which a grade of C, D or F has been earned may not be repeated on an S/U basis. Courses in which a grade of U as received may be repeated on an S/U basis.

Degree credit for a repeated course will be given only once, but the grades assigned for both the first and second time a course is taken will appear on the student’s transcript. In computing the GPA of graduate students who have received a grade of C, D or F only the most recently earned grade for each course and corresponding grade points will be used, up to a maximum of 9 units for all courses repeated. After the 9-unit maximum is reached, the GPA shall be based on all grades assigned and total units attempted.

**Mid-Term Grade Standing**

Students wishing to know their grade at the mid-quarter should ask the instructor. Those who have deficient grades (D, F or NP) are urged to confer with their advisers.

**Final Grades**

Grades are generally available about three weeks after a quarter has ended. You can check your grades through SISWeb or myucdavis Schedule Builder.

**Transcripts**

A record of each student’s academic work at UC Davis is retained permanently by the Office of the University Registrar. Copies of your official transcript may be obtained from the Office of the University Registrar. For more information on how to request a transcript and applicable transcript fees, see the Office of the University Registrar website at [http://registrar.ucdavis.edu/records/transcripts/](http://registrar.ucdavis.edu/records/transcripts/).

Transcripts of all work done through UC Davis Extension or concurrent enrollment must be requested directly from the UC Davis Extension Office, 1333 Research Park Drive, Davis, CA 95616. Transcripts of work completed at another campus of the university or at another institution must be requested directly from the campus or institution concerned.

**PROBATION AND DISMISSAL**

The following provisions apply to all undergraduates. Graduate and professional students with scholarship deficiencies are subject to action at the discretion of their respective deans.

**Scholastic Deficiencies**

A student will be placed on probation or subject to disqualification for failure to meet qualitative or quantitative standards of scholarship.

**Qualitative Standards.** The qualitative standards of scholarship require that a student maintain a C average (2.000) or better for all work undertaken in the university and for the work undertaken in any one quarter.

A student will be placed on probation for qualitative reasons if, at the end of any quarter, the student’s grade point average (GPA) is:

- Less than 2.000, but not less than 1.500, for the quarter
- Less than 2.000 for all courses taken within the University of California

A student will be subject to disqualification for qualitative reasons if, at the end of any quarter,

- The student’s grade point average is less than 1.500 for the quarter,
- The student’s grade point average is less than 1.500 for all courses taken within the University of California,
- The student has attempted more than 16 units graded I (Incomplete),
- The student has spent two consecutive quarters on academic probation.

In the case of probation or subject to disqualification for qualitative reasons, the official transcript will state that the student is not in good academic standing. Once a student has met the qualitative standards of scholarship, or has satisfied all requirements for graduation, the notation will be removed from the transcript.

**Quantitative Standards.** The quantitative standards, referred to as minimum progress requirements, define scholarship in terms of the number of units that you must satisfactorily complete. It is expected that a student will earn the 180-unit minimum degree requirement within 12 quarters (four years). This means students are expected to complete, on average, 15 units per quarter.

Because occasions arise which prevent students from achieving expected progress towards the degree, the campus has established minimum progress requirements, to which students must adhere. To meet minimum progress, a full-time regular undergraduate is required to maintain an average of at least 13 units passed over all quarters of enrollment. Minimum progress is calculated at the end of every Spring Quarter for the preceding three quarters (Fall, Winter, Spring) comprising the academic year. Quarters during that period for which a student was officially approved for part-time status are omitted from the minimum progress calculation.

The following courses may be counted toward unit minimum progress:

- Required non-credit courses, e.g., Mathematics B, will be evaluated according to the “Carnegie unit” rule and counted as units passed, although these courses shall not be applied toward the satisfaction of baccalaureate degree requirements.
- Repeated courses passed to improve D or F grades up to a maximum of 16 units.
- Courses passed in Summer Sessions at UC Davis or at another accredited school and transferred to UC Davis will be counted as units passed (applied to the next full-time quarter of enrollment immediately following the summer session).
Courses passed by examination in accordance with policies established by the Divisional Committee on Courses (applied to quarter in which exam is taken).

Courses that are IP (in progress) will be counted as units passed.

Courses graded I will be counted as units passed when replaced by a passing grade (applied to the quarter in which the I grade is received).

A student will be placed on probation for quantitative reasons if, at the end of any Spring Quarter, the minimum progress calculation for the preceding academic year shows that the student passed an average of less than 13 units but greater than or equal to 12 units per quarter.

A student will be subject to disqualification for quantitative reasons if, at the end of any Spring Quarter, the minimum progress calculation for the preceding academic year shows that the student passed an average of less than 12 units per quarter.

For every student who fails to meet minimum progress at the end of Spring Quarter, a “degree progress average” will be calculated at the close of the next full-time quarter of enrollment at UC Davis. The degree progress average is defined as the quotient of the number of units passed during all full-time quarters from the initial quarter of matriculation at UC Davis divided by the number of full-time quarters completed at UC Davis.

A student whose degree progress average is less than 13 units shall be “subject to disqualification for quantitative reasons.” A student whose degree progress average is 13 or more units shall not be “subject to disqualification for quantitative reasons.”

If a student fails to make minimum progress at the end of Spring Quarter, the degree progress average shall be calculated each subsequent full-time quarter of enrollment as long as the student is “subject to disqualification for quantitative reasons.” A student who is “subject to disqualification for quantitative reasons” at the end of two consecutive full-time quarters of enrollment shall be disqualified from the university.

In the case of dismissal for quantitative reasons, the official transcript will state that the student is not in good academic standing.” Once a student has met the quantitative standards of scholarship, or has satisfied all requirements for graduation, the notation will be removed from the transcript.

### Dismissal

Dismissal for either qualitative or quantitative reasons (defined above) is based on the decision of the dean of the college in which the student is enrolled. Such dismissal is from the University of California system and not simply the college or the UC Davis campus. Should a former UC Davis student later wish to be readmitted to the UC Davis campus, the authority to do so rests with the dean of the college from which the student was dismissed. If a student is dismissed from their college, they will automatically receive a full refund of registration fees paid for that term.

Students should go to the dean's office of their college or the Biology Academic Success Center if they need academic advising about probation and dismissal.

A student will be placed on probation or subject to disqualification for failure to meet qualitative or quantitative standards of scholarship.

### HONORS AND PRIZES

#### Deans’ Honors Lists

According to UC Davis campus regulations, the quarterly Dean’s Honors List includes names of students who have completed, for a letter grade, a minimum of 12 units in a specific quarter with a grade point average equal to or higher than the minimum grade point average attained by the upper 16 percent of those registered in the same class level and college during that quarter. Honors lists will be posted quarterly on deans’ office websites or made available by other means and a notation of these honors will be placed on each student's permanent record by the Office of the University Registrar.

#### Graduation Honors

Honors at graduation are awarded to students who have a grade point average in the top percent of their college as shown in the table below. The College of Letters and Science requires that additional criteria be met for high and highest honors; see the sections below for more information.

#### Grade Point Average by College

<table>
<thead>
<tr>
<th>Percent Determining Cut-Off Point</th>
<th>Agricultural &amp; Environmental Sciences</th>
<th>Biological Sciences</th>
<th>Engineering</th>
<th>Letters and Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>2%</td>
<td>3.717</td>
<td>3.485</td>
<td>3.781</td>
<td>3.730</td>
</tr>
<tr>
<td>3%</td>
<td>3.618</td>
<td>3.606</td>
<td>3.638</td>
<td>3.595</td>
</tr>
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<td>3.118</td>
<td>3.118</td>
<td>3.118</td>
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</tbody>
</table>

A student who complete the Honors Program of the College of Letters and Science, may be recommended by their departments for graduation with high honors or highest honors on the basis of an evaluation of their academic achievements in the major and in the honors project in particular. Graduating students will not be awarded honors with the bachelor's degree if more than eight units of grade I (Incomplete) appear on their transcripts. The College Committee on Honors may consider exceptions to this condition. Petitions for this purpose should be submitted to the Undergraduate Education and Advising Office.

An honors notation is made on students' diplomas and on their permanent records in the Office of the University Registrar.

#### College of Letters and Science

Graduation with “honors” requires that a student meet the appropriate grade point requirement described in the above table for all UC courses completed. Students who meet the grade point requirement for graduation with honors, and who complete the Honors Program of the College of Letters and Science, may be recommended by their departments for graduation with high honors or highest honors on the basis of an evaluation of their academic achievements in the major and in the honors project in particular. Graduating students will not be awarded honors with the bachelor's degree if more than eight units of grade I (Incomplete) appear on their transcripts. The College Committee on Honors may consider exceptions to this condition. Petitions for this purpose should be submitted to the Undergraduate Education and Advising Office.
The Honors Program of the College of Letters and Science

The Honors Program in the College of Letters and Science permits students to pursue a program of study in their major at a level significantly beyond that defined by the normal curriculum. It represents an opportunity for the qualified student to experience aspects of the major that are representative of advanced study in the field. Successful completion of the College Honors Program is a necessary prerequisite to consideration for the awarding of high or highest honors at graduation.

Entrance into the honors program requires that a student have completed at least 135 units with a minimum grade point average of 3.500 in courses counted toward the major. Other prerequisites for entrance into the program are defined by the major. The program consists of a project whose specific nature is determined by consultation with the student’s major adviser. It may involve completion of a research project, a scholarly paper, a senior thesis, or some comparable assignment depending on the major. The project will have a minimum duration of two quarters and will be noted on the student’s record by a variable unit course number or special honors course designation. Successful completion of the honors program requires that a minimum of six units of credit be earned in course work for the project.

The Honors Program of the College of Engineering

An Honors Program is available to qualified students in the Chemical Engineering, Biochemical Engineering, and Materials Science and Engineering majors. The Chemical Engineering and Materials Science Honors Program is a four-year program designed to challenge the most talented students in these majors. Students invited to participate will take a one-unit honors seminar in their freshman year and will enroll in various one-unit honors courses. In the upper division, students will complete either an honors thesis or a project that might involve local industry (Chemical Engineering 194 HA, HB, HC). Students must maintain a grade point average of 3.500 to continue in the program. Successful completion of the Honors Program will be acknowledged on the student’s transcript.

University Honors Program

(formerly Davis Honors Challenge & Integrated Studies Honors Program)

330-732-9797; http://honors.ucdavis.edu

The University Honors Program (UHP) is an interdisciplinary, campus-wide honors program for highly motivated students interested in enhancing their education through special courses, close contact with faculty, and dynamic interaction with academic peers. High-achieving students are invited in spring to apply for participation in the fall.

General Education Honors courses, seminars, and special study opportunities constitute the course offerings of the University Honors Program. A complete list of these courses, with course registration numbers, is made available to admitted students through the UHP office.

Approximately 185 students live in the Honors Academic Residential Community during their first year. Students ranked within the top 5% of the UC Davis entering class are invited to participate and are selected to create a balanced community of students from all four undergraduate colleges. For specific program details, see the University Honors Program website at http://honors.ucdavis.edu.

Prizes and Awards

The University Medal is the highest campus honor awarded to a graduating senior in recognition of superior scholarship and achievement. A College or School Medal is also given to the outstanding graduating student in each of the colleges and professional schools.

Departmental citations, special awards and prizes are also awarded to students for superior achievement and scholarship.

College of Agricultural and Environmental Sciences. Each year, the outstanding graduating senior in the College is awarded a silver medal, known as the “Agricultural and Environmental Sciences Medal.” Scholastic excellence (in a minimum of six quarters at UC Davis) is the primary basis for choosing the recipient. The Mary Regan Meyer Prize is awarded to an outstanding graduate who has demonstrated expertise and an interest in serving humanity. The Charles E. Hess Award is awarded to the graduate with the most noteworthy record of public/community service while at UC Davis. The Kinsella Memorial Prize, in honor of John E. Kinsella, is awarded annually to an outstanding individual who submits his or her Ph.D. dissertation during the spring, fall winter quarter or summer session immediately preceding the due date for nomination.

College of Biological Sciences. Each year the College Medal is awarded to one outstanding graduating senior. Academic excellence is the primary basis for selecting medal nominees. The College Medal is awarded to a graduating senior based on the criteria of academic excellence, research activity and involvement in service to the campus or community. For additional information regarding college awards, please contact the Dean’s Office or the Biology Academic Success Center.

College of Engineering. Each year, outstanding senior students in engineering are selected by their grade point averages as nominees for the M.S. Ghausi Medal. Academic excellence is the primary basis for selecting the recipient of the award. Graduate students are eligible for the Zuhair Munir Award, given to the student who has submitted the year’s best engineering doctoral dissertation. The award honors Zuhair Munir, former Dean of the College and its Associate Dean for Graduate Studies for twenty years.

College of Letters and Science. Graduating seniors with a distinguished academic record may be recommended by the faculty as nominees for the College’s Herbert A. Young Medal. Each June, one medalist is selected from among the graduates of the current academic year. The Leon H. Mayhew Award is conferred upon the outstanding graduate majoring in the arts or humanities, preferably music, art, or literature. Academic excellence is the primary basis for selecting the recipients of these awards. The Lawrence J. Andrews prize is awarded to a student entering the senior year who not only has achieved academic excellence but who also has demonstrated interests outside of pure scholarship.

Chancellor’s Award for Excellence in Undergraduate Research

This prestigious award recognizes a graduating senior who has distinguished him/herself through their excellence in undergraduate research. The winner, chosen for completing research or scholarship in any academic subject while at UC Davis, is announced and awarded a special plaque at commencement ceremonies in June. In conjunction with the Chancellor’s Award, Professor Dean Singleton of UC Davis’ Department of Psychology established an endow-
ment for funding a cash prize for each year’s student recipient. An award is also given each year to a faculty mentor for his/her outstanding contribution to undergraduate research. For more information, see http://undergraduateeducation.ucdavis.edu/awards.html.

Honorary Societies

Election to an honorary society is one of the most prestigious awards a student can receive. At UC Davis, the following honorary societies are represented:

- Alpha Kappa Delta (Sociology)
- Alpha Omega Alpha (Medicine)
- Alpha Zeta (College of Agricultural and Environmental Sciences)
- Chi Epsilon (Engineering)
- Gamma Sigma Delta (College of Agricultural and Environmental Sciences; College of Biological Sciences)
- Golden Key (All colleges and schools)
- The National Society of Collegiate Scholars (All colleges and schools)
- Omicron Delta Epsilon (Economics)
- Order of Omega (Fraternities-Sororities)
- Order of the Coif (Law)
- Phi Alpha Theta (History)
- Phi Beta Kappa (College of Letters and Science)
- Phi Kappa Phi (All colleges and schools)
- Phi Sigma (Biological Sciences)
- Phi Zeta (Veterinary Medicine)
- Pi Delta Phi (French)
- Pi Mu Epsilon (Mathematics)
- Pi Sigma Alpha (Political Science)
- Prytanean Honor Society (All colleges-undergraduate women only)
- Psi Chi (Psychology)
- Sigma Pi Sigma (Physics)
- Sigma Xi (All colleges and schools-research)
- Tau Beta Pi (Engineering)

LEAVING UC DAVIS

Graduation

Each candidate for an undergraduate degree must file an Application for Graduation with the Office of the University Registrar for the quarter in which the candidate plans to receive the degree; see http://registrar.ucdavis.edu/graduation. The dates for campus filing are published in the Academic Calendar, on page 1, and at http://registrar.ucdavis.edu/registration/leave/graduate/.

Students in the College of Agricultural and Environmental Sciences must have their Major Certification evaluated by the dean’s office before their candidacy for a degree can be finalized; see Bachelor’s Degree Requirements for the college in the Undergraduate Education chapter.


Graduating students who wish to participate in the Commencement Ceremony must register to do so with their college by the filing deadline for that term. For links to each college’s registration website, see http://registrar.ucdavis.edu/graduation. Commencement Ceremonies are held twice a year, in the fall (December) and spring (June).

Please note that to graduate, a student must file an Application for Graduation with the Office of the University Registrar by the stated deadline. To participate in the Commencement Ceremony, a student must register with their college by the stated deadline. These are separate actions.

Leave of Absence: Planned Educational Leave Program (PELP)

The Planned Educational Leave Program allows any registered student—undergraduate or graduate—to suspend academic work at UC Davis temporarily. Undergraduates may take one such leave during their academic career at UC Davis; that leave is limited to one quarter in duration. For graduate students the maximum leave is up to one year. Undergraduates apply for PELP at the Office of the University Registrar or http://registrar.ucdavis.edu. Graduate students apply through their departments and professional students apply through their dean’s office.

Applications for PELP may be filed as late as the tenth day of instruction during the quarter for which the student is requesting a leave. However, approved applications submitted after the first day of instruction will entitle you to only a partial retraction of tuition and student fees assessed, which may provide a refund in accordance with the Schedule of Refunds. The Schedule of Refunds refers to calendar days beginning with the first day of instruction. The effective date for determining a refund of fees is the date the completed and approved PELP Form is returned to the Office of the University Registrar; see the Fees, Expenses and Financial Aid chapter.

An application fee is charged to your account when you enroll in the PELP program.

While students may receive academic credit at other institutions and transfer this credit to UC Davis (subject to rules concerning transfer credit), participants are reminded that the intent of the program is to “suspend academic work.” Therefore, students are urged to carefully evaluate the desirability of taking academic work while away from the campus during PELP. Students enrolled in PELP are not eligible to enroll in Open Campus (Concurrent) courses at the UC Davis campus or to otherwise earn academic credit at UC Davis during the PELP leave.

You will not be eligible to receive normal university services during the planned leave. Certain limited services, however, such as placement and student employment services, counseling, and faculty advising are available. Students on PELP may elect to voluntarily enroll in the Davis Health Insurance Plan (SHIP). Undergraduate students may elect to enroll for one additional quarter of coverage. Graduate students may elect to enroll for up to two quarters or one semester of coverage. Students on PELP may also purchase limited borrowing privileges from the library. International students should consult Services for International Students and Scholars to find out how the PELP will affect their status. Grants and other financial aids will be discontinued for the period
of the leave, but effort will be made, where legally possible, to allow you to renegotiate loan payment schedules and to ensure the availability of financial aid upon your return.

Withdrawal

To cancel your registration before the first day of instruction or to withdraw from the university on or after the first day of instruction but on or before the last day of instruction, you must complete a Cancellation/Withdrawal Form and return the Form to the Office of the University Registrar. If you do not submit a Cancellation/Withdrawal Form, you will be liable for fees according to the Schedule of Refunds; see the Fees, Expenses and Financial Aid chapter. The effective date for determining a refund of fees is the date the completed Cancellation/Withdrawal Form is filed with the Office of the University Registrar. No exceptions will be made to this policy. After filing your withdrawal form, you must complete an Exit Interview with Student Accounting; see the Student Accounting website at http://studentaccounting.ucdavis.edu/.

If you are receiving financial aid, you must report your change of status immediately, in person or by mail, to the Financial Aid Office. If you are receiving veteran's benefits, you must also report your withdrawal to the Veterans Affairs Office.

College of Engineering. Engineering students planning to withdraw from the University are strongly advised to meet with an adviser in the Undergraduate Advising Office in 1050 Kemper Hall or call 530-752-1979 to discuss readmission requirements prior to withdrawing.

Retroactive Withdrawal. Petitions for retroactive withdrawal may be obtained from the Office of the University Registrar. Petitions are subject to approval by the Academic Senate Committee on Grade Changes. Reasons for seeking such are medical problems, severe emotional difficulties, or death or severe illness in the immediate family. Petitions should include a detailed account of the problem, appropriate documentation and an adequate explanation of why withdrawal was not taken during the quarter in which the problem occurred.

RETURNING TO UC DAVIS; READMISSION

If you are a former UC Davis undergraduate student who wishes to resume undergraduate studies, you may reapply through the Readmission process. You are considered a former student if you have interrupted the completion of consecutive terms of enrollment on the UC Davis campus. For details regarding the Readmission process, see http://registrar.ucdavis.edu/registration/return/readmission.cfm.

You may obtain the Readmission application from the Office of the University Registrar or download the application at http://registrar.ucdavis.edu/registration/return/readmission.cfm. The Readmission application must be completed and submitted to the Office of the University Registrar with the non-transferable, non-refundable application fee on or before the following deadlines:

- **Fall.** The last business day of July
- **Winter.** The last business day of October
- **Spring.** The last business day of January
UC Davis offers the Bachelor of Arts (A.B.) and Bachelor of Science (B.S.) degrees in over 100 major programs, as well as over 110 minors in a variety of disciplines.

Undergraduate education is governed by the Vice Provost—Undergraduate Education, and the Undergraduate Council, a standing committee of the Davis Division of the Academic Senate. The Vice Provost is also responsible for education-related programs including the Undergraduate Research Center, the Center for Leadership Learning, the University Honors Program, the Davis Honors Challenge, the UC Washington Center, Entry Level Writing, Summer Sessions, the Center for Excellence in Teaching and Learning, and the Women's Resources and Research Center Library.

Academic programs are offered by the four undergraduate colleges: the College of Agricultural and Environmental Sciences, the College of Biological Sciences, the College of Engineering, and the College of Letters and Science.

COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES

Office of the Dean
130 Mrak Hall
530-752-0108; http://www.caes.ucdavis.edu

Major programs in the College of Agricultural and Environmental Sciences highlight the multiple connections among agricultural sciences, environmental sciences and human sciences within the larger context of the quality of life in the global economy. The majors fall into three broad areas of study described below. The College of Agricultural and Environmental Sciences also offers two college-wide degree programs and two college-wide non-degree programs.

The Undergraduate Programs

Agricultural Sciences

These majors prepare students in animal biology and the management of environmental resources as needed to develop sustainable animal production technologies. Also considered is the impact of production and management processes on animal health and welfare, human diet and health, and the natural environment.

The majors that focus on plant science provide a strong background in the context of agricultural and environmental systems and societal needs; ecological understanding of food and fiber production systems; biological and economic principles that underlie management decisions in agribusiness; and a basic background in all areas of plant biology, including plant development, plant protection, biotechnology and post-harvest physiology.

Majors:
- Agricultural and Environmental Education, B.S.
- Animal Biology, B.S.
- Animal Science, B.S.
- Animal Science and Management, B.S.
- Biotechnology, B.S.
- Entomology, B.S.
- Plant Sciences, B.S.
- Sustainable Agriculture and Food Systems, B.S.
- Viticulture and Enology, B.S.

Minors:
- Agricultural Pest Management
- Applied Computing and Information Systems (Plant Sciences)
- Animal Biology (Animal Science)
- Animal Genetics (Animal Science)
- Apiculture Entomology (Entomology)
- Aquaculture (Animal Science)
- Avian Sciences
- Dairy/Livestock (Animal Science)
- Environmental Horticulture (Plant Sciences)
- Equine (Animal Science)
- Forensic Entomology
- Fungal Biology and Ecology (Plant Pathology)
- Insect Biology (Entomology)
- Insect Ecology and Evolution
- Medical-Veterinary Entomology (Entomology)
- Nematology
- Precision Agriculture (Biological and Agricultural Engineering)

Environmental Sciences

These majors focus on the broad facets of the human and natural environments and their interactions. They draw on the social, physical and biological sciences as needed to prepare students for leadership and advanced studies in the areas of natural resource management, environmental quality and stewardship, community planning and design, and public policy decision making.

Majors:
- Agricultural and Environmental Education, B.S.
- Atmospheric Science, B.S.
- Ecological Management and Restoration, B.S.
- Environmental Horticulture and Urban Forestry, B.S.
- Environmental Science and Management, B.S.
- Environmental Policy Analysis and Planning, B.S.
- Environmental Toxicology, B.S.
- Hydrology, B.S.
- Landscape Architecture, B.S.
- Marine and Coastal Science, B.S.
- Soil and Water Science, B.S.; see Environmental Science and Management
- Sustainable Environmental Design, B.S.
- Wildlife, Fish, and Conservation Biology, B.S.

Minors:
- Atmospheric Science (Land, Air, and Water Resources)
- Environmental Policy Analysis (Environmental Science and Policy)
- Environmental Toxicology
- Geographic Information Systems (Biological and Agricultural Engineering)
- Geographic Studies (Environmental Design)
- Hydrology (Land, Air, and Water Resources)
- Landscape Restoration (Plant Sciences)
- Soil Science (Land, Air, and Water Resources)
- Wildlife, Fish, and Conservation Biology
Human Sciences

These majors foster a deeper understanding of the multiple connections between scientific and cultural issues in the context of human health and the quality of life. Basic physical and biological science, social science, design, and economic principles are taught in this context, linking food and fiber production to consumption, emerging knowledge to societal applications and policy, and human development to active, informed citizenship. Emphasis is on linking resources for humans with humans as resources. Physiological, social and aesthetic dimensions of the human experience are explored.

Majors:
- Agricultural and Environmental Education, B.S.
- Clinical Nutrition, B.S.
- Community and Regional Development, B.S.
- Fiber and Polymer Science, B.S.
- Food Science, B.S.
- Human Development, B.S.
- Managerial Economics, B.S.
- Nutrition Science, B.S.
- Sustainable Agriculture and Food Systems, B.S.
- Textiles and Clothing, B.S.

Minors:
- Aging and Adult Development (Human and Community Development)
- Community Development (Human and Community Development)
- Community Nutrition (Nutrition)
- Fiber and Polymer Science (Textiles and Clothing)
- Food Service Management (Nutrition)
- Human Development (Human and Community Development)
- Managerial Economics (Agricultural and Resource Economics)
- Nutrition and Food (Nutrition)
- Nutrition Science (Nutrition)
- Textiles and Clothing

College-wide Programs

The college-wide programs cut across all of the above areas, providing students in a variety of majors with a background in such areas as public policy, economic principles in a global context and the intersections among environmental, agricultural and socio-economic issues. College-wide programs also include non-degree, lower division curricula aimed at providing students with a foundational knowledge base and the potential for developing individualized programs.

Majors:
- Individual Major, B.S. (suspended)
- International Agricultural Development, B.S.

Minors:
- Contemporary Leadership
- International Agricultural Development
- Science and Society

Non-degree programs:
- Undeclared/Exploratory
- Science and Society

COLLEGE OF BIOLOGICAL SCIENCES

Biology Academic Success Center
1023 Sciences Laboratory Building
530-752-0410; http://biosci.ucdavis.edu/BASC

The College of Biological Sciences administers undergraduate programs in fundamental aspects of biology. The college is organized into five departments that represent major themes of modern biology: Evolution and Ecology; Microbiology and Molecular Genetics; Molecular and Cellular Biology; Neurobiology, Physiology, and Behavior; and Plant Biology. A total of eight specialized majors are offered, each focusing on one of the core disciplines of biology. The Biological Sciences major, the Individual major, the Undeclared Life Sciences program and the Bodega Marine Laboratory Spring Quarter Program are offered by the entire college.

The academic advising for all majors within the college is administered through the Biology Academic Success Center (BASC). Students enrolled, or interested, in any of the college's majors may meet with an academic adviser at BASC to receive information on all major, college and university requirements, policies, and procedures, including PELP, withdrawal, readmission, change of major or college, multiple majors and late actions. Academic advisers work closely with master advisers, who are faculty members in the departments, to connect students to research opportunities in a variety of fields, and career development experiences in the community. Students are encouraged to meet with their academic advisers at least yearly, starting during their first two quarters of enrollment in the college.

The Undergraduate Programs

Biological Sciences

The Biological Sciences major is broad in concept, designed to span the numerous core disciplines of biology. The major covers most dimensions of the study of life, ranging from molecules and cells to populations of organisms. While emphasizing breadth, the Bachelor of Science degree also requires the student to select an area of emphasis that provides concentrated study in one facet of biology at the upper division level. Areas of emphasis are Evolution, Ecology and Biodiversity; Marine Biology; Microbiology; Molecular and Cellular Biology; Neurobiology, Physiology, and Behavior; and Plant Biology.

Major:
- Biological Sciences, A.B., B.S.

Minor:
- Biological Sciences

Evolution and Ecology

The major in Evolution, Ecology and Biodiversity offers the student a broad background in the theoretical and empirical basis of our understanding of the evolution and ecology of living organisms. The program of study begins with a core of introductory courses in mathematics, physical sciences and biology. These are followed by survey courses in evolution and ecology and more specialized courses that focus the student on particular disciplines or organisms, with an emphasis on problem-solving and critical thinking.

Major:
- Evolution, Ecology and Biodiversity, A.B., B.S.
Minor:
  - Evolution, Ecology and Biodiversity

Microbiology and Molecular Genetics
Microbiology deals with bacteria, yeasts and other fungi, algae, protozoa and viruses. These microorganisms are ubiquitous in nature and play a crucial role in areas such as agriculture, biotechnology, ecology, medicine and veterinary science. The field of microbiology contributes to areas of fundamental inquiry such as biochemistry, cell biology, evolution, genetics, molecular biology, pathogenesis and physiology.

Major:
  - Microbiology, A.B., B.S.

Molecular and Cellular Biology
The Department of Molecular and Cellular Biology offers three majors.

The Biochemistry and Molecular Biology major introduces students to the chemistry of living organisms and the experimental techniques that are used to probe the structures and functions of biologically important molecules. Students who enjoy both chemistry and biology and who are comfortable with quantitative approaches to problem-solving will find this major a rewarding field of study.

The Cell Biology major provides a comprehensive understanding of the cell, the basic structural and functional unit of all living organisms. The major emphasizes the principles that govern how biomolecules interact with one another to organize themselves into higher order structures that comprise cells and how cellular organization and function contribute to the development, maintenance and reproduction of adult organisms.

The Genetics and Genomics major provides a broad background in the biological, mathematical and physical sciences basic to the study of heredity and evolution. The major provides a dual focus on the molecular mechanisms that regulate utilization of information encoded within the genome as well as the mechanisms and analysis of inheritance of genetic information. The major is sufficiently flexible to accommodate students interested in the subject either as a basic discipline in the biological sciences or in terms of its applied aspects in medicine, biotechnology and agriculture.

Majors:
  - Biochemistry and Molecular Biology, B.S.
  - Cell Biology, B.S.
  - Genetics and Genomics, B.S.

Neurobiology, Physiology, and Behavior
The Department of Neurobiology, Physiology, and Behavior previously offered two majors.

The admission of new and continuing undergraduate students to the major in Exercise Biology will be suspended for 2015-2016 and the college is pursuing discontinuation of this major. The Neurobiology, Physiology, and Behavior major is undergoing revision to encompass some parts of the previous Exercise Biology curriculum.

The Neurobiology, Physiology, and Behavior major emphasizes the understanding of vital functions common to all animals. All animals perform certain basic functions—they grow, reproduce, move, respond to stimuli and maintain homeostasis. The physiological mechanisms upon which these functions depend are precisely regulated and highly integrated. Actions of the nervous and endocrine systems determine behavior and the interaction between organisms and their physical and social environments. Students in this major will study functional mechanisms; the control, regulation and integration of these mechanisms; and the behavior which relates to those mechanisms at the level of the cell, the organ system and the organism.

Majors:
  - Exercise Biology, A.B., B.S.—suspended for 2015-2016
  - Neurobiology, Physiology, and Behavior, B.S.

Minors:
  - Exercise Biology
  - Human Physiology
  - Neuroscience

Plant Biology
Plant Biology is the study of plants as organisms. It includes the newer disciplines of cellular and molecular plant biology and the traditional areas of botany, such as anatomy, morphology, systematics, physiology, mycology, phycology, ecology and evolution. The major provides breadth in diverse areas of plant biology and depth in one of several areas of specialization.

Major:
  - Plant Biology, A.B., B.S.

Minor:
  - Plant Biology

College-wide Programs

Quantitative Biology and Bioinformatics
The interdisciplinary minor in Quantitative Biology and Bioinformatics is an integrative program that introduces students to the quantitative and computational approaches that are redefining all disciplines in the biological sciences, from molecular and cell biology, through genetics and physiology, to ecology and evolutionary biology. The minor in Quantitative Biology and Bioinformatics is open to all undergraduates regardless of major and is sponsored by the College of Biological Sciences.

Minor:
  - Quantitative Biology and Bioinformatics

Individual Major
Students whose academic interests are not met by any established major, or combinations of majors and minors may develop an Individual major. Students work in conjunction with the Committee on Undergraduate Petitions and a faculty member in the college.

Major:
  - Individual Major, A.B., B.S.

Students who wish to explore the array of life science majors offered at UC Davis before declaring a major may be admitted to the college through the Undeclared-Life Sciences program. These students use the Biology Academic Success Center for their advising center. Students in this program must declare a major before completing 90 units.
Bodega Marine Laboratory Program

http://bml.ucdavis.edu/

Spring Quarter Program

A full quarter of undergraduate course work in marine biology is available each spring quarter at the Bodega Marine Laboratory, located in Bodega Bay, California. Course offerings include lecture and laboratory instruction in the developmental biology and physiological adaptation of marine organisms, and population biology and ecology; a weekly colloquium; and an individual research experience under the direction of laboratory faculty (Biological Sciences courses 120, 120P, 122, 122P, 123; Neurobiology, Physiology, and Behavior 141, 141P). This is a 15 unit program and course offerings and instructors may vary from year to year. Applications are due January 31. For more course detail, see Bodega Marine Laboratory Program, on page 186 or http://bml.ucdavis.edu/.

Summer Sessions Courses

This integrated program offers students a multidisciplinary understanding of coastal ecosystems through intensive, hands-on courses taught at Bodega Marine Laboratory. The program offers students three sequences of instruction with up to 10 units in each. Two sequences occur during the first Summer Session dates and one sequence in the second Summer Session dates. Applications are due April 15. For more course detail, see full description under appropriate academic department listing or http://bml.ucdavis.edu/.

The programs are residential with students housed on the laboratory grounds. Participants are assessed a room and board fee in addition to standard campus registration fees. Additional information is available directly from the Bodega Marine Laboratory at 707-875-2211, P.O. Box 247, Bodega Bay, CA 94923.

COLLEGE OF ENGINEERING

Undergraduate Advising Office
1050 Kemper Hall
530-752-1979; http://engineering.ucdavis.edu
Facebook: http://www.facebook.com/UCDEngineering

Engineering is the profession in which the physical and biological sciences are applied in a practical way for the benefit of society. As an engineering student, you will learn to observe and describe technological problems and to seek useful solutions to them. Your skills upon graduation will be useful to you not only as an engineer, but also as a professional in management, sales, operations, manufacturing and other fields.

Undergraduate Majors. Eleven undergraduate majors are offered. Each of these is a four-year program leading to the degree of Bachelor of Science.

The following programs are accredited by the Engineering Accreditation Commission of ABET; see http://www.abet.org:

- Aerospace Science and Engineering
- Biochemical Engineering
- Biomedical Engineering
- Biological Systems Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Materials Science and Engineering
- Mechanical Engineering

The Engineering Accreditation Commission and the Computing Accreditation Commission of ABET accredit the following program; see http://www.abet.org:

- Computer Science and Engineering

Minor Programs. The College of Engineering currently offers nine minor programs:

- Biomedical Engineering (Department of Biomedical Engineering)
- Construction Management and Engineering (Department of Civil and Environmental Engineering)
- Computational Biology (Department of Computer Science)
- Electrical Engineering (Department of Electrical and Computer Engineering)
- Energy Efficiency (Department of Biological and Agricultural Engineering)
- Energy Science and Technology (Department of Biological and Agricultural Engineering)
- Energy Policy (Department of Biological and Agricultural Engineering)
- Materials Science (Department of Biological and Agricultural Engineering)
- Sustainability in the Built Environment (Department of Civil and Environmental Engineering)

In addition, the Department of Computer Science offers a minor in Computer Science.

The Undergraduate Programs

Biological and Agricultural Engineering

Biological Systems Engineering majors learn to combine the science and art of engineering with the science of biology to design systems that influence, control, or use biological materials and organisms for improving the quality of life. Specific objectives include designing systems to process biological materials into consumer products; designing machines to interact with biological systems in disciplines ranging from agriculture to medicine; managing, recycling and using wastes; developing systems to protect and preserve our natural resources and environment; developing and improving processing systems for food; designing equipment and systems that improve nutrition and diets; and minimizing waste discharge to the environment.

Major:

- Biological Systems Engineering, B.S.

Minors:

- Energy Science and Technology
- Energy Policy
- Energy Efficiency

Biomedical Engineering

The Department of Biomedical Engineering advances fundamental medical concepts; creates knowledge from the molecular to the organ systems levels; and develops innovative biologies, materials, processes, implants, devices and informatics approaches. These approaches are applied to the prevention, diagnosis and treatment of disease. The objective is to prepare students for employment in companies that manufacture medical assist devices, human tissue products and therapeutics. The program also prepares students to enter a graduate program in biomedical engineering or pursue professional degrees in medicine and related health fields.
Majors:
- Biomedical Engineering, B.S.

Minor:
- Biomedical Engineering

**Chemical Engineering and Materials Science**

The Department of Chemical Engineering and Materials Science offers three majors.

Chemical Engineering majors learn to apply chemical and engineering principles to create useful products ranging from antibiotics to zirconium, from petroleum to plutonium, from agricultural chemicals to plastics. Specific objectives include the design of industrial processes as diverse as integrated circuit materials production, integrated waste management and petroleum refining.

Biochemical Engineering majors combine chemical engineering studies with studies in the life sciences and bioprocess engineering. Bioprocess engineering is the application of engineering principles to develop, optimize and commercialize manufacturing processes. Specific objectives include pharmaceuticals production, environmental repair, industrial chemical production and food production.

Materials Science and Engineering majors learn to understand the relationships among microscopic structure, properties and behavior of materials in order to produce new and improved materials with capabilities far superior to common metals, alloys and ceramics. Specific objectives include the development of materials for high-speed transportation systems, surgical and dental implants, new generations of power plants and solid-state electronic devices in computer and optical communications technology.

**Majors:**
- Biochemical Engineering, B.S.
- Chemical Engineering, B.S.
- Materials Science and Engineering, B.S.

**Minor:**
- Materials Science

**Civil and Environmental Engineering**

Civil Engineering majors learn to apply the principles of the physical and biological sciences and engineering to plan and design systems to improve the quality of life. Specific objectives include providing potable water and freedom from disease-carrying wastes; protecting the natural environment; mitigating the effects of earthquakes and other natural disasters; designing land-, water- and air-transportation systems; and building roads and structures.

**Major:**
- Civil Engineering, B.S.

**Minors:**
- Construction Engineering and Management
- Sustainability in the Built Environment

**Computer Science and Engineering**

The field of computer science and engineering encompasses the organization, design, analysis, theory, programming and application of digital computers and computing systems. The curriculum develops versatile engineers with backgrounds spanning a broad computer/software spectrum. The Computer Science and Engineering major provides a solid background in mathematics, physics, chemistry and electronic circuits and systems—all supporting the computer hardware and software courses that form the focus of the curriculum. A key theme is the hardware/software interaction in computer system design; this theme is reflected in the balance between hardware and software course requirements and in the orientation of the courses themselves.

**Major:**
- Computer Science and Engineering, B.S.

**Minor:**
- Computational Biology

**Electrical and Computer Engineering**

Electrical Engineering majors learn to apply the principles of the physical sciences and engineering to the design, analysis, development, production and evaluation of electronic systems. Specific objectives include the provision of systems for communications, control, signal processing, integrated circuit fabrication, optoelectronics, consumer electronics and digital systems.

Computer Engineering majors study the design, development, analysis, organization, theory, programming and application of digital computers. Specific objectives include developing the student's ability to design both software and hardware. In comparison to the Computer Science and Engineering major, the Computer Engineering major provides greater emphasis on hardware in the key hardware/software interaction in computer system design.

**Majors:**
- Computer Engineering, B.S.
- Electrical Engineering, B.S.

**Minor:**
- Electrical Engineering

**Mechanical and Aerospace Science Engineering**

Aerospace Science and Engineering majors learn to apply the principles of the physical sciences and engineering to vehicles whose motion is determined by aerodynamic forces. Specific objectives include the design, development and manufacture of aircraft and other transportation systems integrating the disciplines associated with aerodynamics, propulsion, structures and guidance/control.

Mechanical Engineering majors learn to apply physical and mechanical principles to the design and manufacture of machines and products, energy conversion systems and equipment for guidance and control. Specific objectives include the provision of products and processes for intelligent manufacturing systems, biomechanical and sports equipment, power generation systems, propulsion for transportation, integration of vehicles and automated highways, and applications of computer and automation technologies.

**Majors:**
- Aerospace Science and Engineering, B.S.
- Mechanical Engineering, B.S.
COLLEGE OF LETTERS AND SCIENCE

Office of Undergraduate Education
and Advising
Room 200, Social Sciences
and Humanities Building
530-752-0392; http://www.ls.ucdavis.edu/advising/

Major programs in the College of Letters and Science provide students systematic exposure to the key principles, methods, findings and representations of a selected area of study. In pursuing a major, students gain intellectual depth and competency in that subject matter, explore important linkages with collateral fields of inquiry and are encouraged to engage in independent study.

The academic programs offered through the college are grouped in three divisions: Humanities, Arts and Cultural Studies; Mathematical and Physical Sciences; and Social Sciences. One college-wide degree program, the individual major, also is available.

The Undergraduate Programs

Division of Humanities, Arts and Cultural Studies

These majors focus centrally on the artifacts, expressions and concerns of humankind in various cultures and times. They provide students the opportunity to explore the creation, performance and analysis of works of art, the language and customs of non-English speaking societies, the theory and criticism of literature, and the peoples and cultures of this nation and its hemisphere. Students interested in studying these types of issues may select from more than 25 different majors.

Majors:
- African American and African Studies, A.B.
- American Studies, A.B.
- Art History, A.B.
- Art Studio, A.B.
- Asian American Studies, A.B.
- Chicana/Chicano Studies, A.B.
- Chinese, A.B.
- Classical Civilization, A.B.
- Comparative Literature, A.B.
- Design, A.B.
- Dramatic Art, A.B.
- English, A.B.
- Film Studies, A.B.
- French, A.B.
- German, A.B.
- Italian, A.B.
- Japanese, A.B.
- Medieval and Early Modern Studies, A.B.
- Music, A.B.
- Native American Studies, A.B.
- Religious Studies, A.B.
- Russian, A.B.
- Spanish, A.B.
- Technocultural Studies, A.B.
- Women's Studies, A.B.

Minors:
- African American and African Studies
- American Studies
- Art History
- Art Studio
- Asian American Studies
- Chicana/Chicano Studies
- Chinese
- Classical Civilization
- Comparative Literature
- Dramatic Art
- English
- Film Studies
- French
- German
- Global and International Studies
- Greek
- Human Rights
- Italian
- Japanese
- Latin
- Luso-Brazilian Studies
- Medieval and Early Modern Studies
- Music
- Native American Studies
- Professional Writing
- Religious Studies
- Russian
- Sexuality Studies
- Social and Ethnic Relations
- Spanish
- Women's Studies

Division of Mathematical and Physical Sciences

These majors focus primarily on the description and interpretation of the structure, processes and events of the physical universe. They provide students the opportunity to explore in depth the structure, properties and reactions of substances; fundamental mathematical techniques and models and their application to the interpretation and explanation of phenomena; studies of matter and energy and their interconversions; the nature and development of computer languages; and earth and environmental processes. Students interested in studying these types of subjects may select from twelve different majors. The division strongly encourages undergraduates to enroll in undergraduate research projects with one-on-one instruction by faculty scholar/researchers.

Majors:
- Applied Mathematics, B.S.
- Applied Physics, B.S.
- Chemical Physics, B.S.
- Chemistry, A.B., B.S.
- Computer Science, B.S.
- Geology, A.B., B.S.
- Mathematical and Scientific Computation, B.S.
- Mathematical Analytics and Operations Research, B.S.
- Mathematics, A.B., B.S.
- Natural Sciences, B.S.
- Pharmaceutical Chemistry, B.S.
- Physics, A.B., B.S.
- Statistics, A.B., B.S.

Minors:
- Chemistry
- Computer Science
- Environmental Geology
- Geology
- Geophysics
- Mathematics
- Oceanography
• Physics
• Statistics

Division of Social Sciences

These majors focus largely on issues and problems that characterize social, cultural, political and economic life across human societies. They provide students the opportunity to explore the relationships between people and the groups and organizations of which they are a part, the antecedents of individual behavior, the development of political and economic systems, the social forces that have shaped the contemporary world and the foundations of language, thought, knowledge and perception. Students interested in studying these types of issues may select from 15 dozen different majors.

Majors:
• Anthropology, A.B., B.S.
• Communication, A.B.
• East Asian Studies, A.B.
• Economics, A.B.
• History, A.B.
• International Relations, A.B.
• Linguistics, A.B.
• Middle East/South Asia Studies, A.B.
• Philosophy, A.B.
• Political Science, A.B.
• Political Science–Public Service, A.B.
• Psychology, A.B., B.S.
• Science and Technology Studies, A.B.
• Sociology, A.B.
• Sociology–Organizational Studies, A.B.

Minors:
• Anthropology
• Arab Studies
• Coaching Principles and Methods
• Communication
• East Asian Studies

College-wide Program

Students whose academic interests cannot be satisfactorily met through the completion of an established major have the opportunity to develop an individual major. Individual majors may reflect the most recent trends in scholarship and research and are typically interdisciplinary in nature. The major proposal is developed in close and active consultation with two faculty advisers from the academic disciplines most closely related to the subject matter of the individual major. Careful faculty guidance and review assure that individual majors are comparable in academic rigor and intellectual coherence to those regularly available through the departments and programs of the college.

Major:
Individual Major, A.B., B.S.

BACHELOR’S DEGREE REQUIREMENTS

You must satisfy four groups of requirements before you can become eligible for candidacy for the bachelor's degree; see Bachelor's Degree Requirements, below. The four groups are:

Bachelor's Degree Requirements

University Requirements
All students must fulfill the following University of California requirements:
Entry Level Writing Requirement
American History and Institutions Requirement
Unit Requirement
Residence Requirement
Scholarship Requirement

General Education Requirement
All students must fulfill the campus General Education Requirement; see General Education Requirement, on page 97.

College Requirements

College of Agricultural & Environmental Sciences
Unit
Residence
Scholarship
English Composition
College of Biological Sciences
Unit
Scholarship
English Composition
Foreign Language (only A.B. & B.A.S. degrees)
Breadth (only A.B. & B.A.S. degrees)
College of Engineering
Unit
Residence
Scholarship
English Composition
Design
Current Catalog Curriculum
College of Letters and Science
Unit
Residence
Scholarship
English Composition
Area (Breadth)
Foreign Language (A.B. & B.A.S. degrees)

Major Requirements
Course requirements for each major are listed in the Programs and Courses section of this catalog.
Students whose native or school language is not English, and some students whose schooling combines work in the United States and in another country, must demonstrate proficiency in English. The level of proficiency must meet the standards of both the UWP and the Entry Level Writing program. The results of the Analytical Writing Placement Examination administered at the beginning of each quarter determine whether a student has met the Entry Level Writing Requirement or must take specific course work in the UWP Students held for UWP ESL course work have three quarters to meet the Entry Level Writing Requirement plus the number of quarters required in UWP ESL.

American History and Institutions

The American History and Institutions requirement ensures that every graduating student will have at least a minimum knowledge of the background of this country's development and an understanding of the political, economic and social interrelationships of its way of life.

You may meet this requirement in any of these ways:

- Complete one high school unit in American history, or 1/2 high school unit in American history and 1/2 high school unit in civics or American government, with a grade of C or better in each course
- Complete any one of the following courses:
  - African American and African Studies 10, 100
  - Asian American Studies 1
  - Chicana/Chicano Studies 10
  - Economics 111A, 111B
  - Native American Studies 1, 10, 116, 130A, 130B, 130C
  - Political Science 1, 5, 100, 102, 104, 105, 106, 108, 109, 113, 130, 131, 160, 163
  
  Students electing to complete one of the above courses in order to meet this requirement are subject to the rules for prerequisites and majors
- Present evidence that the requirement has been accepted as satisfied at another campus of the university
- Present evidence that the requirement has been satisfied through courses in the area of American History and Institutions at another collegiate institution whose credits are acceptable for transfer to UC Davis
- Successful completion of the Advanced Placement (AP) Examination in American History or American Government and Politics with a score of 3 or higher
- Successful completion of the International Baccalaureate (IB) Examination in History of the Americas Higher Level (HL) with a score of 5, 6, or 7
- Successful completion of the SAT Subject Examination in U.S. History with a score of 550 or higher

International students, regardless of the type of visa they hold, must meet the university's American History and Institutions requirement for graduation.
Unit Requirements

A minimum of 180 quarter units is required for graduation. These must be distributed according to the minimum requirements set forth by the faculty of your college.

A maximum of 12 units of Internship Courses (92, 192, or a combination) may be counted toward the 180-unit bachelor's degree requirement.

The acceptability of transfer courses for unit credit is determined by Undergraduate Admissions. The acceptability of such courses toward specific requirements is determined by the individual college or school.

Students should refer to the Advanced Placement Examination chart and their transcripts to eliminate the possibility of duplication of credit.

Residence Requirements

The minimum residence requirement for a bachelor's degree at the University of California is one academic year (three quarters).

Thirty-five of the final 45 quarter units completed by each candidate must be earned while in residence on the UC Davis campus. Each summer session in which a student completes a course of at least 2 quarter units may be counted as half a quarter's residence. Not more than 18 of these 35 quarter units may be completed in summer session courses at UC Davis.

Regularly approved courses (laboratory, field, or other individual work) done outside of a regular session but under the direction of a department of instruction may be accepted upon the recommendation of the department in partial fulfillment of the residence requirement for the bachelor's degree. Registration is with the consent of the instructor only.

UC Davis Extension courses are not accepted as part of the university residence requirement.

There are additional residence requirements for students enrolled in the Colleges of Letters and Science and Engineering. If you are planning to study abroad during your senior year, you should consult your college dean's office or the Biology Academic Success Center.

With the approval of the dean of a student's college or school, a candidate for the bachelor's degree who was in active service in the armed forces of the United States in the year preceding the awarding of the degree may be recommended for the degree after only one quarter of university residence in which the candidate completes at least 16 units or passes a comprehensive examination in the major or field of concentration.

Scholarship Requirement

To receive a bachelor's degree, you must obtain twice as many grade points as units (a 2.00 GPA) for all courses you have attempted in the university. An exception to this rule is made for those students undertaking certain honors courses. For specific college requirements consult the college sections following.

GENERAL EDUCATION REQUIREMENT

The General Education (GE) requirement promotes the intellectual growth of all undergraduates by ensuring that they acquire a breadth of knowledge that will enlarge their perspectives beyond the focus of a major and serve them well as participants in a knowledge-based society. It seeks to stimulate continued growth by providing knowledge of both the content and the methodologies of different academic disciplines. It involves students in the learning process by its expectation of considerable writing and class participation, and encourages students to consider the relationships between disciplines.

New General Education (GE) Requirement; Fall 2011 and On

The following section pertains to students who matriculated to UC Davis for the first time in Fall 2011 or later. Students who matriculated prior to Fall 2011 should refer to the Former General Education (GE) Requirement; Pre-Fall 2011, on page 98.

The GE requirement has two components, Topical Breadth and Core Literacies, and is defined in terms of units, not courses.

Topical Breadth Component . . . . . . . . . . . . . . . . 52 units

A GE course in topical breadth addresses broad subject areas that are important to the student's general knowledge. The units of most undergraduate courses at UC Davis are assigned to one of the three Topical Breadth Areas.

Note: In the case of a course that has been certified in more than one Topical Breadth Area, a student may count the units of the course in only one of the areas in which it has been certified.

- Arts and Humanities . . . . . . . . . . . . . . . . . . . 12-20 units
- Science and Engineering . . . . . . . . . . . . . . . . . . 12-20 units
- Social Sciences . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 12-20 units

Core Literacies Component . . . . . . . . . . . . . . . . . . . . 35 units

The literacies are crucial both for success in one's profession and also for a thoughtful engaged citizenship in the community, nation and world.

Note: In the case of a course that has been certified in more than one Core Literacy Area, a student may count the units of the course in only one of the core literacy areas in which it has been certified. Additionally, GE credit for a core literacy course a student completes before it was an approved GE literacy course is subject to the relevant dean's office or the Biology Academic Success Center approval.

1. Literacy with Words and Images . . . . at least 20 units

The objective of this core literacy is to help students communicate their ideas effectively in written, oral and visual forms. The requirement also seeks to enhance students' critical judgment of oral, written, and visual messages created by others.

Note: A student must have completed the Entry Level Writing Requirement (formerly known as the Subject A requirement) before receiving General Education credit for coursework satisfying requirements a, b, and Writing Experience coursework satisfying requirement c, below.
a. **English Composition** ......................... 8 units
   (as described by College of A&ES, College of L&S, College of Biological Sciences, or College of Engineering)

b. **Writing Experience** coursework in the student’s major or in other departments .................. at least 6 units

Courses in writing experience provide students instruction on how to communicate ideas in the subject matter of the course. The opportunity to improve writing after having received careful commentary is crucial to this requirement.

c. **Oral Skills** coursework or additional writing experience coursework .............................. at least 3 units

Courses in oral literacy involve effective communication of ideas through oral presentation and build on and strengthen the critical thinking skills exercised through writing. As an alternative to developing oral communication skills, the student may take additional coursework certified as writing experience (see requirement b, above).

d. **Visual Literacy** coursework ...................... at least 3 units

Courses in visual literacy provide students with the analytical skills they need to understand how still and moving images, art and architecture, illustrations accompanying written text, graphs and charts, and other visual embodiments of ideas inform and persuade people. Coursework may stress the skills needed to communicate through visual means as well as the analytical skills needed to be a thoughtful consumer of visual messages.

2. **Civic and Cultural Literacy** ................. at least 9 units

The objective of this core literacy is to prepare students for thoughtful, active participation in civic society. Students will learn to think analytically about American institutions and social relations, understand the diversity of American cultures, and see the relationships between national and local cultures and the world.

   a. **American Cultures, Governance, and History** ........................................... at least 6 units; of which at least 3 units must be in coursework certified as focusing on issues of domestic diversity.

Courses in American Cultures, Governance, and History provide students with an understanding and appreciation of the social and cultural diversity of the United States and of the relationships between these diverse cultures and larger patterns of national history and institutions.

   b. **World Cultures** ........................... at least 3 units

Courses in World Cultures provide students with a global perspective in a world where communication technologies, economic relationships, and the flow of people across national borders increasingly challenge national identities and create transnational cultures. Students can satisfy this requirement through coursework or through certified study abroad.

3. **Quantitative Literacy** ......................... at least 3 units

The objective of this core literacy is to provide students with an understanding of quantitative reasoning and skills for evaluating claims and knowledge generated through quantitative methods.

4. **Scientific Literacy** ............................ at least 3 units

The objective of this core literacy is to provide students with an understanding of the fundamental ways scientists approach problems and generate new knowledge, and an understanding of how scientific findings relate to other disciplines and to public policy.

**Additional Conditions**

**Meeting Total Units Requirement.** With the exception of units used to satisfy the English Composition element, units approved for a Core Literacy will be accepted toward satisfaction of the appropriate Topical Breadth component. Course units that satisfy requirements in the candidate’s major or majors may also be counted toward satisfaction of General Education requirements.

**Grading.** Students may take courses P/NP to fulfill their General Education requirements, up to the limits set by college and campus regulations.

**Advanced Placement and International Baccalaureate.** Students may not present Advanced Placement or International Baccalaureate credit in satisfaction of GE requirements, except insofar as it may be applied to the English Composition component of the Literacy with Words and Images requirement.

**Transfer Students** who have successfully completed the Intersegmental General Education Transfer Curriculum (IGETC) lower division course work are exempt from all General Education requirements that may be met with lower-division courses. Transfer students who have not completed the IGETC, and who are not entitled to graduate under the provisions of a General Catalog issued prior to Fall 2011 as permitted by the applicable college policy on degree requirement changes, are required to satisfy all General Education components under the revised requirement but may offer previously completed coursework toward their satisfaction.

**Approved Revised General Education Courses**

See New General Education Courses; Fall 2011 and On, on page 552, for a list of the courses that provide General Education credit. Please note that you cannot claim GE credit for a course you completed before it was an approved GE course.

**Former General Education (GE) Requirement; Pre-Fall 2011**

The following section pertains to students who matriculated to UC Davis prior to Fall 2011. Students who matriculated for the first time in Fall 2011 or later should refer to the New General Education (GE) Requirement; Fall 2011 and On, on page 97.

The GE requirement has three components: Topical Breadth, Social-Cultural Diversity and Writing Experience.

**Topical Breadth Component** .......................... 6 courses

Topical breadth courses are grouped into three broad subject areas of knowledge:

1. **Arts and Humanities.** Courses in this area provide students with knowledge of significant intellectual traditions, cultural achievements and historical processes.
2. **Science and Engineering.** Courses in this area provide students with knowledge of major scientific ideas and applications. They seek to communicate the scope, power, limitations and appeal of science.

3. **Social Sciences.** Courses in this area provide students with knowledge of the individual, social, political and economic activities of people.

To fulfill the topical breadth component of the General Education requirement you must successfully complete three approved courses in each of the two subject areas of topical breadth other than the one that includes your major. To identify the area of topical breadth to which your major belongs, see Topical Breadth Assigned Subject Areas for Majors and Minors; Pre-Fall 2011, on page 591. Each academic major has been assigned to one of the three subject areas of GE topical breadth. If you have any questions concerning the subject area to which your major is assigned, consult the relevant dean's office or the Biology Academic Success Center.

A course approved in more than one topical breadth subject area may only be offered in satisfaction of only one of those subject areas.

- **Double majors** will satisfy the topical breadth subject areas to which they are assigned. You will still be responsible for completing any topical breadth subject area in which you do not have a major. If, for example, two majors are assigned to the same subject area, you will need to complete the topical breadth component in each of the other two subject areas. If, on the other hand, you complete two majors that have been assigned to two different areas of topical breadth then you will be responsible for completing the topical breadth component in only the remaining subject area.

- **Individual majors** are assigned to an area of topical breadth at the time they are approved by your college.

- **Each minor** has also been assigned to one of the three subject areas of topical breadth. A minor assigned to a subject area other than the area of your major will satisfy the GE course requirement for topical breadth in that subject area.

- **Courses in your major** may count toward the topical breadth component when those courses are also assigned to subject areas other than the area of your major.

**Social-Cultural Diversity .......................... 1 course**

Courses in social-cultural diversity teach students the significance of the many patterned differences that characterize human populations—particularly differences of gender, race, ethnicity, sexuality, religion or social class.

To fulfill the social-cultural diversity component of the GE requirement, you must successfully complete one course from the approved list; see Former General Education Courses; Pre-Fall 2011, on page 576.

**Writing Experience .............................. 3 courses**

Courses in writing experience improve student writing through instruction and practice. Writing assignments are designed to encourage students to think critically and communicate effectively. Courses require one extended writing assignment (five pages or more) or multiple short assignments. Writing is evaluated not only for content, but also for organization, style, use of language, and logical coherence.

To fulfill the writing experience component of the GE requirement, you must successfully complete three courses from the approved list at the back of this catalog.

**Note:** You must satisfy the university Entry Level Writing Requirement (formerly Subject A) before you take any writing experience course for GE credit. If you take an approved writing experience course, but have not yet satisfied the Entry Level Writing Requirement, you will not receive GE writing experience credit for that course.

**Additional Conditions**

**Letter Grading.** All courses taken to fulfill the GE requirement must be taken for a letter grade. No GE credit will be awarded for a course that you take on a Passed/Not Passed basis.

**College and University Composition Requirements.** The following GE courses may not be used to satisfy university or college requirements in composition and GE writing experience simultaneously:

- Communication 1
- Comparative Literature 1, 2, 3, 4
- English 3
- Native American Studies 5
- University Writing Program 1, 18, 19, 101, 102 series, and 104 series

**Courses Approved for Multiple GE Components.** Courses approved for more than one component of the GE requirement (topical breadth, writing experience and social-cultural diversity) will be accepted toward satisfaction of all components for which the course has been approved.

**College of Engineering.** Beginning in Fall 2011, the General Education requirement changed. The new General Education requirement applies to freshmen admitted Fall 2011 or later. However, students admitted before Fall 2011 may follow the previous General Education requirement. To ensure accurate information about satisfying General Education, all students should schedule an appointment with their Engineering Departmental Adviser or speak with an adviser in the Undergraduate Advising office in 1050 Kemper Hall.

**Transfer Student Exemption for IGETC, TCC and UC Reciprocity.** You are exempt from the UC Davis GE requirement if you come from a California community college and are certified as having successfully completed the “Intergeneral Education Transfer Curriculum” (IGETC) or “Transfer Core Curriculum” (TCC), or if you come from another UC campus and are certified as having successfully completed the lower division breadth or General Education requirements of that UC campus (UC reciprocity).

If you are a Transfer student who has not completed TCC or IGETC prior to attending UC Davis, transfer work comparable to approved UC Davis GE courses may be used to satisfy the GE requirement, as determined by the college’s dean’s office or the Biology Academic Success Center.

**Approved Former General Education Courses**

See Former General Education Courses; Pre-Fall 2011, on page 576, for a list of the courses that provide General Education credit. Please note that you cannot claim GE credit for a course you completed before it was an approved GE course.
**General Education Theme Options**

The following section pertains to students who matriculated to UC Davis prior to Fall 2011.

General Education theme options are sets of GE courses sharing a common intellectual theme. Faculty from the College of Agricultural and Environmental Sciences has worked collaboratively to develop sets of complementary courses in several areas of interest. These GE theme options are not a separate element of the GE requirement, but a way of selecting your GE courses so that you may benefit from a coherent focus of study while completing the GE requirement.

Completion of a theme satisfies the GE requirement for students with majors assigned to the GE topical breadth area of Arts and Humanities. Students with majors assigned to the topical breadth area of either Science and Engineering or Social Science will need to complete additional GE courses in Arts and Humanities to satisfy the campus GE requirement.

Beginning a theme option does not prevent you from later choosing to take other approved GE courses to fulfill the GE requirement. If you choose to mix courses from a theme option and the broader GE course lists, you will need to make sure that the combination of courses you select will complete the campus GE requirement.

**COLLEGE REQUIREMENTS FOR THE BACHELOR'S DEGREE**

**College of Agricultural and Environmental Sciences**

**Unit Requirements**

Of the required 180 units counted toward a degree, 54 units must be upper division work.

**Unit Credit Limitations**

In addition, the following unit limitations apply to all majors:

- Not more than 6 units can be Physical Education 1 and 6
- Not more than 20 units can be courses numbered 90X, 92, 97T, 97TC, 99, 190C, 190X, 192, 197T, 197TC, or 199
- Not more than 12 units can be courses numbered 92 and/or 192 (credit will not be given for 192s or 199s taken before the completion of 84 units)
- Not more than 5 units per quarter of Special Study courses (99, 194H, 199)
- Not more than 9 units of professional courses (numbers 300–499) may be used toward the 54 upper division units

**Limitation on Credit for Units Graded P.** The Academic Senate limits the total number of courses graded P including units earned in courses graded “P/NP only,” to one third of the units completed on the UC Davis campus. The P/NP option is to be used only for elective courses and should not be used for major requirements.

**Credit for Open Campus (Concurrent) Courses.** Students may apply credit for courses taken in the Open Campus (Concurrent) Program through UC Davis Extension towards the 180-unit undergraduate degree requirement. The grade points earned when enrolled in Open Campus courses will count toward the calculation of a student's UC GPA upon his/her admission or readmission to regular student status at UC Davis. Students registered at UC Davis may not enroll in Open Campus courses.

**Credit for UC Davis Extension Courses.** Registered UC Davis students who plan to use academic credit earned in a UC Davis Extension course other than Open Campus (Concurrent) towards their UC Davis degree must obtain prior written approval from their College before registering in the UC Davis Extension. Upon approval students may apply a limited number of credits towards the 180-unit undergraduate degree requirements. Courses completed in UC Davis Extension will not count toward the calculation of a student’s UC GPA.

**Registration Beyond the 225-Unit Limit.** Students may not exceed 225 units; registration for enrollment when the limit has been reached may only be approved by the Dean. A petition to complete excess units may be picked up in the Dean’s office or in your major department.

**Residence Requirement**

Thirty-five of the final 45 quarter units completed by each candidate must be earned while in residence on the UC Davis campus.

**Scholarship Requirement**

Students in the College are required to attain a minimum grade point average of 2.000 for all courses specified as depth subject matter in their major. Options, specializations and emphases may be included. Consult your master adviser. Only grades earned in courses taken at UC Davis are included in the grade point calculation. Each candidate must complete a program of study either as prescribed in (a) a major approved by the Undergraduate Majors and Courses Standing committee and printed in this catalog, or (b) an individual major approved by the Individual Major Standing committee.

**English Composition Requirement**

Once the Entry-Level Writing requirement has been satisfied, you may begin taking courses to meet the College's English composition requirement.

The English Composition requirement may be met in one of three ways:

1. Either two courses emphasizing written expression or one course emphasizing oral expression, with a grade of C- (or P) or better. The following UC Davis courses satisfy this requirement:
   
   (a) one course must be selected from English 3, University Writing Program 1, 18, 19, 101, 102 series, 104 series or Nematology 150 (courses with primary emphasis in writing skills);
   
   (b) one course selected from the courses not selected above, or from Communication 1, Comparative Literature 1, 2, 3, 4, or Native American Studies 5 (courses emphasizing either writing or speaking skills);

2. Advanced Placement English score of 4 or 5 PLUS any course listed in 1(a) or 1(b) above EXCEPT University Writing Program 1 or English 3

OR

3. By passing the English Composition Examination administered by the College of Letters and Science upon completion of 70 units of degree credit (the examination does not yield credit).
English Composition Examination. The no-fee, no-unit examination is typically offered on a Saturday in October, January and April; for specific dates, see http://writing.ucdavis.edu/compexam/.

If students choose to take this challenge exam, they are strongly advised to do so in their junior year. Register for the English Composition Examination at http://writing.ucdavis.edu/compexam/ from the Monday before the exam date until Friday at noon or until no spaces remain. The AWPE/Upper-Division Composition Examination form, available at the UC Davis Bookstore, is required. It is recommended that students with disabilities contact the Student Disability Center at 530-752-3184 and the University Writing Program at 530-752-0450 at least two weeks prior to the exam date to arrange accommodations. No examinations are given during the summer.

General Education

You should consult your Dean's Office or department adviser in advance to determine exactly how your General Education courses will apply toward your major.

You can choose one of four General Education theme options to help plan your GE courses. The themes, Global Population and Environmental Issues; Biodiversity and Cultural Diversity; Food and Fiber; and Changing Agriculture are described in more detail in General Education Theme Options, on page 592.

Study Plan Approval

A Study Plan provides for attainment of specific long-term goals and should allow for the acquisition of prerequisite knowledge for courses to be taken in subsequent quarters; the fulfillment of College and major requirements; a proper balance between the demands of the courses and your ability to master the subject matter; and meeting the minimum progress requirements; see Course Load, on page 75.

In conjunction with a faculty adviser and/or staff adviser, you must plan and prepare a program that specifies your goals and shows how the graduation requirements will be met. It is a regulation that a written “study plan” be filed with your faculty adviser or staff adviser by the end of the second quarter of the junior year (having completed not more than 120 units either in residence and/or by transfer).

You may be denied registration for future quarters if you do not comply with this regulation. However, filing this study plan does not preclude a change of major or program modifications.

Major Degree Certification

A Major Certification is completed during the quarter you plan to graduate. At that time, you and your faculty adviser and/or staff adviser check to see that all major requirements have been completed. The Dean's Office completes the degree certification by verifying that all college and university requirements have been satisfied.

Degree Requirement Changes

On occasion, the faculty make changes in the requirements that students must satisfy to obtain the baccalaureate degree. So that you will not be penalized by changes that may work to your disadvantage and so that you will benefit by changes that assist you in completing your degree requirements, it is college policy that you may choose to fulfill the university, college and major requirements in effect at the time you were registered at UC Davis. If you have transferred to UC Davis from a community college, state college, or another university, you may follow the requirements as stated in any UC Davis General Catalog in effect either during the three years immediately preceding your transfer to UC Davis or at the time you first registered at that institution, whichever is most recent. Once you have chosen the year of the General Catalog under which you wish to be governed, you must satisfy all of the university, college and major requirements specified in that catalog.

College of Biological Sciences

All students in the College of Biological Sciences must satisfy the following college requirements in addition to satisfying the University Requirements, on page 96 and General Education Requirement, on page 97.

Unit Requirements

Total Units. Complete no less than 180 units allowing for the unit credit limitations listed below. No student may exceed 225 units in their academic career without approval of the Dean. Units earned in Advanced Placement and International Baccalaureate exams are not counted toward this 225-unit limit. Upon reaching 200 units, a student must submit a quarter-by-quarter graduation plan to the Biology Academic Success Center or a hold will be placed on his/her registration.

Upper Division Units. Complete 64 upper division units.

Unit Credit Limitations

Passed/Not Passed Units. All courses used to satisfy major requirements must be taken on a letter-graded basis, unless courses are only offered on a Passed/Not Passed basis.

The Academic Senate limits the total number of courses graded P, including units earned in courses graded “P/NP only,” to one third of the units completed on the UC Davis campus.

Physical Education. Maximum of 6 units of Physical Education 1, 6 and similar physical activity courses including transfer work.

Transfer work. Maximum of 105 units of credit earned at two-year institutions (community college).

Graduate Courses. Units from courses in the 200 series (with the exception of course 299) may apply toward the minimum 64-unit upper division requirement and/or as a substitution for undergraduate courses in the major under the following conditions:

Students must obtain written permission from the course instructor and the master adviser for their major.

The master adviser will confirm that students have a minimum 3.400 GPA in the major at the time that they register for the course.

Professional and teaching courses. Maximum of 9 units in courses numbered 300-399 and 400-499. These units may not be applied toward the 64-unit upper division requirement.

Upper division standing. Must complete 84 units before enrolling in 192, 194H and 199 to receive degree and upper division credit.

Special Study. Not more than 5 units per quarter of Special Study courses (99, 194H, 199).
• Nonstandard Courses. Maximum of 20 units of nonstandard courses including transfer work.*
Nonstandard courses are defined here as tutoring, internship, research, research conference, honors research and similar course activities. Some examples of these courses are, but are not limited to, courses numbered 90C, 92, 92C, 97T, 97TC, 99, 189, 190C, 191, 192, 192C, 193, 194H, 197T, 197TC, 199, etc. Courses numbered 98 or 198 are not included in this 20-unit limitation.

There are additional unit credit limitations on tutoring and internship units.
• Tutoring. Maximum of 3 tutoring units including but not limited to 97T, 97T, 97TC and 197TC.
• Internship. A maximum of 6 internship units including but not limited to 92, 192, 92C, 192C.

*Specific exceptions to these limits may be granted by the Committee on Undergraduate Petitions based on the uniqueness of the experiences and their concordance with the petitioner's educational objectives.

Credit for Open Campus (Concurrent) Courses. Students may apply credit for courses taken in the Open Campus (Concurrent) Program through UC Davis Extension towards the 180-unit undergraduate degree requirement. The grade points earned when enrolled in Open Campus courses will count toward the calculation of a student's UC GPA upon his/her admission or readmission to regular student status at UC Davis. However, the units earned do not satisfy the university residence requirement. Students registered at UC Davis may not enroll in Open Campus courses.

Residence Requirement
Meet university residence requirement. No additional college residence requirements.

Scholarship Requirement
Students must attain at least a 2.000 GPA for all courses required in their major. Students must also attain a 2.000 GPA in all Depth Subject Matter courses required in their major. Students who fail to maintain a 2.000 GPA in courses required for their major over two consecutive quarters may be required to withdraw from the major.
• Repeating Courses. Students may once repeat courses in which they received a grade of D+ or less. To repeat a course more than once, students must petition the Dean for approval prior to enrolling in the course.
• Passed/Not Passed Grading Option. All courses used to satisfy major requirements must be taken on a letter-graded basis, unless courses are only offered on a Passed/Not Passed basis.

English Composition Requirement
The English Composition requirement may be satisfied in one of two ways:
1. Completing 8 units, to include 4 upper division units, in English composition courses with at least a C- or Passed grade from the following list: Comparative Literature 1, 2, 3, 4, English 3, Native American Studies 5, University Writing Program 1, 18, 19, 101, 102 series, or 104 series.

OR
2. Passing the English Composition Examination, administered by the Entry Level Writing program, upon completion of 70 units of degree credit. This examination does not yield credit. Students interested in entering the health science field should check with the Health Sciences Advising Office or the Biology Academic Success Center before choosing this option.

English Composition Examination. The no-fee, no-unit examination is typically offered on a Saturday in October, January, and April; for specific dates see http://writing.ucdavis.edu/compexam/.

If students choose to take this challenge exam, they are strongly advised to do so in their junior year. Register for the English Composition Examination at http://writing.ucdavis.edu/compexam/ from the Monday before the exam date until Friday at noon or until no spaces remain. The AWPE/Upper-Division Composition Examination form, available at the UC Davis Bookstore, is required. It is recommended that students with disabilities contact the Student Disability Center 530-752-3184 and the University Writing Program 530-752-6283 at least two weeks prior to the exam date to arrange accommodations. No examinations are given during the summer.

Additional Bachelor of Arts Requirements
Bachelor of Arts degrees are available in Biological Sciences; Evolution, Ecology and Biodiversity; Exercise Biology; Microbiology; and Plant Biology. These degrees offer students an opportunity to broaden their education while pursuing a rigorous life science major.

Candidates for the Bachelor of Arts degrees must complete two additional requirements.

1. Foreign Language. The requirement can be met in one of three ways:
• Complete with passing grades 15 quarter units of college level course work, or the equivalent thereof, in a single language.
• Attain a minimal score prescribed by the Committee on Undergraduate Curriculum and Educational Policy, in the College Entrance Examination Board Achievement Test in Foreign Language, which may be taken at any time during the student's high school career, or any other achievement test approved by the Committee on Undergraduate Curriculum and Educational Policy.
• Placement beyond the 15-unit level on a placement/proficiency examination offered by one of the foreign language departments of the University.

2. Breadth Requirements. Satisfaction of the campus General Education requirement (or IGETC for transfer students) in effect Fall 2011 will satisfy the Breadth requirement. Students that matriculated prior to Fall 2011 have the option of completing the Breadth Requirement specified in the College of Biological Sciences regulations prior to this revision. Completion of a minor in the humanities, social sciences or fine arts can offer structure and coherence to the courses selected for satisfaction of the requirement.

Declaration of Major/Undeclared—Life Sciences
Students must declare a major by 90 units. A hold will be placed on a student's registration if he/she is still undeclared after completing 90 units.
All changes of major and college must be completed before the beginning of the student's quarter of graduation.

Students who are enrolled in a major administered by the College of Biological Sciences and students who are Undeclared-Life Sciences see a staff adviser in the Biology Academic Success Center for their major, university, general education, and college academic advising. Master faculty advisers are also available in the department that houses their major, as listed in the catalog, or at the Biology Academic Success Center.

**Degree Check**

Students are encouraged to meet with their academic adviser at least once a year to ensure timely graduation. Students are required to consult a Biology Academic Success Center academic adviser at three points in their academic careers:

- In their first two quarters on the Davis campus.
- Before accumulating 90 units.
- Before accumulating 135 units.
- In addition, if you are taking courses which, if passed, will cause your unit total to exceed 200 units and you intend to register for the next quarter, you must file a plan with your adviser that leads to graduation within 225 units. If the plan anticipates registering after you have accumulated 225 units, the plan must be submitted to the Dean for approval.

If you do not meet any of these advising requirements, a hold may be placed on your registration.

**Degree Requirement Changes or Catalog Rights**

On occasion, the faculty makes changes in the requirements that students must satisfy to obtain the baccalaureate degree. So that you will not be penalized by changes that may work to your disadvantage and so that you will benefit by changes that assist you in completing your degree requirements, it is college policy that you may choose to fulfill the university and college requirements (see [General Education Requirement, on page 97](#) for an exception) as stated in any UC Davis General Catalog in effect at the time you were registered at UC Davis. If you have transferred to UC Davis from a community college, state college, or another university, you may follow the requirements as stated in any UC Davis General Catalog in effect either during the three years immediately preceding your transfer to UC Davis or at the time you first registered at that institution, whichever is most recent. Once you have chosen the year of the General Catalog under which you wish to be governed, you must satisfy all of the university and college requirements specified in that catalog.

With respect to the completion of your major requirements, most of the majors in the College of Biological Sciences require completion of the major degree requirements in effect at the time you officially declared your major. However, because departments differ in how they handle these matters, check with the department or major program office if you have any questions about which requirements apply to you.

**College of Engineering**

**Prerequisite Requirements**

Engineering is a discipline that requires mastery of prerequisite coursework before you can move forward in the curriculum. You should plan to repeat any engineering requirement in which you earned a grade of less than C-. You are encouraged to adhere carefully to all prerequisite requirements. The instructor is authorized to drop you from a course for which you have not completed the stated prerequisites.

**Current Curriculum Requirement**

Because engineering is a rapidly developing profession, the things an engineer needs to know change on an almost daily basis. To respond to this, the faculty members make changes to the curriculum on a regular basis. In order to ensure that students graduate with the most current engineering knowledge, College of Engineering students must complete the major requirements in effect in the academic year of graduation or in the immediately preceding academic year. The College of Engineering Bulletin is published every year with current degree requirements. Information about undergraduate studies in the College of Engineering can be found at [http://engineering.ucdavis.edu/undergraduate/](http://engineering.ucdavis.edu/undergraduate/).

When degree requirements change, a transition plan is developed to ensure that students who are getting regular advising and following recommended course sequences will be able to graduate within four years. Contact your departmental adviser or the Undergraduate Advising Office for more specific information or questions. The list of advisers can be found at [http://engineering.ucdavis.edu/undergraduate/advisors/](http://engineering.ucdavis.edu/undergraduate/advisors/).

**Unit Requirements**

Each candidate for the degree of Bachelor of Science in Engineering must satisfactorily complete an approved curriculum in engineering. No unit of coursework you complete may be used to satisfy two different degree requirements, except under any of the following conditions:

- You may use course units to satisfy both General Education 3 requirements and course requirements for the major.
- You may use course units for two different degree requirements in cases where the catalog specifically states that course units may be used to satisfy two different degree requirements.
- You may use course units for permitted double majors within the College of Engineering.

Detailed requirements for the approved curricula are given in the Programs and Courses chapter of this catalog; to see the courses required in your major, consult this section. The minimum number of required units varies with the curriculum. You are responsible for planning your program and satisfactorily completing all degree requirements.

You may, for good cause, request a modification of particular degree requirements by submitting a student petition. These petitions, available from your departmental adviser or from the Undergraduate Advising Office, can be valuable aids in resolving individual program conflicts or other special problems. Such petitions are subject to approval by the Undergraduate Educational Policy Committee, composed of one faculty representative from each department and non-voting staff advisers and student repre-
sentatives. The Associate Dean for Undergraduate Studies serves as ex-officio member of this committee. A negative decision by the committee may be appealed to the College Executive Committee.

**Transfer students.** To be eligible for transfer into the College of Engineering, you must have at least ninety transferable quarter units (sixty semester units) from another institution. You must complete all lower division engineering major requirements with a minimum GPA of 3.100 in these required courses.

We give highest priority for transfer admission to California community college transfer applicants who have completed two transferable English composition courses and all of the required lower division engineering major requirements offered at the community college they attended.

We give lower priority for admission to community college applicants who are missing one or two of the required lower division engineering major requirements. Community college applicants will be denied admission if they are missing three or more of the required lower-division courses.

Priority is next given to junior-level transfers from other UC campuses and other four-year institutions in and out of state. These students must also have completed all of the required lower-division engineering major requirements.

Successful applicants are admitted to a specific major. You may be limited in your ability to change majors within the college after you are admitted.

**Transfer students.** To be eligible for transfer into the College of Engineering you must have at least ninety transferable quarter units (sixty semester units) from another institution. To be a competitive applicant, you must have a minimum overall GPA of 3.100.

Highest priority for transfer admission is given to California community college transfer applicants who have completed two transferable English composition courses and all of the required lower division engineering coursework offered at the community college they attended.

We give lower priority for admission to community college applicants who are missing one or two of the required lower division courses. Community college applicants will be denied admission if they are missing three or more of the required lower-division courses.

Priority is next given to junior-level transfers from other UC campuses and other four-year institutions in and out of state. These students must also have completed all of the required lower-division coursework.

Successful applicants are admitted to a specific major. You may be limited in your ability to change majors within the college after you are admitted.

**Transfer advising and information.** For more specific advice on lower-division requirements for community college students, meet with the transfer counselor at your institution or see the Assist website at [http://www.assist.org](http://www.assist.org). Transfer credit agreements are available on the College of Engineering website at [http://engineering.ucdavis.edu/transfer-credit-agreements/](http://engineering.ucdavis.edu/transfer-credit-agreements/). You may also contact the College of Engineering Undergraduate Advising Office 530-752-1979.

California Community college students should consider a Transfer Admission Guarantee (TAG), which is a formal written agreement specifying the courses you need to complete and the grade point average you need to earn to be admitted. A signed agreement guarantees that you will be admitted to UC Davis in the major you want and for the term you have chosen—provided that you complete the agreement and apply for admission during the open filing period. If you would like more information on the TAG program, see your community college counselor or see [http://engineering.ucdavis.edu/undergraduate/transfers/transfer-admission-guarantee-tag-program/](http://engineering.ucdavis.edu/undergraduate/transfers/transfer-admission-guarantee-tag-program/).

We also participate in the Transfer Opportunity Program, which encourages community college students to transfer to UC Davis and provides them with services to ease the transition. You can use the Transfer Opportunity Program to get information about admission and transfer requirements, academic programs, financial aid, housing, tutoring, campus life and other services.

Upon your admission as a transfer student, you are classified as having upper division status, but you are obligated to complete all lower division course requirements for the major before your lower division requirements are considered complete. You may, however, start your upper division coursework while completing your lower division requirements, provided that you meet all prerequisites for the upper division courses.

**Credit for Open Campus (Concurrent) Courses.** Students may apply a maximum of 16 units of credit for courses taken in the Open Campus (Concurrent) Program through UC Davis Extension towards the 180-unit undergraduate degree requirement. The grade points earned when enrolled in Open Campus courses will count toward the calculation of a your UC GPA upon your admission or readmission to regular student status at UC Davis. Students registered at UC Davis may not enroll in Open Campus courses. Open Campus is not available to students who have been enrolled at UC Davis within the last 12 months and have not graduated, unless an exception letter is provided to Extension by the Associate Dean for Undergraduate Studies of the College of Engineering.

**Residence Requirement**

College of Engineering students must meet the university residence requirement. There are no additional college residence requirements.

**Scholarship Requirement**

In addition to meeting the university scholarship requirement, College of Engineering students are required to maintain a 2.000 grade point average for all undergraduate coursework within Engineering.

**English Composition Requirement; Upper Division**

Prospective engineering employers cite the ability to write well and communicate effectively as a desirable trait. Because engineers must be able to explain complex ideas, it is critical that you pay close attention to the development of writing and communication skills. All students admitted to the University must complete the Entry Level Writing Requirement (see page 96) before credit for any composition course or general education writing experience course will be granted.

Once the Entry Level Writing Requirement has been satisfied, there are two distinct composition requirements for engineering students:
• Lower-division composition. This requirement can be satisfied by completion of an Advanced Placement English exam with a score of 4 or 5; International Baccalaureate credit for English 3; or completion of one of the following courses with a grade of C- or better: University Writing Program 1, English 3, Comparative Literature 1-4, or Native American Studies 5.

• Upper division composition. Requirements for upper division composition vary by major. Please see your departmental adviser to determine the coursework that has been approved for your major.

Please note that when you use coursework to satisfy either of the composition requirements, you must earn a grade of C- or better.

Engineering Design Requirement

Engineering design is the process of devising a system, component, or process to meet certain needs. Design involves a decision-making process (often iterative), in which the basic sciences, mathematics and engineering sciences are applied to convert resources optimally to meet a stated objective. Among the fundamental elements of the design process are the establishment of objectives and criteria, synthesis, analysis, construction, testing and evaluation. You must take an appropriate amount of design course work through a combination of required and restricted elective courses. Specific comments about design are included in individual curriculum descriptions. You should also review the design content of your individual program with your adviser in the course of completing the upper division advising worksheet.

Electives

In general, there are three kinds of elective courses in the engineering curricula; General Education, Technical and Unrestricted.

General Education Electives. Because, as an engineer, you will be a significant participant in the human setting, you will need to have a breadth of education that will allow you to deal with contemporary social issues and to understand the impact of engineering solutions in the global and societal context. To these ends, you must complete you must complete the UC Davis General Education requirement details; see page 97.

Since all engineering programs are in the Science and Engineering GE topical breadth area, you will fulfill the campus GE requirements by taking courses in the Arts and Humanities and Social Sciences areas.

In satisfying the GE requirement note that (a) you must take GE courses for a letter grade, and (b) you must satisfy the Entry-Level Writing requirement before you can receive writing experience credit for any course.

In consultation with your academic adviser, you should attempt to design a coherent approach to contemporary issues by using your GE elective.

Students in the College of Engineering will complete any version of the general education requirement in effect between the time of matriculation and the time of graduation. Readmitted students will complete any version of the general education requirement in effect between the time of readmission and graduation.

Unrestricted electives. If your curriculum allows for unrestricted electives, you may count any course for which university credit is allowed as an unrestricted elective in the engineering curricula.

Degree Check

Use a Degree Requirement Check sheet for your major to monitor your progress toward completing degree requirements. These check sheets are available from the Undergraduate Advising Office in 1050 Kemper Hall and from your major adviser. The University holds students responsible for knowing and completing all degree requirements. Degree checks are performed as a courtesy to help you make regular progress toward fulfilling all major, college, and university requirements. You should request a preliminary degree check three quarters prior to graduation and a follow-up degree check prior to the beginning of a your final quarter. Requests can be submitted to the Undergraduate Advising Office in 1050 Kemper Hall.

College of Letters and Science

Unit Requirements

A minimum of 180 units is required for the bachelor’s degree. Of these units, 64 must be earned in upper division courses.

Registration Beyond the 225-unit Limit. You are expected to fulfill all degree requirements within the 180- to 225-unit range. Once 225 units have been completed (excluding units awarded for College Board Advanced Placement Examinations or International Baccalaureate Examinations), you may register only with the permission of the dean. Such permission is rarely granted and then typically only to allow completion of minimum degree requirements. You will be expected to adhere to a program of courses agreed upon and to meet other conditions that may have been set. Approval must be obtained before you will be permitted to register for courses for the quarter following completion of 225 or more units.

If you are in good standing, you will be able to complete 12 quarters or the equivalent (e.g., four years) of college work even if you have earned more than 225 units before you finish your fourth year. You must petition for continuation, however, and file the quarter-by-quarter course program you have planned.

Unit Credit Limitations

For certain courses, limits have been established on the number of units that can be counted towards the 180-unit minimum required for the degree. To avoid discovering just before graduation that you are short units, keep track of the number of units you have taken in each of the following categories.

Limitation on Credit for Graduate and Professional Courses. Undergraduates may enroll in graduate and professional courses in the 200, 300, and 400 series subject to the restrictions described in Academic Information, on page 73, in this catalog. Graduate and professional courses that have been completed will be listed on the student’s transcript in the usual manner. However, the units earned may be counted toward degree requirements only under the conditions listed below.

Within the limitations A, B and C given below, undergraduate students in the College may count an unlimited number of units in graduate 200 series courses and up to a combined total of 9 units in 300 and 400 series professional courses toward degree requirements. These units, however, are not counted as upper division units unless this is granted by petition to the dean.
A. The recommendations of the instructor in the course and the department chairperson—in addition to approval from the dean—must be obtained by petition in order to receive credit toward the degree for the following kinds of courses:

- All graduate courses 200–298, whether offered by a department or program outside of or within the College of Letters and Science
- All professional courses 300–398 for teachers offered outside of the College of Letters and Science
- All postgraduate professional courses 400–498 offered outside of the College of Letters and Science
- All variable unit courses 300–398 and 400–498 offered within the College of Letters and Science

B. The minimum eligibility conditions for an undergraduate student in the College to petition for degree credit for a 200, 300, or 400 series course are a UC grade point average of 3.300 and completion of 18 upper division units basic to the subject matter of the course. These eligibility conditions may be waived, however, upon the recommendation of the course instructor and concurrence of the department chairperson if the student's preparation warrants exception.

C. Undergraduates in the College cannot receive degree credit for special study courses 299, 399, or 499.

Limitation on Credit for Units Graded P. Excluding courses that are graded on a Passed/Not Passed (P/NP) basis only, the number of units graded P that may be accepted towards a degree in the College of Letters and Science is limited to not more than one fourth of the units completed in residence on the UC Davis campus.

The Academic Senate limits the total number of courses graded P, including units earned in courses graded "P/NP only," to one third of the units completed on the UC Davis campus. This limitation applies to all UC Davis undergraduates, including Letters and Science students.

Limitation on Credit for UC Davis Extension Courses.

A. UC Davis Extension courses with a designator of "X." Students may apply credit earned through lower division and upper division UC Davis Extension "X" courses towards the 180-unit requirement only with written approval from the dean prior to registration. The degree credit allowed by the dean for such courses is usually less than the unit value listed in the course description. Additional limitations on UC Davis Extension "X" courses include: a maximum of 9 units may be offered for elective credit only and may not be applied toward fulfillment of the Area, Foreign Language, Upper Division, or Residence requirements of the College.

B. UC Davis Extension courses with a designator of "XD." Students may apply credit earned through lower division and upper division UC Davis Extension "XD" courses towards the 180-unit requirement. Additionally, credit from such courses may be applied toward fulfillment of all university, campus, college and major unit and subject matter requirements—including the Area, Foreign Language, Upper Division and Residence requirements of the College—in the same manner that the corresponding regular UC Davis course is so accepted.

C. UC Davis Extension courses with a designator of "XDC" (Open Campus (Concurrent) Program). Subject to the following conditions, students may apply credit earned through lower division and upper division UC Davis Extension Open Campus (Concurrent) courses i.e., those bearing the "XDC" designator—towards university unit and subject requirements, and, effective Fall 2003, the calculation of the student's UC GPA, upon admission or readmission to regular student status at UC Davis.

- Students on leave of absence and regular status students when matriculated, or regular status students for a period of one calendar year following the last term of regular enrollment at UC Davis, may not enroll in Open Campus (Concurrent) courses. Exceptions to this policy for undergraduate students may be made only under extraordinary circumstances by petition with prior approval by the dean and the Dean of UC Davis Extension.
- Concurrent ("XDC") courses do not count toward satisfaction of the University residence requirement or the residence requirements of the campus or the college.
- Concurrent ("XDC") courses may constitute at most half of the units offered in satisfaction of the upper division requirements of the major.
- In the event that the faculty of the College imposes further restrictions on the number of units of UC Davis Extension Open Campus (Concurrent) course work that may be applied to undergraduate degree programs, the allowable number of units of course work will be determined chronologically, starting with the course completed first. Grade point credit for such courses will be determined in the same manner.

Other Unit Credit Limitations. The following are additional courses that have limits on the number of units that can be counted toward your degree.

- Internship courses (numbers 92, 192): 12 units maximum including internship units taken at other institutions; see Nonstandard courses
- Music 130, 131, 140-150 (combined): 19 units maximum
- Nonstandard courses (92, 97T, 97TC, 99, 192, 194H, 197T, 197TC, 199 and similar courses): 30 units maximum or one-sixth of the units taken at UC Davis, whichever is the smaller; note the separate unit limits on internship, special study and tutoring courses; and major limitations
- Physical Education 1 and 6 (combined): 6 units maximum
- Special Study courses (99, 194H, 199): 5 units maximum in any one quarter; see Nonstandard courses
- Tutoring courses (97T, 97TC, 197T, 197TC): 10 units maximum; see Nonstandard courses, above

Residence Requirement

While registered in the College of Letters and Science, a minimum of 27 upper division units, including 18 upper division units in the major, must be completed on the UC Davis campus; work completed while registered in the UC Education Abroad Program or the UC Davis Extension Open Campus Program does not satisfy campus or College Residence requirements.

Scholarship Requirement

The minimum grade point average to satisfy the scholarship requirement is 2.000 for all courses counted toward the major and for all upper division courses used to satisfy major requirements. Only grades earned in courses taken at UC Davis will be included in the grade point computations. To obtain these minimum aver-
ages in the major, you may repeat courses that are graded D or F. If you have to repeat a course more than once, you need the dean’s prior approval.

**English Composition Requirement**

The English Composition requirement can be met in one of two ways:

1. By passing the English Composition Examination upon completion of 70 units of degree credit (the examination does not yield credit);

   OR

2. By completing with a grade of C– (or P) or better
   - One course from English 3, Comparative Literature 1, 2, 3, 4, Native American Studies 5, or University Writing Program 1, 1V, 1Y, 18, 19;
   - and
   - One course from University Writing Program 101, 102 series, or 104 series, which must be taken after 84 units have been completed.

**Transfer Courses in English Composition.** Transfer courses considered by the Dean to be equivalent or comparable to English 3, Comparative Literature 1, 2, 3, 4, Native American Studies 5, or University Writing Program 1, 1V, 1Y, 18, 19, 101, or 104 series, will be accepted toward satisfaction of the English Composition requirement. Note that University Writing Program 101 and 104 series courses or the equivalent must be taken after you have completed 84 units of transferable degree credit.

If your transfer work does not include an acceptable English composition course taken after you had completed or accumulated 84 units, you may fulfill the requirement by examination (see below) or take one course from University Writing Program 101, 102 series, or 104 series at UC Davis.

**English Composition Examination.** The no-fee examination is typically offered on a Saturday morning in October, January and April. No examinations are given during the summer.

For specific examination dates, instructions, and to sign up to take an examination, see the University Writing Program-Upper Division Composition Exam Information webpage at [http://writing.ucdavis.edu/programs-and-services/upper-division-composition-exam-information/upper-division-composition-exam-information](http://writing.ucdavis.edu/programs-and-services/upper-division-composition-exam-information/upper-division-composition-exam-information). It is recommended that students with disabilities contact the Student Disability Center at 530-752-3184 and the Entry Level Writing Program Office 530-752-0450 at least two weeks prior to the exam date to arrange accommodations.

**Area (Breadth) Requirement**

The College Breadth Requirement promotes the intellectual growth of students by asking them to acquire a broader background of knowledge than is provided by the usual major. The Breadth requirement also guides students in exploring the interdependence of knowledge.

**A.B. Degree.** Satisfaction of the campus General Education requirement.

**B.S. Degree.** A total of 90 units in natural sciences/ mathematics; units used in satisfaction of the campus General Education requirement in Science and Engineering topical breath may also be used to satisfy this requirement.

Courses numbered 92, 97T, 97TC, 98, 192, 197T, 197TC, 198 and from 200 through 499 cannot be counted toward satisfaction of the natural sciences/mathematics Area requirement. A maximum of 10 units in special study courses (99, 194H, 199) may be counted toward that portion of the Area requirement. Subject to the restrictions just listed, courses acceptable for fulfilling the 90-unit natural sciences/mathematics Area requirement are:

**Natural Sciences and Mathematics**

- Anatomy, Physiology and Cell Biology 100
- Anthropology 1, 5, 15, 151, 152, 153, 154A, 154BN, 156A, 156B, 137, 198
- Astronomy
- Avian Sciences 13
- Biological Sciences
- Cell Biology and Human Anatomy 101, 101L
- Chemistry
- Engineering 6, 10, 35, 102
- Engineering: Biomedical 126
- Engineering: Electrical and Computer 70, 170, 173A
- Entomology 10, 100, 153
- Environmental and Resource Sciences 30, 131
- Environmental Science and Policy 30, 100, 121
- Environmental Toxicology 101
- Evolution and Ecology
- Fiber and Polymer Science 110
- Food Science and Technology 100A, 100B, 101A, 101B
- Geology
- Integrated Studies 8A
- Mathematics
- Microbiology
- Molecular and Cellular Biology
- Neurobiology, Physiology, and Behavior
- Nutrition 10, 111AV, 111B
- Pathology, Microbiology, and Immunology 126
- Physical Education 133, 135
- Physics
- Plant Biology
- Psychology 41, 100, 101, 103A, 103B, 104, 113, 121, 122, 123, 124, 126, 127, 129, 130, 131, 135, 146, 180B
- Statistics
- Wildlife, Fish, and Conservation Biology 10

**Foreign Language Requirement; A.B. and B.A.S. Degrees**

A key component of liberal education, the study of another language exposes students to a ubiquitous and highly diverse component of human behavior and interaction. Language learning enables students to communicate effectively in an increasingly internationalized world, enhances their ability to understand ways of thinking different from their own, gives them direct access to cultural production from another time and place, awakens in them an awareness of the conditioned nature of their assumptions about the world, and trains them to cope more effectively with intellectual and practical problems they may face in their future careers.
The College of Letters and Science encourages its students to acquire functional proficiency in at least one language other than English before graduating. At a minimum, the College requires A.B. candidates to complete three sequenced quarters (15 units) of courses, or its equivalent, in one foreign language. B.S. candidate requirements are determined by their respective major program.

Languages Satisfying the Requirement

The Foreign Language Requirement may be satisfied in any language offered at UC Davis, including ancient languages, or which is normally taught at—and for which transfer credit is allowed—from another institution, including American Sign Language. Students may also satisfy this requirement by examination in a language not offered on the UC Davis campus (see below).

Satisfaction of the Requirement

At UC Davis or Another Accredited Institution. You may satisfy the requirement by taking 15 quarter units of one foreign or classical language offered at UC Davis. You may also fulfill this requirement by taking the equivalent number of transferable quarter units in one foreign language at an accredited institution.

Transfer students should consult the Transfer Credit Evaluation, which is issued by the Deans' Office within a quarter after their first enrollment at UC Davis. Students planning to continue to study the same language at UC Davis must consult the relevant language coordinator.

If you have successfully completed the second or third year of a language in the tenth or higher grade in high school, you may receive unit credit for course 1 of that language when taken at UC Davis, but the grading mode will be P/NP only. Although a Passed or Not Passed grade will be charged to your P/NP option, no petition is required; see Pass/Not Passed (P/NP) Grading in the Academic Information chapter.

Through Study Abroad. Certain study abroad programs offered by UC Davis through the Education Abroad Center, UC Education Abroad Program and other accredited institutions may be used to satisfy the requirement. Some of these programs do not have a language prerequisite, but others do. If you intend to apply for a study abroad program with a language prerequisite, you should plan on completing the relevant foreign language requirement by the end of your second or third year, depending on the program.

With the Interssegmental General Education Transfer Curriculum (IGETC). IGETC is a series of courses which prospective transfer students attending California community colleges may complete to satisfy the lower division breadth/general education requirements at the University of California. Students may satisfy the Foreign Language requirement by attaining certification of IGETC completion.

By Examination: Proficiency Exam. The Language Learning Center (LLC) offers proficiency tests in numerous languages. A proficiency test does not yield unit credit—it only determines whether the Foreign Language requirement has been met or at which point in the language sequence you should enroll. Students must follow the language program's placement policy if they decide to study the language at UC Davis.

By Examination: Standardized Tests. College Board Subject Test: Earning a qualifying score of at least 550 on a College Board Foreign Language Subject Test satisfies the requirement. This test may be taken at any time during your high school career. Once your score is on file at Undergraduate Admissions, notify the Letters and Science Deans' Office so that satisfaction of the College requirement can be noted on your record.

College Board Advanced Placement Examination. A score of 5, 4 or 3 on any foreign language College Board Advanced Placement Examination, with the exception of Latin, taken in high school will satisfy the Foreign Language requirement.

International Baccalaureate Higher Level Examination. A score of 7, 6, or 5 on the French A1, A2, or B Examination, the German A1, A2 or B Examination, the Italian A1 Examination, the Latin Examination, the Portuguese A1, A2 or B Examination, or the Spanish A1 Examination taken in high school will satisfy the Foreign Language requirement.

By Examination: Other means. If you have not completed the required level language course, but assume you have attained equivalent language fluency and cultural knowledge, you may satisfy the language requirement by passing a proficiency examination. For more information, consult the appropriate foreign language department.

You may validate your knowledge of a language acquired by any means before matriculating at UC Davis by taking a proficiency test or another form of evaluation (if available in the relevant language department). A test may not be taken, however, in a language for which you have already received degree credit.

Major Degree Certification

Requirements for major programs are described in the Undergraduate Courses chapter of this catalog. These requirements are fulfilled by completing a major program offered by a teaching department or program committee in the College of Letters and Science (see the list of majors) or an individual major program approved by the College's Committee on Individual Majors.

No more than six units in internship courses (numbered 92, 192, or similar internship courses) may be accepted in satisfaction of the requirements of major programs. Courses numbered 97T, 97TC, 197T and 197TC do not satisfy unit or course requirements in the major.

Degree Check

Before the beginning of your senior year, take some time to consider your goals and to plan the academic program for your final year as an undergraduate. To plan properly and to ensure that you get the most out of your remaining education and complete all graduation requirements as well, you should know what requirements remain unsatisfied. To help you in these efforts, the Undergraduate Education and Advising Office provides on its website informational materials and instructions on how to evaluate your progress on college and university requirements; see http://www.lses.ucdavis.edu/advising/. Many departments provide similar information regarding your major requirements.

Once you have completed 90 units of degree credit, you should contact your departmental adviser for a check of your major requirements. At approximately this point, you also should request an official degree check summarizing your progress in fulfilling college and university requirements from the Undergraduate Education and Advising Office; see http://www.lses.ucdavis.edu/advising/ for additional information.
**Degree Requirement Changes**

On occasion, the faculty makes changes in the requirements that students must satisfy to obtain the baccalaureate degree. So that you will not be penalized by changes that may work to your disadvantage and so that you will benefit by changes that assist you in completing your degree requirements, it is College policy that, unless otherwise specified by the Davis Division of the Academic Senate, you may choose to fulfill the university and College requirements as stated in any UC Davis *General Catalog* in effect at any time you were registered as a full-time student at a postsecondary institution of higher education; e.g., community college, college or university.

Once you have chosen the year of the *General Catalog* under which you wish to be governed, you must satisfy all of the university and college requirements specified in that catalog. With respect to the completion of your major requirements, most of the majors in the College of Letters and Science require completion of the major degree requirements in effect at the time you officially declared your major. However, because departments differ in how they handle these matters, check with the department or major program office if you have any questions about which requirements apply to you.
GRADUATE STUDIES

250 Meek Hall
330-752-0650; http://gradstudies.ucdavis.edu

UC Davis offers advanced degrees in nearly 100 graduate programs. A student's graduate study is guided by either departments or graduate groups. Graduate programs are composed of individual faculty members from multiple departments with similar academic interests. The group structure, used extensively at UC Davis, permits faculty to be affiliated with graduate programs in more than one discipline and offers students an interdisciplinary graduate experience that crosses the administrative boundaries of the various departments, colleges, schools, and sometimes campuses. In keeping with UC Davis' progressive spirit, the group structure also allows for evolution of established degree programs and facilitates the development of new ones. More than half of the graduate programs at UC Davis are organized as graduate groups. You will find a complete list of graduate degrees under Degrees Offered by UC Davis, on page 11.

Graduate study is governed by the Graduate Council, a standing committee of the Davis Division of the Academic Senate and by the dean of Graduate Studies. A university-wide Coordinating Committee on Graduate Affairs determines general policies and establishes common procedures.

PREPARING FOR AN ADVANCED DEGREE

Admission to a graduate program at the University of California requires a bachelor's degree that is comparable in quality to a degree from the University of California both in distribution of academic subject matter and in scholarly achievement.

The primary requirement for admission to any program is evidence of intellectual achievement and promise. Your application will be evaluated first on the basis of your transcript to assure that your qualifications meet minimum standards as set by the university and UC Davis Graduate Council. Generally, you must have a minimum B average in undergraduate course work from an institution of acceptable standing to be considered for admission. UC Davis also requires a Statement of Purpose and a Personal History Statement from each applicant. International applicants must demonstrate the ability to understand and use English by submitting TOEFL or IELTS scores. Graduate programs frequently require submission of additional materials such as Graduate Record Examination (GRE) scores, letters of recommendation, and portfolios or examples of written work to assist in selecting from among many highly qualified applicants. Admission to graduate study is limited by the number of spaces available in major programs. Not all eligible applicants can be admitted.

UC Davis is committed to maintaining excellence, preserving fairness and promoting diversity in its student population. In addition to an applicant's past scholastic achievement, admissions criteria include an applicant's potential for service in the field, keeping in mind the needs of our society and of underrepresented and disadvantaged communities. Evaluation criteria also attempt to take into account any prior disadvantages applicants have overcome that may bear on future achievements and services.

APPLYING FOR ADMISSION

To apply for admission, please see http://gradstudies.ucdavis.edu.

Each program to which you apply must receive a complete application, including the nonrefundable application fee of $90 (U.S.) or $110 (international).

To apply for fellowship, please see http://gradstudies.ucdavis.edu.

For application deadlines, please go to the Office of Graduate Studies website at http://gradstudies.ucdavis.edu/prospective/admissiondeadlines.cfm. It is also recommended that you check the website of the program to which you are applying for their application deadlines. No applications are accepted after the published program-specific deadline.

About Admissions

Applications are accepted for fall quarter only. You may apply for admission to graduate study at http://gradstudies.ucdavis.edu. Transcripts of all your college-level academic coursework, along with other supporting documents (if required), must be sent by mail to your graduate major program office.

You should begin the application process as early as possible in the academic year since many programs have early deadlines. In addition, your chances for appointment as a teaching assistant or graduate student researcher, or of receiving financial support, are enhanced by applying early. The application deadlines are available on the Graduate Studies website as noted above or until your proposed graduate program is full, whichever occurs first.

The Graduate Admissions Advisory Committee for the program will submit its recommendation and evaluation to the Office of Graduate Studies; final admission decisions rest with the Dean of Graduate Studies. This approval procedure applies to all applicants, including those seeking a transfer to UC Davis from another UC campus.

Applications for the degrees of Juris Doctor, Doctor of Medicine, Doctor of Veterinary Medicine, Master of Business Administration, Master of Professional Accountancy, and Master of Preventive Veterinary Medicine must be filed directly with the appropriate professional school.

Readmission

If you were formerly registered at UC Davis as a graduate student and wish to return to pursue the same degree objective in the same major, you must apply for readmission and pay the readmission application fee of $70. The readmission application must be filed with the Office of Graduate Studies by the tenth day of instruction of the quarter. If you are seeking to return to a new degree program and/or new major, you must apply for admission along with other new applicants. Apply at http://gradstudies.ucdavis.edu. Transcripts of any college-level coursework undertaken since you were last registered in graduate status at UC Davis must be presented with the application. There is no assurance of reentry, as applicants for readmission will be considered in competition with other applicants for the program.
International Students

http://intlstudents.ucdavis.edu

Assessment of a foreign degree is based on the characteristics of the national system of education, the type of institution attended, and the level of study completed.

If you are an international student with credentials from universities outside the U.S., you should begin the application process as early as one year in advance. Official copies or certified copies of all transcripts in English and in the original language are required before your application can be processed. Do not attempt to convert your grade point average or ranking to a U.S. equivalent. The Office of Graduate Studies will determine your eligibility using U.S. guidelines for credential evaluation. International students are also required to complete the online application process and pay the nonrefundable application fee. International students must apply at http://gradstudies.ucdavis.edu.

English Requirement. Applicants whose native language and language of prior instruction is not English must take the TOEFL or IELTS. The minimum score required for admission to graduate study at UC Davis is total score of 550 for the paper test or a total score of 80 on the Internet-based test for TOEFL, or band score of at least 7.0 on a 9-point scale for IELTS. TOEFL and IELTS scores are valid for two years only. Some programs require higher scores; for more information, see http://gradstudies.ucdavis.edu/programs. UC Davis does not offer conditional admission on the basis of future English language test scores. TOEFL scores must be reported electronically by ETS. The score report is required before application processing begins.

TOEFL Scores. The Test of English as a Foreign Language (TOEFL) is given by Educational Testing Service (ETS), TOEFL Services, PO Box 6151, Princeton NJ 08541-6151, 609-771-7100. Request information from toefl@ets.org or see http://www.ets.org/toefl.

IELTS Scores. The Academic Modules of the International English Language Testing System (IELTS) are designed by the University of Cambridge Local Examinations Syndicate and administered by the British Council worldwide. You are responsible for providing us with an official Test Report Form (TRF) of your IELTS. Remember to order the TRF when you register to take the test. To register for the IELTS, see http://www.ielts.org or contact the IELTS Subject Officer, University of Cambridge, Local Examinations Syndicate, 1 Hills Road, Cambridge, CB1 2EU, United Kingdom.

Visas. If you need a certificate of eligibility for a student visa issued by UC Davis, you will be required to complete a certification of finances form showing the availability of sufficient funding for your graduate program. For complete details, see Services for International Students and Scholars (SISS), on page 71.

PROGRAM OF STUDY

New students are assigned an adviser within the appropriate department or graduate group who assists them in planning a program of study. The program will depend to some degree on the student's undergraduate training and may include undergraduate courses to remove deficiencies. Each student must satisfy the degree requirements as stated by the program and found at http://gradstudies.ucdavis.edu/programs.

Additional requirements for study may be established by the department or group and approved by the Graduate Council. These requirements often include a core of required courses, but considerable flexibility is permitted to suit individual needs. Undergraduates at UC Davis who plan to pursue graduate study should consult with their major adviser at the end of their junior year or the beginning of their senior year to guarantee adequate preparation.

A graduate degree is awarded to recognize a student's command of a wide range of knowledge in an academic field. It is not awarded merely for fulfillment of technical requirements, such as residence or the completion of specific courses.

Master’s Degree

Students working toward a master’s degree must be registered for at least three full-time quarters. Two regular six-week Summer Sessions may count as the equivalent of one quarter. Usually, all work for the master’s degree is done in residence on the UC Davis campus; however, some work taken elsewhere may be credited toward your degree with the consent of the graduate adviser and the Associate Dean for Graduate Students. The limit for such transfer credit is 6 units from another institution, or 12 concurrent units (Open Campus enrollment), or up to one half of the unit requirement if the courses were taken at another UC campus-providing the units were not used to satisfy requirements for another degree.

A master’s degree may be awarded upon completion of one of two basic plans in which either a thesis or a comprehensive examination is required.

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<td>Deadline for candidates for master's degrees to file thesis with the dean of Graduate Studies</td>
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<td>Deadline for candidates for master's degrees to take comprehensive examination</td>
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<td>Deadline for students who expect to complete work for the degrees of Doctor of Philosophy and Doctor of Engineering to file applications for candidacy with the dean of Graduate Studies</td>
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<tr>
<td>Deadline for candidates for the degrees of Doctor of Philosophy, Doctor of Education, and Doctor of Engineering to file dissertation with the dean of Graduate Studies</td>
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* Deadlines are subject to change without notice.
Doctoral Degree

The Doctor of Philosophy degree, as granted at the University of California, means that the recipient possesses knowledge of a broad field of learning and has given evidence of distinguished attainment in that field; it is a warrant of critical ability and powers of imagination and synthesis. It means, too, that the candidate has presented a dissertation containing an original contribution to the knowledge in the chosen field of study.

Students working toward a doctorate must be registered for a minimum of six full-time quarters. Experience indicates that it takes considerably longer than this to complete a degree program. Two consecutive regular Summer Sessions may count as the equivalent of one regular quarter.

There is no university unit requirement for the doctoral degree. However, individual programs have course requirements that must be completed before admission to the Qualifying Examination.

The Qualifying Examination is administered by a committee appointed by the dean of Graduate Studies. The examination is intended to demonstrate critical thinking ability, powers of imagination and synthesis and broad knowledge of the field of study. Upon recommendation of the Qualifying Examination Committee, and with the approval of the Graduate Council, the examination may be repeated one time.

After successful completion of the Qualifying Examination, the student must file for Advancement to Candidacy for the degree. At this time, a committee is appointed to direct the research problem and guide in the preparation of the dissertation.

Graduate students in certain doctoral programs may participate in a Designated Emphasis, a specialization that might include a new method of inquiry or an important field of application that is related to two or more existing doctoral programs. The Designated Emphasis is awarded in conjunction with the doctoral degree and is signified by a transcript designation; for example, “Ph.D. in History with a Designated Emphasis in Critical Theory.” Programs approved as Designated Emphases include African American and African Studies, Biology of Vector-borne Diseases, Biophotonics, Biotechnology, Classics and Classical Receptions, Critical Theory; Feminist Theory and Research; International and Community Nutrition; Native American Studies; Organism-Environment Interaction; Reproductive Biology; Second Language Acquisition; Stem and Progenitor Cells; Studies in Performance and Practice; Translational Research; and Writing, Rhetoric, and Composition Studies.

INTERCAMPUS EXCHANGE PROGRAM

A graduate student registered on any campus of the University of California may become an intercampus exchange student with the approval of the graduate adviser, the chairperson of the department or group on the host campus, and the Dean of Graduate Studies on both the home and the host campuses.

An intercampus exchange student has library, health service and other student privileges on the host campus, but is considered a graduate student in residence on the home campus. The grades obtained in courses on the host campus are transferred to the home campus and entered on the student’s official graduate transcript.

Application forms may be obtained from the Office of Graduate Studies website (http://gradstudies.ucdavis.edu) and must be submitted five weeks before the beginning of the quarter in which you wish to participate in the program. Petitions received after the first day of the quarter will not be processed.

FELLOWSHIPS, ASSISTANTSHIPS AND LOANS

http://gradstudies.ucdavis.edu/ssupport

Financial support for graduate study at UC Davis is available in several forms: teaching and research assistantships, financial aid and fellowships/scholarships. For more information, see http://gradstudies.ucdavis.edu/ssupport.

Financial aid is awarded on the basis of demonstrated financial need and is administered by the Financial Aid Office. Federal financial aid includes student loans, grants and work-study funding. You may apply for financial aid before you have been admitted. To be considered for financial aid, or for any awards based on financial need, you must file a “Free Application for Federal Student Aid” (FAFSA), at http://www.fafsa.ed.gov no later than March 2, prior to the fall quarter enrollment. This form, submitted directly to the Federal Student Aid Program Office, Iowa City, IA, is used to determine financial need only. Contact the Graduate Financial Aid Office for information regarding loans, grants and work-study at http://financialaid.ucdavis.edu/graduate.

Graduate fellowships are awarded primarily on the basis of scholarly accomplishment and promise of outstanding academic and professional achievement. Fellowship awards can include a stipend, fees and/or Nonresident Supplemental Tuition. Considered in evaluations are the Graduate Record Examination (GRE) scores, undergraduate and graduate grade point averages, academic transcripts, statement of purpose, letters of recommendation and other documentation such as publications or awards. The minimum cumulative undergraduate or graduate grade point average required for a stipend, Nonresident Supplemental Tuition fellowships or in-state fee award is 3.000 (A=4.000).

UC Davis has a single online application system for the admission application and for the student fellowship application. To apply for fellowship, see http://gradstudies.ucdavis.edu.

For fellowship application deadlines, please go to the Office of Graduate Studies website at http://gradstudies.ucdavis.edu/prospective/admissiondeadlines.cfm. It is also recommended that you check the website of the program to which you are applying for their fellowship application deadline.
GRADUATE ACADEMIC CERTIFICATE PROGRAM

A Graduate Academic Certificate (GAC) program is a structured sequence of courses and requirements that focus on a specialty or area of expertise not offered by a regular graduate degree program. GACs are administered by a UC Davis instructional unit (professional school, department, graduate group or a designated emphasis program) and are an additional sequence of training and expertise for graduate students enrolled in a degree program.

GACs consist of a minimum of 12 units of graduate level instruction and are recognized by transcript notation and an official certificate issued by UC Davis with the gold seal of the University of California. GAC programs include Air Quality and Health, Conservation Management, Development Practice, and Second Language Acquisition. For more information, see http://gradstudies.ucdavis.edu/programs/GACs.html.

GRADUATE CERTIFICATE PROGRAM FOR ENGINEERS

For engineers who already have a degree, the College of Engineering offers Graduate Certificate Programs in various fields of Engineering. The certificate programs consist of course work in selected engineering subjects and require fewer units than the degree programs. The purpose of the Graduate Certificate Program is to provide practicing engineers with an opportunity to develop additional expertise in specific areas and to explore new fields of technical interest.

General requirements for the programs are:
- 15 or 16 units of specified graduate course work, or a combination of specified graduate and undergraduate course work.
- Admission to Graduate Studies.

Further information on the Graduate Certificate Programs may be found within the graduate programs of the College of Engineering; see http://engineering.ucdavis.edu/graduate.

SEMINAR ON COLLEGE TEACHING


The Seminar on College Teaching introduces graduate students to the principles and methods of designing and delivering college-level instruction. The seminar deals with a broad range of skills and issues involved in helping college students learn, including classroom presentations, planning discussions, facilitating active learning, evaluating student learning and employing effective class management strategies.

Participants meet for weekly two-hour sessions. Participants select and complete several assignments, such as developing a syllabus, preparing a lesson plan, investigating an ethical issue related to teaching, creating a teaching blog, or writing a teaching philosophy statement. Readings from various sources complete the seminar experience.

Participants who attend every session and fulfill the required brief assignments in a satisfactory manner receive a certificate of completion that is appropriate to note in a curriculum vitae.
The School of Education offers a wide range of academic and professional development programs that prepare teacher and administrative leaders for the world of public education (P-16), as well as researchers and university faculty. Hallmarks of our work include research that is integrated with practice and policy; deep, sustained engagement with schools and communities; and authentic, collaborative partnerships with those who share our goals.

Through our Ph.D., Ed.D. and M.A. programs, we prepare students to take leadership roles in strengthening schools, community colleges and universities, advancing research and scholarship, and improving education policy and practice. In our credential program (Teaching Credential/M.A.), we prepare students to become teacher leaders and educational advocates for all children.

**PROGRAMS OF STUDY**

The Minor in Education is considered a foundation for undergraduates who wish to obtain a teaching credential; enter any education-related field such as speech therapy, school counseling, occupational learning, or social work; obtain a master's degree in education or a related field; pursue a doctoral degree in education; or develop a better understanding of issues confronting education today. Education Minor coursework focuses on social foundations of education, psychology of learning, schools as institutions, challenges of educational assessment, and educating diverse populations in a wide variety of disciplines and contexts. As part of the Education Minor, students also complete an internship in a local K-12 school or other learning context.

Undergraduates who are interested in exploring teaching mathematics or science in public schools should contact the MAST Program at their first opportunity. The MAST Program offers seminars that give participants experience in elementary, middle school, and high school classrooms. MAST advisors can help students combine the prerequisites for a credential program with General Education requirements. The Natural Sciences major is sound preparation for teaching the science disciplines offered in middle and high schools. A major in Mathematics will provide the broad understanding needed to teach in public schools.

The Master of Arts in Education provides a course of study for examining research and theory about learners, teachers, schools, and related social institutions. The program prepares professionals to conduct research about the education of children, youth, and adults in a multicultural society. Graduates may assume leadership positions in school districts, state education agencies, and private organizations concerned with instructional research, policy and practice.

The M.A. Program in Education offers (1) a general track that serves a broad range of student research interests and career plans, and (2) an M.A./Credential track that integrates the M.A. with the Teaching Credential and focuses particularly on classroom-based research.

The Integrated Teaching Credential with Master's Degree Program offers an opportunity for qualified students to complete the requirements for both a Masters of Arts in Education degree and a Multiple Subject OR Single Subject Credential in English, mathematics, science, social science or agriculture in a 15-month, five-quarter program. The BCLAD (bi-lingual) authorization is available to credential candidates in both the elementary and secondary programs.

The Credential Program prepares students for the teaching profession by immersing them in the total environment of a public school classroom while enrolled in required coursework. The coursework incorporates a theoretical-practical approach to the teaching-learning process, encouraging close interactions among teacher candidates and teacher education faculty. Students complete requirements for the M.A. degree during two part-time quarters following the credential year. This coursework introduces the integration of research into teaching practice, making teachers more informed and pro-active practitioners.

The Capital Area North Doctorate in Educational Leadership (CANDEL) is a collaborative program of UC Davis and Sonoma State University. The program, leading to a Doctor of Education (Ed.D.) degree, is intended primarily for working professionals in P-12 or Community College related leadership positions. Graduates of this program will be prepared to lead in educational environments that promote learning, equity and achievement for all students. Armed with both real-world, problem-based learning, and scholarship skills, program graduates will be uniquely ready to manage the complexities of educational organizations, affect school change processes and shape the educational policies that bear on the practice of education in the public setting.

The Ph.D. in Education is a multidisciplinary program offered by the Graduate Group in Education, with faculty drawn from education, mathematics, science, social science and humanities units throughout the UC Davis campus. The program provides a challenging course of study for examining research and theory about learners, teachers, schools and related social institutions. Through coursework, apprenticeships and mentoring, Ph.D. students are prepared to conduct research and teach about the education of children, youth and adults in a multicultural and multilingual society. Graduates of the program have assumed faculty positions in universities, as well as other leadership positions in universities, school districts, state education agencies and in private organizations that support teaching and learning in schools and communities. The program offers five areas of emphasis: Language, Literacy and Culture; Learning and Mind Sciences; Mathematics Education; Science/Agricultural Education; and School Organization and Educational Policy.
PREPARING FOR THE STUDY OF EDUCATION

Teaching Credential/M.A. Degree Program

Academic preparation for the Teaching Credential Program includes a completed bachelor's degree and a GPA of at least 3.000. For the Multiple Subject credential, many undergraduate majors are appropriate preparation for the program. For Single Subject credential candidates, we recommend an undergraduate major in the intended area of secondary teaching. Use undergraduate internship opportunities to gain classroom experience in the grade levels at which you wish to teach. In addition to these general requirements, learn about current state and UC Davis credential prerequisites at the School of Education website or call our Student Services Office.

- Classroom experience in the appropriate grade levels
- U.S. Constitution course
- Specific preparatory coursework; see adviser for details
- California Basic Educational Skills Test (CBEST)
- For the elementary credential program, the California Subject Examination for Teachers (CSET)
- For secondary credential programs, approved subject matter coursework or the California Subject Examination for Teachers (CSET) for the appropriate subject

Applicants are encouraged to have program prerequisites and testing requirements completed prior to submitting an application. Credential requirements are revised by the State of California. To obtain the most current information, students considering a career in teaching are encouraged to consult with the School of Education advisers throughout their undergraduate career.

M.A. in Education Degree Programs. Applicants to the General Track M.A. must have completed an undergraduate degree with a major in a field that supports their intended area of emphasis. A minimum undergraduate GPA of 3.000 is necessary for graduate admission at the University of California, Davis. Please consult with advisers in the School of Education regarding additional testing or supplemental information that may be required for application to a specific program.

Ed.D. Degree (CANDEL). Applicants to the CANDEL program must meet general admission requirements for graduate study at the University of California. Requirements include a bachelor's and master's degree (or equivalent) from an accredited institution, and a GPA of at least 3.000. In addition, applicants will have demonstrated prior experience in administrative or leadership roles in an educational institution or related areas.

Ph.D. Degree. Applicants to the Ph.D. program in Education must have a bachelor's degree, and normally will have completed a master's degree (or equivalent) in a field that supports their intended area of emphasis. A minimum GPA of 3.000 in previous undergraduate coursework is required for graduate admission at the University of California, Davis. Applicants must demonstrate a high potential for scholarly achievement and research. Individuals possessing graduate degrees in fields other than education are encouraged to apply. Experience in teaching, research, or related areas of education are desirable.

APPLYING FOR ADMISSION

School of Education graduate and teaching credential students are admitted for fall term ONLY. Online applications will be available through the Office of Graduate Studies website at http://gradstudies.ucdavis.edu/.

Application deadlines and requirements vary by program. Please consult with a School of Education adviser regarding your program interests. Applicants with underrepresented and nontraditional backgrounds are encouraged to apply.

Minor in Education

No Application Deadline. The Education Minor is open to students in all majors.

For more information, see http://education.ucdavis.edu or contact the School of Education Student Services Office at 530-752-0757 or eduadvising@ucdavis.edu.

Steps in declaring a minor in education:

- Consult with the education undergraduate adviser in our Student Services Office
- Declare minor by completing a “Declaration of Minor” form available from the Dean's Office in the college of your major

Teaching Credential/M.A. Degree Program

Application Deadline. Please see the School of Education website for Program application information and deadlines at http://education.ucdavis.edu.

For more information or instructions please see our website or contact the School of Education Student Services Office at 530-752-0757 or eduadvising@ucdavis.edu.

Steps in the Admissions Process:

- Complete Office of Graduate Studies online application
- Submit nonrefundable application fee payable to UC Regents
- Submit two (2) official transcripts for all college and university work completed
- Submit to the School of Education any supporting documentation: verification of classroom field experience, copies of test scores, etc.

Applicants will be:

- Screened and scheduled for an admissions interview
- Evaluated and reviewed by an admissions committee
- Recommended to Office of Graduate Studies for admission or denial
- Notified of admission or non-admission by the Office of Graduate Studies
**M.A. Degree**

**Master of Arts in Education General Track**

**Application Deadline.** Please see the School of Education website for Program application information and deadlines at [http://education.ucdavis.edu](http://education.ucdavis.edu).

For more information or instructions please see our website or contact the School of Education Student Services Office at 530-752-0752 or eduadvising@ucdavis.edu.

Steps in the Application Process:

- Complete Office of Graduate Studies online application, which includes three (3) uploaded letters of recommendation
- Submit nonrefundable application fee payable to UC Regents
- Submit official transcripts for all college and university work completed
- Submit to UC Davis your official scores (taken within the last five (5) years) for the Graduate Record Exam (GRE) General Test

**Capital Area North Doctorate in Educational Leadership (CANDEL)**

**Application Deadline.** Please see the School of Education website at [http://education.ucdavis.edu](http://education.ucdavis.edu).

For more information, see the program website at [http://education.ucdavis.edu/candel-admissions](http://education.ucdavis.edu/candel-admissions) or contact the School of Education at 530-754-6664 or eduadvising@ucdavis.edu.

Steps in the application process:

- Complete the online application for the Capital Area North Doctorate in Educational Leadership
- Submit two (2) official transcripts in sealed envelopes as received from the registrar(s) of each college or university attended
- Submit official score(s) for the Graduate Record Examination (GRE) General Test or the Miller Analogies Test (MAT)
- Submit three (3) letters of recommendation written by three employers, professors, or others in a position to assess the applicant's potential for graduate work (must be uploaded online)
- Include a statement of support from employer; a separate document from the applicant's current employer verifying a commitment to provide periodic leave for intensive program activities

Finalists will be interviewed by the CANDEL Admissions Committee.

**Ph.D. Degree**

**Application Deadline.** Please see the School of Education website at [http://education.ucdavis.edu](http://education.ucdavis.edu).

For more information or an application package, see the program website at [http://education.ucdavis.edu/phd-education](http://education.ucdavis.edu/phd-education) or contact the School of Education Student Services Office at 530-752-0757 or phdedua@ucdavis.edu.

Steps in the application process:

- Complete online UC Davis Office of Graduate Studies application
- Submit nonrefundable application fee payable to UC Regents
- Official score(s) for the Graduate Record Examination (GRE) General Test
- Three (3) letters of recommendation
- One (1) official transcript from all institutions attended
- Writing sample (typically a seminar paper, thesis, or published article)
**SCHOOL OF LAW**

School of Law, Admission Office  
530-752-6477; admissions@law.ucdavis.edu, http://www.law.ucdavis.edu

The University of California Davis School of Law offers a three-year professional curriculum leading to the degree of Juris Doctor. Within a uniquely supportive atmosphere, law students are provided a comprehensive modern law school curriculum taught by a nationally and internationally distinguished faculty. The School offers a full range of traditional law courses, opportunities for practical experience through clinical programs and for in-depth study of an area of law in an individualized program of classroom work, research, writing, or experience in the community. It further provides professional skills training in interviewing and counseling, negotiation and dispute resolution and trial practice. The School seeks to promote critical evaluation of law and legal institutions in a broad perspective, integrating non-legal disciplines with professional legal education.

UC Davis Law School is fully accredited by the American Bar Association, is a member of the Association of American Law Schools and has a chapter of the Order of the Coif.

**PREPARING FOR THE STUDY OF LAW**

No specific college major is required for admission to the School of Law and there is no prescribed pre-legal program. Your college record and Law School Admission Test (LSAT) score must, of course, demonstrate that you are highly qualified for the study of law.

As a pre-law student, you should plan a course of study that will give you a broad cultural background and include intensive work for a substantial period of time in a selected field of study. Pre-law students should develop the ability to think critically. You should gain an understanding of people and institutions and know how to gather and weigh facts, to solve problems and think creatively. You should be able to read rapidly with comprehension and express themselves clearly, completely and concisely, both orally and in writing.

You can get help with program planning from the Pre-Law Advising Office in 160 South Silo 530-752-4475.

For additional information, see the [Official Guide to ABA-Approved Law Schools](http://www.law.ucdavis.edu), a publication of the Law School Admission Council and the American Bar Association. The guide includes information on the law and lawyers, pre-law preparation, applying to law school and the study of law, together with individualized information on all ABA approved law schools. It can be found at college and major bookstores or ordered at [https://officialguide.lsac.org/release/OfficialGuide_Default.aspx](https://officialguide.lsac.org/release/OfficialGuide_Default.aspx).

**APPLYING FOR ADMISSION**

Deadline for filing electronic applications for admission to the School of Law:

**March 15**

1. Request the law school catalog to learn more about the School and the admission process. The electronic application can be accessed at the School's website, [http://www.law.ucdavis.edu](http://www.law.ucdavis.edu) or at the Law School Admission Council (LSAC) website at [http://www.LSAC.org](http://www.LSAC.org). Complete instructions about the admission process, including answers to frequently asked questions, can be found in the Prospective Student section of the Law School website.

The last date for filing completed electronic applications, together with all supporting documents, including Law School Admission Test (LSAT) scores, Credential Assembly Service (CAS) reports and letters of recommendation, is March 15 of the year in which admission is sought. Early filing of all application materials is strongly recommended.

2. You must take the Law School Admission Test and register with the Credential Assembly Service so that the score will be reported to the school. You are urged to take the test as early as possible and no later than February of the year in which admission is sought; the June test date is too late for fall admission.

Testing centers are located in all parts of the United States and in many foreign countries. Tests are given four times a year: February, June, September/October, and December.

To obtain information about the test, specific test dates and the location of testing centers, visit the Law School Admission Council (LSAC) website at [http://www.lsac.org/jd/](http://www.lsac.org/jd/). Both the CAS and LSAT registration process are electronic.

3. Register with the Credential Assembly Service (CAS) no later than December 1 at the LSAC website. Arrange to have a transcript from each college or university you have attended sent directly to LSAC. Complete instructions for the online services are available at the LSAC website.

4. Submit an official transcript of college work completed during the first semester or quarter of your senior year directly to the School of Law as soon as it is available. Failure to do so may delay consideration of your application materials. Successful applicants must submit directly to the School of Law a final transcript showing the award of a bachelor's degree.

5. Provide two letters of recommendation from objective and responsible persons who know you well. At least one of these letters should come from a faculty member under whom you studied while in college. UC Davis Law School requires all applicants to submit recommendations to the LSAC Letter of Recommendation Service (LOR) for inclusion with your CAS report.
Your application will be reviewed by the School of Law Admissions Committee, which seeks students of demonstrated academic ability, as evidenced by a variety of factors including information provided in the required two-four page personal statement and letters of recommendation, in combination with the LSAT score and the undergraduate grade point average (GPA). The Committee seeks students of diverse backgrounds and considers economic factors, obstacles overcome, advanced degrees or other advanced studies, significant work experience and extracurricular and community activities during and after the college years. An applicant's growth, maturity and commitment to the study of law are also major considerations. Students are admitted only on a full-time basis and only for fall admission.

6. When accepted by the School of Law, you are simultaneously admitted to Graduate Studies on the UC Davis campus of the university for the program leading to the degree of Juris Doctor. If you intend to pursue studies leading to other graduate degrees, or wish to become a candidate for a Combined Degree Program, you must make separate application to Graduate Studies or the Graduate School of Management before commencing such studies.

Admission to Advanced Standing

If you have completed at least one year of full-time law course work in another American Bar Association (ABA) approved law school, you may be considered for admission to advanced standing with credit for not more than one year of such work. The application filing period is January 1-30. No application for advanced standing will be considered until the Office of Admissions has received transcripts for at least one semester of full-time course work in a three-year program.

Application procedures for advanced standing are the same as described above with the addition of (1) a letter of good standing including class rank from the dean of any law school previously attended; (2) at least one letter of recommendation from a law professor; (3) transcripts of all law school work; (4) LSAT score provided as part of an updated CAS report from LSAC; and (5) an official transcript from the school where you earned your undergraduate degree, stating the date the degree was conferred. The deadline for transfer applications is June 30 of the year for which transfer is sought. Those applicants who demonstrate high academic performance in the first semester of law school may be offered early admission. Those offered early admission must complete the first full year in the top one-third of the class or the School of Law reserves the right to reconsider its offer of admission. All other decisions are normally made in July or early August of the year in which admission is sought.

Students who have been disqualified at another law school will not be admitted to UC Davis Law School.

Recruitment of Underrepresented Groups

The students and faculty of the School of Law recognize the great need for lawyers from under-represented groups. The School, therefore, actively solicits applications from those groups that reflect the many diverse populations of California but, traditionally, have been underrepresented in the law school population.

The School of Law, in cooperation with the Association of American Law Schools (AALS) and the Council on Legal Education Opportunity (CLEO), participates in programs designed to increase the number of law students from underrepresented groups. CLEO applications may be obtained by writing to Council on Legal Education Opportunity, 740 15th Street, N.W., 9th Floor, Washington, D.C. 20005, (202) 828-6100 or toll free (866) 886-4343; http://www.cleoscholars.com.

PROGRAM OF STUDY

The professional curriculum requires six semesters for completion and extends over a period of three years. It is for full-time students only; no part-time or evening program is offered. New students are admitted only at the beginning of the fall semester.

After satisfactorily completing the professional curriculum of 88 semester units and the required period of resident study, you will receive the degree of Juris Doctor (J.D.). Students who fail to attain satisfactory grades may be required to withdraw from the School at the end of any academic year.

The first year's work is prescribed and provides the essential foundation for subsequent legal study. Satisfactory completion of the first-year courses is, in all cases, prerequisite to second- and third-year courses. The work of the second and third years is elective. The courses of the professional curriculum are listed in the Undergraduate Courses chapter.

Combined Degree Programs

Individual students may find a combined degree involving law and another discipline such as economics, business, sociology, or science advantageous. To support this kind of study, the School, in conjunction with other schools and university departments, has established Combined Degree Programs. Under these programs, a student may work toward a J.D. degree and a master's degree in another discipline at the same time. Students working toward a combined degree are required to spend their first year at the law school.

Normally, a Combined Degree Program will take at least four years. You will usually be able to earn up to 10 semester-hours of law school credit for work in the related discipline and normally complete the combined degrees in less time than it would take to earn the two degrees separately. The first year of the Combined Degree Program must be taken entirely in the School of Law. During the remaining years, course work may be divided between the law school and the related discipline. You must satisfy the admission requirements for both programs and file applications with both units.

Students have pursued degree programs in combination with UC Davis departments for the M.A. degree in economics, philosophy, computer science and sociology, and with the School of Management for the M.B.A. degree. The law school will attempt to work out an additional program if you are interested in other disciplines. You may enroll in the Combined Degree Program any time before the beginning of your third year in law school. If you are interested in pursuing a Combined Degree Program, and have made a separate application to another school or department, you should notify the School of Law if that application is accepted.
School of Law

The LL.M. Program

530-757-8569; Fax 530-757-8596; lawinfo@ucde.ucdavis.edu
http://www.law.ucdavis.edu/international/

The Law School LL.M. (Master of Laws) program integrates American and foreign law students at all levels of study. For foreign law graduates, the program provides an opportunity to gain a basic knowledge of the United States legal system. United States law school graduates and selected foreign LL.M. candidates may also seek admission on a thesis rather than a course basis. Other opportunities available to all graduate law students include developing special expertise in a particular area and doing special projects and original research under the direction of a faculty member.

Each LL.M. candidate must successfully complete a minimum of 20 semester units of work, usually 10 units each semester. Foreign LL.M. students must enroll in the 1-unit course Introduction to Legal Research and the 2-unit course Introduction to the Law of the United States. They earn the remainder of their required course credit in regular elective J.D. courses. Each foreign student must also complete an intellectually rigorous legal research and writing project, constituting at least 2 units of credit.

All LL.M. candidates begin their year of study with a complete orientation in the academic and social life of the law school, the UC Davis campus and the city of Davis. LL.M. students are encouraged to enroll in the School of Law’s Orientation in U.S.A. Law Program, given in the month before the LL.M. Program begins.

SCHOOL OF LAW ACADEMIC CALENDAR 2014-2015

The School of Law operates on a semester system rather than the quarter system used on the remainder of the UC Davis campus.

<table>
<thead>
<tr>
<th>Event</th>
<th>Fall 2014</th>
<th>Spring 2015</th>
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</thead>
<tbody>
<tr>
<td>Introduction Week</td>
<td>Monday–Friday, Aug 18–22</td>
<td>Thursday, Jan 8</td>
</tr>
<tr>
<td>Law School instruction begins</td>
<td>Monday, Aug 25</td>
<td></td>
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<tr>
<td>Labor Day holiday</td>
<td>Monday, Sep 1</td>
<td></td>
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<tr>
<td>Veteran’s Day holiday</td>
<td>Tuesday, Nov 11</td>
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<tr>
<td>Thanksgiving holiday</td>
<td>Thursday–Friday, Nov 27–28</td>
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<tr>
<td>Martin Luther King, Jr. holiday</td>
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<tr>
<td>Presidents’ Day holiday</td>
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<tr>
<td>Spring recess</td>
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<tr>
<td>Law School instruction ends</td>
<td>Thursday, Dec 4</td>
<td>Friday, Mar 23–27</td>
</tr>
<tr>
<td>Reading period</td>
<td>Friday–Sunday, Dec 5–7</td>
<td>Saturday–Tuesday, Apr 25–28</td>
</tr>
<tr>
<td>Law School examination period</td>
<td>Monday–Monday, Dec 8–22</td>
<td>Wednesday–Thursday, Apr 29–May 14</td>
</tr>
<tr>
<td>Law School Commencement</td>
<td></td>
<td>Friday, May 15</td>
</tr>
</tbody>
</table>

Wednesday, December 3 is treated as a Friday for class schedule purposes. Thursday, January 22 is treated as a Monday for class schedule purposes. Friday, February 20 is treated as a Monday for class schedule purposes.

GRADUATE SCHOOL OF MANAGEMENT

Graduate School of Management
Gallagher Hall
530-752-7658; http://gsm.ucdavis.edu

The Graduate School of Management offers a full-time, two-year program leading to the Master of Business Administration degree. The program provides both entry-level and mid-career students with an understanding of management approaches to problem solving and an awareness of the environment within which public and private management decisions are made. Successful completion requires not only a sophisticated understanding of a variety of functional skills in finance, marketing, production, program evaluation and accounting, but also an understanding of computers, information systems and the application of scientific methods to the identification and solution of management problems.

Preparing for the Study of Management

A bachelor's degree and a strong interest in professional management are prerequisites for admission to the Graduate School of Management. The school seeks students from diverse professional and academic backgrounds and does not limit its consideration to applicants from any particular category of majors. Entry-level and mid-career applicants are considered and women and minorities are encouraged to apply.

Although the program has no specific subject prerequisites, it is strongly recommended that students complete the following course work before enrolling:

- **Accounting**—an introductory course in financial accounting
- **Economics**—an introductory course in microeconomics
- **Mathematics**—an introductory course in calculus
- **Statistics**—a course in elementary statistics

APPLYING FOR ADMISSION

Application Deadlines are in November, January, March and May, each year. Dates are subject to change.

For the most current information, see http://gsm.ucdavis.edu.

Admission is for the fall quarter only. Application materials can be obtained in the following ways:

- Apply at http://gsm.ucdavis.edu
- Print the application materials at http://gsm.ucdavis.edu or contact the Admissions office at admissions@gsm.ucdavis.edu
- 530-752-7658

Complete and return your application, with all supporting documents, by the deadlines given above. The application fee is $125.00.

In addition to your application, you need to submit:

- Transcripts from all colleges or universities previously attended
- Graduate Management Admission Test (GMAT) or Graduate Record Exam (GRE) taken within the last five years of the admission date. For further information and registration forms, contact Graduate Management Admission Council at http://mba.com or Educational Testing Service at http://ets.org/gre
- Two letters of recommendation
- Two essays on specific topics
- Interviews are by invitation only

For more information, call 530-752-7658, or contact admissions@gsm.ucdavis.edu.

International Students

International applicants for whom English is a second language must take either Test of English as a Foreign Language (TOEFL) or IELTS within the last two years. For more information, contact TOEFL, Educational Testing Service at http://toefl.org or IELTS Int'l at http://ielts.org.

International students must show proof of financial support for two academic years including fees and living expenses.

Criteria for Admission

Admission to the UC Davis MBA Program is highly selective. The aim of the Admissions Committee is to select those applicants whose academic background, intellectual capability, work experience, demonstrated leadership and communication skills meet the challenging demands of the MBA program and a managerial career. Consideration of an applicant's undergraduate performance includes a review of trends in scholastic performance and areas of academic strength as well an assessment of overall grade point averages. Admissions standards and grading policies of the schools attended are also considered. Verbal, quantitative and analytical scores on the GMAT are used to evaluate general aptitude for management study. Background and maturity as indicated by employment history, service and activity records, recommendations and the applicant's essays are factors in the committee's evaluation. Professional management experience is not required for admission but is favorably considered.

PROGRAM OF STUDY

The hallmark of the two-year UC Davis MBA program is its flexibility. Students are required to take ten core courses, 30 units, and 42 units of elective coursework for the 72 units required for the degree. The required core curriculum is designed to provide you a foundation in the functional areas of business-accounting, economics, finance, marketing, organizational behavior, statistics, and strategy. These management disciplines are examined through the use of case studies, lectures and the analysis of a few select companies on which to base illustrations and spark discussions. As early as the first year of study, students are able to integrate elective courses into their personal curriculum.

Elective courses at the Graduate School of Management place an emphasis on real-world application of management principles through the use of executive guest speakers who present “live” case study analyses and actual “client” businesses for student projects. Many courses require team projects and emphasize managing by innovation and entrepreneurialism. These team projects develop your independent research abilities and hone your presentation skills.

Most students choose functional concentrations such as:

- Business Analytics and Technologies
- Entrepreneurship
- Finance/Accounting
- General Management
Part-Time MBA Programs in Sacramento and Bay Area

In addition to the full-time program, the Graduate School of Management offers two part-time MBA programs in Sacramento and in the Bay Area. Students enrolled in the MBA Program pay a flat rate per unit.


Application Deadlines are in November, January, March, May and June each year. Dates are subject to change. For the most current information, see http://gsm.ucdavis.edu.

If you would like more information about this program, please contact the Graduate School of Management Admissions at 530-752-7658 or see http://gsm.ucdavis.edu.

Master of Professional Accountancy (MPAc)

The Master of Professional Accountancy (MPAc) degree is a full-time, one-year program designed to prepare students for a career in the accounting field, and to fulfill the requirements for those seeking to take the Uniform Certified Public Accountant exam administered by the State of California. The MPAc degree provides students with the skills to be experts in risk assessment, systems analysis, taxation, and corporate governance, and to act as overseers of public trust.

Graduates will gain a breadth of communication, business, and accounting skills that will meet the demands of sought-after organizational leadership roles.

Preparing for the Master of Professional Accountancy

An undergraduate degree in accounting is not a prerequisite for the MPAc program, however in order to prepare for the rigorous curriculum at the graduate level, students are required to complete the following three courses:

- Introduction to Financial Accounting, Basic concepts of accounting; interpreting and using financial statements; understanding accounting principles
- Introduction to Managerial Accounting, Product costing; using accounting information for decision making; planning and performance evaluation
- Business Law, General principles of business law in the areas of contracts, business organization, real property, uniform commercial code, sales, commercial paper, employment relations, and creditor-debtor against a background of the history and functioning of our present legal system

Students are expected to complete prerequisites before beginning the MPAc program; any deficiencies must be completed prior to enrollment. Transfer credits from other institutions cannot be substituted for the MPAc curriculum, although such classes can be used to fulfill the aforementioned prerequisites.

The MPAc program welcomes applicants from all undergraduate disciplines and backgrounds. Women and minorities are encouraged to apply.

Applying For Admission

Application deadlines are in December, February, March and June, each year. For current information, see http://gsm.ucdavis.edu/master-professional-accountancy.

To obtain application materials or apply online, see http://gsm.ucdavis.edu/mpac-admissions. Application deadlines are typically four times each year. For current information, see http://gsm.ucdavis.edu/master-professional-accountancy.

Supporting documents include:
- Transcripts from all colleges or universities attended
- Scores from either the Graduate Management Admission Test (GMAT) or the Graduate Record Examination (GRE) taken within the last five years
- Two letters of recommendation
- International students who have not earned an undergraduate degree in an English-speaking institution must take the Test of English as a Foreign Language (TOEFL), the Pearson Test of English (PTE), or the International English Language Testing System (IELTS) exam. For more information, see http://toefl.org, http://pearsonpte.com, or http://ielts.org
- International students must demonstrate proof of financial support for one academic year, including fees and living expenses.

Interviews are by invitation only.

Admission Criteria

The goal of the Admissions Committee is to select those applicants whose academic background, intellectual capability, communication skills, and professional promise meet the demands of the MPAc program.

Consideration of an applicant’s undergraduate performance includes a review of trends in scholastic performance and areas of strength as well as an assessment of overall grade point averages. Admissions standards and grading policies of the schools attended are also considered. Verbal, quantitative and analytical scores on the GMAT or GRE are used to evaluate general aptitude for the MPAc course of study. Recommendations and the applicant’s essays are factors in the committee’s evaluation.

Program of Study

The MPAc program is “lock-step” meaning there are no electives and students complete courses as a unified cohort. The curriculum, which begins in the fall quarter and finishes the following spring quarter, is designed to establish a foundation in financial reporting and analysis, financial management, taxation and tax analysis, auditing and attestation, professional communication, managerial controls, and accounting ethics.

Students must pass a capstone examination which is taken after advancing to candidacy and at the end of coursework at the culmination of spring quarter to receive the degree.

For more information, call the Graduate School of Management at 530-752-7658, or see http://gsm.ucdavis.edu/master-professional-accountancy.
SCHOOL OF MEDICINE

School of Medicine
http://www.ucdmc.ucdavis.edu/medschool/

The Doctor of Medicine degree requires the satisfactory completion of a four-year course of study composed of 13 consecutive quarters. Course work is conducted on the Sacramento campus, at the UC Davis Medical Center and in nearby affiliated hospitals.

PREPARING FOR THE STUDY OF MEDICINE

When you apply to the School of Medicine, you must submit the results from the Medical College Admission Test (MCAT), so it is recommended that you take the MCAT by the spring before application. Information can be obtained at your undergraduate institution or directly from MCAT Program, Box 4056, Iowa City, IA 52243; 319-337-1357. To be acceptable for the fall entering class, the MCAT must be taken no later than the previous fall. No scores older than three years from June of the year you apply will be accepted. Applicants must also meet the following academic requirements.

A. Completed at least three years of study in an accredited college or university in the United States. A minimum of 90 semester hours or 135 quarter units of college-level work is required. Courses in highly specialized fields are acceptable only at the discretion of the medical school.

B. Physicians should have a broad college level education in the natural, social, and behavioral sciences and the humanities. We require the MCAT and three years (90 semester hours or 135 quarter hours) in an accredited college or university that include the specific requirements listed below.

C. Required college-level courses (verified by AMCAS):
   - Biological Sciences: 1 year
   - Chemistry, general and organic sequence: 2 years
   - Physics: 1 year
   Technical, Non-Academic Standards are also required. For more information, see http://www.ucdmc.ucdavis.edu/mdprogram/admissions/requirements.html.

For additional information, contact the School of Medicine Admissions Office at 916-734-4800.

ADMISSIONS PROCESS

The UC Davis School of Medicine admissions cycle starts in July and ends the following July. Upon applying through AMCAS, you receive information on how to enter and use the Applicant Portal. All communications and updates related to your application are managed through the Applicant Portal. For your convenience, please communicate through the Message Center, which is checked regularly. The UCDSOM admissions process consists of four major steps:

STEP 1: Complete your AMCAS Application

June 1 is the first day students may submit applications to the American Medical College Application Service. It is a good idea to submit your AMCAS application no later than August 1. October 1 is our deadline to submit all application materials to AMCAS. Extensions will not be considered.

STEP 2: Secondary Application (by invitation only)

After applying, your application is reviewed and qualified applicants are invited to complete our UC Davis School of Medicine secondary application. The secondary application consists of:
   - Supplementary activities and essays including possible interest in special Programs in Medical Education (PRIME) tracks and research pathways
   - Letters of recommendation (3-6 LORs allowed)
   - Complete pre-requisite information
   - Non-refundable application fee: $80

Completed secondary applications are forwarded to the admissions committee who perform a holistic review of applications and invite select applicants for an interview. Interview invitations are on a rolling basis-July through January.

STEP 3: Interview Day (by invitation only)

Our interviews are always held on Fridays starting in mid-August and ending in February.

STEP 4: Acceptance Decision

Upon completion of your interview, your application is forwarded to Admissions Committee. Acceptance decisions are made on a rolling basis starting on October 15 through July 15 the following year. Decisions are made within 30-45 days post-interview after review of your entire application packet. Categories of decision are:
   - Acceptance: Starting October 15 and through July 15
   - Wait list: Applicant informed of wait list status with final decision staring May 15 through July 15
   - Not Accepted

ADMISSIONS CRITERIA

The UC Davis School of Medicine Admissions Committee reviews each applicant’s experiences, attributes, and metrics as related to our core student physician competencies:
   - Patient care
   - Knowledge
   - Interpersonal and communications skills
   - Professionalism
   - System-based practice (working within the health care system to enhance care)
   - Life-long learning

The Admissions Committee determines whether the applicant will be granted a secondary application, interview, and ultimately acceptance to the UC Davis School of Medicine. Committee members attempt to do a holistic assessment of each applicant that includes, but is not limited to, the following experiences, attributes, and metrics (in no particular order of importance):

Experiences
   - Healthcare experience
   - Research experience
   - Leadership experience
   - Community service
   - Educational background
   - Experience working in inter-professional teams
• Life experiences (e.g. obstacles overcome)

Attributes
• Geographic origin (e.g. rural or medically underserved area)
• Resilience
• Motivation for a medical career
• Intellectual curiosity
• Communication skills, including listening and empathy
• Languages spoken, particularly by underserved patient populations
• Critical thinking skills including problem solving
• Professional responsibility and accountability
• Values and ethical beliefs
• Self-assessment and improvement skills
• Altruism and compassion
• Appreciation for diverse perspectives
• Ability to work in inter-professional teams
• Honesty and integrity

Metrics
• Undergraduate grades, grade trends, and course load
• Medical College Admissions Test (MCAT) score
• Performance in a post-baccalaureate and/or graduate degree program

Western Interstate Commission for Higher Education (WICHE) and residents of participating states will be considered as residents for the purposes of admission. For more information submit inquiries to WICHE at http://wiche.edu/askWICHE/submit or call 303-541-0200.

Transfer with Advanced Standing
We do not accept transfer students.

PROGRAM OF STUDY

Doctor of Medicine. The curriculum for the M.D. degree is normally a four-year program that provides comprehensive training for the practice of medicine and provides a blend of basic sciences training and clinical experience. The emphasis during the first two years is on the basic-science foundations of medicine. Medical students are introduced to patient care during their very first quarter of study, reflecting the school's commitment to the training of highly skilled clinicians. Several volunteer clinics, largely staffed by UC Davis medical students, provide an ideal setting for hands-on clinical experience.

Tailored Clinical Tracks. We offer tailored clinical training for students interested in providing care for rural communities, urban underserved communities, and communities in the San Joaquin Valley: Our newest track, offered in collaboration with Kaiser Permanente Northern California, is a three-year pathway through medical school for students committed to Primary Care careers.

Combined Degree Program. In addition to the Doctor of Medicine degree, the School of Medicine at UC Davis offers a variety of dual-degree programs through coordination with other graduate groups and divisions. These advanced degrees can couple the M.D. degree with the M.P.H., Ph.D., and M.B.A. that train physicians to meet, respond to and solve the broad diversity of problems and dilemmas facing current and future health care.

Meeting this challenge requires those capable of advancing our biological sciences knowledge base and others who can recognize and solve the ethical, political and humanitarian issues that confront the broad delivery of health care to all. Hence, the field for the Ph.D. in the joint degree program at UC Davis can be any graduate program offered on the UC Davis campus, extending beyond the traditional biological sciences boundaries, and strongly encouraging candidates to seek degrees in social sciences and humanities. All requirements for both degrees are met in a course of study that usually lasts seven years. To be admitted, and be concurrently enrolled in both degree programs, students must apply for separate admission to both the M.D. and Ph.D. programs and obtain permission of the School of Medicine M.D./Ph.D. Advisory Committee. Funding for two competitive fellowships is awarded annually to students enrolled in the M.D./Ph.D. program.

Advisory Committee. Inquiries about admission to graduate education should be directed to the Dean of Graduate Studies, University of California, One Shields Avenue, Davis, CA 95616. For more information concerning the combined-degree programs, contact Joanna Garcia, Office of Admissions, School of Medicine, University of California, 4610 X Street, Sacramento, CA 95817.

Master of Public Health (MPH) Degree. The Department of Public Health Sciences (PHS) offers the MPH degree. The MPH degree is accredited by the Council on Education for Public Health. Students apply for admission through the Office of Graduate Studies. The MPH program is designed for people interested in disease prevention and community health. The program includes instruction in epidemiology, biostatistics, environmental and occupational health, health services and administration, and social and behavioral science, and prepares students for an expanding range of professional opportunities and roles in public health and medicine. The MPH program runs on the main campus quarter system. The majority of courses are taught on the Davis campus. For more information, see http://mph.ucdavis.edu/.

ACADEMIC CALENDAR

The School of Medicine operates on a different schedule from the rest of the UC Davis campus. The program is a continuous four-year academic experience. The first year curriculum commences in mid-summer and extends through mid-spring of the following year. There is a six week break between the first and second year for electives, research, and remediation. The second year curriculum begins in early summer and extends through mid-spring of the following year. This is followed by a six-week academic period for preparation for USMLE Step 1. The third year clinical clerkships start in the spring and extend for 48 weeks. The fourth year curriculum begins immediately thereafter and extends through spring of the following year, with graduation in May.
BETTY IRENE MOORE SCHOOL OF NURSING AT UC DAVIS

Education Building, Sacramento campus
UC Davis Health System
916-734-2145; http://nursing.ucdavis.edu

The Betty Irene Moore School of Nursing at UC Davis advances health and ignites leadership through innovative education, transformative research and bold system change.

The school cultivates academic excellence through immersive, interprofessional and interdisciplinary education and research in partnerships with the communities it serves. Faculty, staff and students discover and disseminate knowledge to advance health, improve quality of care and shape policy.

The school was launched through a $100 million commitment from the Gordon and Betty Moore Foundation, the nation’s largest grant for nursing education. The Betty Irene Moore School of Nursing cultivates academic excellence and addresses urgent societal needs through:

- Leadership development—build capacity for advocacy and action at all levels
- Interprofessional/interdisciplinary education—health professionals learn multiple perspectives to work and communicate as teams
- Transformative research—apply the science of nursing to improve health and reshape health systems with emphasis on aging, rural health and diverse communities
- Cultural inclusiveness—teach culturally-appropriate approaches to care and involve communities to design and conduct relevant research
- Innovative technology—use technology to create an engaged and interactive approach to nursing education, research and practice

Through the Nursing Science and Health-Care Leadership Graduate Degree Program, the school welcomed its first classes for the Master of Science—Leadership and the Doctor of Philosophy degree programs in fall 2010 and for the Master of Science—Physician Assistant Studies Degree Program in summer 2013.

Graduates of the Betty Irene Moore School of Nursing are prime candidates for formal leadership positions. Graduates exercise leadership through scientific approaches, vision, initiative, cultural inclusiveness, teamwork, and a commitment to assuring health care is highly effective, compassionate and accessible. Students with experience or interest in leading the transformation of health care through nursing education and research are sought for the Nursing Science and Health-Care Leadership Doctor of Philosophy program. Ideal students want to focus on important societal health issues through the work of advancing health and improving the systems that provide health services.

Graduates of the Betty Irene Moore School of Nursing are prime candidates for formal leadership positions. Graduates exercise leadership through scientific approaches, vision, initiative, cultural inclusiveness, teamwork, and a commitment to assuring health care is highly effective, compassionate and accessible. The full-time, academic doctoral program prepares graduates as leaders in health care, health policy and education and research at the university level to:

- Conduct transformative research
- Educate health professionals and researchers
- Effect system change
- Influence and implement policy
- Advance health from multiple settings

Master of Health Services—Physician Assistant

The Master of Health Services—Physician Assistant Studies Degree Program prepares graduates to deliver care as physician assistants. In alignment with the school’s vision to advance health, a primary goal of the physician assistant program is to improve the availability of culturally relevant primary care to underserved populations and educate clinicians to deliver care as a member of a health-care team.

Physician assistants are health-care professionals licensed to practice medicine with physician supervision. As part of their comprehensive responsibilities, physician assistants conduct physical exams, diagnose and treat illnesses, order and interpret tests, counsel on preventive health care, assist in surgery and write prescriptions.
Within the physician-physician assistant relationship, the physician assistant exercises autonomy in medical decision making and provides a broad range of diagnostic and therapeutic services.

A physician assistant’s practice may also include education, research and administrative services.

The Master of Health Services—Physician Assistant Degree Program graduates are prepared to work as leaders of health-care teams and learn methods to continually critique and improve their care, provide care that is evidence-based, and to establish systems of care to address population health. All students must take core academic courses and complete a thesis as well as 1,630 hours of supervised clinical practice.

**Master of Science—Leadership**

Master’s degree leadership students are those with experience or interest in transforming health care through nursing education and research. They want to focus on important societal health issues through the work of advancing health and improving the systems that provide health services.

Graduates of the Nursing Science and Health-Care Leadership Graduate Degree Program are prepared for academic and leadership positions. Graduates exercise leadership through scientific thinking, responsibility, initiative, cultural inclusiveness, knowledge of organizations and system change, teamwork, and a commitment to healthy communities.

The full-time, professional master's degree leadership program prepares graduates for health-care leadership roles in a variety of organizations and as nurse faculty at the community college-level.

Some examples include:

- Leaders of health organizations and agencies—such as community clinics, trade associations, advocacy groups—improving quality of care and work environments, and advancing outcomes and health-care effectiveness and efficiency
- Community college and other prelicensure nursing faculty—teaching the next generation of nurses
- Legislative and governmental agency staff and leadership developing, influencing and implementing policy to improve access and outcomes (not limited to health agencies but other organizations that provide public infrastructure such as transportation, planning or parks and recreation)
- Careers across the health-care sector, such as insurance, pharmaceutical, hospital, home health, aging support services, adoption services, chronic illness support services and medical equipment industries fostering the integration of excellence in clinical care, management, policy, education and research
- Students who wish to enroll in this track must first be accepted into the M.S.—Nurse Practitioner program. Once accepted, the student works in conjunction with his or her adviser to determine dual-track eligibility.

**Master of Science—Nurse Practitioner and Physician Assistant Dual-Track Program**

Nurse practitioner students at the Betty Irene Moore School of Nursing can simultaneously prepare for both the nurse practitioner and physician assistant professions through the unique Master of Science—Nurse Practitioner and Physician Assistant Dual-Track Program.

This dual-track program is the only one in the nation where nurses are prepared to work as both nurse practitioners and physician assistants.

Students who wish to enroll in this track must first be accepted into the M.S.—Nurse Practitioner program. Once accepted, the student works in conjunction with his or her adviser to determine dual-track eligibility.

Students in the dual-track program must complete additional coursework and supervised clinical hours to meet both the nurse practitioner and physician assistant education requirements. The dual-track program is nine quarters in length. Upon completion of the dual-track program, students earn a Master of Science—Nurse Practitioner Track Degree in Nursing Science and Health-Care Leadership and are then eligible to complete the certification exam for the nurse practitioner and the licensing exam for the physician assistant.

**Preparation for the Study of Nursing**

The Nursing Science and Health-Care Leadership Graduate Degree Program is ideal for students who:

- See problems in health care and think of solutions
- Want to improve health systems and advance health
- Find value in diversity of thought, belief, language and culture
APPLYING FOR ADMISSION

Betty Irene Moore School of Nursing students are admitted during fall term only for the Master of Science—Leadership Track and Doctor of Philosophy programs and summer term only for the Master of Science—Nurse Practitioner and Master of Health Services—Physician Assistant programs. Students applying for the physician assistant or nurse practitioner programs must complete a Centralized Application System for Physician Assistants (CASPA) application and meet selection criteria. Following that process, a select pool of qualified applicants is invited to apply for UC Davis graduate admissions. All invited applicants must meet UC Davis graduate admissions requirements. Online applications are available through the Office of Graduate Studies website at http://gradstudies.ucdavis.edu.

Application deadlines and requirements vary by program and year. For more information, please see the School of Nursing website at http://nursing.ucdavis.edu or contact the School of Nursing at 916-734-2145.

DOCTOR OF PHILOSOPHY

Admission Requirements

• A bachelor's degree in nursing or a related field
• A minimum undergraduate G.P.A. of 3.000
• Three (3) letters of recommendation
• A statement of purpose and personal-history statement, including research interests and future goals
• The application process may require an interview
• G.R.E. is not required

Degree Program Requirements

Required courses for the doctoral program include a combination of core courses and electives. Students work with their advisers to select electives appropriate to their areas of interest.

• Full-time enrollment (12 units per quarter) is required
• Required courses for the doctoral-degree program include a combination of core and elective courses. A series of courses in research methods is also required
• Doctoral students are required to pass an oral qualifying examination. The intent of the oral qualifying examination is to determine whether the student is adequately prepared and sufficiently intellectually independent to conduct doctoral-level research. The exam may include both an oral component as well as the student's proposal for the dissertation research
• A doctoral dissertation is required. Students will enroll in dissertation units as full-time students after the qualifying exam until the dissertation is complete
• Ph.D. students are expected to complete the program in four years

MASTER OF HEALTH SERVICES—PHYSICIAN ASSISTANT STUDIES DEGREE PROGRAM

Admission Requirements

• A bachelor's degree in a health-related field
• A minimum undergraduate G.P.A. of 3.000
• A minimum 2,700 G.P.A. in all science prerequisite coursework
• A minimum of 1,000 hours of paid or volunteer experience in a clinical environment with direct patient exposure
• Statement of purpose, personal-history statement, research interests and future goals
• The application process may require an interview
• G.R.E. is not required

Degree Program Requirements

• Full-time enrollment (12 units per quarter) is required.
• Required courses for the master's degree program include a combination of core courses and electives. Six graduate-level core courses—Health Status and Care Systems, Implementation Science, Leadership in Health Care, Quantitative Skills for Change, Community Connections and an Informatics course—and the Master's Degree Seminar are required courses for the master's-degree program
• A master's thesis is required
• Physician assistant students are expected to complete the program in 27 months

MASTER OF HEALTH SERVICES—LEADERSHIP TRACK DEGREE PROGRAM

Admission Requirements

• Current registered nurse (R.N.) licensure
• A bachelor's degree in nursing or a related field
• A minimum undergraduate G.P.A. of 3.000
• A statement of purpose and personal-history statement, including research interests and future goals
• Three (3) letters of recommendation
• The application process may require an interview
• G.R.E. is not required

Degree Program Requirements

• Full-time enrollment (12 units per quarter) is required.
• Required courses for the master's-degree leadership program include a combination of core courses and electives. Six graduate-level core courses—Health Status and Care Systems, Implementation Science, Leadership in Health Care, Quantitative Skills for Change, Community Connections and an Informatics course—and the Master's Degree Seminar are required courses for the master's-degree program
• Students work with their advisers to select electives appropriate to their areas of interest
• A master's thesis is required
• M.S.—Leadership Track students are expected to complete the program in five quarters. A sixth quarter option is available if needed
MASTER OF HEALTH SERVICES—NURSE PRACTITIONER TRACK DEGREE PROGRAM

Admission Requirements

- Current registered nurse (R.N.) licensure
- A bachelor’s degree in nursing or a related field
- A minimum undergraduate G.P.A. of 3.000
- A minimum 2.700 G.P.A. in all science prerequisite coursework
- A statement of purpose and personal-history statement, including research interests and future goals
- The application process may require an interview
- G.R.E. is not required

Degree Program Requirements

- Full-time enrollment (12 units per quarter) is required.
- Required courses for the master’s-degree program include a combination of core courses and electives
- A master’s thesis is required
- Nurse practitioner track students are expected to complete the program in 24 months

MASTER OF HEALTH SERVICES—NURSE PRACTITIONER AND PHYSICIAN ASSISTANT DUAL-TRACK PROGRAM

Nurse practitioner students at the Betty Irene Moore School of Nursing can simultaneously prepare for both the nurse practitioner and physician assistant professions through the unique Master of Science—Nurse Practitioner and Physician Assistant Dual-Track program. This dual-track program is the only one in the nation where nurses are prepared to work as both nurse practitioners and physician assistants.

Students who wish to enroll in this track must first be accepted into the M.S.—Nurse Practitioner Program. Once accepted, the student works in conjunction with his or her adviser to determine dual-track eligibility. Students in the dual-track program must complete additional coursework and supervised clinical hours to meet both the nurse practitioner and physician assistant education requirements.

ACADEMIC CALENDAR

The School of Nursing operates on the traditional UC Davis campus quarter system. The Doctor of Philosophy program is a four-year academic program and requires full-time enrollment. Core courses are offered fall, winter and spring quarters (not summer).

The Master of Health Services—Physician Assistant Studies Degree Program is a full-time, 27-month program. Core courses are offered summer, fall, winter and spring quarters.

The Master of Science—Leadership Degree Program is a full-time, professional degree five-quarter program. Core nursing courses are offered in fall, winter and spring quarters only (not summer).

The Master of Science—Nurse Practitioner Degree Program is a full-time, 24-month program. Core courses are offered summer, fall, winter and spring quarters.
The mission of the School of Veterinary Medicine is to advance the health of animals, people and the environment through teaching, research and public service. Students are offered a rigorous four-year program of study that prepares them for diverse career opportunities in veterinary medicine.
UNDERGRADUATE COURSES

Lower Division Courses

These courses, numbered 1–99, are open to all students for lower division credit, but are designed primarily for freshmen and sophomores.

Upper Division Courses

These courses, numbered 100–199, are open to all students who have met the necessary prerequisites as indicated in the General Catalog course description. Preparation should generally include completion of one lower division course in the given subject or completion of two years of college work.

VARIABLE-UNIT COURSES

Subject to approval by the department chair, an instructor may arrange to give a special study course (numbers 90X, 92, 97T, 97TC, 98, 99, 190X, 192, 194H, 197T, 197TC, 198, 199) to interested students. These courses may be offered any fall, winter, or spring quarter as determined by the department.

• 90X/190X (Seminar) are seminar courses for in-depth examination of a special topic within the subject area.
• 92/192 (Internship) courses enable individual students to obtain practical experience to complement their educational goals or to explore potential career interests and opportunities. Students must have completed 84 units before enrolling in course 192.
• 97T/197T (Tutoring) and 97TC/197TC (Tutoring in the Community) are courses for students who want to tutor in a subject in which they are proficient—generally in their major field—while enrolled as an undergraduate.
• 98/198 (Directed Group Study) courses are set up on a one-time basis for a group of students in a subject for which no regular courses have been established.
• 99 (Special Study for Undergraduates) is a course arranged for an individual student who shares, with an instructor, an academic interest that cannot be accommodated within the formal course structure.
• 194H (Special Study for Honors Students) courses are for individual students with honor status, as determined by the department offering the course and who have completed 84 units.
• 199 (Special Study for Advanced Undergraduates) courses are the upper division counterparts of course 99 and involve supervised independent study and research requiring adequate background in the subject proposed for study as well as prior completion of 84 units.

Credit in courses 99, 194H and 199 is limited to a total of 5 units per term.

Autotutorial Courses are courses in which students instruct themselves at their own pace. These courses can be identified by the letters AT at the end of their course numbers, e.g., 13AT, 141AT.

Virtual Courses are courses in which instruction is delivered on the Internet. These courses can be identified by the letter V at the end of their course numbers, e.g., 10V, 162V.

Research Conference Courses are courses in which advanced undergraduate students may participate in critical discussions of staff research activities. These one-unit courses are numbered 190C and are graded on a Passed/Not Passed basis.

GRADUATE COURSES

Courses numbered 200–299 are open to graduate students and to undergraduates who have completed 18 units of upper division work basic to the subject matter of the course. However, admission is subject to the approval of the instructor in charge of the course. Grading in 290C courses and most variable-unit 299 or 299D courses is Satisfactory/Unsatisfactory. Check the course description for grading information.

PROFESSIONAL COURSES FOR TEACHERS AND NURSE PRACTITIONERS

Courses numbered 300–399 are teacher-training courses in the School of Education and in other departments and are especially intended for teachers or prospective teachers. Courses designed to provide instruction to teaching assistants are included. Courses for certification of family nurse practitioners and physician assistants are also included. These courses are open only to students enrolled in those programs.

OTHER PROFESSIONAL COURSES

Courses numbered 400–499 are professional training courses. Graduate students should consult their faculty adviser or contact the Graduate Studies Office before registering in 400 series courses to determine if graduate credit may be awarded for the course in question.

PREREQUISITES

Prerequisites for courses should be noted carefully; the responsibility for meeting these requirements rests on the student. If you can demonstrate that your preparation is equivalent to that specified by the prerequisites, the instructor may waive these requirements for you. However, the prerequisite that requires that you complete 84 units before registering in the course may not be waived. The instructor in charge of a course may request that the Registrar drop from the course any student who has enrolled without completing the published prerequisites if, in the judgment of the instructor, failure to have completed that work seriously reduces the probability that the student will successfully complete the course. An instructor who intends to exclude a student for this reason must notify the student before taking action.
COURSE DESCRIPTIONS

Below is a sample of how a course is listed in this catalog.

190. Proseminar in Nutrition (1)
Seminar—1 hour. Prerequisite: senior standing; course 111. Discussion of human nutrition problems. Each term will involve a different emphasis among experimental, clinical, and dietetic problems of community, national and international scope. May be repeated twice for credit with consent of instructor.—I, II, III. (I, II, III.) Zidenberg-Cherr

Top line is course number; title; units.
Paragraph following is course instructional format; prerequisite; course description; grading, if other than letter grading; GE attributes, if any; quarter offered 2014–15; quarter offered 2015–16 (in parentheses); instructor (if specified).

Quarters offered is the quarter in which a course is intended to be given is shown as follows:
• I. Fall Quarter (September to December) or Fall Semester (August to December), School of Law
• II. Winter Quarter (January to March) or Spring Semester (January to May), School of Law
• III. Spring Quarter (April to June)
• IV. Summer Quarter (July to September)
The quarter a course is offered is subject to change. For more information, consult the department.

Alternate Year Designation

Some course descriptions will include the phrase “Offered in alternate years.” If the course will be offered in the 2014–15 academic year, the quarter designation immediately follows the description. If the course will be offered in the 2015–16 academic year, the quarter designation is inside parentheses.

Multi-Quarter Courses

A series of course numbers followed by two or three letters (for example, Physics 110A-110B-110C) is continued through three successive quarters, ordinarily from September to June. The first quarter course listed this way is a prerequisite to the second and the second is prerequisite to the third. On the other hand, where A and B portions of a course are listed separately (for example, Economics 160A and 160B), the A course is not a prerequisite to B, unless it is specifically mentioned in the list of prerequisites.

Expanded Course Descriptions

Because of space limitations, you may find that the descriptions in the General Catalog do not include all the information you would like about a course. The faculty has responded to this need by writing the “Expanded Course Descriptions,” giving more detailed explanations about each course offering. These descriptions are available each quarter to assist students in selecting their courses. They contain such information as texts used, preparation required of students, basis for grading, course format, special assignments (papers, field trips, etc.) and a topical outline of the material to be covered.

Copies of the “Expanded Course Descriptions” are available for on-campus use at the College dean's offices or the Biology Academic Success Center, advisers' offices, advising centers, and departmental offices.

The course offerings and instructors listed in this catalog are subject to change without notice. For the most current offerings and instructors, refer to the General Catalog Supplement at http://catalog.ucdavis.edu/.
African American and African Studies

( College of Letters and Science)
Halifu Osumare, Ph.D., Director
Program Office, 2201 Hart Hall
530-752-1548; http://aas.ucdavis.edu
Committee in Charge
Wale Adebanwi, Ph.D.
(African American and African Studies)
Moradewun Adejunmobi, Ph.D.
(African American and African Studies)
Milmon Harrison, Ph.D.
(African American and African Studies)
Laurie Lambert, Ph.D.
(African American and African Studies)
Bettna Ng‘weno, Ph.D.
(African American and African Studies)
Halifu Osumare, Ph.D.
(African American and African Studies)
Elisa Joy White, Ph.D.
(African American and African Studies)
Faculty
Wale Adebanwi, Ph.D., Assistant Professor
Moradewun Adejunmobi, Ph.D., Professor
Milmon F. Harrison, Ph.D., Senior Lecturer SOE II
Bettna Ng‘weno, Ph.D., Associate Professor
Halifu Osumare, Ph.D., Professor
Emeriti Faculty
John Stewart, Ph.D., Professor Emeritus
Distinguished Former Faculty
Jacob K. Olupona, Professor
Patricia A. Turner, Ph.D., Professor
The Major Program
African American and African Studies is an interdisciplinary field of study in the humanities, arts, and social sciences. This major introduces students to the social cultural, historical and artistic dimensions of global African Diaspora and Black communities in the United States, Africa, Europe, Asia, Caribbean, Latin America and Pacific regions of the world. The instructors are creative, accessible and highly qualified, with specializations across a range of disciplines. Students are exposed to and trained to think critically about the conditions and demands of global societies. Students may choose to enrich their education studying for a summer, a quarter, or a year in Africa, or by studying for a quarter in the Caribbean. Majors and Minors are also encouraged to take advantage of relevant internship opportunities.

The Program
The purpose of this program is to give African American students a sense of the individual characteristics and common concerns of Black communities in Africa, the United States, and in the wider Diaspora. The African American emphasis includes courses on history, culture, and the impact of developments in politics and the economy on the social organization of Black people in the United States. The African Diaspora emphasis enables students to study the way Black people outside Africa and the United States have dealt with questions of race and ethnicity. It also considers how they have defined their identity in the political arena as well as by religion, art, dance, literature and film. The African emphasis allows students to focus on Africa’s recent history, social issues, and contemporary culture.

Career Alternatives
Students majoring in African American and African Studies gain knowledge and strong critical thinking and analytical skills, problem-solving skills and communication skills, all suited for advanced studies in the social sciences, low, education and professional schools. Graduates in the major have pursued careers in education, the private and public sectors, the non-profit sector, international organizations and in human service. The interdisciplinary nature of African American and African Studies is excellent preparation for professional organizations as the Urban League, NAACP and the Office of Economic Opportunity.

A.B. Major Requirements:
The major program must be developed in consultation with the African American and African Studies Adviser, and approved by the program’s Faculty Adviser.

Preparatory Subject Matter .......................... 28
One course from: African American and African Studies 10, 12 .......................... 4
One course from: African American and African Studies 15, 17, 18, 50, 51, 52, 80 .......................... 4
One course from: Anthropology 2; Economics 1A, 1B; Geography 2; Sociology 1; Political Science 1, 2; Psychology 1 .......................... 4
One course from: Chicana/o Studies 10; Native American Studies 1, 10; Women & Gender Studies 50; American Studies 10; Asian American Studies 1, 2 .......................... 4
Two courses from: History 135, 17A, 178 .......................... 8
A coordinated program of upper division courses, selected and approved in consultation with the major adviser and chosen to reflect the student’s major emphasis .......................... 24

Depth Subject Matter .......................... 36
One course from: Africana Studies 111, 123, 130, 133, 141, 145A, 145B, 156, 162, 163, 165, 172, 176, 177 .......................... 8
A coordinated program of upper division courses, selected and approved in consultation with the major adviser and chosen to reflect the student’s major emphasis .......................... 24

Possible areas of emphasis include the following: Creative arts in the black community worldwide, social and political trends in the global black community, African American society and culture, African Diasporas. These areas of emphasis allow majors to develop research and writing courses for students in the major. They are not the only areas of emphasis that students may choose for the major.

Related Upper Division Courses
The following courses are offered by faculty members in other disciplines and focus on African American studies, African diaspora studies, or African studies.

Total Units for the Major .......................... 64
Major Adviser, Contact Program office.

Minor Program Requirements:

Minor African American and African Studies ... 24
Select one course from: African American and African Studies 10, 12, 15, 17, 18, or 80 .......................... 4
Select any five upper division courses offered in African American and African Studies, but not including African American and African Studies 154.

Note: Although a course may be listed more than once, such a course may satisfy only one requirement.

American History and Institutions.
This University requirement may be satisfied by completion of African American Studies 100; see also under University Requirements, on page 96.

Courses in African American and African Studies (AAS)

Lower Division

African American Culture and Society (4)
Lecture—3 hours; discussion—1 hour. Critical examination of the historical, political, social, and economic factors that have affected the development and status of African-American people in contemporary society. GE credit: SocSci, Div | ACGH, DD, SS, WE—I. (II.) Harrison

Introduction to African Studies (4)
Lecture/discussion—4 hours. Introduction to African Studies which will focus on the various disciplinary perspectives through which African society and culture are generally studied. A survey of methods, resources and conceptual tools for the study of Africa. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE—II. (II.) Adebanwi, Adejunmobi

Introduction to African American Humanities (4)
Lecture—3 hours; discussion—1 hour. Introduction to the humanist tradition developed by writers, philosophers, and artists of African descent in the West. Attention also given to African sources, as well as European, Caribbean, Latin-American, and North American variations on this tradition. Class size limited to 165 students. GE credit: Wrt | ACGH, AH, DD—II. (II.) Harrison

Verbal and Performance Arts in Africa (4)
Lecture-discussion—4 hours. African verbal arts; oral texts from different African cultures. Types of critical response to oral texts, role of oral artists, context and esthetics of oral performance in Africa. GE credit: ArtHum, Div, Wrt | AH, VL, WC.—II. (II.) Adejunmobi

Women in African Societies (4)
Lecture/discussion—4 hours. Gender relations in traditional and contemporary African society. Involvement of African women in politics, religion, the economy, the arts. African responses to feminist theory. Images of women in African literature. GE credit: SocSci, Div, Wrt | SS, WC, WE—III. (III.) Adebanwi

Introduction to Caribbean Studies (4)
Lecture—3 hours; discussion—1 hour. Introduction to the contemporary culture, peoples, politics, and societies of the Caribbean. Topics include movements of people, goods and ideas across the Atlantic world and creative productions within the Caribbean. GE credit: ArtHum or SocSci | AH or SS, WC—II. (II.) Ng‘weno

Black Popular Culture (4)
Lecture—3 hours; discussion—1 hour. Survey of the African American images in popular culture (film, television, comedy, sports and music). GE credit: AH or SS, WC—III. (III.) Harrison

History of Afro American Dance (4)
Lecture—3 hours; discussion—1 hour. Evolution of African-American dance, tracing its history and development, from West and Central Africa to the United States. Investi...
gates the social and cultural relevance of African American dance and its artistic merits through contributions from its choreographers and performers. GE credit: ArtHum | AH, DD, VL.—III. (III.) Osumare

52. African Traditional Religion (4)
Lecture—2 hours; discussion—2 hours. Introduction to traditional religions of the sub-Saharan African peoples, emphasizing oral arts, rituals and symbols in West, East, Central and South African indigenous religions. Examines themes: sacred kingship, divination system, women, prophecy, conversion and adaptation, religious pluralism. GE credit: ArtHum, Div, Wrt | AH, WC.—II. (II.)

80. Introduction to Black Politics (4)
Lecture—4 hours. Introduction to the analysis of African politics, using conceptual frameworks from political science and other social sciences. GE credit: SocSci, Div, Wrt.—III. (III.) Harrison

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Upper Division

100. Survey of Ethnicity in the U.S. (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing or consent of instructor. Limited enrollment. Ethnographic and historical analysis of the experience, culture, and relations of and between groups considered racial and/or ethnic minorities in the United States. GE credit: ArtHum | ACGH, AH, DD.—II. (II.) Harrison, Osumare

101. Introduction to Research in the Afro-American Community (4)
Lecture—4 hours. Prerequisite: course 10 or consent of instructor. Introductory survey of Afro-American Studies methods and techniques; problems and methodology in Afro-American Studies.—III. (III.) Harrison, White

107A. African Descent Communities and Culture in the Caribbean and Latin America (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Origin and development of African descent communities and cultures in the Caribbean, and Latin America. The similarities and differences among African descent communities and cultures in terms of religious practices, music, and national identity. GE credit: ArtHum, Div, Wrt | WC.—I. (I.) Lambert, Ng’weno

107B. African Descent Communities and Culture in North America (4)
Lecture—2 hours; discussion—1 hour; term paper. Prerequisite: upper division standing. Origin and development of African descent communities and culture in the U.S., Canada, and Mexico from the African slave trade to contemporary urban society. Offered in alternate years. GE credit: ArtHum, Div, Wrt.—II. (II.)

107C. African Descent Communities and Culture in Europe and Asia (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. The study of the origin and development of African descent communities and cultures in Europe and Asia. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC.—II. (II.) Adebawuni, Adejumobi

110. West African Social Organization (4)

111. Cultural Politics in Contemporary Africa (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Themes and style of new cultural forms in Africa as displayed in art, music, film and writing, especially in regard to blending of indigenous and foreign influences. Social and political forces shaping contemporary cultural expression. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC.—II. (II.) Adebanwi, Adejumobi

123. Black Female Experience in Contemporary Society (4)
Lecture—4 hours. Prerequisite: upper division standing or consent of instructor. Black female social, intellectual, and political development. Black women’s contributions in history, literature, and social science; life experiences of Black women and philosophical underpinnings of the feminist movement.—Offered in alternate years. GE credit: ArtHum or SocSci, Div | ACGH, DD, SS.—III. (III.) Lambert

130. Education in the African Community (4)
Lecture—2 hours; discussion—1 hour; fieldwork—3 hours. Prerequisite: upper course 100, completion of the subject A requirement. Examination of the history of the education of African Americans in the United States. Examination and critique of contemporary theories concerning the schooling of African Americans. Offered irregularly. (Former course 140.) GE credit: SocSci | DD, SS.—I. (I.)

133. The Black Family in America (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing or consent of instructor. Analysis of social science research to examine relationships between black (African-descent) family structures, patterns of functioning, and political, economic, and social development in the U.S. Offered in alternate years. GE credit: SocSci, Div | ACGH, DD, SS.—III. (III., IV, III.) Harrison

141. Psychology of the African American Experience (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 10 or consent of instructor. Introduction to the psychological issues faced by African Americans. Analysis of issues from European/Western and Afro-centric frame of reference. Emphasis on Optimality Theory, a psychological theory based on an Afro-centric world view.—III. (III.) Haggins

145A. Black Social and Political Thought (4)
Lecture—4 hours. Prerequisite: course 10 or 80, or consent of instructor. Exploration and analysis of Black social and political thought in the Americas. Offered in alternate years. GE credit: SocSci, Div | DD, SS.—III. (III.) Harrison

145B. Black Intellectuals (4)
Lecture—4 hours. Prerequisite: course 10, 80, 145A, or consent of instructor. Exploitation and critical analysis of selected theoretical writings of Black intellectuals, and especially political and social thinkers, in the American and African Diaspora. GE credit: SocSci, Div | DD, SS, WE.—(III.) Harrison, Lambert, Osumare

150A. Afro-American Visual Arts Tradition: A Historical and Cultural Study (4)
Lecture—4 hours; discussion—4 hours. Prerequisite: upper division standing. Afro-American visual arts tradition, folk and formal, in historical and cultural context, from 1600 through Reconstruction. GE credit: ArtHum, Div.—I. (I.)

150B. Afro-American Visual Arts Tradition: A Historical and Cultural Study (4)
Lecture—4 hours. Prerequisite: upper division standing. Afro-American visual arts tradition, folk and formal, in historical and cultural context, from 1600 through Reconstruction. GE credit: ArtHum, Div.—II. (II.)

151. Afro-American Vernacular Music and Verbal Arts (4)
Lecture—2 hours; discussion—2 hours. Socio-political dimensions of African-American musical forms like spiritual, work song, minstrelsy blues, rhythm and blues, jazz, gospel, soul and contemporary pop, and related verbal arts like preaching, toasting, rapping.—III. (III.)

152. Major Voices in Black World Literature (4)
Lecture—2 hours; discussion—1 hour; term paper. Prerequisite: upper division standing, completion of course 10, or course 12, or course 18. Recurrence of cultural tropes in the works of major black world authors and formation of an African-oriented canon. Prerequisites: activities include critical reading and discovery of literature as a cultural resource. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, DD, WC, WE.—(II.) Adejumobi

153. African Literature (4)
Lecture—3 hours; term paper. Prerequisite: completion of Entry Level Writing Requirement (ELWR). Colonial and post-colonial sub-Saharan African literature and the African oral traditions from which it emerged. Genres and themes of African literature from the nineteenth century to the present. Offered in alternate years. [Same course as Comparative Literature 154.] GE credit: ArtHum, Div, Wrt | AH, WC, WE.—III. (III.) Adejumobi

155A. African-American Dance and Culture in the United States, Brazil and the Caribbean (4)
Lecture/discussion—4 hours. Comparative study of the cultural contributions of African-Americans in the U.S.A., Brazil, Haiti, Cuba, Jamaica, Barbados, and Trinidad. Examination of ritual, folk, and popular dance forms and the socio/historical factors that have influenced these forms. [Same course as Dramatic Art 155A.] GE credit: ArtHum | AH, VL, WC.—II. (II.) Osumare

156. Language and Identity in Africa and the African Diaspora (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing or course 12. Relationship between language and identity in literature from Africa and the African Diaspora. Use of pidgins, creoles, translation from African languages, and impact of language policies. Offered irregularly. GE credit: ArtHum, Div | AH, DD, WC.—III. (III.) Adejumobi

157. Literature and Society in South Africa (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Political and social developments in 20th-century South Africa as illustrated by a range of South African writing. Response of different writers to race relations, impact of government policy on types and context of writing. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, WC, WE.—II. (II.) Adejumobi

160. African-American Folklore (4)
Lecture—2 hours; discussion—1 hour; fieldwork—3 hours. Prerequisite: course 10. Theory and history of African American folklore and folk life, including music, material culture, oral history, proverbs and humor. African and Caribbean cultural influences on New World folk genres will be probed. GE credit: ArtHum, Div.—III. (III.)

162. Islam in Africa and the Americas (4)
Lecture/discussion—4 hours. Prerequisite: Introduction to Afro-American Studies 60 or course 12 or course 110. Comparative and historical survey of Islam in the regional and cultural settings of Sub-Saharan Africa and the Americas. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WC, WE.—III. (III.)

163. African Religions in the Americas (4)
Lecture—2 hours; discussion—2 hours. Prerequisite: course 10; course 15 or consent of instructor. Comparative study of African religious traditions and belief systems in the Americas: Jamaica, Trinidad, Cuba, U.S.A., Haiti, and Brazil. Emphasis on the origins and development of Candomble, Santeria, Shango, Vodun, and Rastafariism in the New World. [Former course 153.] GE credit: ArtHum, Div, Wrt | AH, WC, WE.—III. (III.)

165. Afro-Christianity and the Black Church (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing; course 10, 15 or consent of instructor. Examination of the historical role of Christian belief and practice as well as the institution of the Black Church in the experience of African Americans, from slavery to the present. Offered in alternate years. GE credit—SocSci, Div | ACGH, DD, SS.—III. (III.) Harrison
168. Black Documentary: History and Theory (4)
Lecture—3 hours; laboratory—5 hours. Prerequisite: Film Studies 1, course 170; course 50 recommended; consent of instructor. Study of Black documentary history and methodology. Fundamentals of documentary practice and the role of documentary films and modern technology in the history of African American life. GE credit: ArtHum, Div | AH, DD, VL, W, WC.—(II.) Lambert, White

170. African-American Film and Video (4)
Lecture—3 hours; film viewing—3 hours. Prerequisite: Film Studies 1, course 50 recommended. Comparative analysis of the African American experience in film and video. Overview of African American cinema and its impact on American society. Role of African Americans in actively shaping their representation. GE credit: ArtHum, Div | AH, DD, VL, WE.—II. White

171. Black African and Black European Film and Video (4)
Lecture—discussion—3 hours; film viewing—3 hours; term paper. Prerequisite: one of course TS, 50, or English 160 or 162, or consent of instructor. Comparative analysis of the African American experience in film and video. Overview of African American cinema and its impact on American society. Role of African Americans in actively shaping their representation. GE credit: ArtHum, Div, Wrt | AH, DD, VL, WE.—II. (II.) Lambert, White

172. Diaspora and New Black Identities (4)
Lecture—discussion—3 hours; term paper. Critical analysis of what it means to be Black/African American in the United States today. Topics include old and new diasporas, immigration, national origin, language, religion, class, education, politics, identity and culture, and heritage. GE credit: SocSci, Div, Wrt | AGCH, DD, SS, WE.—II. (II.) Lambert

175A. Black Documentary: History and Theory (4)
Lecture—3 hours; film viewing—3 hours. Prerequisite: Film Studies 1, course 170; course 50 recommended. Black documentaries and documentary theory. Use of black documentaries for political purposes. Offered in alternate years. GE credit: ArtHum, Div | AH, DD, VL, WE.—II. (II.) Lambert

175B. Black Documentary Practicum (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 175A and consent of instructor. Creation of documentary projects, with students working in production crews. Offered in alternate years. GE credit: ArtHum | AH, DD.—II, III

176. The Politics of Resources (4)
Lecture/discussion—4 hours. Prerequisite: course 12 or 110; limited enrollment. Examination of the ways in which the processes of the extraction, purification, and use of natural resources and the complex regimes of valuation and commodification they (re)produce lead to cooperation and conflict in contemporary American society. GE credit: SocSci | SS, WC.—III. (III.) Adebanwi

177. Politics of Life in Africa (4)
Lecture—discussion—4 hours. Existing income capacities in the structures of state and society in Africa for people to live well. Topics include institutions and practices that define state and civil society encounters in Africa; democracy, ethnicity, economic crisis, religion, citizenship, etc. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS, WC.—II. Adebanwi

180. Race and Ethnicity in Latin America (4)
Lecture/discussion—4 hours. The social and political effects of racial and ethnic categorization in Latin America, including issues of economic production, citizenship, national belonging, and access to resources. Emphasis is on peoples of African, Indigeneous, and African descent. GE credit: ArtHum or SocSci, Div | SS, WC, WE.—II. (II.) Ngweno

181. Hip Hop in Urban America (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing or consent of instructor. Must have Junior or Senior level standing. History, aesthetics, urban and economic impacts of hip hop in the US, and its globalization. Hip hop’s four artistic elements—rap, deejaying, breakdancing, and aero-sol art—allow the examination of issues of race, ethnicity, and gender in youth culture and American society. GE credit: ArtHum | AH, DD, VL.—III. (III.) Osumare

182. Hip Hop Culture & Globalization (4)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 181 preferable, not required. Investigation of hip-hop youth cultures outside the United States using globalization and Cultural Studies theories. Analysis of international hip-hop sites in Africa, Asia, Europe, South America, and elsewhere. Through reading, discussion, and visiting virtual sites. Offered in alternate years. GE credit: ArtHum, Div | AH, WL.—III. (III.) Lambert

185. Topics in African-American Film (4)
Lecture—3 hours; film viewing—3 hours. Prerequisite: course 170; course 50 recommended. Intensive study of special topics in African American film. May be repeated one time for credit. GE credit: ArtHum, Div, Wrt | AH, DD VL.—II. (II.) Lambert, White

190. Topics in African and African-Diaspora Studies (4)
Lecture/discussion—3 hours; term paper. Prerequisite: upper division standing in African American and African Studies or consent of instructor. Intensive treatment of a special topic or problem in African or African Diaspora Studies. May be repeated one time for credit when topic differs.—III. Lambert

192. Internship in African and African Studies (1-8)
Internship—3-24 hours. Prerequisite: upper division standing, completion of 12 units of upper division study in African American and African Studies courses and consent of instructor. Enrollment limited to African American and African Studies majors and minors. Supervised internship in community, government, or private institutions, in all subject areas offered by the African American and African Studies Program. May be repeated for credit for a total of 12 units. (P/NP grading only.)

1975. Tutoring in Afro-American Studies (1-5)
Tutoring—1-5 hours. Prerequisite: consent of major committee, upper division standing in major in Afro-American Studies. Leading of small voluntary discussion groups affiliated with one of the department’s regular discussion groups. May be repeated for credit for a total of six units. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Graduate 201. Critical Foundations in African American Studies (4)
Seminar—3 hours. Prerequisite: graduate standing. Introduction to history of African American Studies. Topics include: research agendas, policy implications, debates, crises, and institutional frameworks. Offered in alternate years.—(I.) Harrison, Osumare

Seminar—3 hours; term paper. Prerequisite: graduate standing. Introduces students to the history and current organization of African Studies as area of intellectual investigation. Offers students an opportunity to review research agendas and policy implications, debates, crises, and institutional frameworks surrounding the production of knowledge about Africa. Offered in alternate years.—III. Adebanwi, Adejumobi

203. Critical Foundations in African Diaspora Studies (4)
Seminar—3 hours; term paper. Integrative conceptual framework includes History, Geography, Political Economy, Culture, and as tools to investigate the African Diaspora. Students engage African Diaspora theories within their research projects understanding issues developing from the movement of Africans to the rest of the world.—III. Lambert, White

204. Methodologies in African American and African Studies (4)
Seminar—3 hours; term paper. The relationship between theory and methodology, with emphasis on identifying relevant Methodological approaches and constructing theoretically informed research projects for studying the experience of people of African descent whether on the African continent or in the rest of the world.—I. Harrison, Ngweno

298A. Directed Group Study in African American and African Diaspora Studies (1-5)
Prerequisite: graduate standing. May be repeated for credit up to three times. (S/U grading only.)

298B. Directed Group Study in African Studies (1-5)
May be repeated for credit up to three times. (S/U grading only.)

299. Directed Group Study in African Studies (1-12)
(S/U grading only.)
Agricultural and Environmental Education

(College of Agricultural and Environmental Sciences and School of Education)

The Major Program

The major serves those interested in teaching agricultural and environmental sciences in schools or in non-formal settings such as nature preserves, environmental camps, or other venues. This major prepares graduates to direct programs in the agricultural and environmental sciences as well as provides them with a skill set necessary to work within social science careers related to these fields. This program of study meets state and federal requirements for entry into teacher preparation in agriculture and science, as well as requirements in Career Technical Education (CTE).

The Program

The program is designed to provide students with a broad background in various agricultural and environmental science disciplines, e.g., animal science, environmental science, plant and soil science, agricultural engineering, business management, agroecology, and horticulture. The program also focuses on the social sciences related to human resource development. The program provides students with practical experiences through fieldwork, school, and non-formal learning sites placements, or placement in sites related to a student’s focus of study. Through this major students will have the opportunity to explore and then incorporate agricultural and environmental issues into educational and development settings.

Career Alternatives

The need for scientists, technicians and educators to assist in domestic and international agricultural and environmental programs has created a continued demand for qualified instructors and supervisory personnel. This major also provides general preparation which is appropriate for work in banking, sales and service, rural recreation and related agricultural and environmental sectors. Students interested in obtaining breadth in both agricultural and environmental sciences will appreciate the scope and flexibility the major provides.

B.S. Major Requirements (AE):

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<tr>
<th>Units</th>
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<tr>
<td>Government/U.S. Constitution ................. 4</td>
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<tr>
<td>History 17A or Political Science 1 .......... 4</td>
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<tr>
<td>Preparatory Subject Matter ................. 50</td>
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A minimum of eight (8) units is required in each area of Animal Science, Agricultural Business and Economics, Applied Biological Systems Technology, Environmental Horticulture, Environmental Science and Natural Resources, and Plant and Soil Science. A maximum of eight (8) units can be selected from the following areas of study:

- Animal Science 1, 2, 21, 22
- Applied Biological Systems Technology 1, 52, 49, 101
- Agricultural & Resource Economics 15 and either Economics 1A or 1B
- Environmental Horticulture 1, 6
- Plant Sciences 5
- Environmental Science and Policy 10
- Environmental Toxicology 10, Hydrologic Sciences 10, 47
- Plant Sciences 1, 2, 15, 49
- Viticulture and Enology 2, 3

Science/Math Preparatory ................. 42-44

- Biological Sciences 2A & 2B
- Chemistry 2A & 2B
- Geology 1, 20
- Soil Science 10
- Mathematics 16A & 16B, or 17A&B
- Physics 7A & 7B

Agricultural and Computing Information Systems

See Applied Computing and Information Systems, on page 165.
Upper Division

100. Concepts in Agricultural and Environmental Education (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: upper division standing. Philosophy and nature of formal and non-formal agricultural and environmental education programs. Emphasis on understanding the role of the teacher and observing a variety of programs. GE credit: SocSci, Wrt.—II. (II.) Martin
dale
160. Vocational Education (3)
Lecture—3 hours. Philosophy and organization of vocational education, with particular reference to educational principles for agriculture commerce, home economics, and industry. GE credit: SocSci, Wrt.—II. (II.)
171. Audiovisual Communications (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: upper division standing. Theory and principles of audiovisual communications. Comparison of audiovisual materials such as transparencies, slides, computer-generated graphics, and videos. Operation and use of audiovisual equipment is stressed.
172. Multimedia Productions (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 171 recommended. Design and production of educational, technical, and professional multimedia presentations. Instructional or professional presentations using a variety of media, including slides, video, transparencies, and computer-generated graphics. Offered in alternate years. GE credit: SocSci, Wrt.
190. Seminar in Agricultural Education (2)
Seminar—2 hours. Discussion of selected critical issues in agricultural education. May be repeated for credit with consent of instructor. (P/NP grading only)—II. (II.)
192. Internship (1-12)
Internship—3-36 hours. Prerequisite: upper division standing, consent of instructor. Supervised internship off and on campus in areas of agricultural education. (P/NP grading only)
198. Directed Group Study (1-5)
(P/NP grading only)
199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only)

Professional

300. Directed Field Experience in Teaching (2)
Discussion—1 hour; field experience—3 hours. Prerequisite: course 100. Experience as teaching assistant in agriculture or home economics programs in public schools. May be repeated one time for credit. (S/U grading only)
301. Planning for Instructional Programs (3)
Lecture—3 hours. Prerequisite: course 100; course 300 (may be taken concurrently). Major paradigms in program planning and development. Emphasis on key steps in curriculum development, including selection and organization of educational objectives, learning experiences and teaching materials and resources. —III. (III.) Trel
er
302. Teaching Methods in Agricultural Education (2)
Lecture—2 hours; laboratory—2 hours. Prerequisite: course 100, course 300 (may be taken concurrently). Development of teaching strategies with special emphasis on the designing of learning experiences, instructional execution, and use of teaching aids in agricultural education.
306A. Field Experience with Future Farmers of America and Supervised Experience Programs (4)
Lecture/discussion—2 hours; field work—6 hours. Prerequisite: acceptance into a teacher education program; course 306B (concurrently). Develop an understanding of the Future Farmers of America and supervised occupational experience programs through planning, conducting, and evaluating actual programs.
306B. Field Experience in Teaching Agriculture (5-18)
Student teaching (corresponds with public school session). Prerequisite: acceptance into a teacher education program; course 306A (concurrently); courses 100, 300, 301, 302. Directed teaching including supervision of occupational experience programs and youth activities in secondary schools or community colleges. May be repeated for credit up to a maximum of 18 units.
323. Resource Development: Agricultural Education (3)
Discussion/lab—4 hours. Prerequisite: acceptance into a teacher education program and courses 306A, 306B. Selection and implementation of community resources in teaching.
390. Seminar: Issues in Agricultural Education (2)
Discussion/lab—4 hours. Prerequisite: selection of a topic relating to agricultural education. May be repeated for credit.

Agricultural Management and Rangeland Resources

(College of Agricultural and Environmental Sciences)
This major was discontinued as of Fall 2008; see Ecological Management and Restoration, on page 229.
Faculty. See Plant Sciences, on page 476. Courses. See Plant Sciences, on page 476.

Agricultural and Managerial Economics

See Managerial Economics, on page 386.

Agricultural and Resource Economics

(College of Agricultural and Environmental Sciences)
Richard J. Sexton, Ph.D., Chair of the Department
Department Office. 2116 Social Sciences and Humanities Building 530-752-9995
Undergraduate Student Information for the Manage
tial Economics major, 1171 Social Sciences and Humanities Building 530-754-9536;
http://manecon.ucdavis.edu
Graduate Student Information, 1171 Social Sci
ces and Humanities Building 530-752-6185, http://www.agecon.ucdavis.edu
Faculty
Julian M. Alston, Ph.D., Professor
Stephen R. Boucher, Ph.D., Associate Professor
Calin A. Carter, Ph.D., Distinguished Professor
Michael R. Carter, Ph.D., Professor
James A. Challant, Ph.D., Professor
Y. Hussein Farzin, Ph.D., Professor
Dalia A. Gharem, Ph.D., Assistant Professor
Rachael E. Goodhue, Ph.D., Professor
Richard D. Green, Ph.D., Professor
Lovell S. Jarvis, Ph.D., Professor

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; DivDom—Domestic Diversity; Wrt—Writing Experience
Fall 2011 and on Revised General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WRT—Writing Experience
1. Economic Basis of the Agricultural Industry (4)

Lecture—4 hours. Agriculture and man; the agricultural industry in U.S. and world economies; production and supply, marketing and demand; agricultural land, capital labor, and social problems of agriculture in an urban and industrialized economy emphasizing California. GE credit: SocSci | SS.

15. Economic Basis of the Agricultural Industry (4)

Lecture—4 hours. Agriculture and man; the agricultural industry in Australia and world economies; production and supply, marketing and demand; agricultural land, capital labor, and social problems of agriculture in an urban and industrialized economy emphasizing Australia. Taught in Australia under the supervision of a UC Davis faculty member. Not open for credit to students who have completed course 1. GE credit: SocSci | SS, WC.

15. Population, Environment and World Agriculture (4)

Lecture—3 hours; discussion—1 hour. Economic analysis of interactions among population, environment, natural resources and development of world agriculture. Introduces students to economic thinking about population growth, its causes and consequences for world food demand, and environmental and technological limits to increasing food supplies. GE credit: SocSci, Div, Wrt | SS, WC, WE—II. (II)

18. Business Law (4)

Lecture—4 hours. Prerequisite: sophomore standing. General principles of business law in the areas of contracts, business organization, real property, uniform commercial code, sales, commercial paper, employment relations, and creditor-debtor against a background of the history and functioning of our present legal system. GE credit: SocSci | SS—I, III, IV, (I, II, III, IV)

98. Directed Group Study (1-5)

Prerequisite: consent of instructor. Restricted to lower division students. (P/NP grading only.) GE credit: SS.

99. Special Study for Undergraduates (1-5)

Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SS.

Upper Division

100A. Intermediate Microeconomics: Theory of Production and Consumption (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A, 1B; Mathematics 16B. Theory of individual consumer and market demand; theory of production and supply of agricultural products, with particular reference to the individual firm; pricing, output determination, and employment of resources under pure competition. Not open for credit to students who have completed Economics 100 or the equivalent; however, Economics 100 will not serve as prerequisite to course 100B. GE credit: SocSci | QL, SS—I, II, III, IV, (I, II, III, IV)

100B. Intermediate Microeconomics: Imperfect Competition, Markets and Welfare Economics (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A. Pricing, output determination, and employment of resources under conditions of monopolistic competition and monopolopoly. GE credit: SocSci | QL, SS—I, II, III, IV, (I, II, III, IV)

106. Econometric Theory and Applications (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A, Statistics 103. Pass one open to managerial economics majors; pass two open to majors in the College of Agricultural and Environmental Sciences. Mathematical methods for analyzing data to solve problems in managerial economics. Topics include the linear regression model, methods to resolve data problems, and the economic interpretation of results. Not open for credit to students who have enrolled in or completed course 100B. GE credit: SocSci | QL, SS—I, II, III, IV, (I, II, III, IV)

112. Fundamentals of Organization Management (4)

Lecture—4 hours. Prerequisite: upper division standing or consent of instructor. Pass one open to majors in the College of Agricultural and Environmental Sciences. Role of organizational design and behavior in business and public agencies. Principles of planning, decision behavior, management, leadership, informal groups, conflict and change in the organization. GE credit: SocSci | SS—I, II, III, IV, (I, II, III, IV)

113. Fundamentals of Marketing Management (4)

Lecture—4 hours. Prerequisite: Economics 1A. For non-majors only. Nature of product marketing by the business firm. Customer relationship pricing, and demand; marketing policies and marketing strategy; promotion and advertising; product life cycles; the distribution system; manufacturing, wholesaling, retailing. Government regulation and restraints. (Not open for credit to students who have completed course 136.) GE credit: SocSci | SS.

115A. Economic Development (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A and 1B. Major issues encountered in emerging from international poverty, problems of growth and structural change in populations, food supply and demand, urban and industrialized economy emphasizing Australia. Taught in Australia under the supervision of a UC Davis faculty member. Not open for credit to students who have completed course 1. GE credit: SocSci, Div | SS, WC—II, III, (I, II, III)

115B. Economic Development (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A and 1B. Macroeconomic issues of developing countries. Issues include problems of generating capital, conduct of monetary and fiscal policies, foreign aid and investment. Important issues of policy concerning international trade and industrialization. Same as course as Economics 115B.A. GE credit: SocSci, Div | SS, WC—II, III, (I, II, III, IV)

118. Tax Accounting (4)

Lecture—4 hours. Prerequisite: Management 11A, 1B; course 18 recommended. Development and application of a framework to understand the tax effects of typical management decisions on both entities and their owners. Impacts that different methods of taxation have on business with emphasis on tax planning, using income and deduction strategies, retirement plans, and choice of business entity for tax minimization.

119. Intermediate Managerial Accounting (4)

Lecture—4 hours; extensive problem solving—8 hours. Prerequisite: Management 11A and 11B. Pass one open to majors in the College of Agricultural and Environmental Sciences. Use of accounting information by managers in decision making, planning, directing and controlling operations. Focuses on managerial/cost accounting theory and practice. Covers costing systems, budgeting, decision making, statement analysis. GE credit: SocSci | SS—I. (I)

120. Agricultural Policy (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A or the equivalent. Analytical treatment of historical and current economic problems and governmental policies influencing American agriculture. Uses of economic theory to develop historical and conceptual understanding of the economics of agriculture; how public policies influence the nature and performance of American agriculture. GE credit: SocSci | ACGH, SS—I, III. (III)

1205. Agricultural Policy (4)

Lecture—4 hours. Prerequisite: course 100A or consent of instructor. Analytical treatment of historical and current economic problems and governmental policies influencing agriculture. Uses of economic theory to develop historical and conceptual understanding of the economics of agriculture; how public policy influences the nature and performance of agriculture. Taught in Australia under the supervision of a UC Davis faculty member. Not open for credit to students who have completed course 120. GE credit: SocSci | SS, WC

121. Economics of Agricultural Sustainability (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: Physics 1 and/or Mathematics 12. Topics include: food production and distribution; environmental sustainability; soils and water; sustainability issues. Case studies include biodiversity, genetically modified foods and geographically differentiated products. GE credit: SocSci | SS, WC

130. Agricultural Markets (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A. The nature, function, organization structure, and operation of agricultural markets;
prices, costs, and margins; market information, regulation, and controls; cooperative marketing. GE credit: SocSci | SS.—I, II.

132. Cooperative Business Enterprises (3)
Lecture—3 hours. Prerequisite: Economics 1A. Study of cooperative business enterprise in the United States and elsewhere; economic theories of behavior, production, finance, decision-making, and taxation. GE credit: SocSci | SS.—II, III.

135. Agribusiness Marketing Plan Development (2)
Lecture/discussion—2 hours. Prerequisite: upper division standing. Fundamental components required to develop a marketing plan. Appreciation of the concept of a marketing plan, appropriate research required, including the use of library and Internet, survey and interview instruments, government documents, market analysis, business proposition, action planning, financial evaluation and monitoring. (P/NP grading only.) GE credit: SS.

136. Managerial Marketing (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A and 100B; Economics 100. Pass One open to majors in the College of Agricultural and Environmental Sciences. Basic nature and scope of international trade in agricultural commodities, agricultural inputs, and natural resources. Market dimensions and policy institutions. Case studies to illustrate import and export problems associated with different regions and commodities. GE credit: SocSci | SS.—II, III, IV. (II, III)

139. Futures and Options Markets (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A; Statistics 103. Pass One open to majors in the College of Agricultural and Environmental Sciences. History, mechanics, and economic functions of futures and options markets; hedging; theory of inter-temporal price formation and behavior of futures and options prices; price forecasting, futures and options as policy tools. GE credit: SocSci | SS.—II, III, IV. (II, III, IV)

140. Farm Management (5)
Lecture—5 hours. Prerequisite: Economics 1A. Farm organization and resources; economic and technological principles in decision-making; analytical techniques and management control; problems in organizing for managing the farm business. GE credit: SocSci | SS.

142. Personal Finance (3)

143. Investments (3)
Lecture—3 hours. Prerequisite: course 142 or consent of instructor. Survey of investment institutions, sources of investment information, and portfolio theory. Analysis of the stock, bond and real estate markets for evaluation of the prospective of the investor. GE credit: SocSci | SS.—III, IV.

144. Real Estate Economics (3)
Lecture—3 hours. Prerequisite: course 100A. The economic theory, analysis, and institutions of real estate markets and related financial markets. Case studies drawn from the raw land, single family, multi-family, industrial and office real estate markets. GE credit: SocSci | SS.—III. (III)

145. Farm and Rural Resources Appraisal (4)

146. Business, Government Regulation, and Society (3)
Lecture—3 hours. Prerequisite: course 100A or the equivalent. Pass one open to majors in the College of Agricultural and Environmental Sciences. Variety, nature and impact of government regulation: anti-trust laws and economic and social regulation. Nature of the legislative process, promulgation of regulations, and their impact, especially as analyzed by economists. GE credit: SocSci | ACGH, SS.—I, II.

147. Resource and Environmental Policy Analysis (3)
Lecture—3 hours. Prerequisite: Economics 1A; enrollment open to non-majors only. Natural resource use problems with emphasis on past and current policies and institutions affecting resource use; determinants, principles, and patterns of natural resource use; property rights, conservation, private and public resource use problems; and public issues. (Students who have had or are taking course 100A, Economics 100, or the equivalent, may receive only 2 units of credit.) GE credit: SocSci | SS.—II.

147M. Resource and Environmental Policy Analysis (2)
Lecture—3 hours. Prerequisite: Economics 1A; enrollment open to non-majors only. Natural resource use problems with emphasis on past and current policies and institutions affecting resource use; determinants, principles, and patterns of natural resource use; property rights, conservation, private and public resource use problems; and public issues. (Students who have had or are taking course 100A, Economics 100, or the equivalent, must enroll in this course for 2 units rather than course 147.) GE credit: SocSci | SS.—II.

150. Agricultural Labor (3)
Lecture—3 hours; discussion—1 hour. Importance of family and hired labor in agriculture; farm labor market; unions and collective bargaining in California agriculture; effects bargaining exercise, effects of unions on farm wages and earnings. GE credit: SocSci, Div, Wtr | ACGH, DD, SS, WE,—III, (III)

155. Operations Research and Management Science (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A; Statistics 103. Pass One open to Management Economists majors; Pass Two open to majors in the College of Agricultural and Environmental Sciences. Introduction to quantitative methods used to analyze business and economic processes: decision analysis for management, mathematical programming, competitive analysis, and other methods. GE credit: SocSci | SS, QL—II, III, IV. (I, II, III, IV)

156. Introduction to Mathematical Economics (4)
Lecture—4 hours. Prerequisite: courses 100A and 155; Mathematics 16C or 21C recommended (students should note that the formal mathematical content of this course is higher than other courses in the curriculum). Linear algebra for economics; necessary and sufficient emphasis on static optimization problems; implicit function theorem; economic methodology and mathematics; comparative statics; envelope theorem; Le Chatelier principle; applications to production and consumer models. GE credit: SocSci | QL, SS.

157. Analysis for Operations and Production Management (4)
Lecture—4 hours. Prerequisite: course 100A; Statistics 103. Pass One open to majors in the College of Agricultural and Environmental Sciences; Pass Two open to all majors. Application of economic theory and quantitative methods to analyze operations and production management problems, including process strategy, quality management, layout and plant layout, and inventory management. GE credit: SocSci | SS.—I, II, III, IV.

171A. Financial Management of the Firm (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 106; Management 11A/11B. Financial analysis at the firm level: methods of depreciation; influence of the tax structure; inventory, cash, and accounts receivable management; sources of short-term and long-term financing, and financial problem solving using a computer spreadsheet program. Not open for credit to students who have completed Economics 134. GE credit: SocSci | QL, SS.—II, III, IV. (I, II, IV)

171B. Financial Management of the Firm (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 171A. Financial analysis at the firm level: methods of capital budgeting; calculating the cost of capital; dividend policies; mergers and acquisitions; and special current topics. GE credit: SocSci | QL, SS.—I, II, III, IV. (I, II, III, IV)

175. Natural Resource Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100B or Economics 100 or the equivalent. Economic concepts and issues associated with natural resources, renewable resources, (ground water, forests, fisheries, and wildlife populations) and non-renewable resources (minerals and energy resources, soil) (same course as Environmental Science and Policy 175). GE credit: SocSci | SS.—II, III.

176. Environmental Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100B or Economics 100. Role of the environment in economic activity and methods for protecting and enhancing environmental quality; implications of market failures for public policy; design of environmental policy; theory of welfare measurement; measuring the benefits of environmental improvement. GE credit: SocSci | SS.—II, III.

190. Topics in Managerial Economics (3)
Lecture—3 hours. Prerequisite: passing grades in course 100A and 100B; consent of instructor. Selected topics in managerial economics, focusing on current research. May be repeated four times for credit when topic differs. Offered irregularly. GE credit: SocSci | SS.

192. Internship (1-6)
Internship—3-18 hours. Internship experience off campus and on campus in all subject areas offered in the Department of Agricultural and Resource Economics. Internships are supervised by a member of the staff. (P/NP grading only.) GE credit: SS.

194HA-194HB. Special Study for Honors Students (4-4)
Independent study—3-18 hours; seminar—1 hour. Prerequisite: Minimum GPA of 3.500; course 100B, courses 106 and 155 (may be taken concurrently); major in Agricultural and Managerial Economics or Managerial Economics; senior standing. A program of research culminating in the writing of a senior honors thesis under the direction of a faculty adviser. (Deferred grading only; pending completion of sequence.) GE credit: SocSci | QL, SS, WE.

197T. Tutoring in Managerial Economics (1-3)
Prerequisite: senior standing in Managerial Economics and consent of Department Chairperson. Undergraduates assist the instructor by tutoring students in one of the department's regularly scheduled courses. (P/NP grading only.) GE credit: SS.
Lecture—4 hours; discussion—1 hour. Prerequisite: course 200A or 204A; course 240A recommended. Agricultural development theory, with a focus on microeconomics. Agricultural household behavior with and without property rights and uncertainty. Analysis of land, labor, credit and insurance markets, institutions, and contracts. (Same course as Economics 215A.)—I. (II.)

215B. Microeconomics of Development
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 200A or 204A; 200D or 205, and 214 or 215A. Models and policy approaches regarding trade, monetary and fiscal issues, capital flows and debt are discussed. The microeconomics of development of an open developing country. The basic analytical focus is real exchange rate and its impact on sectoral allocation of resources. (Same course as Economics 215B.)—II. (III.)

215C. Microdevelopment Theory and Methods II (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 215A. Extension of development theory and microeconomic methods to developing countries using growth and technological change; poverty and income inequality; multilateral, including village and regional models. Computable general equilibrium methods and applications. (Same course as Economics 215C.)—III. (III.)

215D. Environment and Economic Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200A. Extension of development theory and microeconomic methods to developing countries using growth and technological changes; poverty and income inequality; multilateral, including village and regional models. Computable general equilibrium methods and applications. (Same course as Economics 215D.)—III. (III.)

222. International Agricultural Trade and Policy (3)
Lecture—3 hours. Prerequisite: course 100B or 204A; Economics 160A or the equivalent. Analysis of country interdependence through world agricultural markets. Partial equilibrium analysis is used to study the impacts of national intervention on world markets, national policy choice in an open economy and multinational policy issues.—I. (II.)

231. Supply and Demand for Agricultural Products (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 200A, 202A, and 240A or consent of instructor. Analysis of supply and demand for agricultural commodities emphasizing the effective use of microeconomic theory with econometric methods, and other empirical procedures, in conducting applied analysis of supply and demand at the firm and industry level.—I. (II.)

232. Agricultural Commodity Markets (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 200A, 202A, and 240A or consent of instructor. Analysis of agricultural industries that produce, market, transport, store, and process basic commodities. Analysis of market equilibrium under perfect and imperfect competition, with and without government intervention.—II. (II.)

233. Agricultural Policy (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 200A, 202A, and 240A or consent of instructor. Nature, formation, evolution, and institutions of agricultural policy applied to food, agricultural, and rural issues. Examples for detailed discussions include commodity, security, commodity issues, and trade policy. Analytical approaches include static and dynamic welfare analysis, policy design, and political-economic analysis.—III. (III.)

239. Economic Foundations (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in undergraduate-level econometrics. The course will prepare students for econometric theory and empirical work by examining the statistical foundations of econometrics. Special attention is paid to problems specific to nonexperimental data common to social sciences. Topics from probability theory are also covered. (Same course as Economics 239.)—I. (II.)

240A. Econometric Methods (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Statistics 133A and a course in linear algebra or the equivalent. Least squares, instrumental variables, and maximum likelihood estimation and inference for single equation linear regression model; linear restrictions; heteroskedasticity; and fixed and lagged dependent variables. (Same course as Economics 240A.)—II. (III.)

240B. Econometric Methods (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 204A. Topics include asymptotic theory and instrumental variables, pooled time-series cross-section estimation, seemingly unrelated regression, classical hypothesis tests, identification and estimation of simultaneous equation models, cointegration, error-correction models, and qualitative and limited dependent variable models. (Same course as Economics 240B.)—III. (III.)

240C. Time Series Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 240B. Probability theory, estimation, inference and forecasting of time series models; trends and non-standard asymptotic theory; vector time series methods and cointegration; and time series models for higher order moments and transition data; state-space modeling; the Kalman filter. (Same course as Economics 240C.)—I. (II.)

240D. Cross Section Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 240B. Estimation and inference for non-linear regression models for cross-section data; models for discrete data and for limited dependent variables; models for panel data; additional topics such as bootstrap and semiparametric regression. (Same course as Economics 240D.)—I. (II.)

240E. Topics in Time Series Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 240A, 240B and 240D. Modern econometric techniques for cross-section time series data. Expand on topics covered in Economics 240A, 240B and 240C. Contents may vary from year to year. (Same course as Economics 240E.)—III. (III.)

240F. Topics in Cross Section Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 240A, 240B and 240D. Modern econometric techniques for cross-section time series data. Expand on topics covered in Economics 240A, 240B and 240C. Contents may vary from year to year. (Same course as Economics 240F.)—III. (III.)

252. Applied Linear Programming (4)
Lecture—3 hours; discussion—1 hour. Applied linear programming methods emphasizing uses for business decisions: production, diet, blending, network and related problems.—II. (II.)

253. Optimization Techniques with Economic Applications (4)
Lecture—3 hours; discussion—1 hour. Microeconomic topics in the framework of mathematical programming.—II. (II.)

254. Dynamic Optimization Techniques with Economic Applications (4)
Lecture—4 hours. Prerequisite: course 253 and elementary knowledge of ordinary differential equations. Necessary and sufficient conditions in the calculus of variations and optimal control, economic interpretations, the dynamic envelope theorem and transversality conditions, infinite horizon problems and phase diagrams, local stability and comparative statics of the steady state, comparative dynamics.—I. (I.)

255. Applied Dynamic Structural Econometric Modeling (4)
Lecture—4 hours. Prerequisite: course 254. Course covers structural econometric models of static games of incomplete information, single-agent dynamic
optimization problems and multi-agent dynamic games, with a focus on applications to issues relevant to the environment, natural resources, agriculture, and development.—II. (II.)

256A. Applied Econometrics I (4)
Lecture—4 hours. Prerequisite: course 106 or Economics 140; or consent of instructor. First of two courses in the Masters-level econometrics sequence. The linear regression model and generalizations are applied to topics in agricultural and resource economics. Tools for empirical research for problems requiring more sophisticated tools than standard regression models are emphasized.—I. (I.)

256B. Applied Econometrics II (4)
Lecture—4 hours. Prerequisite: course 256A or consent of instructor. Second of two courses in the Masters-level econometrics sequence. The linear regression model and generalizations are applied to topics in agricultural and resource economics. Tools for empirical research for problems requiring more sophisticated tools than standard regression models are emphasized.—II. (II.)

258. Demand and Market Analysis (4)
Lecture—4 hours. Prerequisite: courses 204B and 256 or consent of instructor. Application of theoretical material covered in 204A/B, with particular focus on production theory/factor demand and imperfect competition/market power. Use of theoretical models as a foundation for empirical economic analysis, and empirical exercises. Independent research on chosen topics, with empirical application.—III. (III.)

275. Economic Analysis of Resource and Environmental Policies (4)
Lecture/discussion—4 hours. Prerequisite: course 204A. Development of externality theory, market failure concepts, welfare economics, theory of renewable and non-renewable resource use, and political economic models. Applications to policy issues regarding the agricultural/environment interface and managing resources in the public domain. (Same course as Environmental Science and Policy 275.)—II. (II.)

276. Environmental Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 204A or consent of instructor. Applications of externality theory to the design of efficient environmental policies. Evaluation of pollution control policy instruments in light of information limitations and market imperfections. Methods for nonmarket valuation of the benefits of environmental improvement.

277. Natural Resource Economics (4)
Lecture—4 hours. Prerequisite: course 254 or consent of instructor. Application of capital theory and dynamic methods to issues of optimal use of renewable and nonrenewable resources. Examination of policy issues associated with forests, fisheries, groundwater, energy resources, watersheds, soil, global climate, and wildlife.—III. (III.)

290. Topics in Agricultural and Resource Economics (3)
Lecture—3 hours. Selected topics in agricultural and resource economics, focusing on current research. May be repeated 4 times for credit. Offered irregularly.

293. Analysis of California Agriculture and Resource Economics (3)
Lecture—1.5 hours; fieldwork—45 hours total, including one 5-day summer field trip. Review and analysis of production, marketing, and resource issues facing agricultural firms in California. Application of economic theory and measurement to individual firm and industry decisions in an applied setting. (S/U grading only.)—I. (I.)

298. Directed Group Study (1-5)
Advanced study through special seminars, informal group studies, or group research on problems for analysis and experimentation. Sections: (1) Managerial Economics; (2) Agricultural Policy; (3) Community and Regional Development; (4) Natural Resources; (5) Human Resources; (6) Research Methods and Quantitative Analysis; and (7) Dissertation Research Prospectus. (S/U grading only.)

299. Individual Study (1-12)
Sections: (1) Managerial Economics; (2) Agricultural Policy; (3) Community and Regional Development; (4) Natural Resources; (5) Human Resources; (6) Research Methods and Quantitative Analysis; and (7) Dissertation Research Prospectus. (S/U grading only.)

299D. Special Study for Doctoral Dissertation (1-12)
(S/U grading only.)

Professional

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)

Agricultural Systems and Environment

(College of Agricultural and Environmental Science)

Minor Program Requirements:

UNITS

Agricultural Systems and Environment ........................................... 18-19

Preparatory material: Course in statistics such as Statistics 13, 32, 100, Plant Sciences 120, Sociology 42B or equivalent. Course in plant science such as Plant Sciences 2A, Biological Sciences 1C, or equivalent; completion of Biological Sciences 2A and 2B and 2C also fulfills this requirement. Select one of the following tracks:

Sustainable Agriculture track
- Plant Sciences 142 or 150 ................. 4
- Soil Science 100 .......................... 5
- Plant Sciences 105 or 176 or
- Entomology 110 ......................... 3-5
- Minimum of six units from the following:

Range and Natural Resources track
- Plant Sciences 130 .......................... 3
- Minimum of 15 units from the following:
- Plant Sciences 112, 131, 135, 150, Environmental Science and Policy 123,
- 172, Wildlife, Fish and Conservation
- Minor Advisers: T. Gradziel (Plant Sciences)
- Advising Center is located in 1220A Plant and Environmental Sciences 330-752-1715.

Agronomy

See Plant Sciences, on page 476.

Agronomy and Range Science

See Plant Sciences, on page 476.

American Studies

(College of Letters and Science)

Julie Sze, Ph.D., Program Director
Program Office. 2134A Hart Hall 530-752-6429; http://www.ucdavis.edu

Committee in Charge
Charlotte Bilteckoff, Ph.D. (American Studies)
Christina Cagdoll, Ph.D. (Design)
Carolyn de la Peña, Ph.D. (American Studies)
Caren Kaplan, Ph.D. (American Studies)
Susette Min, Ph.D. (Asian American Studies)
Eric Smooldin, Ph.D. (American Studies)
Julie Sze, Ph.D. (American Studies)
Grace Wlang, Ph.D. (American Studies)

Faculty
Charlotte Bilteckoff, Ph.D., Assistant Professor
Carolyn de la Peña, Ph.D., Professor
Caren Kaplan, Ph.D., Professor
Eric Smooldin, Ph.D., Professor
Julie Sze, Ph.D., Associate Professor
Grace Wlang, Ph.D., Assistant Professor

Emeriti Faculty
Jay Mechling, Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award
Michael L. Smith, Ph.D., Senior Lecturer Emeritus
David Scaife Wilson, Ph.D., Senior Lecturer Emeritus

The Major Program
American Studies explores the cultures of the United States, as well as their transnational exchanges and impact. The discipline’s practitioners seek to understand the historical origins of particular cultures and practices held by individuals and groups within the United States and how those values and beliefs shape social and political realities within and beyond U.S. borders. The approach that American Studies takes is interdisciplinary, meaning that in American Studies we answer these questions using tools developed by numerous disciplines including history, sociology, anthropology, literary criticism, folklore, media and science and technology studies. American Studies takes as its subject American cultures and provides an excellent, broad education in the liberal arts. Our aim is to make each student a culture critic, a person capable of bringing a thoughtful and humane approach to bear upon our understanding of the varieties of American experiences. Making connections is the way we like to characterize our work in American Studies. American Studies majors are good critical thinkers, develop excellent writing skills, and most importantly “learn how to learn,” that is, you learn to figure out what intellectual tools and specialized knowledge you will need to perform a task or solve a problem. These intellectual and communication skills will prepare majors for a broad array of careers.

The Program
American Studies majors take five upper division courses devoted to close study of major issues crucial to the practice of American Studies. Advanced work in at least two other departments or programs allows each student to tailor his or her own individual education goals. Sample emphases include: Cultural Consumption, Youth Education, Social Identities, Nature, Culture and Environment, Marketing, Advertising and Business, and Food and Health, for example. Students have the option of writing a senior thesis within this emphasis.

Career Alternatives
As an interdisciplinary program, American Studies provides a good liberal arts and sciences undergraduate education. American Studies maximizes a student’s exposure to a variety of subject matter and approaches. Graduates have moved into a broad range of career settings, including journalism, law, teaching, marketing, non-profit and community organizations, government, social work, environmental planning, library science, and...
A.B. Major Requirements:

<table>
<thead>
<tr>
<th>Preparatory Subject Matter</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Studies 10</td>
<td>4</td>
</tr>
<tr>
<td>One additional lower division American Studies course</td>
<td></td>
</tr>
<tr>
<td>One course from: American African and Asian Studies 10, Asian American Studies 1, Chicana/o Studies 10, Native American Studies 1, or an equivalent course in racial and ethnic diversity</td>
<td></td>
</tr>
<tr>
<td>Lower Division</td>
<td>20</td>
</tr>
<tr>
<td>In consultation with the American Studies Undergraduate Adviser, the student designs a program of 20 units (typically five courses) of upper division coursework, around a unifying theme, period, or subject matter in American cultures. The courses should come from two or more departments or programs and can include up to 8 units of American Studies courses. Only 4 units of course 192 (internship) can be included in the emphasis. The student may choose the senior thesis option (190A-190B) for 8 units of the emphasis and take the writing 12 units outside the program.</td>
<td></td>
</tr>
</tbody>
</table>

Total Units for the Major | 64 |

Recommended:

Complete the requirement in English composition before enrollment in American Studies 190A.

Minor Program Requirements:

<table>
<thead>
<tr>
<th>American Studies</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Studies, upper division courses</td>
<td>20</td>
</tr>
<tr>
<td>No more than 8 units of course 192 may be counted toward this total.</td>
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</tr>
</tbody>
</table>

Faculty Advisers: C. Billekoff, C. Kaplan, E. Smoookin, J. Sze, G. Wang

Courses in American Studies (AMS)

Lower Division

| 1A. Science and American Culture (4) | Lecture—3 hours; discussion | 1 hour. American science as a cultural system. Mutual influence and interaction of that system with other cultural systems including religion, social thought, art, architecture, literature, music, and visual sense. GE credit: ArtHum or SocSci, Div, Wrt | 1 ACHG, AH or SS, DD, WE. |
| 1B. Religion in American Lives (4) | Lecture—5 hours; discussion | 1 hour. Religions and spiritual practices in the United States, and their interrelationships with other aspects of U.S. history, society and culture; indigenous and imported faiths, and the impact of immigration, colonization and culture contact on them. GE credit: ArtHum or SocSci, Div, Wrt | 1 ACHG, AH or SS, DD, WE. |

1C. American Lives Through Autobiography (4)

Lecture—3 hours; discussion | 1 hour. American culture as understood through the individual life stories told by Americans, with attention to the roles of gender, race, ethnicity, social class, and sexual orientation in the individual's life cycle. GE credit: ArtHum or SocSci, Div, Wrt | ACHG, AH or SS, DD, WE. |

1E. Nature and Culture in America (4)

Lecture—3 hours; discussion | 1 hour. Uses and abuses of nature in America; patterns of inhabitation, exploitation, and neglect; attention to California; emphasis on metaphor as a key to understanding the natural world, attention to manipulation of its healing powers, ecology, the “right” movement. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | ACHG, AH, SS, DD, WE. |

4. Freshman Seminar (2)

Seminar—2 hours. Prerequisite: open only to students who have completed fewer than 40 quarter units. Investigation of a special topic in American Studies through shared readings, discussions, written assignments, and special activities (such as fieldwork, site visits). Emphasis on student participation in learning. Limited enrollment—II, III, (III.) |

5. Technology in American Lives (4)

Lecture—2 hours; discussion | 2 hours. Prerequisite: completion of Subject A requirement. Technology as both a material cultural force and a symbol in American culture; the lives of engineers at work and play; images of the engineer and technology in popular culture; social political and ethical issues raised by technology. GE credit: ArtHum or SocSci, Div, Wrt | SS, WW. |

95. Careers and Identity in American Culture (2)

Lecture—1 hour; discussion | 1 hour. Defining one's identity through the career. The life course, preparation, and choices. Personality and career. Ethics. Gender, ethnicity, sexuality, and social class in the workplace. The transnational workplace. Conflict between the career and other social roles—II, III, IV., (I, IV, III.) |

98. Directed Group Study (1-5)

Prerequisite: consent of instructor. (P/NP grading only.)

99. Individual Study for Undergraduates (1-5)

(P/NP grading only.)

Upper Division

100. Methods in American Studies (4)

Lecture/discussion | 3 hours; term paper. Design and implementation of interdisciplinary research, analysis and writing for American Studies and other cultural studies fields. Library research, research skills, project/problem definition, methods for study of texts, individuals, communities. Hand-on, skill-building, focused reading, discussion. |

101A-H. Special Topics (4)

Seminar—3 hours, intensive reading, writing, and special projects. Interdisciplinary group study of special topics in American Culture Studies, designed for non-majors as well as majors. Content will vary according to the instructor and will be announced in the following titles: (A) Popular Culture Studies; (B) Women's Studies; (C) Material Aspects of American Culture; (D) American National Character; (E) American Lives Through Autobiography; (F) The Interrelationship Between Arts and Ideas; (G) New Directions in American Culture Studies; (H) Problems in Cross-Cultural American Studies. May be repeated for credit in different subject area only. —II, III, (IV, III.) |

110. A Decade in American Civilization (4)

Lecture—2 hours; discussion | 2 hours. Prerequisite: one of courses 1A, 1B, 1C, 1D, 1E or 1F. Close examination of a single decade in American civilization; the connections between the history, literature, arts, customs, and ideas of Americans living in the decade. Issues and representations of race, class, gender, age, and sexuality in the decade. May be repeated for credit if decades studied are different. GE credit: ArtHum or SocSci, Div, Wrt | ACHG, AH or SS, DD, WE. |

120. American Folklore and Folklife (4)

Lecture—3 hours; fieldwork | 1 hour. Theory and method of the study of American folk traditions, including oral lore, customs, music, and material folk culture; the uses and meanings of those traditions in diverse groups, communities, including families, ethnic institutions, voluntary organizations, and occupational groups. GE credit: ArtHum or SocSci, Div, Wrt | ACHG, AH or SS, DD, WE. |

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses
of cultural diversity upon corporate cultures, both from within and in contact with foreign corporations.

130. American Popular Culture (4) Lecture/discussion—3 hours; fieldwork—1 hour. Prerequisite: course 1 or upper division standing. American popular expression and experience as a cultural system and its relationship to American and elite culture and folk traditions. Exploration of theorists and methods for discovering and interpreting patterns of meaning in American popular culture. GE credit: ArtHum or SocSci, Div, Writ | ACCH, AH or SS, DD, WE.—II. (III) Smooldin

139. Feminist Cultural Studies (4) Lecture/discussion—4 hours. Prerequisite: one course in Women's Studies or American Studies. The histories, theories, and practices of feminist traditions within cultural studies. (Same course as Women's Studies 139.) GE credit: SocSci, Div, Writ | ACCH, AH, DD, SS, VI, WE.—II. (III)

151. American Landscapes and Places (4) Lecture—2 hours; fieldwork—1 hour. Prerequisite: consent of instructor. Course in American and elite culture and folk traditions. GE credit: ArtHum or SocSci, Div, Writ | ACCH, AH or SS, DD, WE.—II. (III)

152. The Lives of Children in America (4) Lecture—2 hours; discussion—2 hours. Experience of childhood and adolescence in American culture, as understood through literature, art, and social scientific approaches. GE credit: ArtHum or SocSci, Div, Writ | ACCH, AH or SS, DD, WE.—II. (III) Smooldin

153. The Individual and Community in America (4) Lecture—2 hours; discussion—2 hours. Interdisciplinary examination of past and present tensions between the individual and the community in American experience, as those tensions are expressed in other cultural systems as folklore, popular ritual, popular entertainment, literature, fine arts, architecture, and social thought. GE credit: ArtHum or SocSci, Div, Writ | ACCH, AH or SS, DD, WE.—II. (III) Sze

154. The Lives of Men in America (4) Lecture—2 hours; discussion—2 hours. Interdisciplinary examination of the lives of boys and men in America, toward understanding cultural definitions of masculinity, the ways individuals have accepted or resisted these definitions, and the broader consequences of the struggle over the social construction of gender. GE credit: ArtHum or SocSci, Div, Writ | ACCH, AH or SS, DD, WE.—II. (III) Sze

155. Eating in America (4) Lecture—3 hours, discussion—1 hour. The analysis of the relationship between human bodies and technologies in modern society. Dominant and eccentric examples of how human bodies and technologies influence one another and reveal underlying cultural assumptions. (Same course as Technocultural Studies 158.) GE credit: GE credit: ArtHum | ACCH, AH, WE.—II. (III)

160. Undergraduate Seminar in American Studies (4) Seminar—3 hours; term paper. Prerequisite: open to junior and senior American Studies majors only. Intensive reading, discussion, research, and writing by small groups in selected topics of American Studies scholarship, emphasizing on its contribution to American material. Limited enrollment. May be repeated one time for credit when content differs.—II, III. (I, II, III)


190B. Senior Thesis (4) Independent study—12 hours. Prerequisite: senior standing in American Studies major and course 190A. In consultation with advisor, student writes an extended research paper on a topic proposed in course 190A.—I, II, III. (II, III)

192. Internship in American Institutions (1-12) Internship—1-12 hours. Prerequisite: enrollment dependent on availability of intern positions, with priority to American Studies majors. Supervised internship and study within and about key organizations in American civilization at archives, libraries, museums, schools, historical societies, governmental and social agencies, with attention to the techniques of participant observation and the collection of ethnographical data. May be repeated for credit for a total of 12 units. (P/NP grading only.)

197T. Tutoring in American Studies (1-5) Tutorial—1-5 hours. Prerequisite: consent of Chairperson of American Studies Program. Tutoring in lower division American Studies courses, usually in small discussion groups. Periodic meetings with the instructor in charge, reports and readings. May be repeated for credit when the tutoring is for a different course. (P/NP grading only.)

198. Directed Group Study (1-5) Prerequisite: consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5) Prerequisite: consent of instructor and chairperson of American Studies Program. (P/NP grading only.)

Graduate

220. American Folklore and Folklife (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Theory and methods for the study of the folklore and the folk customs of American behavior; contributions of folklore studies to scholarship in humanities and social science disciplines.—III. (III) Turner

250. Cultural Study of Masculinities (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Interdisciplinary approaches to understanding the social and cultural construction of masculinities; attention to the effects of biology, gender, race, class, sexual and national identities; criticism of oral, printed, visual, and mass mediated texts, and of social relations and structures. (Same course as Women's Studies 250.)—II
Animal Biology

There is an application deadline of Dec 15 for fall quarter.

Preparation. Appropriate preparation is a bache- lor’s or master’s degree in a discipline relevant to the biology of behavior. In addition, at least one course from each of the following areas must be taken before admission into the program or before the end of the first year in the program.

Ecology: e.g., Evolution and Ecology 101, Environmental Science and Policy 100
Genetics: e.g., Biological Sciences 101
Statistics: e.g., Statistics 102 or Psychology 103
Evolution: e.g., Evolution and Ecology 100
Animal behavior: Neurobiology, Physiology, and Behavior 102
Physiology: e.g., Neurobiology, Physiology, and Behavior 101

Core Requirements. Students take two “breadth” courses, at least one course in statistics, a methodology and grant writing course, and a graduate seminar. Required courses:

Methodology and Grant Writing: Animal Behavior 201
Advanced Statistics: Psychology 204A, 204B, 204C, or 204D
Graduate Seminars: Animal Behavior 290

Core courses in the major include courses in animal behavior, ecology, evolution, and behavior 102, Evolution and Ecology 100, or the equivalent. Development of an empirical or theoretical interdisciplinary approach to research on a current topic in animal behavior.

207. Research Conference in Behavioral Ecology (1)
Conference—1 hour. Prerequisite: graduate standing and consent of instructor. Critical presentation and evaluation of current literature and ongoing research in behavioral ecology and enrollment. May be repeated for credit. (S/U grading only.)

287. Advanced Animal Behavior (2)
Seminar—2 hours. Prerequisite: graduate standing and consent of instructor, courses in animal behavior [Neurobiology, Physiology, and Behavior 102 or the equivalent], and either evolution (Evolution and Ecology 100 or the equivalent) or evolution (Evolution and Ecology 101 or the equivalent). Reading, reports and discussion on current topics in animal behavior, a focus on topics that lie at the interface between animal behavior, ecology and evolution. (Same course as Population Biology 287.) May be repeated two times for credit.

290. Seminar in Animal Behavior (1-3)
Seminar—1-3 hours. Prerequisite: consent of instructor. Selected topics in animal behavior. (S/U grading only.)—I, II, III, (I, II, III.)

294. Seminar in Behavioral Ecology of Predators and Prey (3)
Seminar—2 hours. Prerequisite: graduate standing. Preparation and analysis of research papers on social and foraging behavior of predatory animals, antipredator strategies to co-evolution of predators and prey, and ecology of predator prey interactions. May be repeated two times for credit. (Same course as Wildlife, Fish, and Conservation Biology 294.) Offered in alternate years.—II, Caro

298. Group Study (1-5)
Prerequisite: graduate standing and consent of instructor.

299. Research (1-12)
Prerequisite: and consent of instructor. Critical presentation and evaluation of current literature and ongoing research in behavioral ecology and enrollment. May be repeated for credit. (S/U grading only.)

Professional

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)

Animal Biology

(College of Agricultural and Environmental Sciences)
Department of Entomology and Nematology

Faculty
Edward P. Caswell-Chen, Ph.D. Professor
Joanna Chiu, Ph.D., Assistant Professor
Brian R. Johnson, Ph.D., Assistant Professor
Neal M. Williams, Ph.D., Associate Professor
Robert Kimsey, Ph.D., Lecturer

The Major Program

The Animal Biology major offers students training in the biological and natural sciences as they apply to animals. The major covers the basic biological sciences that explain animal evolution, systematic, ecology, physiology and molecular biology. Students in the Animal Biology major are encouraged to think beyond particular groups of animals in which they are interested and to consider science as a process and a way of advancing society. Emphasis is on bio- logical principles that can be used in research or in solving societal problems associated with animals in agriculture, urban areas, or natural environments.

The Program. The Animal Biology major consists of core courses in the biological sciences that build an understanding of animal biology from the molecu- lar to the ecological and evolutionary levels of orga- nization. After completing these core courses, students have the option of specializing in various interdisciplinary aspects of animal biology, and plan their chosen emphasis of study part of a required discussion course and in consultation with their advisor. The Animal Biology major emphasizes courses on biological principles as opposed to courses on animal care and husbandry. This pro- gram includes a senior thesis, which each student designs to bridge the disciplines of the major.

Internships and Career Alternatives. The pro- gram and interests of each student in solving societal problems guides him or her to logical internship and career choices. On- and off-campus internship opportunities are available in research laboratories, in field situations, with governmental agencies, with private industry, and in international programs. A degree in Animal Biology prepares students for careers in research, teaching, governmental regula- tion, health or agriculture as each relates to the inte- grative biology or ecology of animals. Careers in veterinary medicine, animal husbandry and animal management are open to Animal Biology majors, however, other preparation may be required. Stud- ents in the major gain research experience and may choose to continue their training at the gradu- ate or professional level in a variety of biological disciplines.

B.S. Major Requirements:

Preparatory Subject Matter......... 68-74
Biological Sciences 2A, 2B, and 2C .... 14
Chemistry 2A-2B-2C, and 8A-8B or 118A-
118B ........................................ 21-23
Mathematics 137A-137B-137C or 147A-
147B-147C ................................. 48-53
Physics 1A-1B-1C .......................... 48-51
One course from: Statistics 130 or 130C
or Agricultural Management and Rangeland
Resources 120 .................................... 4
Animal Biology 50A, 50B, 50C ........... 8

Depth Subject Matter ............. 29-38
Biological Sciences 101, 102, and 103 .... 23
One course from: Animal Biology 102
Animal Biology 102 and 103 or Biological
Sciences 102 and 103 .......................... 6-10
One course from: Neurobiology, Physiology,
and Behavior 101, 117; Entomology 102;
Wildlife, Fish, and Conservation
Biology 121 ........................................ 3-5
One course from: Anatomy, Physiology and
Cell Biology 100; Entomology 101;
187. Animal Biology Seminar (2)  
Seminar—1 hour; discussion—1 hour. Prerequisite: junior standing, course 50A, 50B, 50C, and 187; course 190D concurrently. (P/NP grading only.)—I, II, III, (I, II, III.)

189. Senior Practicum (2)  
Independent study—6 hours. Prerequisite: junior standing, courses 50A, 50B, 50C, and 187; course 190D concurrently. (P/NP grading only.)—I, II, III, (I, II, III.)

92. Internship in Animal Biology (1-12)  
Internship—3-36 hours. Prerequisite: completion of 84 units and consent of instructor. Office, laboratory or fieldwork off or on campus in research, governmental regulation, policy making, and private enterprise dealing with animal related issues of production, welfare, pest management, biodiversity and the environment. All requirements of Internship Approval Request form must be met. (P/NP grading only.)

98. Directed Group Study (1-5)  
(P/NP grading only.)

99. Special Study for Advanced Undergraduates (1-5)  
(P/NP grading only.)

Animal Biology (A Graduate Group)
Courses in Animal Biology (ABG)
Graduate
200A. Integrated Animal Biology I (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing; Biological Sciences 101 or the equivalent or consent of the instructor. Natural history, management, historical and current uses, and specialized disciplinary features of model and novel animal systems used in research. Development of conceptual approaches in organismal biology to improve experimental design and interpretation of interdisciplinary research studies. Limited enrollment; first pass restricted to Animal Biology Graduate Group students.—I. (I) DefPeters

200B. Integrated Animal Biology II (3)
Lecture/discussion—3 hours. Prerequisite: course 200A. Natural history, management, historical and current uses, and specialized disciplinary features of model and novel animal systems used in research. Development of conceptual approaches in organismal biology to improve experimental design and interpretation of interdisciplinary research studies. Limited enrollment; first pass restricted to Animal Biology Graduate Group students.—II. (II) Conley, Murray

202. Grant Procurement and Administration (2)
Lecture—1 hour; discussion/laboratory—1 hour. Prerequisite: course 200B. Pass I restricted to Animal Biology Graduate Group students. Topics include: structure of grants, attention to specifications, concise persuasive writing, and grant budgeting. Identify grants appropriate to a persuasive research grant proposal, and administer grants. Limited enrollment.—I. (I)

250. Mathematical Modeling in Biological Systems (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing; Mathematics 161A, 163, or equivalents required; Mathematics 16C or equivalent recommended; Statistics 100 or equivalent required; more than one course in statistics recommended; Animal Biology 102 or Biological Sciences 102 recommended or equivalent course in biochemistry. Limited enrollment. Model development and evaluation including sensitivity analyses using R. Four principle modeling methodologies included: algebraic functions of biological processes, physiological-based compartmental models, linear programming and meta-analysis. Fundamental background and understanding of mathematical modeling principles in biological systems.—II. (II) Fadel, Kreebra

255. Physiology of the Stress Response (2)
Lecture/discussion—2 hours. Prerequisite: graduate student; definition of Stress; Physiological mechanisms of adaptaton to stress; Hormonal control of the systemic stress response; Mechanisms of the cellular stress response; Discussion of current trends in stress physiology and current methods for studying the stress response. (Same course as Molecular, Cellular, and Integrative Physiology 255.)—III. (III) Kuekutz

290C. Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Student presentations of research in Animal Biology and discussions among participating students and Animal Biology faculty. May be repeated for credit. (S/U grading only.)—I, II, III, IV, (I, II, III, IV)

298. Group Study in Animal Biology (1-5)
Prerequisite: graduate standing.

299. Research (1-11)
Prerequisite: graduate standing and consent of instructor. Research with a faculty member in Animal Biology Graduate Group. May be repeated for credit. (S/U grading only.)—I, II, III, IV (I, II, III, IV)

Professional
300. Methods in Teaching Animal Biology (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing and consent of instructor. Practical experience in the methods and problems of teaching animal biology. Includes analysis of laboratory exercises, discussion of teaching techniques, grading scientific essays, preparing for and conducting discussion or laboratory sections, formulating quiz and exam questions under instructor supervision. May be repeated up to three times for credit. (S/U grading only.)—I, II, (I, II) Famula, Oberbauer

396. Teaching Assistant Training Practicum (1-4)
Variable—3-12 hours. Prerequisite: graduate standing and consent of instructor. May be repeated for credit. (S/U grading only.)—I, II, III, (I, II, III)

Animal Genetics

(Quantitative) genetics based on the unity of mammalian genetics and making breeding decisions based on fundamental genetic concepts. GE credit: SciEng | SE, SL.—III. (III) Famula

107. Genetics and Animal Breeding (5)
Lecture—4 hours; laboratory—3 hours. Prerequisite: Biological Sciences 101. Principles of quantitative genetics applied to improvement of livestock and poultry. Effects of mating systems and selection methods are emphasized with illustration from current breeding practices. GE credit: SciEng | SE.—I. (I) Medrano

111. Molecular Biology Laboratory Techniques (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1C, 101, 102, 103. Introduction to the concepts and techniques used in molecular biology; the role of this technology in both basic and applied animal research, and participation in laboratories using some of the most common techniques in molecular biology. GE credit: SciEng | SE, SL—WE—I. (I) Kuetz, Murray

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. Selected topics relating to animal genetics. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

Graduate
204. Theory of Quantitative Genetics (3)
Lecture—3 hours. Prerequisite: course 107 or the equivalent. Theoretical basis of quantitative genetics and the consequences of Mendelian inheritance. Concepts used to estimate quantitative genetic differences and basis for partitioning the phenotypic variance. Offered irregularly.

206. Advanced Domestic Animal Breeding (3)
Lecture—3 hours. Prerequisite: course 107 and Animal Science 202; course 204 recommended. Procedures for the genetic evaluation of individuals to include selection indices and mixed model evaluation for single and multiple traits. Methods of estimating genetic trends. Offered in alternate years.—Famula

208. Estimation of Genetic Parameters (3)
Lecture—3 hours. Prerequisite: course 107 and Animal Science 205; courses 204 and 108 recommended. General methods for the estimation of components of variance and covariance and their application to the estimation of heritability, repeatability and genetic correlations are considered. Specific emphasis is given to procedures applicable to livestock populations under selection. Offered irregularly.—Famula

211. Genetic Engineering of Animals (2)
Lecture—1 hour; lecture/discussion—1 hour. Review of techniques for the genetic engineering of animals and their limitations and applications. Student led discussions of recent papers in the field and possible future applications of genetically engineered animals in basic research and applied agricultural and medical research. Offered in alternate years. (S/U grading only.)

212. Sequence Analysis in Molecular Genetics (2)
Lecture/laboratory—2 hours. Prerequisite: Biological Sciences 101 or the equivalent; graduate standing or consent of instructor. Use of computer algorithms and online databases to analyze nucleic acid and protein sequences in molecular genetics research. Offered in alternate years.—II.

298. Group Study (1-5)
Prerequisite: consent of instructor. Lectures and discussions of advanced topics in animal genetics. (S/U grading only.)

299. Research in Animal Genetics (1-12)
Prerequisite: consent of instructor. (S/U grading only.)
Animal Physiology

See Animal Biology, on page 150; Animal Science, on page 153; Neurobiology, Physiology, and Behavior, on page 443; Philosophy, on page 460; and Molecular, Cellular, and Integrative Physiology (A Graduate Group), on page 433.

Animal Science

[College of Agricultural and Environmental Sciences]

Anita M. Oberbauer Ph.D., Chairperson of the Department

Department Office, 2223 Meyer Hall 530-752-1250; http://animalscience.ucdavis.edu/

Master Adviser, E.J. DePeters

Undergraduate Advising, 1202 Meyer Hall 530-754-7915; UC46.ucdavis.edu

Advising Center for the majors, minors and coursework advising (including faculty advising) is located in the Animal Science Advising Center in 1202 Meyer Hall 530-754-7915. Each student will be assigned a faculty adviser through this office upon entering the major.

Graduate Advising, 1249 Meyer Hall 530-752-3982

Faculty

Trish J. Berger, Ph.D., Professor
C. Christopher Calvert, Ph.D., Professor, Academic Senate Distinguished Teaching Award
Ernest S. Chang, Ph.D., Professor, (Biological Sciences, Bodega Marine Laboratory)
Mary E. Delany, Ph.D., Professor and Associate Dean in CA&ES
Edward J. DePeters, Ph.D., Professor, Academic Senate Distinguished Teaching Award, UC Davis Prize for Undergraduate Teaching and Scholarly Achievement
Sergei D. Doroshov, Ph.D., Professor, (Wildlife, Fish & Conservation Biology; Animal Science)

James G. Fadel, Ph.D., Professor
Thomas R. Farnsworth, Ph.D., Professor, Academic Senate Distinguished Teaching Award
Ruth J. Hovey, Ph.D., Professor
Sillas S. O. Hung, Ph.D., Professor
Erima Kabreba, Ph.D., Professor
Annie J. King, Ph.D., Professor
Kirk C. Klausing, Ph.D., Professor
Juan F. Medrano, Ph.D., Professor
Joy A. Mench, Ph.D., Vice Chairperson, Professor
Michael R. Miller, Ph.D., Assistant Professor
Frank M. Mitloehner, Ph.D., Professor and Specialist in Cooperative Extension

James D. Murray, Ph.D., Professor
Anita M. Oberbauer, Ph.D., Professor, Academic Senate Distinguished Teaching Award
Janet E. Roper, Ph.D., Professor
Pablo J. Ross, Ph.D., Assistant Professor
Ricardo D. Sainz, Ph.D., Professor
Anne Toddgham, Ph.D., Assistant Professor
Cassandra B. Tucker, Ph.D., Associate Professor
Barry W. Wilson, Ph.D., Professor
Huajun Zhou, Ph.D., Associate Professor
Richard A. Zinn, Ph.D., Professor

Emeriti Faculty

Hans Abplanalp, Ph.D., Professor Emeritus
Thomas E. Adams, Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award

Gary B. Anderson, Ph.D., Distinguished Professor Emeritus, Distinguished Teaching Award
Graduate/Professional UC Davis Prize for Undergraduate Teaching and Scholarly Achievement, Academic Senate Distinguished Teaching Award
C. Robert Ashton, Ph.D., Professor Emeritus
Wallis H. Clark, Jr., Ph.D., Professor Emeritus
Douglas E. Conklin, Ph.D., Professor Emeritus
Graham A. E. Goll, Ph.D., Professor Emeritus
William N. Garrett, Ph.D., Professor Emeritus
Yu-Bang Lee, Ph.D., Professor Emeritus
James R. Millam, Ph.D., Professor Emeritus
Edward O. Price, Ph.D., Professor Emeritus
Kathryn Ralke, Ph.D., Professor Emeritus
Wesley W. Weathers, Ph.D., Professor Emeritus
Barry W. Wilson, Ph.D., Professor Emeritus

Affiliated Faculty

Fred S. Conte, Ph.D., Specialist in Cooperative Extension and Lecturer
Joshua Hull, Ph.D., Assistant Adjunct Professor
Elizabeth A. Lamb, Ph.D., and Lecturer
Bernard P. May, Ph.D., Adjunct Professor
Deanne Meyer, Ph.D., Specialist in Cooperative Extension and Lecturer
James W. Oljen, Ph.D., Specialist in Cooperative Extension and Lecturer
Peter H. Robinson, Ph.D., Specialist in Cooperative Extension and Lecturer
Alison L. Van Eenennaam, Ph.D., Specialist in Cooperative Extension and Lecturer
Dana B. Van Liew, M.Ed., Continuing Lecturer

Academic Senate Prize for Excellence in Teaching Award

The Major Program

The Animal Science major is devoted to the sciences central to understanding biological function of domestic and captive animals, their care, management, and utilization by people for food, fiber, companionship and recreation. Advances in science and technology, and an ever growing human population, have increased the complexity of issues surrounding the care and management of animals. Specializations within the major allow students to develop a scientific appreciation of animals and their relationship to their environment. Graduates in Animal Science are able to advance the science and technology of animal care and management in an objective and effective manner for the betterment of animals and society.

The Program. The curriculum provides depth in the biological and physiological sciences and allows students to specialize within the broad field of applied animal sciences. Study begins with introductory courses in animal science, biology, chemistry, mathematics, and statistics. Students undertake advanced courses in animal behavior, biochemistry, genetics, nutrition, and physiology and the integration of these sciences to animal function, growth, reproduction, and lactation. Students complete the curriculum by choosing a specialization in either an animal science discipline (behavior, biochemistry, genetics, nutrition, or physiology) or in the sciences particular to a class of animals (aquatic, avian, companion and captive, equine, laboratory, livestock and dairy, or poultry).

Career Alternatives. A wide range of career opportunities are available to graduates. The primary goal of the major is to prepare students for graduate study leading to the M.S. and Ph.D. degrees; for continued study in a professional school such as veterinary medicine, human medicine, or dentistry; for careers in research, agricultural production, farm and ranch management, or positions in business, sales, financial services, health care, agricultural extension, consulting services, teaching, journalism, or laboratory technology.

B.S. Major Requirements: 

| Units | 
| Preparatory Subject Matter | 53-57 |
| Animal Science 1, 2, 41, 41L | 12 |
| Biological Sciences 2A, 2B, 2C | 15 |

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2013-16 offering in parentheses

Pre-Fall 2011 General Education (GE): AH=Arts and Humanities; Sci=Science and Engineering; SocSci=Social Sciences; Div=Dominant Diversity; Writ=Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; Sci=Science and Engineering; SocSci=Social Sciences; Div=Dominant Diversity; Writ=Writing Experience

A=AGCH-Agricultural Cultures, DD=DDominant Diversity, OL=Oral Skills, QL=Quantitative, SS=Scientific, VL=Visual, WC=World Cultures, WRE=Writing Experience

Chemistry 2A, 2B and 8A, 8B or 118A, 118B | 16-18 |
Mathematics 1A, UC Davis Core or 2A, 2B | 21B |
Plant Sciences 120 or Statistics 100 | 4 |
Note: Some professional and graduate schools may require additional preparatory subject matter. Please consult the advising center.

Depth Subject Matter | 39-43 |
Biological Sciences 101; Animal Genetics 107; Animal Biology 102, 103; Neurobiology, Physiology, and Behavior 101 | 24 |
Integral Animal Biology: Animal Science 122, 124, and Neurobiology, Physiology, and Behavior 121 and 121L | 23 |
Laboratory: Select one from the following: Animal Genetics 111; Animal Science 106, and 136, 137; Microbiology 1021; Molecular and Cellular Biology 120L, or 1601; Neurobiology, Physiology, and Behavior 101L or 104L; Pathology, Microbiology, and Immunology 126L | 2-6 |

Area of Specialization | 20-23 |
Choose one area of specialization below; the program of study must be approved in advance by your faculty adviser. Courses must be taken for a letter grade.

Animal Science with a Disciplinary Focus | 20 |
Select 20 upper division units, with approval from your faculty adviser, to form a coherent series of courses in one of the following disciplines: animal behavior, biochemistry, genetics, nutrition, or physiology.

Aquatic Animals | 20 |
Animal Science 123 and 131; Nutrition 124; Animal Science 118 or 119. Select additional upper division units from any Animal Genetics or Animal Science course, or other courses approved by your faculty adviser. Students in this specialization must take Animal Science 136 and 137 to meet their Laboratory Depth Subject Matter requirement. Students in this specialization may elect to substitute any of Biological Sciences 104, Evolution and Ecology 112, or Wildlife, Fish, and Conservation Biology 120 and 121 for the 12-unit requirement under Integrative Animal Biology, with approval of your faculty adviser.

Avian Science | 20 |
Avian Sciences 13, 100, 150; Nutrition 123, 123L. Select additional upper division units from any Animal Genetics, Animal Science, or Avian Sciences courses or other courses approved by your adviser. Students in this specialization must substitute Avian Sciences 103, 121, and Neurobiology, Physiology, and Behavior 117 for the Animal Science 124 and Neurobiology, Physiology, and Behavior 121 and 121L requirement under Integrative Animal Biology.

Companion and Captive Animals | 20 |
Animal Science 42, 142; Nutrition 115 or 122 or 123 and 123L, Animal Science 170. Select additional upper division units from any Animal Genetics, Animal Science or Avian Sciences course, or from Nutrition 115, 122, 123, 123L or other courses.

Equine Science | 20 |
Animal Science 15, 115, 141 and one of Animal Science 125, 126 or 127. Select additional upper division units from any Animal Genetics or Animal Science course, or from Nutrition 115, 122, 123, 123L or other courses approved by your faculty adviser.
## Animal Science

### Laboratory Animal Science Courses

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<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>Animal Science 42</td>
<td>103, 140, Nutrition 121, 122, 123</td>
<td>4</td>
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<tr>
<td>Animal Science 43</td>
<td>104, 121, 122</td>
<td>4</td>
</tr>
<tr>
<td>Animal Science 102, Neurobiology, Physiology, and Behavior 102, Anatomy, Physiology, and Cell 100</td>
<td>122, 123, 123L</td>
<td>8</td>
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<tr>
<td>Livestock and Dairy</td>
<td>143, 144, 146</td>
<td>12</td>
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<tr>
<td>Animal Science 145 or 147</td>
<td>112-125</td>
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### Animal Science—Animal Biology Courses

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<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>Animal Science 20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Animal Science 103, 104, 121, 122, 123, 123L</td>
<td>Select four or eight units from Animal Science 143, 144, 146, 112-125</td>
<td>112-125</td>
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### Animal Science—Dairy/Livestock Courses

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<td>Animal Science 41 and 41L</td>
<td>21</td>
<td>20</td>
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<tr>
<td>Animal Science 104</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Additional upper division courses</td>
<td>4</td>
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<tr>
<td>Select four or eight units from Animal Science 143, 144, 146</td>
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### Animal Science—Equine Courses

<table>
<thead>
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<th>Units</th>
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<tr>
<td>Animal Science 15, 104</td>
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<td>3</td>
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<td>Animal Science 115, 141</td>
<td>115, 141</td>
<td>8</td>
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<tr>
<td>Animal Science 125 or 126</td>
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<tr>
<td>Another upper division course</td>
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### Minor Advisor

- E.J. DePeters

### Graduate Study

- The Animal Biology Graduate Group offers a program of study and research leading to the M.S. or Ph.D. degree in Animal Biology. See Animal Biology (A Graduate Group), on page 151; see also Graduate Studies, on page 111.

### Courses in Animal Science (ANS)

#### Lower Division

**1. Domestic Animals and People (4)**
- Lecture—3 hours; laboratory—3 hours. Animal domestication and factors affecting their characteristics and distribution. Animal use for food, fiber, work, drugs, research and recreation; present and future roles in society. Laboratory exercises with beef and dairy cattle, poultry, sheep, swine, laboratory animals, fish, horses, meat and dairy products. GE credit: SciEng, Writ | SE, WE | I, II, III. (I, II) Famula

**2. Introductory Animal Science (4)**
- Lecture—3 hours; laboratory—3 hours. Prerequisite: course 1 and Biological Sciences 1A recommended. Growth, reproduction, lactation, inheritance, nutrition, and disease control in domesticated animals and species used in culture; the application of sciences to animal production. GE credit: SciEng, Writ | SE, SL, VL, WE | I, II, III. (I, II, III) Murray

**12. Animal Science: Basic Principles and Application (3)**

**15. Introductory Horse Husbandry (3)**
- Lecture—3 hours. Prerequisite: course 2 recommended. Instruction to care and use of light horses emphasizing the basic principles for selection of horses, responsible horse ownership, nutrition, and raising of foals. GE credit: SciEng, Writ | QL, SE, VL, WE | I, II, III. (I, II, III) Roser

**17. Canine Behavior: Learning and Cognition (3)**
- Lecture—3 hours. Domestic dog behavior from basic principles of learning to complex cognitive behaviors; interaction between learning and cognition including how these processes contribute to interactions with humans; the genetic correlates of learning and cognition. —IV. (IV) Raser

**18. Introductory Aquaculture (4)**

**21. Livestock and Dairy Cattle Judging (2)**
- Lecture—6 hours. Prerequisite: course 1 or 2 recommended. Evaluation of type as presently applied to light horses, meat animals and dairy cattle. Relationship between form and function, form and carcass quality, and form and milk production. GE credit: SciEng | OL, SE | I, II, III. (I, II, III) Van Liew

**22A. Animal Evaluation (2)**
- Laboratory—3 hours; fieldwork—30 hours (total). Prerequisite: course 22A or the equivalent. Attendance at 3 one-day weekend field trips required. Domestic livestock species with emphasis on visual appraisal, carcass evaluation, and application of performance information. Emphasis on accuracy written and oral descriptions of evaluations. Prerequisite to intercollegiate judging competition. Offered in alternate years. (P/NP grading only.) GE credit: OL, SE | I, II, III. Van Liew

**22B. Animal Evaluation (2)**
- Laboratory—3 hours; fieldwork—30 hours (total). Prerequisite: course 22A or the equivalent. Attraction at 3 one-day weekend field trips required. Continuation of course 22A with emphasis on specific species: swine, beef cattle, and sheep. Application of animal science principles to selection and management problem-solving scenarios. Prerequisite to intercollegiate judging competition. Offered in alternate years. (P/NP grading only.) GE credit: OL, SE | I, II, III. Van Liew

### 41. Animal Domestic Production (2)

- Lecture—2 hours. Principles of farm animal management, including dairy and beef cattle, sheep, and swine. Industry trends, care and management, nutrition, and reproduction. GE credit: SciEng | SE | I, II. (I) Miller

### 41L. Animal Domestic Production Laboratory (2)

- Discussion—1 hour; laboratory—3 hours. Prerequisite: course 41 (may be taken concurrently). Animal production principles and practices, including five field trips to dairy cattle, beef cattle, sheep, and swine operations and campus labs. (P/NP grading only.) GE credit: QL, SL, VL, WE | I, II, III. (I, II, III) Miller

### 42. Introductory Companion Animal Biology (4)


### 49A-K. Animal Management Practices (2)

- Discussion—1 hour; laboratory—3 hours. The application of the principles of elementary biology to the management of a specific animal species. Among the topics offered: (A) Aquaculture, (B) Beef, (C) Dairy, (D) Goats, (E) Horses, (F) Laboratory Animals, (G) Meats, (H) Poultry, (I) Sheep, (J) Swine, (K) Captive and Companion Avian. Up to 4 different topics may be offered. GE credit: SciEng, Writ | QL, SL, VL, WE | I, II, III. (I, II, III) Miller

### 90C. Research Group Conference (1)

- Discussion—1 hour. Prerequisite: lower division standing, consent of instructor. Weekly conference on research problems, progress and techniques in the animal sciences. May be repeated for credit. (P/NC grading only.)—I, II, III. (I, II, III) Miller

### 90E. Internship in Animal Science (1-12)

- Internship—9-12 hours. Prerequisite: consent of instructor. Internship off and on campus in dairy, live stock, and aquaculture production, research and management; or in a business, industry, or agency associated with these or other animal enterprises. All requirements of Internship Approval form must be met. (P/NC grading only.)—I, II, III. (I, II, III) Miller
104. Principles and Applications of Domestic Animal Behavior (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or Biological Sciences 28. Basic principles of animal behavior as applied to domesticated species. Emphasis placed on application of the principles of animal behavior. GE credit: ScEng | SE.—II. (II.) Tucker

106. Domestic Animal Behavior Laboratory (2)
Laboratory—6 hours. Prerequisite: course 104 or the equivalent. Research with laboratory animals, focusing on the behavior of large domestic animals. Experimental design, methods of data collection and analysis, and reporting of experimental results. GE credit: ScEng, Wrt | SE.—II. (II.) Tucker

112. Sustainable Animal Agriculture (3)
Lecture/discussion—3 hours. Prerequisite: Biological Sciences 28 or course 1; Statistics 100 or Plant Sciences 120 recommended. Current applications of sustainable animal agriculture including the challenges of animal production, animal welfare, and the protection of the environment and resources for future food supply systems. Various scenarios for meeting sustainability objectives are evaluated using computing modeling. GE credit: ScEng or SoSci | Ol, QL, SE, or SL.—III. (III.) Kelebrew

118. Fish Production (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Wildlife, Fish, and Conservation Biology 120 and 121. Current practices in fish production; relationship between the physiological aspects of a species and the production systems, husbandry, management, and marketing practices utilized. Emphasis on species currently reared in California. GE credit: ScEng | QL, SE, SL, WE.—I. (I.) Ross

119. Invertebrate Aquaculture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 18. Management, breeding and feeding of aquatic invertebrates; application of basic principles of physiology, reproduction, and nutrition to production of mollusks and crustaceans for human food; emphasis on interaction of species biology and management techniques on production efficiency and aquaculture outcomes; existing regulations, sample analyses, interpretation and utilization of data, evaluation of alternative practices, and policy development. GE credit: ScEng | SE, SL.—II. Meyer

120. Principles of Meat Science (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A. Anatomical, physiological, developmental, and biochemical aspects of muscle underlying the conversion of muscle to meat. Includes meat processing, preservation, microbiology, and public health issues associated with meat products. [Some course as Food Science and Technology 120] GE credit: ScEng, Wrt | SE.—II. (II.) Doroshov

120L. Meat Science Laboratory (2)
Discussion—1 hour; laboratory—3 hours. Prerequisite: Biological Sciences 1A; course 120 may be taken concurrently. Laboratory exercises and student participation in transformation of livestock to carcass and meat, structural and biochemical changes related to meat quality, chemical and sensory evaluation of meat, and field trips to packing plant and processing plant as course Food Science and Technology 120L GE credit: ScEng | SE.

123. Animal Growth and Development (4)
Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: Animal Biology 103 or Biological Sciences 103. Growth and development of animals from conception to maturity, viewed from practical and biological perspectives; includes genetic, metabolic, nutritional control of cell and organism function. GE credit: ScEng | OL, QL, SL, WE, WE.—III. (III.) Ross

124. Lactation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101; Animal Biology 102 or the equivalent or consent of instructor. The application of principles of animal behavior to domestic animals. GE credit: ScEng | Sl, SE.—II. (II.) Hovey

125. Equine Exercise Physiology (3)
Lecture—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101 or 102 and Animal Biology 102 or the equivalent physiology of the exercising horse. Includes physiological systems, gait analysis, lameness, pharmacology, sports medicine, sport horse performance evaluation and conditioning. Offered in alternate years. GE credit: ScEng | Sl.—III.

126. Equine Nutrition (3)
Lecture—3 hours. Prerequisite: course 15; Nutrition 115. Equine digestion, digestive physiology, diet development and evaluation, and the relationship of the topics to recommended feeding practices and nutritional portfolios. Offered in alternate years. GE credit: ScEng | SE.—III.

127. Advanced Equine Reproduction (3)
Lecture—3 hours. Prerequisite: upper division physiology courses (Animal Physiology, Physiology, and Behavior 101) and an advanced horse production and management course (e.g., course 115). Reproductive physiology, endocrinology of the mare and stallion. Emphasis on structure/function relationships as they are related to improving equine reproductive management and efficiency. GE credit: ScEng | SE.—III.

128. Agricultural Applications of Linear Programming (4)
Lecture—2 hours; laboratory—2 hours; discussion—1 hour. Prerequisite: upper division standing and Agricultural Systems and Environment 21 or the equivalent. Applications of linear programming in agriculture, emphasizing resource allocation problems and decision making. Problems include crop production, labor allocation, and problem management. Hands-on experience in developing linear programming and interpreting the results. GE credit: ScEng | OL, SE, SL.—II. (II.) Fodell

129. Environmental Stewardship in Animal Production Systems (3)
Lecture—3 hours. Prerequisite: Biological Sciences 10 and 1A. Biotechnology 2A, 2B, 8A, BB. Management principles of environmental stewardship for grazing livestock, and the consideration of environmental, social, and economic factors related to environmental quality, nutrition, and environmental and policy related to reproduction. Offered in alternate years. GE credit: ScEng | SE, Sl.—II. Meyer

131. Reproduction and Early Development in Aquatic Animals (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: Molecular and Cellular Biology 150; Wildlife, Fish, and Conservation Biology 120, 121; or consent of instructor. Physiological and developmental functions related to reproduction, breeding efficiency and fertility of animals commonly used in aquaculture. GE credit: ScEng | SE, WE.—III. (III.) Doroshov

136A. Techniques and Practices of Fish Culture (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 2. Daily care and maintenance of fish in residential aquariums, research and commercial facilities. Biological and environmental factors important to sound management of fish. Laboratories focus on fish culture and include specific training for credit to students who have completed course 136. GE credit: ScEng | QL, SL, VL, WE.—I. (I.) Hung

136E. Techniques and Practices of Avian Culture (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 2. Daily care and maintenance of birds for research, commercial production, and companion or hobby uses. Biological and environmental factors important to sound management of birds. Laboratories focus on bird husbandry, management and care, and include growth trials. GE credit: ScEng | OL, QL, SL, VL, WE.—I. (I.) Hung

137. Animal Biochemistry Laboratory (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: Animal Biology 102 or Biological Sciences 102 or the equivalent. Chemical and biochemical methods, and instruments commonly used in animal science. Wet chemical methods, UV/visible and atomic absorption spectrophotometry, thin-layer and gas-liquid chromatography, commercial chemical kits. Attention to safety. GE credit: ScEng | QL, SL, WE.—II. (II., III.) Hung

140. Management of Laboratory Animals (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101. Laboratory animal management procedures in view of animal physiology, health and welfare, government regulations, and experimental needs. Clinical techniques using rodents and rabbits as models. GE credit: ScEng | SE.—I. (I.)

141. Equine Enterprise Management (4)
Lecture/discussion—4 hours. Prerequisite: course 15; Economics 1A, 1B recommended. Examination of the concepts and principles involved in the operation of an equine enterprise. Essential aspects of equine enterprise management, including equine law, marketing, cash flow analysis, and impact of state and federal regulations. GE credit: SoSci, Wrt | SS.—II.

142. Companion Animal Care and Management (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 42; Biological Sciences 101, Neurobiology, Physiology, and Behavior 101; Animal Biology 102 and 103 recommended. Management and production of companion animals. Integration of the disciplinary principles of behavioral, nutritional, and physiological and related to the care of companion animals. GE credit: ScEng | QL, QL, SE, SL, VL, WE.—I. (I.) Oberbauer

143. Pig and Poultry Care and Management (4)
Lecture—3 hours; laboratory—3 hours; Saturday field trips. Prerequisite: Nutrition 115; Neurobiology, Physiology, and Behavior 101. Care and management of swine, broilers and turkeys as related to sound management of these species. GE credit: ScEng | Ol, QL, SE, SL, VL, WE.—I. (I.) Doroshov

144. Beef Cattle and Sheep Production (4)
Lecture—3 hours; laboratory—3 hours; one or two Saturday field trips. Prerequisite: course 41; Animal Genetics 107, Nutrition 115, or consent of instruc-
145. Meat Processing and Marketing (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: consent of instructor. Distribution, processing, and marketing of meat and meat products. May be repeated for credit. GE credit: SciEng | SL, VL, WE. —III. (III.) Zinn

146. Dairy Cattle Production (5)
Lecture—3 hours; laboratory—3 hours; fieldwork—1 hour; discussion—1 hour. Prerequisite: consent of instructor. Dairy Animal Genetics 107, and Nutrition 115, or consent of instructor. Scientific principles from genetics, nutrition, physiology, and related fields applied to conversion of animal feed to human food through dairy animals. Management and economic decisions are related to animal biology considering the environment and animal wellbeing. Mandatory Saturday fieldtrip. GE credit: SciEng | Wrt | VL, WE. —III. (III.) DePeters

147. Dairy Processing and Marketing (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 146 or consent of instructor. Examination of distribution systems, processing practices, product quality, impact of government policy (domestic and foreign), marketing alternatives, and product development. GE credit: SciEng | SE

148. Enterprise Analysis in Animal Industries (4)
Lecture/discussion—4 hours. Prerequisite: course 141 or 145 or 147 or consent of instructor. Examination and application of decision making and problem solving in the production enterprise. The areas of production analysis, problem solving, risk analysis and cost-benefit analysis will be examined in terms of the total enterprise. GE credit: SocSci, Wrt | OL, QL, SL, WE. —III. (III.) Kabreab

149. Farrier Science (3)
Lecture—3 hours. Prerequisite: course 115. Distance learning class broadcast from California Polytechnic State University San Luis Obispo, California Polytechnic State University Pomona, and California State University Fresno. In-depth examination of the structure-function relationships of the equine hoof and how it relates to conformation, injury, and performance. GE credit: SciEng | SE

149L. Farrier Science Laboratory (1)
Laboratory—3 hours. Prerequisite: course 149 [may be taken concurrently] or consent of instructor. The art and science of shoeing/hoeing in equine related fields. Proper use of the tools, materials and techniques in the fabrication of shoes and safe preparation of the hoof for application of shoes. (P/NP grading only.)

170. Ethics of Animal Use (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: any basic course in composition or speech. Ethical issues related to animal use in contemporary society. Integration of philosophical theories with scientific evidence on animal behavior, mentality, and welfare. Uses of animals in agriculture, research, and as companions. Ethical responsibilities regarding wildlife and the environment. GE credit: Ethic | OL, QL, SL, WE. —III. (III.) Bren

190C. Research Group Conference (1)
Discussion—1 hour. Prerequisite: advanced standing; consent of instructor. Weekly conference on research problems, progress and techniques in the animal sciences. May be repeated for credit. (P/NP grading only.)

192. Internship in Animal Science (1-12)
Internship—3-36 hours. Prerequisite: completion of 84 units and consent of instructor. Internship off and on campus in dairy, livestock and aquaculture production, research and management; or in a business, industry, or agency associated with these or other animal enterprises. All requirements of Internship Approval Form must be met. (P/NP grading only.) —I, II, III. (I, II, III)

194. Research in Animal Science (3)
Laboratory—6 hours; discussion—1 hour. Prerequisite: upper division standing, course 193, one laboratory course in animal biology and consent of instructor. Research with a faculty mentor. Weekly discussion and laboratory on specific research topic. May include a seminar to research group. Choose from sections: (1) Animal Behavior; (2) Animal Genetics; (3) Animal Nutrition; (4) Animal Physiology. May be repeated for credit for a total of four times. —I, II, III. (I, II, III.)

194HA. Undergraduate Honors Thesis in Animal Science (4)
Lecture—1 hour; laboratory—9 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101, Animal Biology 103, minimum cumulative GPA of 3.200 and selection by the Honors Selection Committee. Students will carry out a research project [chosen from faculty-suggested or approved proposals] during the academic year under the guidance of a faculty member. Upon completion, student will write a thesis and present a public seminar describing his/her research. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | OL, SE

194HB. Undergraduate Honors Thesis in Animal Science (4)
Lecture—1 hour; laboratory—9 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101, Animal Biology 103, minimum cumulative GPA of 3.200 and selection by the Honors Selection Committee. Students will carry out a research project [chosen from faculty-suggested or approved proposals] during the academic year under the guidance of a faculty member. Upon completion, student will write a thesis and present a public seminar describing his/her research. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE, VL

194HC. Undergraduate Honors Thesis in Animal Science (4)
Lecture—1 hour; laboratory—9 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101, Animal Biology 103, minimum cumulative GPA of 3.200 and selection by the Honors Selection Committee. Students will carry out a research project [chosen from faculty-suggested or approved proposals] during the academic year under the guidance of a faculty member. Upon completion, student will write a thesis and present a public seminar describing his/her research. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE, WE

197T. Tutoring in Animal Science (1-2)
Tutoring—1-2 hours. Prerequisite: Animal Science or related major, advanced standing, consent of instructor. Tutoring of students in lower division animal science courses; weekly conference with instructor in charge of course; written critiques of teaching procedures. May be repeated for credit. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

Graduate

200. Strategies in Animal Production (4)
Lecture/discussion—4 hours. Prerequisite: consent of instructor. Examines the forces and issues in animal agriculture through the strategic management process.

206. Models in Agriculture and Nutrition (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Mathematics 168; Statistics 100B. Application of regression techniques and models. Techniques and models for non-linear experimental designs and management models are presented. Qualitative analysis and evaluation of linear and non-linear equations used in agriculture and nutrition.

259. Literature in Animal Science (1)
Seminar—1 hour. Prerequisite: graduate standing. Critical presentation and analysis of recent journal articles in animal science. May be repeated for credit up to nine times. (S/U grading only.)

290. Seminar (1)
Seminar—1 hour. Reports and discussions of topics of interest in genetics, nutrition, and physiology as they apply to animal science. (S/U grading only.) —I, II, III. (I, II, III.)

290C. Research Group Conference (1)
Discussion—1 hour. Prerequisite: graduate standing. Weekly conference on research problems, progress and techniques in the animal sciences. May be repeated for credit. (S/U grading only.) —I, II, III. (I, II, III.)

291. Current Research in Animal Science (1)
Seminar—1 hour. Prerequisite: graduate standing. Current research in animal science explored at weekly seminars presented by guest lecturers. Discussion of research presented. May be repeated for credit. (S/U grading only.) —I, II, III. (I, II, III.)

297. Supervised Teaching in Animal Science (2)
Supervised teaching—6 hours. Prerequisite: consent of instructor. Practical experience in teaching Animal Science at the University level, curriculum design and evaluation; preparation and presentation of material. Assistance in laboratories, discussion sections, and evaluation of student work. An evaluation letter sent to the Graduate Adviser with a copy to the student. (S/U grading only.) —I, II, III. (I, II, III.)

298. Group Study (1-5)
Prerequisite: consent of instructor. (Sect. 1, 2, 3—letter grading; from Sect. 4 on—S/U grading only.)

299. Research (1-12)
(S/U grading only.)

Animal Science and Management

[College of Agricultural and Environmental Sciences]

Master Adviser. J.G. Fadel

Advising Center for the major (including peer advising) is located in 1202 Meyer Hall 530-754-7915. Each student will be assigned a faculty adviser through this office upon entering the major. http://acag.ucdavis.edu

The Major Program

The Animal Science and Management major combines a thorough education in the basic biology of domestic animal species with a strong background in agricultural economics. Graduates of this interdisciplinary major will be well positioned to adjust to our rapidly changing world and job market.

The Program. The interdisciplinary program in Animal Science and Management combines a fundamental background in the natural sciences (chemistry, biology, physiology, nutrition, genetics, mathematics, and behavior), with an understanding

Quarter Offered: Fall, Winter, Spring, Summer. 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): AHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; DivDom—Domestic Diversity; Write—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; AC—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

156 Animal Science and Management
of economics and humanities. After completing preparatory courses, students focus on both the animal species that interest them (for example, companion animals, goats, fish, crustaceans or mollusks, among others) and principles of managerial economics (marketing, finance, business organization or systems analysis). Students preparing for medical or veterinary school can meet professional entrance requirements with those of this major if they plan ahead.

Career Alternatives. Job opportunities for successful graduates are plentiful and include positions with banking and financial institutions, agribusiness, Peace Corps, and farms of all scales. Most Animal Science and Management graduates are well prepared for professional study (medical, law, veterinary, and graduate business schools) as well as graduate research programs leading to the M.S. or Ph.D. degrees. Advanced degrees open doors to work as extension specialists, farm advisers, and teachers, and prepare students for international service.

B.S. Major Requirements:

Written and Oral Expression.................................. 8

Preparatory Subject Matter........................................ 69-72
Animal Science 1 and 2 ........................................... 8
Biological Sciences 2A, 2B, and 2C.......................... 13-15
Chemistry 2A, 2B, 8A, 8B ...................................... 16
Plant Sciences 21 or Computer Science Engineering 15 .................................................. 8
Economics 1A, 1B, Management 1IA, 1IB .................. 16
Mathematics 16A, 16B, and 16C or 17A-B-C or 21A-B-C ............... 9-12
Plant Sciences 120, Statistics 100 or 103, or other courses in quantitative skills with prior approval of the Master Adviser. 8

Depth Subject Matter............................................ 27-30
Biological Sciences 101 ........................................ 4
Nutrition 115 ................................................... 4
Neurobiology, Physiology, and Behavior 101 ............... 4
Business Management 141-17
Agricultural and Resource Economics 100A,
One course from: Agricultural and Resource Economics 113, 130, 136, 138,
One course from: Agricultural and Resource Economics 120, 132, 140, 145, 157;
Plus one course from: Animal Science 128
At Agricultural and Resource Economics 155.

Area of Specializations............................................ 14-16
Choose one area of specialization below:
Aquatic Animals .................................................. 16
Animal Science 18, 118 or 119, 131, and 148.
Companion Animals ............................................. 16
Animal Science 42, 140, 142, and 148
Data Analysis: Include an introductory course in
Animal Science 41, 411, 146, 147, and 148.
Equine ................................................................... 15
Animal Science 15, 115, 141, and 148
Livestock .................................................................. 16
Animal Science 41, 411, 143 or 144, 145, and 148.
Poultry ..................................................................... 15
Avian Sciences 11, Animal Science 143, 145, and 148.
Individualized ......................................................... 14-16
Students may, with prior approval from their advisor and the Master Adviser, design their own individualized specialization within the major. The specialization will consist of 4 to 6 courses with one of the courses being Animal Science 148. The other courses are determined by introduction, care and management, and processing and/or marketing aspects of the animal of interest.

Restricted Electives...................................................... 8-10
Aavian Sciences 100, 103, 115, 121, 123, 149, 150; Animal Genetics 101, 105, 107, 111; Nutrition 122, 123, 123L, 124, Animal Biology 102 [strongly recommended], 103; Computer Science Engineering 124; Management 100; Neurobiology, Physiology, and Behavior 117, 121, 121L, 130; Wildlife, Fish, and Conservation Biology 120, 120L, 130.

Total Units for the Major ........................................... 126-136

Anthropology

(College of Letters and Science)
Li Zhang, Ph.D., Chairperson of the Department
Department Office. 328 Young Hall
530-752-0745; http://www.anthropology.ucdavis.edu

Faculty
Robert D. Betzig, Ph.D., Professor
Monique Borgerhoff Mulder, Ph.D., Professor
Timothy K. Choy, Ph.D., Associate Professor
Science and Technology Studies
Margaret C. Crafoot, Ph.D., Assistant Professor
Christynnn M. Associate Professor
Marisol de la Cadena, Ph.D., Professor
Donald L. Donham, Ph.D., Distinguished Professor
Joseph Dumit, Ph.D., Professor
Science and Technology Studies
Jenner V. Eerkens, Ph.D., Professor
Cristiana Giordano, Ph.D., Assistant Professor
Lyne A. Isbell, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Suad Joseph, Ph.D., Distinguished Professor
Women and Gender Studies
Alan Klima, Ph.D., Professor
Andrew J. Marshall, Ph.D., Associate Professor
Richard McElreath, Ph.D., Professor
Suzanna M. Sawyer, Ph.D., Associate Professor
Janet S. Shibamoto-Smith, Ph.D., Professor
David Glenn Smith, Ph.D., Professor
James H. Smith, Ph.D., Associate Professor
Smiti Srinivas, Ph.D., Professor
Teresa E. Steele, Ph.D., Associate Professor
Timothy D. Wease, Ph.D., Associate Professor
Li Zhang, Ph.D., Professor
Nicolas Zwyna, Ph.D., Assistant Professor

Ermeriti Faculty
Bruce P. Winterholder, Ph.D., Emeritus
Aram A. Tengoyan, Ph.D., Emeritus
Richard F. Emeritus

The Major Program
Anthropology is the systematic study of human beings. The student of anthropology learns about human biology, ecology, and social life—past and present—and gains a broad understanding of humans and societies. It is a diverse field, and the courses, faculty, and degree programs at UC Davis are subdivided into two wings—Evolutionary and Sociocultural.

Evolutionary. Evolutionary anthropologists are united by their common application of science to understand the behavior, ecology, and evolutionary history of human beings. The B.A. degree in evolutionary anthropology uses DNA to study the genetic relationships among different populations and the adaptive significance of specific genetic traits. Paleoanthropology uses comparisons among fossilized remains to help understand what biological changes occurred during the course of human evolution. Biogeography investigates the biology behind the geographic distribution of species, and the evolution of humans and non-human primates. Molecular anthropology studies the patterns of loss of biological diversity—in this department, it focuses on threatened non-human primates and the conservation of natural resources by a rapidly growing population. Primatology is the study of behavior, ecology and morphology of primates to address questions about the evolution and function of behavioral and morphological patterns in non-human primates and to test models of the origins of human morphology and behavior.

Sociocultural. Sociocultural anthropologists study the varied ways in which people around the world organize their lives and interpret the circumstances in which they operate. Their main method is extended field research, which combines attention to global issues with the close study of human relations and culture. Among the department's undergraduate courses are globalization and transnationalism; human ecology and environmental change; cultures of healing, health and medicine, the global spread of media and technology; migration, multiculturalism and urban life; colonialism and neocolonial development and post-development; race, class and gender; politics and the political; cultures of everyday life; language use and discourse; and self, identity and family. The track in sociocultural anthropology thus offers a rich set of resources for understanding and engaging pressing issues in a globalizing world characterized by new forms of international culture and community as well as by increasing material inequality and political volatility.

The Program. The Bachelor of Arts program is divided into two tracks, Sociocultural and Evolutionary, which parallel the two wings described above. Students interested in the study of recent and contemporary human languages and societies should follow the Sociocultural Track. A.B. degree in sociocultural anthropology, each student is required to complete courses that provide (1) foundational skills, (2) language and cultural skills, (3) comprehensive skills, and (4) specialized skills. Students interested in the study of archaeology; primate studies; or human biology, ecology or origins should follow the Evolutionary Track. The B.A. degree offered by the Evolutionary Track provides a unique perspective in anthropology from an evolutionary perspective. The Evolutionary Track also offers a B.S. degree that requires more rigorous lower division coursework in...
math and science than the A.B. degree and upper division coursework in biological anthropology and closely related disciplines.

Students in both tracks are encouraged to gain practical experience through courses taken while studying abroad (under the administration of the UC Davis Study Abroad) and through internships performed for credit (under the administration of the Internship and Career Center). Students showing exceptional ability are welcome to seek permission from instructors to participate in graduate seminars offered by the department in order to have these courses count toward the fulfillment of upper division requirements for the major.

Career Alternatives. A Bachelor of Arts degree in Anthropology is suited for students seeking a solid liberal arts education. With its broad goal to facilitate understanding across lines of cultural difference, sociocultural anthropology prepares students for lives that are influenced by increasingly pervasive cultural exchange, as well as cultural conflicts around the world. The program serves as excellent preparation for careers in which intercultural skills are increasingly needed, including social and environmental activism, business, diplomacy and social administration, journalism, law, education and international relations. Students that focus on evolutionary processes will be well prepared to enter fields such as medical or health anthropology, museum studies, cultural resource management and wildlife conservation. A Bachelor of Science degree in Anthropology provides suitable pre-medical, pre-dental, and pre-professional training, and the educational background for further training in the health professions, biological/evolutionary sciences and forensic investigation. The A.B. or B.S. degree in anthropology prepares candidates for education in good preparation for high school teaching in social, biological and natural sciences. An anthropology degree also provides the foundation for advanced study leading to careers in college-level teaching and research.

A.B. Major Requirements:

<table>
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<tr>
<th>Units</th>
<th>Preparatory Subject Matter</th>
<th>Pre-direct</th>
<th>Pre-Fall 2011 General Education (GE):</th>
<th>Pre-Fall 2011 General Education (GE):</th>
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<tbody>
<tr>
<td>19-21</td>
<td>Anthropology 1, 2, 3</td>
<td>3</td>
<td>Social Sciences</td>
<td>Social Sciences</td>
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<tr>
<td></td>
<td>Anthropology 15 or 23</td>
<td>4-5</td>
<td>Basic Skills</td>
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<tr>
<td></td>
<td>Anthropology 13, Statistics 13, 32, 100 or 102</td>
<td>3-4</td>
<td>Arts and Humanities</td>
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<td>Anthropology 100, 110</td>
<td>8</td>
<td>Oral Skills</td>
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<td>42-47</td>
<td>Depth Subject Matter</td>
<td>4</td>
<td>tcomponents</td>
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<td></td>
<td>Two courses from: Anthropology 100, 102, 103, 105, 122A, 128A, 154A, 154B, 158, 178</td>
<td>7-9</td>
<td>Pre-Domestic Studies</td>
<td>Pre-Domestic Studies</td>
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<tr>
<td></td>
<td>Anthropology 153 or 157</td>
<td>3-5</td>
<td>International</td>
<td>International</td>
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<tr>
<td></td>
<td>Anthropology 170, 171, 172, 173, 176, 180, 184</td>
<td>4</td>
<td>Environmental</td>
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<tr>
<td></td>
<td>One course from: Anthropology 170, 171, 172, 173, 176, 180, 184</td>
<td>4</td>
<td>Environmental</td>
<td>Environmental</td>
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<tr>
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<td>One course from: sociocultural track in consultation with an evolutionary track undergraduate adviser</td>
<td>4</td>
<td>International</td>
<td>International</td>
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<tr>
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<td>Select 20 additional units from any upper division evolutionary track Anthropology courses as listed in consultation with an evolutionary track undergraduate adviser</td>
<td>20</td>
<td>International</td>
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<td>Total Units for the Major</td>
<td>61-68</td>
<td>Pre-Fall 2011 General Education (GE):</td>
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<td>Note: Evolutionary track courses at the upper division level are those with numbers from 100 to 149B, with the exception of 101, 103, 105, 128A, and 141B.</td>
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<td>Pre-Fall 2011 General Education (GE):</td>
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<td></td>
<td>Sociocultural track courses are those that refer to one or more peoples or regions of the world.</td>
<td></td>
<td>Pre-Fall 2011 General Education (GE):</td>
<td>Pre-Fall 2011 General Education (GE):</td>
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B.S. Major Requirements:

<table>
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<tr>
<th>Units</th>
<th>Preparatory Subject Matter</th>
<th>Pre-direct</th>
<th>Pre-Fall 2011 General Education (GE):</th>
<th>Pre-Fall 2011 General Education (GE):</th>
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<tr>
<td>54-60</td>
<td>Anthropology 1, 2, 3</td>
<td>12</td>
<td>Social Sciences</td>
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<td>Biological Sciences 2A, 2B, 2C</td>
<td>14</td>
<td>Basic Skills</td>
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<td>Chemistry 2A, 2B, 8A, 8B</td>
<td>118A, 118B</td>
<td>International</td>
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<td>Mathematics 16A-16B-16C or 17A-17B-17C</td>
<td>9-12</td>
<td>International</td>
<td>International</td>
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<td></td>
<td>Anthropology 13, Statistics 13, 32, 100 or 102</td>
<td>4</td>
<td>International</td>
<td>International</td>
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<tr>
<td>45</td>
<td>Depth Subject Matter</td>
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<td></td>
<td>Anthropology 152, 153, 157, 158</td>
<td>15</td>
<td>Pre-Domestic Studies</td>
<td>Pre-Domestic Studies</td>
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<tr>
<td></td>
<td>Three additional courses in anthropology chosen in consultation with evolutionary track undergraduate adviser</td>
<td>8-12</td>
<td>International</td>
<td>International</td>
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<td>Additional units from the list below to achieve a minimum of 45 upper division units</td>
<td>4</td>
<td>International</td>
<td>International</td>
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<td>Anthropology 101, 102, 103, 105, 122A, 128A, 151, 154B, 155, 156, 157, 157, 158, 159, 180, 181, 182, 183, 184</td>
<td>8-13</td>
<td>Pre-Domestic Studies</td>
<td>Pre-Domestic Studies</td>
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</table>

Honors Program. Candidates for high or highest honors in Anthropology must write a senior thesis under the direction of a faculty member. The thesis project will have a minimum duration of two quarters. Honors candidates must take at least six units of Anthropology 174A. Only students who, at the end of their junior year (132 units), have a cumulative grade point average of 3.500 in Anthropology courses will be eligible for the honors program. The quality of the thesis work will be the primary determinant for designating high or highest honors at graduation.

Teaching Credential Subject Representative: see the Teaching Credential/M.A. Program on page 115.

Graduate Study. The Department offers a program of study leading to the M.A. and Ph.D. degrees in Anthropology. Further information regarding graduate study may be obtained at the Department office and at Graduate Studies.

Courses in Anthropology (ANT)

Lower Division

1. Human Evolutionary Biology (4)
   Lecture—2 hours; discussion—1 hour. Processes and course of human evolution, primatology, biological and social diversity within humans; paleoanthropology. GE credit: SciEng, Div Wrt | Sl | Si, WE.
11Y. Human Evolutionary Biology (4)
Web seminar—4 hours; discussion—1 hour. Evolutionary theory and mechanisms of evolution; basic population and quantitative genetics; primateology; biological and cultural diversity within Homo sapiens; paleoanthropology and evolution of human societies. Course 54 or consent of instructor. GE credit: Div | Se, Sl.

26. Mummies of the Ancient World (2)
Lecture—2 hours. Archaeological approaches for studying mummies and the process of mumification in the ancient world. Topics include environmental factors promoting mumification, and archaeological conservation of mumified bodies. Offered in alternate years. GE credit: SS, Wt | WL, L, T, E.

30. Sexualities (4)
Lecture/discussion—4 hours. Introduction to the study of sexuality, particularly to the meanings and social organization of same-sex sexual behavior across cultural time. Biological and cultural approaches will be compared, and current North American issues placed in a wider comparative context. GE credit: ArtHum or SoSci, Div | ACCH, AH or SS, DD, Wt.

32. Drugs, Science and Culture (4)
Lecture—3 hours; discussion—1 hour. Drugs, politics, science, society in a cultural perspective: emphasis on roles of science, government and the media in shifting attitudes toward alcohol, marijuana, Prozac and other pharmaceuticals; drug laws, war on drugs and global trade in sugar, opium, cocaine. [Same course as Science and Technology Studies 40 or consent of instructor. GE credit: SoSci, Div | SS, Wt | Wt | SL, VL, Wt, Wt.

34. Cultures of Consumerism (4)

50. Evolution and Human Nature (4)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

99. Special Study for Lower Division Students (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Upper Division
100. Theory in Social-Cultural Anthropology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Discussion of the theoretical and philosophical developments in cultural anthropology from the 19th century to the present. Not open for credit to students who have completed course 137. GE credit: SoSci, Div | SS, Wt.

Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or 2 or Environmental Science and Policy 30 or Evolution and Ecology 100 or Biological Sciences 101. Interdisciplinary study of diversity and change in human societies, using frameworks from anthropology, evolutionary ecology, history, archaeology, psychology, geography, and other fields. Topics include population dynamics, subsistence transitions, family organization, disease, economics, warfare, politics, and resource conservation. [Same course as Environmental Science & Policy 101.] GE credit: SoSci, Div | SS, Wt, Wt.

103. Indigenous Peoples and Natural Resource Conservation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Political economy of environmental struggles. Relationship between social inequality (based on race, class, and/or gender) and ecological degradation. Articulation of local peoples, national political, and global environmental global economy in the contestation over the use of environmental resources. Not open for credit to students who have completed course 121N. (Former course 134N.) GE credit: SoSci, Div | ACCH, DD, OL, SS, Wt, Wt.

104N. Cultural Politics of the Environment (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Political economy of environmental struggles. Relationship between social inequality (based on race, class, and/or gender) and ecological degradation. Articulation of local peoples, national political, and global environmental global economy in the contestation over the use of environmental resources. Not open for credit to students who have completed course 134N. (Former course 134N.) GE credit: SoSci, Div | ACCH, DD, OL, SS, Wt, Wt.

105. Evolution of Societies and Cultures (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or 2 or Environmental Science and Policy 30 or Evolution and Ecology 100 or Biological Sciences 101. Interdisciplinary study of social and cultural evolution in humans. Culture as a system of inheritance, psychology of cultural learning, culture as an adaptive system, evolution of maladaptations, evolution of technology and institutions, evolutionary transitions in human history, coevolution of genetic and cultural variation. Only two units of credit to students who have completed course 134N. (Former course 134N.) GE credit: SoSci, Wt | SS, Wt, Wt.

110. Language and Sociocultural Anthropology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. The role of language analysis and linguistic theory in the development of sociocultural anthropology. Language, culture, and thought; the linguistic accomplishment of social action; language ideology; language and social power. Language as a cultural mediator of political processes. GE credit: SoSci, Div | SS, Wt, Wt.

117. Language and Society (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 4, or Linguistics 1 and course 2. Consideration of language in its social context. Methods of data collection and analysis; identification of socially significant linguistic variables. Contributions of the study of contextualized speech to linguistic theory. GE credit: SoSci, Wt | SL, SS, Wt, Wt.

120. Language and Culture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2, or courses 2 and Linguistics 1. Culture, cognition, meaning, and interpretation; language and the classification of experience; communication and learning in crosscultural perspective. GE credit: SoSci, Div | ACCH, DD, OL, SS, Wt.
121. Special Topics in Medical Anthropology (4)
Lecture/discussion—4 hours. Prerequisite: course 2 or Science and Technology Studies 1. Introduction to critical medical anthropology. Topics include anthropological analysis of biomedicine, psychiatry, systems of knowledge and healing, the body, emotions, and clinical encounters in a cross-cultural perspective. [Same course as Science and Technology Studies 121.] GE credit: SocSci, Div, Wrt | SS, WC, WE.

122A. Economic Anthropology (4)
Lecture—3 hours; discussion—1 hour. Varieties of production, exchange, and consumption behavior in precapitalist economies, their interaction with culture and social-political organization, and the theories that account for these phenomena. The effects of capitalism on precapitalist societies. Not open for credit to students who have completed course 122. [Former course 122.D.] GE credit: SocSci, Div, Wrt | ACCH, DD, SS, WC, WE.

122B. Anthropology and Political Economy (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Survey of anthropological approaches to the study of political organizations; inter-relationships among political institutions, economic infrastructures and cultural complexity. Not open for credit to students who have completed course 122A. [Former course 122.] GE credit: SocSci, Div, Wrt | SS, WC, WE.

123AN. Resistance, Rebellion, and Popular Movements (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Analysis of popular protest in Third World and indigenous societies ranging from covert resistance to national revolts. Comparative case studies and theories of peasant rebellions, millenarian movements, social bands. Indian "wars," ethnic and regional conflicts, gender and class conflicts. Not open for credit to students who have completed course 123AS. [Former course 123A.] GE credit: SocSci | SS, WC, WE.

124. Religion in Society and Culture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Discussion of anthropological theories of religion with emphasis on non-literate societies. Survey of shamanism, magic and witchcraft, rituals and symbols, and religious movements. Extensive discussion of ethnographic examples and analysis of social functions of religious institutions. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

125A. Structuralism and Symbolism (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Survey of anthropological approaches to understanding the logic of structuralism and symbolism in non-literate societies. Analysis of how anthropological and symbolic interpretations relate to cultural and linguistic universals and to the philosophical basis of relativism in the social sciences. [Former course 125.] GE credit: SocSci, Div, Wrt | SS, WC, WE.

125B. Postmodernism and Culture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. "The U.S.-European postmodern condition. "Modernity" as an incomplete project for subordinated groups and postcolonial and political conditions leading to postmodern aesthetics, in comparison with postcolonialism, feminism and minority discourse. GE credit: SocSci, Div, Wrt | SS, WC, WE.

126A. Anthropology of Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Theories of development and current critiques. Colonial legacies and postcolonial political and social changes; development paradigms; and international organization and politics. Case studies emphasizing non-industrial societies. Not open for credit to students who have completed course 126. [Former course 126.] GE credit: SocSci, Div, Wrt | SS, WC, WE.

126B. Women and Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Current Third World and Western issues concerning women in agriculture, industry, international division of labor, political movements, revolutions, politics of health, education, family and reproduction. Impact of colonialism, the international political economy, and international feminism on women and development. Not open for credit to students who have completed course 123B. [Former course 123.] GE credit: SocSci, Div, Wrt | SS, SS, WC, WE.

127. Urban Anthropology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Survey of approaches to urban living: political structures, organization of labor, class relations, world views. The evolution of urban life and its contemporary dilemmas. Cross-cultural comparisons discussed through case studies. GE credit: SocSci, Div, Wrt | SS, WC, WE.

128A. Kinship and Social Organization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Comparative examination of personal kinship, descent, marriage, household and family organization, the theories that account for variation, and recent advances in the treatment of these data. Not open for credit to students who have completed course 128. [Former course 128.] GE credit: SocSci, Div, Wrt | SS, WC, WE.

128B. Self, Identity, and Family (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Comparative examination of personal kinship, descent, family and identity systems. Cross-cultural comparisons discussed through case studies. GE credit: SocSci, Div, Wrt | SS, WC, WE.

129. Health and Medicine in a Global Context (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 2 or Science and Technology Studies 1. Recent works in medical anthropology and the scientific study of medicine dealing with social and cultural aspects of global health issues such as AIDS, pandemics, clinical trials, cultural differences in illnesses, diabetes, organ trafficking, medical technologies, illness narratives, and others. [Same course as Science and Technology Studies 129.] GE credit: SocSci, Div, Wrt | SS, WC, WE.

130A. Cultural Dimensions of Globalization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. The cultural dimensions of recent economic and political changes, the process called "globalization." GE credit: SocSci, Wrt | SS, WC, WE.

130BN. Migration and the Politics of Place and Identity (4)
Lecture/discussion—4 hours. Prerequisite: course 2 or consent of instructor. Internal and international migration from an anthropological perspective, including causes, processes, and political, economic, and cultural effects of spatial mobility and displacement. Categories of identity, place, and power in diverse cultural and historical contexts. Not open for credit to students who have completed course 123D. [Former course 123D.] GE credit: SocSci, Div, Wrt | SS, WC, WE.

131. Ecology and Politics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Analysis of the complex interactions between ecological dynamics and political processes employing the emerging conceptual approach of political ecology. Study of environmental degradation (e.g., desertification, logging, mineral extraction, petroleum, water) from various cultural and geographic regions. GE credit: SocSci, Div.

132. Psychological Anthropology (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 2 or Science and Technology Studies 1. History of and relationship between anthropology and psychoanalysis. Exploration of anthropological emotions, colonial psychology, contemporary ethnopsychiatry, studies on personhood, perception, magic, altered states of consciousness, and definitions of the normal and the pathological in different contexts and cultures. GE credit: SocSci, Div, Wrt | SS, WC, WE.

134. Buddhism in Global Culture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one lower division course in Anthropology, Sociology, History, or Religious Studies. Buddhist meditation and ritual as a cultural system that adapts to global and local forces of change. Anthropological theory and method in understanding global culture transmission, including Buddhist reform movements in Asia and Buddhist practice in the West. Limited enrollment. Offered irregularly.

135. Anthropology of the Family (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or completion of course 121. Lectures covering the anthropology of family, focusing on family processes and structures in a variety of cultural and geographic regions. GE credit: SocSci, Div, Wrt | SS, VL, WC, WE.

136. Ethnic and Religious Studies (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Overview of the field of religious studies in anthropology, including causes, processes, and political, economic, and cultural effects of spatial mobility and displacement. Categories of identity, place, and power in diverse cultural and historical contexts. Not open for credit to students who have completed course 128. [Former course 128.] GE credit: SocSci, Div, Wrt | ACCH, DD, SS, WC, WE.

137. Migration and Culture (4)
Lecture/discussion—3 hours; discussion—1 hour. Prerequisite: course 2. Explorations of the role of migration in postmodern societies and its advantages and limitations in comparison to written ethnographic descriptions. Essential features of ethnographic films. Film production in anthropological research and problems encountered in producing films in the field. GE credit: SocSci, Wrt | SS, VL, WC, WE.

138. Ethnographic Research Methods in Anthropology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 2 and 137. Basic concepts and approaches to ethnographic field research. Problem formulation, research design, qualitative and quantitative data collection procedures, and techniques for organizing, retrieving, and analyzing information. Ethnographic description and constructed inference. Students will organize and conduct individual research projects. GE credit: SocSci | SS, WC, WE.

139A. Race, Class, and Gender (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Comparative analysis of class/race/gender inequality, concentrating on the ways in which beliefs about descent, "blood," and biological differences interact with property systems to affect the distribution of power in society. Not open for credit to students who have completed course 139. [Former course 139.] GE credit: SocSci, Div, Wrt | ACCH, DD, SS, WC, WE.

139BN. Gender and Sexuality (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Gender and sexual identity in foraging bands, horticultural and pastoral tribes, small-scale agricultural and industrial communities. Relations of family and gender to cultural evolution and distribution of gender hierarchies. Impact of politics, economics, religion, social practices, women’s movements on gender and sexuality. Culture, nature, and sexuality. Not open for credit to students who have completed course 139. [Former course 139.] GE credit: SocSci, Div, Wrt | ACCH, DD, SS, WC, WE.

140A. Cultures and Societies of West and Central Africa (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Ethnographic survey of West Africa and Congo Basin with analyses of representative societal issues which illustrate problems of general theoretical concern. Major consideration will be the continuities and discontinuities between periods prior to European contact and the present. GE credit: SocSci, Div, Wrt | SS, WC, WE.
148A. Culture and Political Economy in Contemporary China (4)
Lecture/discussion—4 hours. Prerequisite: course 2 or consent of instructor. The reading contemporary Chinese culture and political economy through reading ethnographic studies on recent transformations in rural and urban Chinese society. Special attention is given to state and its popular culture, spatial mobility, city, space, and gender. GE credit: SocSci, Div, Wrt | SS, WC, WE.

149A. Traditional Japanese Society (4)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 2. Family, social organization from prehistoric to early twentieth-century Japan. Origins, prehistory, and traditional religious and political systems, marriage and kinship, language and culture. Challenges and traditional and contemporary Japanese culture are addressed. GE credit: SocSci, Div, Wrt | SS, WC, WE.

149B. Contemporary Japanese Society (4)
Lecture—3 hours; discussion—1 hour. Introduction to contemporary Japanese social structure, social organization, and patterns of culture. Analysis of rural-urban cultural continuities and contrasts, class relations, political and economic systems, kinship, sex/gender systems, religious beliefs and behavior, conflict, consensus, and cultural stereotypes. GE credit: SocSci, Div, Wrt | SS, WC, WE. —Shibamoto-Smith

151. Primates Evolution (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or Biological Sciences 1B. Origin and relationships of the prosimians, monkeys, and apes. GE credit: SciEng, Wrt | SE, WE.

152. Human Evolution (5)
Lecture—3 hours; discussion—1 hour; term paper. Prerequisite: course 1 or Biological Sciences 1B. Nature and results of the evolutionary processes involved in the formation and differentiation of humankind. GE credit: SciEng, Wrt | SE, WE.—D. G. Smith.

153. Human Biological Variation (5)
Lecture—3 hours; discussion—1 hour; term paper. Prerequisite: course 1 or Biological Sciences 1B. Origins, adaptive significance and methods of analysis of genetic differences among populations. Special attention given to racial differences such as those in blood groups, plasma proteins, red cell enzymes, physiology, morphology, pigmentation and dermatoglyphics. GE credit: SciEng, Wrt | QL, SE, WE.—D. G. Smith.

154A. The Evolution of Primate Behavior (5)
Lecture—3 hours; discussion—1 hour; term paper. Prerequisite: course 1 or introductory course in evolutionary biology or ecology. Examination of the ecology of primates within an evolutionary framework. Theoretical concepts in individual, population, and community ecology, illustrated with primate (and other mammal) examples. Includes topics in primate and rainforest conservation. GE credit: SciEng, Wrt | QL, SE, VL, WE.

154BN. Primate Evolutionary Ecology (5)
Lecture—3 hours; lecture/discussion—1 hour; term paper. Prerequisite: course 1 or introductory course in evolutionary biology or ecology. Examination of the ecology of primates within an evolutionary framework. Theoretical concepts in individual, population, and community ecology, illustrated with primate (and other mammal) examples. Includes topics in primate and rainforest conservation. GE credit: SciEng, Wrt | QL, SE, VL, WE.

154C. Behavior and Ecology of Primates (2)
Lecture/discussion—2 hours. Prerequisite: course 54, 154A, or 154BN; Statistics 13 or its equivalent. Scientific methods of studying, describing and analyzing the behavior and ecology of primates. Offered in alternate years. (P/NP grading only.) GE credit: SciEng, Wrt | SE.—C. Golden.

154CL. Laboratory in Primate Behavior (4)
Laboratory—6 hours; term paper. Prerequisite: course 54, 154A, or 154BN; Statistics 13 or its equivalent. Design and conduct of scientific field studies of the behavior of groups of primates at the California National Primate Research Center. Offered in alternate years. GE credit: SciEng | OL, SE, WE.—Crockett, Ibelings.

156A. Human Osteology (4)
Lecture—2 hours; laboratory—4 hours. Prerequisite: course 1 or equivalent. Human skeleton from archaeological, forensic, and paleontological perspectives, including anatomical variation with sex and age, function, evolution, growth, and development of bones and teeth. Hands-on study and identification of human skeletal remains. Cannot be taken by students who have previously completed course 156. GE credit: SciEng | SE.

156B. Advanced Human Osteology (4)
Lecture—2 hours; laboratory—4 hours. Prerequisite: course 156A or equivalent. Human skeletons from archaeological, forensic, and paleontological contexts. Bone and tooth structure, growth, and development; measurement, statistics, and biomechanics; assessment of age, sex, weight, height, and ancestry; and indicators of injuries, diet, and activities. Offered in alternate years. GE credit: SciEng | SE.

157. Anthropological Genetics (3)
Lecture—3 hours. Prerequisite: course 1 or Biological Sciences 1A, and either Genetics 100 or enrollment in course 157 (concurrently or following). Methods for identifying genetic variation in human blood group antigens, serum proteins and red cell enzymes (hemaglutination), general electrophoresis on starch, cellulose acetate and polyacrylamide, immunodiffusion and immunoelectrophoresis on agarose. (P/NP grading only.) GE credit: QL, SE.

158. The Evolution of Females and Males: Biological Perspective (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Current theoretical frameworks for explaining the evolution of sex differences and for understanding the interrelationship between biological processes and cultural consequences of gender roles. GE credit: SciEng, Wrt | OL, WE.—D. G. Smith.

159. Molecular Anthropology of Native America (4)
Seminar—3 hours; term paper. Prerequisite: course 1 or Biological Sciences 1B or consent of instructor. Use of DNA and other genetic polymorphisms to test hypotheses regarding genetic relationships among different Native American tribal groups and about prehistoric population replacements and migrations to and within the Americas. Integration with cranio-metric, archaeological, paleoenvironmental, linguis- tic and ethnohistorical evidence. GE credit: SciEng, QL, SE.—D. G. Smith.

160. Neandertals and Modern Human Origins (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or equivalent. Origins, evolution, and disappearance of Neandertals, and the relationship of humans like us in both anatomy and behavior. Interpretation of the fossil and archaeological records of Europe and Africa. Genetics of living and fossil humans. Offered in alternate years. GE credit: SciEng | SE.—Weaver.

170. Archeological Theory and Method (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1 and 3. Introduction to history and development of archeological theory and method, with particular emphasis on the basic dependence of the latter on the former. Stress is on historical development of archeology in the New World. GE credit: SocSci, Div, Wrt | SS, WE.—Bettiger.
172. New World Prehistory: The First Arrivals (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or consent of instructor. Survey of the prehistory of North America. Offered in alternate years. GE credit: SocSci, Div, Wrt | SS, WC, WE. —Darwent

173. New World Prehistory: Archaic Adaptations (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or consent of instructor. Survey of the prehistory of North America with particular emphasis on the East, Southeast, Midwest, Plains, Southwest, and Northwest. Offered in alternate years. GE credit: SocSci, Div, Wrt | SS, WE. —Darwent

174. European Prehistory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or consent of instructor. Survey of the prehistory of Europe from its earliest human inhabitants, to the Neandertal and first modern humans, and through early agricultural and complex societies. Analysis and interpretation of the European archaeological record for understanding human dispersals into Europe. Offered in alternate years. GE credit: SocSci | SS, WC, WE. —Eerkens

175. Andean Prehistory: Archaeology of the Incas and their Ancestors (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3. Prehistory of the Andean region, especially Peru, from the earliest hunting and gathering societies through the use of agricultural technology and archaeological data to reconstruct ancient human adaptations to the varied Andean environments. Offered in alternate years. GE credit: SocSci | SS, WC, WE. —Eerkens

176. Prehistory of California and the Great Basin (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or consent of instructor. Description and analysis of the prehistoric peoples of California and the Great Basin from earliest times to European contact. Offered in alternate years. GE credit: SocSci, Div, Wrt | ACGH, DD, SS, WE. —Eerkens

177. African Prehistory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or consent of instructor. Survey of the prehistory of Africa from early human ancestors, through modern human origins, and into early agricultural and complex societies in the context of the Bantu expansion. Analysis and interpretation of the African archaeological record, incorporating human paleontology and genetics. Offered in alternate years. GE credit: SocSci | SS, WC, WE. —Eerkens

178. Hunter-Gatherers (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or consent of instructor. Survey of prehistory of Africa from early human ancestors, through modern human origins, and into early agricultural and complex societies in the context of the Bantu expansion. Analysis and interpretation of the African archaeological record, incorporating human paleontology and genetics. Offered in alternate years. GE credit: SocSci | SS, WC, WE. —Eerkens

179. Asian Prehistory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or consent of instructor. Survey of the prehistory of Asia from the earliest human occupations with primitive technologies and without benefit of modern lifeway in which peoples support themselves with agriculture on the island of Madagascar. Offered in alternate years. GE credit: SocSci. —Zwanyi

180. Zooarchaeology (4)
Lecture—2 hours; discussion/laboratory—3 hours. Prerequisite: course 1 and 3 or consent of instructor. Theoretical and practical study of identifying animal skeletal remains from archaeological sites. Identification and quantification of zooarchaeological material, cultural and natural processes affecting animal bones from both prehistoric and posthistoric times. Use of faunal remains for determining past human diets and past environments. Offered in alternate years. GE credit: SciEng | SE. —Darwent, Steele

181. Field Course in Archaeological Method (9)
Lecture—6 hours; daily field investigation. Prerequisite: course 3. On-site course in archaeological methods and techniques held at a field location in the western United States, generally California or Nevada. Introduces basic methods of archaeological survey, mapping, and excavation. GE credit: SciEng | SE—IV.

182. Archaeometry (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course 3; Statistics 13 or the equivalent recommended. Course aimed at the study of the chemical and physical properties of archaeologically relevant materials. Types of anthropological questions that can be addressed with different methods. Preparation and analysis of archaeological materials. GE credit: SciEng | GL, SE, VL, WE. Offered in alternate years. —Eerkens

183. Laboratory in Archaeological Analysis (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 181 or consent of instructor. Museum preparation, advanced field investigation, and guidance in preparation of museum material for publication. May be repeated for credit with consent of instructor. Limited enrollment. GE credit: SciEng, Wrt | GL, QL, SE, WE.

184. Prehistoric Technology: The Material Aspects of Prehistoric Adaptation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or 3. Examination of the role of lithic, ceramic, textile and wooden implements as elements in prehistoric survival and development. Emphasis is descriptive, but the significance of material resources as factors in prehistoric adaptation, settlement patterns, and culture change are discussed. Offered in alternate years. GE credit: SocSci | SS, WC, WE. —Eerkens

191. Topics in Anthropology (4)
Lecture/discussion—3 hours; term paper. Prerequisite: junior or senior standing in anthropology. Intensive treatment of a special anthropological topic or problem. May be repeated one time for credit when topic differs.

192. Internship in Anthropology (1-12)
Internship—3-36 hours. Prerequisite: Upper division standing, consent of instructor. Work experience off and on in campus or off-campus sites in anthropology. GE credit: P/NP grading only.

194H. Special Study for Honors Students (1-5)
Special study. Prerequisite: open only to majors of senior standing who qualify for honors program. Independent study of an anthropological problem involving the writing of an honors thesis. May be repeated for a total of 12 units including 192H courses taken in other departments. [P/NP grading only.]

197T. Tutoring in Anthropology (1-5)
Tutoring—1-5 hours. Prerequisite: upper division standing with major in Anthropology and consent of Department Chairperson. Leading of small voluntary study groups affiliated with one of the department's regular courses. May be repeated for credit. [P/NP grading only.]

198. Directed Group Study (1-5)
Tutorial—1-5 hours. Prerequisite: upper division standing with major in Anthropology and consent of Department Chairperson. Leading of small voluntary discussion groups affiliated with one of the department’s regular courses. May be repeated for credit. [P/NP grading only.]

207. Ethnographic Writing (4)
Lecture—3 hours; term paper. Prerequisite: courses 137, 201, or the equivalent. Relationship between conducting participant observation of others and writing it up, emphasizing the processual rift between the reality of fieldwork and its written representation. Study of various literary genres and textual strategies used in cultural anthropology. May be repeated for credit.

210. Aspects of Culture Structure (4)
Lecture—3 hours; term paper. Analysis of various phases of culture, such as religion, economics, law, and folklore. May be repeated for credit when topic differs. —I, II, III. [I, II, III.]

211. Advanced Topics in Cultural Ecology (4)
Lecture/discussion—3 hours; term paper. Prerequisite: Environmental Science and Policy/Anthropology 133, graduate standing in Anthropology or Ecology. Topics of current analytical and methodological importance in cultural ecology. Examination of general issues in cultural ecology through study of human response to and influence on climate. [Same course as Ecology 211.]

212. Political Ecology (4)
Lecture/discussion—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Interdisciplinary seminar evaluating contributions from ecological anthropology, political economy, cultural constructivism, postmodernism, and feminism towards development of theories of political ecology. Historical relationships between local/global power...
216. Problems in Archeological Method (4)
Seminar—3 hours; term paper. Techniques for analyzing archeological data; application to various prehistoric cultures. May be repeated for credit with consent of instructor. —Warren, Stolt, Eerkens

217. Quantitative Modeling in Archaeology (4)
Lecture/discussion—3 hours; term paper. Examination of the nature of archeological data with a focus on the quantitative and statistical techniques available to model, analyze, display, and make sense of such data. Offered in alternate years. —Ill. Eerkens

218. Topics in New World Prehistory (4)
Seminar—3 hours; term paper. Advanced study on current problems in New World Prehistory and archaeology. May be repeated for credit only if material is unique for that student and with consent of instructor. May be repeated for credit. Offered irregularly.

219. Topics in Old World Prehistory (4)
Seminar—3 hours; term paper. Advanced study on current problems in Old World prehistory and archaeology. May be repeated for credit only if material is unique for that student and with consent of instructor. May be repeated for credit. Offered irregularly.

220. Field Course in Linguistics (4)
Seminar—2 hours to 2 hours. Prerequisite: courses 110, 111. Techniques of eliciting, recording, and analyzing; work with a native speaker.

221. Rural Transformation in Postcolonial Societies (4)
Seminar—3 hours; term paper. Prerequisite: courses 223, 265, or consent of instructor. Problems of rural transformation arising out of political and economic interaction between national elites and rural regions and their implications under varying conditions of induced change in postcolonial societies. Attention will be given to the implications of this interaction for rapid economic growth. May be repeated for credit.

222. Cities and Citizenship (4)
Seminar—3 hours; term paper. Prerequisite: courses and consent of instructor. Problems of rural transformation arising out of political and economic interaction between national elites and rural regions and their implications under varying conditions of induced change in postcolonial societies. Attention will be given to the implications of this interaction for rapid economic growth. May be repeated for credit.

223. Economic Anthropology (4)
Seminar—3 hours; term paper. Prerequisite: course 122 or consent of instructor. Selected current methodological and theoretical problems in the analysis of modern economic systems.

224. Problems in Comparative Religion (4)
Seminar—3 hours; term paper. Advanced study on current problems in the anthropological study of religion.

225. State and Nation in the Modern World (4)
Seminar—3 hours; term paper. A presentation of current anthropological theories of the origins and nature of the modern nation-state in both the First and Third Worlds and special reference to state ideology (nationalism) and forms of control.

226. Consciousness and Resistance (4)
Seminar—3 hours; term paper. Prerequisite: completion of first-year graduate work or consent of instructor. Consideration of approaches to the study of social inequality, and responses of subordinated groups. Emphasis on situating approaches to contemporary social theory, concrete research problems, and political strategies. Topics: formulations of consciousness and identity; collective action, accommodation to frontal resistance.

228. Culture and Power (4)
Seminar—3 hours; extensive writing. Prerequisite: graduate standing or consent of instructor. Exploration of one of the core paradigms within contemporary anthropological inquiry, “culture and power.” Focus on how distant theoretical perspectives—Marxism, feminism, poststructuralism, and feminism—have examined the mutually constitutive nature of culture and power. —II. (II.) Sawyer

229. Gender, Identity, and Self (4)
Seminar—3 hours; term paper. Intersections of gender, identity, and selfhood cross-culturally and historically. How the self is feminized and masculinized, and with interfaces with sexual, race, class, work, national, minority, and majority identities under different historical, cultural, and social structural conditions. May be repeated for credit when topic differs. —II. (II.) Joseph

Lecture—1.5 hours; seminar—1.5 hours; term paper. Prerequisite: graduate standing in one of the social sciences including History. Comparative examination of family and kinship concepts, context, and of reproductive behaviors and strategies. A major theme is how family-system norms specify the relative desirability of differently configured off-spring sets. Cases are drawn from Western Europe and South and East Asia.

232. Political Movements (4)
Seminar—3 hours; term paper. Prerequisite: completion of first-year graduate work recommended. An interdisciplinary approach to political movements of protest, reform, and revolution emphasizing historical comparison and evaluation of major theoretical approaches including world systems, resource mobilization, state/culture, structural choice, moral economy, social class and gender.

239. Problems in African Society and Culture (4)
Seminar—3 hours; term paper. Prerequisite: courses and consent of instructor. Problems of rural transformation arising out of political and economic interaction between national elites and rural regions and their implications under varying conditions of induced change in postcolonial societies. Attention will be given to the implications of this interaction for rapid economic growth. May be repeated for credit.

245. Ethnology of Northern and Central Asia (4)
Seminar—3 hours; term paper. Prerequisite: a reading knowledge of German, Russian, Chinese, or Japanese. Lectures on the culture aboriginally found north of the Caucasus-Korea line. Supervised study of the primary and secondary sources. Work with informants when available.

246. Ethnology of Europe (4)
Seminar—3 hours; term paper. Prerequisite: a reading knowledge of a European language other than English. Supervised study of the primary and secondary sources dealing with the ethnography and culture history of Europe. Emphasis upon folk, peasant, and minority groups.

248. Topics in Chinese Culture and Society (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing in one of the social sciences. May be repeated for credit with consent of instructor.

250. Behavioral Ecology of Primates (4)
Seminar—3 hours; term paper. Prerequisite: course 154A (may be taken concurrently) or the equivalent. Analysis of primate behavior, with particular emphasis on adaptation for field studies. May be repeated for credit when topic differs.

251. Anthropology Colloquium Seminar (1)
Seminar—1 hour. Reports and discussions of recent advances in the subfields of anthropology. To be presented by guest speakers. May be repeated twice for credit. (S/U grading only.) —I, II, III, IV.
16. Metal Properties and Fabrication (2)
Lecture—1 hour; laboratory—3 hours. Study of metal properties and of techniques for fabricating in metal. Physical properties considerations, effects of techniques on quality and appearance, and evaluation procedures. Experience in working with metal. (P/NP grading only.) GE credit: QL, SE, VL—II. (I.) Shafii

17. Plastic Properties and Fabrication (2)
Lecture—1 hour; laboratory—3 hours. Study of the properties of plastic materials and the fundamentals of fabrication techniques. Experience in working with common plastics, with applications to biological systems. (P/NP grading only.) GE credit: QL, SE, VL—II. (I.) Shafii

49. Field Equipment Operation (2)
Lecture—1 hour; laboratory—3 hours. Operation, adjustment, and troubleshooting of farm tractors and field equipment. Principles of operation, equipment terminology and uses of tillage, cultivating, thinning, and planting equipment. Typical sequences in cropping practices. (P/NP grading only.) GE credit: QL, SE, VL—II. (I.) Shafii

52. Field Equipment Welding (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 16 or consent of instructor. Intermediate welding to include hardfacing and use of welding. Class projects on repair and fabrication by welding. Troubleshooting and major repair of field equipment. (P/NP grading only.) GE credit: QL, SE, VL—II. (I.) Shafii

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE

99. Special Study for Lower Division Students (1-5)
(P/NP grading only) GE credit: SE

Upper Division

101. Engine Technology (3)
Lecture—2 hours; laboratory—5 hours. Prerequisite: upper division standing or consent of instructor. Principles of 2-stroke cycle, 4-stroke cycle gasoline and 4-stroke cycle diesel engine construction and operation. Engine systems, performance, troubleshooting and overhaul. GE credit: SciEng | QL, SE, VL—II. (I.) Rosa

110L Experiments in Food Engineering (2)
Laboratory—6 hours. Prerequisite: Food Science and Technology 110B (may be taken concurrently). Use of temperature sensors; measurement of thermal conductivity and heat transfer in foods; refrigeration, freezing, concentration and dehydration of foods. GE credit: SciEng | QL, SE, VL—I. (I.) Singular

121. Animal Housing and Environment Management (2)
Lecture—2 hours. Prerequisite: Animal Science 1 or 2. Optimal structures and environments for animal growth and comfort; heat and moisture transfer principles; heating, cooling, ventilating principles and equipment; animal housing design; environmental regulations and waste management practices. Offered in alternate years. GE credit: SciEng | SE—II. (I.) Zhang

142. Equipment and Technology for Small Farms (2)
Lecture—1 hour; laboratory—3 hours. Types and characteristics of farm equipment and technology appropriate for small commercial farming. Adjustment and calibration of equipment. Selection of and budgeting for equipment. (Same course as International Agricultural Development 142.) GE credit: SciEng | QL, SE, VL—II. (II.) Perkins

150. Introduction to Geographic Information Systems (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Plant Sciences 21 or equivalent with consent of instructor. Priority given to College of Agricultural and Environmental Science majors. Basic concepts, principles and methods of GIS are presented. Data structures, database design, GIS data creation, GIS and spatial analysis techniques are emphasized. Lab topics include: online data sources, aerial photogrammetry, GPS data input, suitability analysis, cartographic design and graphics. Not open for credit to students who have completed Applied Biological Systems Technology 180/Plant Sciences 180 or Applied Biological Systems Technology 181N. GE credit: SciEng | QL, SE, VL—II. (I.) Greco, Upadhyay

161. Water Quality Management for Aquaculture (3)
Lecture—3 hours. Prerequisite: Biological Sciences 18, Mathematics 16B, Chemistry 2B. Basic principles of water chemistry and water treatment processes as they relate to aquacultural systems. Offered in alternate years. GE credit: SciEng | QL, SE, VL—I. (I.) Piedrahita

163. Aquaculture Systems Engineering (3)
Lecture—3 hours. Prerequisite: course 161. Design of aquatic systems: design methodology, principles and design, site selection and facility planning, management operations, computer modeling. Offered in alternate years. GE credit: SciEng | QL, SE, VL, WE—II. (II.) Delwiche, Grismer

181N. Concepts and Methods in Geographic Information Systems (4)
Lecture—4 hours, laboratory/discussion—3 hours. Prerequisite: Agricultural Management and Rangeland Resources 21 or equivalent familiarity with computers, Agricultural Management and Rangeland Resources 120 or the equivalent, Mathematics 16A. Management and analysis of georeferenced data. Spatial database management and modeling. Applications to agriculture, biological resource management and social sciences. Cartographic modeling. Vector and raster-based geographic information systems. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 132. (Same course as Plant Sciences 180.) GE credit: SciEng | QL, SE, VL—I. (II.) Plant

181N. Concepts and Methods in Geographic Information Systems (4)
Lecture/laboratory—5 hours. Prerequisite: course 180 or Agricultural Management and Rangeland Resources 180 or Landscape Architecture 50 or consent of instructor. Data representation and analysis in geographic information systems (GIS). Creation of spatial data sets from analog and digital sources such as aerial photography and maps; data structures, data management, database design, georeferencing, geostatistics, serverless models, analysis, and spatial data visualization. Offered in alternate years. GE credit: SciEng | SE, SL, VL—II. (II.) Zang

182. Environmental Analysis using GIS (4)
Lecture—2 hours; laboratory—4 hours. Prerequisite: course 180 or equivalent GIS experience and skills; general biology and/or ecology courses recommended. Ecosystem and landscape modeling with emphasis on hydrology and solute transport. Spatial analysis of environmental risk including eco- logical risk assessment, natural resource management. Spatial database structures, scripting, data models, and error analysis in GIS. Offered in alternate years. (Same course as Hydrologic Science 182.) GE credit: SciEng | QL, SE, SL, VL—III. (III.) Zhang

190C. Research Conference for Advanced Undergraduates (1)
Discussion—1 hour. Prerequisite: consent of instructor. Research conferences for specialized study in applied biological systems technology. May be repeated for credit. (P/NP grading only.) GE credit: SE—II. (II.)
192. Internship in Applied Biological Systems Technology (1-5)
Internship—3-15 hours. Prerequisite: upper division standing; approval of project prior to period of internship. Supervised internship in applied biological systems technology. May be repeated for credit. (P/NP grading only.) GE credit: SE.

197T. Tutoring in Applied Biological Systems Technology (1-5)
Tutorial. Tutoring individual students, leading small voluntary discussion groups, or assisting the instructor in laboratories affiliated with one of the departments. Regular courses, or may be repeated for credit if topic differs. (P/NP grading only.) GE credit: SE.

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.) GE credit: SE.

Graduate

233. Pest Control Practices (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: graduate standing or consent of instructor. Practical and theoretical considerations of pest control systems and techniques. Design, selection, and use of mechanical systems for field, orchard, greenhouse, and vector control use. Biological, legal, and environmental considerations in pest control and pesticide application.—II. Giles

290C. Graduate Research Conference (1)
Discussion—1 hour. Prerequisite: consent of instructor. Research problems, progress, and techniques in applied biological systems technology. May be repeated for credit. (S/U grading only) GE credit: SE.

298. Group Study (1-5)
299. Research (1-12)
(S/U grading only)

Professional

317. Teaching Agricultural Mechanics (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: a course in physics; 6 units related to agricultural mechanics; enrolled in Agricultural Education Teacher Credential Program. Preparation of the teacher to plan, organize, and conduct an agricultural mechanics program in secondary schools. Development of and presentation of lesson plans and teaching aids. Review of subject matter in metal fabrication, power and machinery and architectural structures areas.—I (1). Perkins

Applied Mathematics (A Graduate Group)

Group Office. 1130 Mathematical Sciences Bldg. 530-752-8130
studentservices@math.ucdavis.edu; http://math.ucdavis.edu/grad/ggam

Faculty. The Group includes approximately 90 faculty members, of whom about one-third are in the Department of Mathematics. Membership comprises chemists, biologists, physicists, geologists, statisticians, computer scientists, and engineers. Research interests include biology, atmospheric sciences, mechanics, solid and fluid dynamics, optimization and control, theoretical chemistry, computer and engineering sciences, mathematical physics, signal and image processing, harmonic analysis, numerical analysis and nonlinear partial differential equations. A complete list of faculty and their research areas are available at http://math.ucdavis.edu/grad/ggam/faculty.

Graduate Study. Students prepare for careers where mathematics is applied to problems in the physical and life sciences, engineering, and management. The degree requirements consist of rigorous training in applied mathematics, including course work and a research dissertation under the direction of a member of the Graduate Group in Applied Mathematics. The M.S. degree provides preparation for further study in applied mathematics or an application area, or for a career in industry or public service. The Ph.D. degree provides preparation for a career in research and/or teaching, or in industrial or rational research laboratories. For further information, please contact studentservices@math.ucdavis.edu or 530-752-8130.

New applicants are admitted to the fall quarter only.

Preparation. The program admits qualified students with a bachelor’s degree in mathematics, physics, chemistry, engineering, economics, the life sciences and related fields. General and advanced mathematics GRE scores are required, and applicants should display evidence of strong quantitative skills. Undergraduate courses should include calculus (including vector calculus), linear algebra, and ordinary differential equations. Advanced calculus (introduction to real analysis) is strongly recommended. Additional background in probability, partial differential equations, and/or numerical analysis is also required. The ability to program in a high-level computer programming language (e.g., C, Fortran, MATLAB, Python, R, etc.) is assumed.

Graduate Advisers. Contact the Student Services Office at 530-752-8130 or by email at studentservices@math.ucdavis.edu.

Courses. For a list of the courses in applied mathematics and mathematics, see Mathematics, on page 390.

Applied Computing and Information Systems

Courses. See Physics, on page 466.

Aquaculture

Courses. See Animal Biology, on page 150; Animal Science, on page 153; Applied Biological Systems Technology, on page 164; and Wildlife, Fish, and Conservation Biology, on page 544.

Arabic

Courses. See Classics, on page 198.

Art History

Courses. See ART, on page 382.

Biology

Courses. See BIOL, on page 363.

Chemistry

Courses. See CHEM, on page 372.

Computation and Information Systems

Courses. See COMS, on page 110.

Departmental Honors

Courses. See Honors, on page 497.

Economics

Courses. See ECON, on page 386.

Engineering

Courses. See ENGR, on page 376.

Environmental Science

Courses. See ENVS, on page 296.

French

Courses. See FREN, on page 380.

Geological and Planetary Sciences

Courses. See GEOL, on page 398.

Geophysics, Planetary Geology, and Fluvial Geomorphology

Courses. See GEOP, on page 376.

Geophysics, Planetary Geology, and Fluvial Geomorphology (Graduate Pathway)

Courses. See GEOP, on page 376.

German

Courses. See GER, on page 384.

History

Courses. See HIST, on page 384.

History of Art

Courses. See ART, on page 382.

Humanities

Courses. See HUM, on page 414.

Integrative Biology

Courses. See IB, on page 43.

Japanese

Courses. See JAP, on page 382.

Japanese Literature

Courses. See JAP, on page 382.

Japanese History

Courses. See JAP, on page 382.

Latin

Courses. See LAT, on page 382.

Legal Studies

Courses. See LS, on page 386.

Management

Courses. See MGMT, on page 394.

Mathematics

Courses. For a list of the courses in applied mathematics and mathematics, see Mathematics, on page 390.
Art History

galleries, historic preservation, art libraries, publishing, journalism, advertising, art conservation, and art investment. As the world becomes increasingly flooded with images, the critical visual literacy gained through the study of art history becomes more important for a wide variety of careers.

A.B. Major Requirements:

Preparatory Subject Matter .......................... 20
Any four of the following courses: Art History 1A, 1B, 1C, 1DV, 1E, 5, and 25. 16
Any lower division Art Studio course except Art 10 or 30 ................................................. 4

Depth Subject Matter .................................. 40
Four courses, one each in four of the following six areas. Two courses must be from areas a, b, or c. The two courses must be from areas d, e, or f. ...................................................... 16
(a) Ancient Mediterranean Art: Art History 172A, 172B, 173, 175
(b) East Asian Art: Art History 163A, 163B, 163C, 163D, 164
(c) Islamic Art: Art History 155, 156
(d) European Art before 1700: Art History 110, 120A, 176A, 176B, 176C, 178B, 178C, 179B
(e) Western Art 1700-1900: Art History 110, 118B, 121A, 130A, 138B, 138C, 188A, 188B 188C
(f) Art after 1900: Art History 110, 148, 163D, 183C, 184, 185, 186, 187, 189

Seminar or Undergraduate Seminar Art History 190A-L .................................................. 4
Electives .................................................................. 20
Five additional upper-division Art History courses to be chosen in consultation with the major adviser. Appropriate course substitutions may be made with the permission of the major adviser. Art History 401 and 402 may be counted among the elective units.

Total Units for the Major .................................. 60

Emphasis in Architectural History

Emphasis in Architectural History follows the same requirements as for the Art History major above, applying at least six of the following courses to their respective required areas or as electives: Art History 25, 110, 120A, 155, 156, 163A, 163B, 163C, 163D, 164
(c) Islamic Art: Art History 120A, 155, 156
(d) European Art before 1700: Art History 110, 120A, 176, 178B, 178C, 179B
(e) Western Art 1700-1900: Art History 110, 148, 163D, 183C, 184, 185, 186, 187, 189

Fulfilling the undergraduate seminar requirement (Art History 190A-H) through an architectural topic is highly recommended.

Minor Program Requirements:

Minor Art History ............................................. 20
Three courses chosen from three of the following six areas with at least one course in area a, b, or c, and one course in area d, e, or f. ............................................................. 12
(a) Ancient Mediterranean Art: Art History 172A, 172B, 173, 175
(b) East Asian Art: Art History 163A, 163B, 163C, 163D, 164
(c) Islamic Art: Art History 120A, 155, 156
(d) European Art before 1700: Art History 110, 206, 178B, 178C, 179B
(e) Western Art 1700-1900: Art History 110, 148, 163D, 183C, 184, 185, 186, 189

Two additional Art History courses which may be included in the undergraduate Seminar, Art History 190AH strongly recommended ....................................................... 8
One lower division course may be substituted for upper-division study in any of these areas. Other appropriate substitutions may be made for the course options listed above with the prior consent of the major adviser.

Honor Program. The Honor Program is encouraged for Art History majors who are considering attending graduate school. To be eligible for the program, a student must maintain a grade point average of 3.700 in the major or the consent of the major adviser. In addition to meeting the standard major requirements, the Honor students complete one undergraduate seminar (Art History 190A-L), and write an Honors thesis (course 194H) after completing Art History 100 or equivalent, and after satisfactorily preparing a preliminary thesis draft through a preparatory special study (Art History 199), supervised by the prospective thesis adviser. Students participating in this Program are candidates for Departmental recommendation for graduation with High or Highest Honors. See the Academic Information chapter, Letters and Science honors section, of this catalog and consult the department website for more information.

Teaching Credential Subject Representative. Department Chairperson; see the Teaching Education Program.

Graduate Study. The Program in Art History offers studies leading to the Master of Arts degree in History of Art as preparation for further graduate study or professional work. For more information, contact the Graduate Staff Adviser at 530-752-8710, or see http://arthistory.ucdavis.edu.

Courses in Art History (AHI)

Lower Division

1A. Ancient Mediterranean Art (4)

Lecture—3 hours; discussion—1 hour. Introduction to the art and architecture of the ancient Mediterranean world, including Mesopotamia, Egypt, Greece, and Rome. GE credit: AHI 100 or 190A-L. II. (I.) Roller

1B. Medieval and Renaissance Art (4)

Lecture—3 hours; discussion—1 hour. Christian, Barbian, Moslem, and Classical traditions in European Art from the fourth through the sixteenth centuries. GE credit: AHI 100 or 190A-L. III. (II.) Burnett

1C. Baroque to Modern Art (4)

Lecture—3 hours; discussion—1 hour. Survey of developments in western art and visual culture from 1600-present. Major artists and movements, theories of visuality, focusing on interpretations of class, gender, sexuality, and ethnicity from the Baroque period through modernism to the present. May be repeated for credit. GE credit: AHI 100 or 190A-L. Div | ACGH, AHI, VL, WC, WE. II, IV. (II, IV.)

1D. Arts of Asia (4)

Lecture—3 hours; discussion—1 hour. Introduction to major forms and trends in the arts and material culture of Asia from the Neolithic to the contemporary emphasizing the visual manifestations of secular and religious ideas and ideals. Not open for credit to students who have completed course 194D. GE credit: AHI 174D. Div | AHI, VL, WC, WE. III. (II.)

1DY. Arts of Asia (5)

Web virtual lecture—2.5 hours; discussion—1 hour; lecture/discussion—1.5 hours. Introduction to major forms and trends in the arts and material culture of Asia from the Neolithic to the contemporary, emphasizing the visual manifestations of secular and religious ideas and ideals. Not open for credit to students who have completed course 194D. GE credit: AHI 174D. Div | AHI, VL, WC, WE. III. (II.)

1E. Islamic Art and Architecture (4)

Lecture—3 hours; discussion—1 hour. Introduction to the art and architecture of the Islamic world including the Middle East, Africa, Europe, and South Asia, from the 7th century CE to the 20th century. GE credit: AHI 174E. Div | AHI, VL, WE. I. (I.) Watenpaugh

5. Introduction to Visual Culture (4)

Lecture—2 hours; film discussion—2 hours; discussion—1 hour. Development of visual literacy for an increasingly visual world. Critical analyses focus on a wide variety of visual media—art, television, film, advertising, the Internet—intended for a diverse spectrum of audiences. GE credit: AHI 401, Div, WR. II, III.

10. Twenty Monuments (4)

Lecture—3 hours; lecture/discussion—1 hour. Demonstration of the breadth and depth of art/historical interpretation through the consideration of the meaning and significance of world-historical monuments from prehistory to the present. GE credit: AHI 100 or 190A-L. Div | AHI, VL, WE. II. (II.)

25. Introduction to Architectural History (4)

Lecture—3 hours; discussion—1 hour. Formal and social history of architecture examining design principles, major traditions, and concepts of architectural history with a focus on issues in Western architecture. Emphasis on nineteenth and twentieth centuries. GE credit: AHI 100 or 190A-L. VL, WC, WE. II. (II.)

98. Directed Group Study (1-5)

Prerequisite: consent of instructor. Restricted to lower division students. [P/NP grading only.]

99. Special Study for Undergraduates (1-5)

Prerequisite: consent of instructor. [P/NP grading only.]

Upper Division

100. Methods of Art History (4)

Extensive writing or discussion—3 hours; term paper. Prerequisite: two upper-division Art History courses; intended primarily for junior and senior students in Art History. Methods of art historical research and analysis, and the general issues in critical thought. Writing skills appropriate to a range of art/historical exposition. Offered irregularly. GE credit: AHI 174D. Div | AHI, VL, WE. II. Ruda

110. Cultural Histories of Museums (4)

Lecture/discussion—3 hours; term paper. Evolution of museums in the western world from the “cabinet of curiosities” of sixteenth-century Europe to the modern “art center.” The changing motives behind collecting, exhibiting, and interpretation of objects. Attention to museums’ historical legacies and continuing philosophical dilemmas. Offered in alternate years. GE credit: AHI 174D. Div | AHI, VL, WE. III. Strazdes

120A. Art, Architecture, and Human Rights (4)

Lecture/discussion—4 hours. Study of human rights as they relate to art, architecture, and cultural heritage. Examines museums, art collections, and cultural heritage management, their relation to the cultural prerogatives of communities and indigenous groups, and protection of cultural heritage during war and conflict. [Same course as 120A offered in alternate years.] GE credit: AHI 174D, Div | AHI, VL, WC, WE. II—IV. (II, IV.)

148. Theory and Criticism: Painting & Sculpture (4)

Lecture—3 hours; term paper. Prerequisite: Art Studio 5 or 7 recommended. Study of forms and symbols in historic and contemporary masterpieces. [Same course as Art Studio 148 offered in alternate years.] GE credit: AHI 174D, Div | AHI, VL, WE. II—III. Hearne, Pardee

150. Arts of Sub-Saharan Africa (4)

Lecture—3 hours; term paper or gallery studies and review. Traditional arts and crafts of sub-Saharan Africa; particular attention to relationships between sculpture and culture in West and Central Africa. GE credit: AHI 174D, Div | AHI, VL, WC.
151. Arts of the Indians of the Americas (4) 
Lecture—3 hours; term paper or gallery studies and review. Development of art in North America, emphasizing artistic output in Mexico. South American relationships and parallels. Recent and contemporary Indian arts and crafts from Alaska to Chile. GE credit: ArtHum, Div | AH, VL, WC.

152. Arts of Oceania and Prehistoric Europe (4) 
Lecture—3 hours; term paper. Traditional arts of Aboriginal Australia, Melanesia, Polynesia, and Micronesia, as seen in their cultural contexts. Prehistoric Europe and the Near East. GE credit: ArtHum, Div | AH, VL, WC.

155. The Islamic City (4) 
Lecture—3 hours; term paper. Prerequisite: course 1E recommended. Introduction to the urban history of the Islamic world. Includes critical study of the city-landscape of the Islamic city, development of urban form, institutions and rituals, and analysis of selected themes. GE credit: ArtHum, Div, Wrt.—II. (II.) Wattenpouh

156. Arts of the Islamic Book (4) 

163A. Chinese Art (4) 
Lecture—3 hours; term paper or gallery studies and review. A survey from the beginning to the twelfth century focusing on the major art forms that are traditionally known as well as newly discovered through archaeology in China. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.—II. (II.) Burnett

163B. Chinese Painting (4) 
Lecture—3 hours; term paper or gallery studies and review. The unique expression of ink painting, with or without colors, depicting human and animal figures, flowers-and-birds, and landscape—the favorite and enduring theme of the Chinese scholar-painter. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.—Burnett

163C. Painting in the People's Republic of China (4) 
Lecture—3 hours; term paper. Prerequisite: course 1D or upper division standing. Analysis of the interaction between art and politics in the emergence of China into the modern world. Integration of Western influence, implementation of Mao Zedong's thought on art and development of contemporary Chinese painting. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.—Burnett

163D. Visual Arts of Early Modern China (4) 
Lecture—3 hours; term paper. Prerequisite: course 1E3B or consent of instructor. Variable topics in Chinese art history during the 17th-19th centuries, considering artists' statements (visual and textual) within their historical contexts, asking what was at stake in the creation of new art forms. May be repeated for credit with consent of instructor. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—II. Burnett

164. The Arts of Japan (4) 
Lecture—3 hours; term paper, and/or gallery studies and review (determined by instructor each quarter course offered). Study of the significant achievements in architecture, painting, sculpture, and decorative arts from prehistoric age to nineteenth century. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.

168. Great Cities (4) 
Lecture—3 hours; term paper. Transformation in architecture and urban form in Paris, London, and Vienna in the context of varying social, political, and economic systems as well as very different cultural traditions, concentrating on the years 1830-1914. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC.—Sailer

172A. Early Greek Art and Architecture (4) 
Lecture—3 hours; term paper. Examination of the origin and development of the major monuments of Greece from the prehistoric era to the mid-fifth century B.C. Not open for credit to students who have completed course 154A. (Same course as Classics 172A.) Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—II. Roller

172B. Later Greek Art and Architecture (4) 
Lecture—3 hours; term paper. Study of the art and architecture of later Classical and Hellenistic Greece, from the first centruy B.C. Not open for credit to students who have completed Art History 154B. (Same course as Art History 172B.) Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—II. (II) Roller

173. Roman Art and Architecture (4) 
Lecture—3 hours; term paper. Art and architecture of Rome and the Roman Empire, from the founding of Rome through the fourth century C.E. (Same course as Classics 173.) Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—III. Roller

175. Architecture and Urbanism in Mediterranean Antiquity (4) 
Lecture—3 hours; extensive writing. Prerequisite: a lower division course (except 30, 31), course 1A recommended. Architecture and urban development in the ancient Near East, Greece, and Rome. Special emphasis on the social structure of the ancient city as expressed in its architecture, and on the interaction between local traditions and the impact of Greek-Roman urbanism. (Same course as Classics 175.) Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.—(II) Roller

176A. Art of the Middle Ages: Early Christian and Byzantine Art (4) 
Lecture—3 hours; term paper or gallery studies and review. Painting, sculpture and architecture of the early Christian era and Byzantine Empire: through the later Roman Empire in the West and to the final capture of Constantinople in the East. GE credit: ArtHum, Wrt | AH, VL, WC, WE.

176B. Art of the Middle Ages: Early Medieval and Romanesque Art (4) 
Lecture—3 hours; term paper or gallery studies and review. Painting, sculpture and architecture of western Europe in the early medieval era: from the rise of the barbarian kingdoms through the twelfth century. GE credit: ArtHum, Wrt | AH, VL, WC, WE.

176C. Art of the Middle Ages: Gothic (4) 
Lecture—3 hours; term paper or gallery studies and review. Painting, sculpture and architecture in northern European regions of the fifteenth centuries. GE credit: ArtHum | AH, VL, WC, WE.

177A. Northern European Art (4) 
Lecture—3 hours; term paper or gallery studies and review. Painting and sculpture of the fifteenth century in Austria, Germany, France and the Lowlands, including such artists as Jan van Eyck and Hieronymus Bosch. GE credit: ArtHum, Wrt | AH, VL, WC, WE.

177B. Italian Renaissance Art (4) 
Lecture—3 hours; term paper or gallery studies and review. Early Renaissance in Florence, fifteenth-century artists from Donatello and Masaccio through Botticelli, in their artistic and cultural setting. GE credit: ArtHum, Wrt | AH, VL, WC, WE.

178C. Italian Renaissance Art (4) 

179B. Baroque Art (4) 
Lecture—3 hours; term paper or gallery studies and review. Seventeenth-century painting, including such artists as Caravaggio, Rubens, Rembrandt, and Velázquez. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—(II) Roller

182. British Art and Culture, 1750–1800 (4) 
Lecture—3 hours; term paper. Prerequisite: course 1C recommended. British painting in relation to the position of women in society in the mid- to late-class art market. Topics include Hogarth and popular culture, Queen Victoria and the female gate, and Pre-Raphaelite artists and collectors. Offered irregularly. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—II.

183A. Art in the Age of Revolution, 1750–1850 (4) 
Lecture—3 hours; term paper. Prerequisite: course 1C recommended. Emergence of modernism in Europe from the late 18th century to the mid-19th century. Major artistic events viewed against the revolutionary backdrop of changing attitudes toward identity, race, and gender. Offered irregularly. GE credit: ArtHum | AH, VL, WC, WE.—II.

183B. Impressionism and Post-Impressionism: Manet to 1900 (4) 
Lecture—3 hours; discussion—I hour. Prerequisite: course 1C recommended. Innovations of Impressionists, Post-Impressionists, and Symbolists in relation to social changes. Assessment of role of dealers and critics, myth of the artist-genius, and gender relations in French art and culture of the late 1800s. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.—II. (II.)

183C. Modernism in France, 1880–1940 (4) 
Lecture—10 hours; discussion—3 hours; fieldwork—11 hours. Course will take place as a 3-week summer course in France. A survey of gender and patronage in the development of modern art in France. Post-Impressionism and Surrealism are considered in relation to the intervention of dealers and women collectors in the formulation of modernism. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.—Sailer

184. Twentieth Century Architecture (4) 
Lecture—3 hours; term paper. Prerequisite: course 25 recommended. Major movements in architecture of the twentieth century in Europe and America. Formal innovations are examined within the social, political, and economic circumstances in which they emerged. GE credit: ArtHum, Wrt | AH, VL, WE.—Sailer

Lecture/discussion—4 hours. Prerequisite: one course in art history, or upper division standing and a major or minor in the arts or humanities recommended. Social, cultural, and political development for artists and their audiences in the context of larger issues like the Mexican, Russian and German revolutions, WWI, the Depression, WWII, etc., and a critical approach to questions of modernism, modernity, and avant-gardism. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, VL, WC.

186. Art After Modernism, 1948–Present (4) 
Lecture/discussion—4 hours. Prerequisite: one course in art history, or upper division standing and a major or minor in the arts or humanities recommended. Social, cultural, and political development for artists and their audiences in the context of larger issues like McCarthyism, the New Left, free love, feminism, Reaganiomics, globalization, etc., and a critical approach to questions of neomodernism, postmodernism, and postmodernity. Offered in alternate years. Not open for credit to students who have completed course 183E. GE credit: ArtHum, Div, Wrt | ACGH, AH, VL, WE.—I. Stimson

187. Contemporary Architecture (4) 
Lecture—3 hours; term paper. Prerequisite: course 25 and/or course 184 recommended. Introduction to world architecture and design since circa 1930. Relation of influential styles, buildings, and architects to postmodern debates and to cultural,
188A. The American Home (4)
Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, VL, III. (I, II, III."

188B. Architecture of the United States (4)
Lecture—3 hours; discussion—1 hour. Major movements from colonial times to the present. The role of buildings in a changing society, the interplay of styles with technologies of construction, the relationship between American and European developments, and developments of the architectural profession. GE credit: ArtHum, Wrt | AH. —I, II. Cogdell

188C. American Art to 1910 (4)
Lecture/discussion—4 hours; term paper. Major movements in American art from the 17th-century English speaking colonies to the onset of World War I. Offered in alternate years. GE credit: ArtHum | ACGH, AH, VL, WE. —I, II, III. Strazdes

188D. American Painting and Sculpture to the Civil War (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one lower division Art History course or junior standing. Major movements in American painting and sculpture to 1865. Colonial portraiture, development of genre painting, and the Hudson River School of landscape painting. Emphasis on European cultural currents and their effects. GE credit: ArtHum, Wrt | AH. —II. Strazdes

189. Photography in History (4)
Lecture/discussion—4 hours. Prerequisite: one course in art history, or upper division standing and a major or minor in the arts or humanities recommended. Social, cultural, aesthetic and technical developments in the history of photography including patronage and reception, commercial, scientific, political and artistic applications, and a critical theoretical inquiry into photography's impact on the social category "art" and the history of subjectivity. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, VL. —III. (I.) Simson

190A-L. Undergraduate Proseminar in Art History (4)
Lecture/discussion—3 hours; term paper. Prerequisite: Art History major, minor, or other significant training in Art History recommended. Study of a broad problem or theoretical issue. Intensive reading, discussions, research, writing. Topics (A) Mediterranean Antiquity; (B) Medieval; (C) Renaissance; (D) American Art; (E) Gendering of Culture; (F) Chinese Art and Material Culture, GE credit: ArtHum | AH, OL, VL, WC, WE; (G) Japanese Art and Material Culture; (H) Late Modern Art and Theory, GE credit: ArtHum | ACGH, AH, DD, OL, VL, WC, WE. May be repeated once for credit when topic differs. —I. (II, III."

192. Internship (2-12)
Internship—term paper or catalogue. Supervised program of internships at professional art institutions such as museums, galleries, and art archives including collections of slides and photographs. May be repeated once for credit. (P/NP grading only.)

194H. Special Study for Honor Students (4)
Independent study—12 hours. Prerequisite: course 190 or the equivalent, as determined by the major adviser. Open only to students in the Art History Honors Program. Independent study of an art historical problem culminating in the writing of an honors thesis under the supervision of a faculty guidance committee.

198. Directed Group Study (1-5)
(P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.)

Graduate

200A. Visual Theory and Interpretive Methods (4)
Discussion—3 hours; extensive writing. Close study of selected recent developments in interpretive methodologies used by art historians and other analysts of visual culture and the place of those developments within art history's history and in the larger field of social, cultural and historical analysis. May be repeated one time for credit. —I. (II.) Roller, Watten-paugh

200B. Research and Writing Methods in Art History (4)
Discussion—3 hours; term paper. Restricted to graduate students in art history. Development of the research, writing, and editing skills necessary for producing publishable work. Focus on reference tools used by art historians and the mechanics of scholarship, from question framing and organization of ideas to writing clear, effective prose. —II. (II.) Burnett, Strazdes

200C. Thesis Writing Colloquium (1)
Discussion—1.5 hour, tutorial. Prerequisite: course 200B, taken by all Art History M.A. students in their first year. Restricted to graduate students in Art History. Meeting concurrently with Art History M.A. students in their first year. Restricted to graduate students in Art History. Meeting concurrently with Art History M.A. students in their first year.

250. Problems in Art Historical Research (4)
Seminar—3 hours; term paper. Major topics in art historical research, emphasizing special methods of investigation, and of historical and critical analysis. May be repeated for credit. —II.

251. Seminar in Tribal Arts (4)
Seminar—3 hours; term paper. Selected topics in the art and aesthetics of small scale societies. May be repeated for credit when topic differs and with consent of instructor.

254. Seminar in Classical Art (4)
Seminar—3 hours; term paper. Selected areas of special study in classical art of the Greek and Roman tradition. Course may be repeated for credit with consent of instructor. —Roller

263. Seminar in Chinese Art (4)
Seminar—3 hours; term paper. Selected areas of special study in Chinese art. May be repeated for credit with consent of instructor. —II. Burnett

276. Seminar in Medieval Art (4)
Seminar—3 hours; term paper. Selected areas of special study in medieval art from Early Christian to late Gothic. May be repeated for credit with consent of instructor.

278. Seminar in Italian Renaissance Art (4)
Seminar—3 hours; term paper. Selected areas of special study in Italian art from the fourteenth to the sixteenth century. May be repeated for credit with consent of instructor. —III.

283. Seminar in Visual Culture and Gender (4)
Seminar—3 hours; term paper. Selected areas of special study in the relationship between visual culture and gender in Europe and America from 1750 to present. May be repeated for credit with consent of instructor. Offered in alternate years. —I.

288. Seminar in European and American Architecture (4)
Seminar—3 hours; term paper. Exploration of selected topics in European and American architectural history with concentration on the Modern Period. May be repeated for credit with consent of instructor. —II. Cogdell, Sadler, Strazdes

290. Special Topics in Art History (4)
Seminar—3 hours; term paper. Special research seminar in the theory or methods of Art History, or in a period of Art History. Topic will vary depending on the interests of the instructor or students. May be repeated for credit when topic differs and with consent of instructor. Offered irregularly. —I, II, III.

292. Internship (1-6)
Internship—3-12 hours. Prerequisite: graduate student; consent of instructor. Supervised internship at professional art or cultural institution including museums, galleries, archives, government offices, visual resources libraries, etc. May be repeated up to eight units for credit. Graduate students in Art History only. Offered irregularly. Limited enrollment. (S/U grading only)

298. Directed Group Study (1-5)
(S/U grading only)

299. Individual Study (1-6)
(S/U grading only)

Professional

Note: Various of the below courses are not offered each year.

390. Introduction to Teaching Art History for Teaching Assistants (1)
Discussion—1 hour. Designed for teaching assistants with emphasis on problems of pedagogy and professional art or cultural institution including museums, galleries, archives, government offices, visual resources libraries, etc. May be repeated up to eight units for credit. Graduate students in Art History only. Offered irregularly. Limited enrollment. (S/U grading only)

396. Teaching Assistant Training Practicum (4)
Seminar—2 hours; Practice—10 hours. Prerequisite: graduate standing. Principles and techniques of the effective teaching of undergraduate courses in the history of art. May be repeated for credit as often as the student is awarded a TAship. (S/U grading only) —I, II, III. (II, III.)

401. Museum Training: Curatorial Principles (4)

402. Museum Training: Exhibition Methods (4)
Seminar—3 hours; exhibition. Approved for graduate degree credit. History of exhibition methods in private and public collections. Comparisons of different types of museums and their exhibition problems. Lighting and techniques of display with emphasis on actual design. Experimentation with unusual presentation forms. —II.
Art Studio

(Registrar of Letters and Science)
Hearne Pardee, M.F.A., Chairperson of the Depart-

Department Office: 101 Art Building
530-752-0105; http://art.ucdavis.edu

Faculty
Tom Bills, M.F.A., Professor
Rabin Hill, B.F.A., Professor
Darrin Martin, M.F.A., Associate Professor
Hearne Pardee, M.F.A., Professor
Lucy Puls, M.F.A., Professor
Annabeth Rosen, M.F.A., Professor
Youngsuk Suh, M.F.A., Assistant Professor
Gina Werfel, M.F.A., Professor

Emeriti Faculty
Conrad Atkinson, R.A.S. (honors), Professor Emeritus
William Henderson, M.F.A., Professor Emeritus
Lynn Hershman, M.A., Professor Emeritus
Harvey Himelfarb, M.A., Professor Emeritus
Academic Senate Distinguished Teaching Award
David Hollowell, M.F.A., Professor Emeritus
Malagias Mantoya, B.F.A., Professor Emeritus
Maunel Neri, Professor Emeritus
Roland C. Petersen, M.A., Professor Emeritus
Cornelia Schulz, M.F.A., Professor Emerita
Academic Senate Distinguished Teaching Award
UC Davis Prize for Teaching and Scholarly Achievement

The Major Program
The Studio Art Major provides the studio experience necessary for a broad understanding of the practice and interpretation of the visual arts.

The Program. The Art Studio program is designed to deliver a broad range of hands-on studio practices to the art major. Areas of focus include painting, sculpture, drawing, photography, ceramics, printmaking, and time-based media. Course choices/sequences are determined by the student according to major distribution requirements. Students are encouraged to explore a broad range of disciplines and are expected to take advantage of beginning classes which provide a critical introduction to the research possibilities within the major, across disciplines. In addition to studio classes, students are encouraged to participate in a distinguished visiting artist lecture series, professional practice seminars, student exhibitions/competitions, internships, and opportunities to exposure to cultural events and exhibitions in Davis, Sacramento, and the Greater Bay Area.

Portfolios. While portfolios are not required for admission to the art major, students at all levels are expected to maintain current portfolios of completed work in order to qualify and compete for the numerous internships, fellowships, grants, awards, and exhibitions the program has to offer, as well as to better prepare the graduates of graduate school and/or an independent studio practice.

Career Options. Graduates of the Studio Art Program attend prestigious post-baccalaureate and graduate programs in studio art. Alumni often go on to develop professional studio practices. Commitment to the development of one’s studio work leads to exhibition opportunities as well as accomplishments in the realm of fellowships, commissions, collaboration, and a host of other professional projects and opportunities. For the student wishing to explore additional arts-related trajectories, in the private or public sector, a studio arts education provides a strong foundation for careers and/or graduate study in K-12 art education, art therapy, arts administration, curatorial studies, set design, architecture, culinary arts, design, film, animation, art criticism/journalism among others.

A.B. Major Requirements:

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<th>A.B. Major Requirements:</th>
<th>UNITS</th>
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<tr>
<td>Preparatory Subject Matter</td>
<td>24</td>
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<tr>
<td>Four courses chosen from: Art Studio 2, 5, 7, 8, 9, 11, 12</td>
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<tr>
<td>Two lecture courses chosen from: Art Studio 24, 30, or Art History 1A, 1B, 1C, 1D, 1DE, 1E, 5, 10, 25</td>
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<tr>
<td>Depth Subject Matter</td>
<td>44</td>
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<td>36 upper division units in Art Studio</td>
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<tr>
<td>Any two upper division history or theory courses from: Art History, Cinema and Technocultural Studies, Design, Music or Theatre and Dance</td>
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Total Units for the Major: 68

Major Advisers. Information on the current Academic Advisers can be obtained by contacting the Art Department Main Office at 530-752-0105.

Minor Program Requirements:

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<thead>
<tr>
<th>Minor Program Requirements:</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Art Studio</td>
<td>20</td>
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<tr>
<td>Prerequisite courses must be taken prior to enrollment in upper division courses.</td>
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<tr>
<td>Independent studio courses are not applicable.</td>
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<tr>
<td>Upper division studio courses in two of the following areas:</td>
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<tr>
<td>Area 1 (Painting, Drawing, Printmaking)</td>
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<td>Area 2 (Sculpture and Ceramic Sculpture)</td>
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<tr>
<td>Area 3 (Photography and Video)</td>
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<td>Note: One lower division substitute course permissible</td>
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Teaching Credential Subject Representative. Department Chairperson; see the Teacher Education program.

Graduate Study. The Department of Art offers programs of study and research leading to the M.F.A. degree in the practice of art. For more information contact the Graduate Staff Adviser at 530-752-8710 or at http://art.ucdavis.edu.

Courses in Art Studio (ART)

Lower Division

2. Beginning Drawing (4)

Studio—6 hours. Introduction to drawing using various black and white media. Drawing techniques covered are contour line, ink bleeds, rendering, “blind” drawing, and self portrait.—I, II, III, IV, I, II, III, IV.—Henderson, Hollowell, Pardee, Puls, Werfel

5. Beginning Sculpture (4)

Studio—6 hours. Basic sculpture techniques using a variety of media. Form in space using cardboard, plaster, and other media.—I, II, III, I, II, III.—Hills, Hill, Puls

7. Beginning Painting (4)

Studio—6 hours. Introduction to techniques and concepts in the practice of painting.—Henderson, Hollowell, Werfel

8. Beginning Ceramic Sculpture (4)

Studio—6 hours. Introduction to ceramic sculpture construction and processes.—Rosen

9. Beginning Photography (4)

Studio—6 hours. Introduction to the fundamental technical, aesthetic aspects of photography. Camera skills, film developing and printing in the black and white darkroom.—Suh

10. Introduction to Art Appreciation (3)

Lecture—3 hours. The understanding and appreciation of painting, sculpture, architecture and industrial art. Illustrated lectures. Intended for non-majors. GE credit: ArtHum | AH, VL.

11. Beginning Printmaking (4)

Studio—6 hours. Introduction to printmaking techniques such as monotype, relief, and intaglio. Investigation of personal imagery through use of these techniques.

12. Beginning Video (4)

Studio—6 hours. Production techniques of video shooting, editing, lighting, sound and effects. A conceptual framework for video-art techniques.—Martin

24. Introduction to Experimental Video and Film (4)

Lecture—3 hours; discussion—1 hour; term paper. Evolution of moving image technologies. Shifts within avant-garde artistic practices. Conceptual and historical differences between film and video. Offered in alternate years. GE credit: ArtHum | AH, VL, WE—(I.) Martin

30. Introduction to Contemporary Visual Culture (4)

Lecture—3 hours; discussion/labatory—1 hour. Establishing visual literacy across the media of fine art, photography, advertising, television and film, media culture; focus on critical decoding of contemporary visual culture. GE credit: ArtHum, Div. Wrt | AH, VL—II, II.

98. Directed Group Study (1-5)

Prerequisite: consent of instructor. Restricted to lower division students. (P/NP grading only)

99. Special Study for Undergraduates (1-5)

Prerequisite: consent of instructor. (P/NP grading only)

Upper Division

Pre-enrollment in upper division courses is restricted to art majors.

101. Intermediate Painting (4)

Studio—6 hours. Prerequisite: courses 2, 7. Individualized projects exploring and specializing in a variety of subject matter and approaches. Builds on basic skills and concepts from beginning drawing and painting courses. Study of historical and contemporary art in relation to studio practice. GE credit: ArtHum | AH, VL—I, II, III, I, II, III.—Pardee, Werfel

102A. Advanced Painting: Studio Projects (4)

Studio—6 hours. Prerequisite: course 101. Sustained development of painting for advanced students. Approaches will vary according to the instructor. Pass 1 restricted to Art Studio majors. May be repeated for credit only. GE credit: ArtHum | AH, VL—Pardee, Werfel

102B. Advanced Painting: Figure (4)

Studio—6 hours. Prerequisite: course 101. Advanced painting using the human figure as subject. Pass 1 restricted to Art Studio majors. May be repeated for credit only. GE credit: ArtHum | AH, VL—Pardee, Werfel

102C. Advanced Painting: Special Topics (4)

Studio—6 hours. Prerequisite: courses 2, 7, 101, course 102A or 102B. Special topics in painting for upper division students. Emphasis on development of a personal practice of painting informed by awareness of contemporary issues in painting and their historical background. Topics will vary with instructor. Pass 1 restricted Art Studio majors. May be repeated for credit only. GE credit: ArtHum | AH, VL—Pardee, Werfel

103A. Intermediate Drawing: Black and White (4)

Studio—6 hours. Prerequisite: courses 2. Advanced study of drawing composition using black and white media. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL—Pardee, Werfel

103B. Intermediate Drawing: Color (4)

Studio—6 hours. Prerequisite: courses 2. Study of drawing composition in color media. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL—Pardee, Werfel

105A. Advanced Drawing: Studio Projects (4)

Studio—6 hours. Prerequisite: courses 2; course 103A or 103B. Exploration of composition and process in drawing. Emphasis on the role of drawing in contemporary art and on drawing as an interdiscipli
Art Studio

110A. Advanced Photography: Digital Imaging (4)

110B. Intermediate Photography: Digital Imaging (4)
Studio—6 hours. Prerequisite: course 12 or Techno-cultural Studies 100. Use of video to expand performance art production. Exploration of improvisation, direction, projection, and image processing in real time. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Martin

114C. Intermediate Video: Performance Strategies (4)
Studio—6 hours. Prerequisite: course 12 or Techno-cultural Studies 100. Study of space and light, and visual projects. May be repeated for credit one time. GE credit: ArtHum | AH, VL — Martin

117. Advanced Video and Electronic Arts (4)
Studio—6 hours. Prerequisite: course 12 or Techno-cultural Studies 100; one of course 112, 114A, 114B, or 114C; upper division standing Art Studio Majors. Independently driven video, digital, and/or performance projects. Further development in the electronic arts ranging from video installation to performance. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Martin

121. Interdisciplinary Studio—6 hours. Prerequisite: courses 2, 7, 19. Interpretation of landscape through painting, drawing, and related media. Emphasis on the integration of historical, cultural, natural, and artistic contexts. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Martin

125A. Intermediate Printmaking: Relief (4)
Studio—6 hours. Prerequisite: course 11. Woodcut linocut, metal-plate, relief, and experimental uses of other materials for printmaking. Additive and subtractive relief techniques. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Martin

125B. Intermediate Printmaking: Intaglio (4)
Studio—6 hours. Prerequisite: course 11. Woodcut linocut, metal-plate, relief, and experimental uses of other materials for printmaking. Additive and subtractive relief techniques. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Martin

147. Theory and Criticism of Photography (4)
Lecture—3 hours; term paper. Prerequisite: course 9. Development of camera vision, ideas, and aesthetics and their relationship to the fine arts from 1839 to the present. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL — II, Geiger, Suh

149. Introduction to Critical Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: of two of Art History 1B, 1C, or 183F. An overview of 20th century critical theories of culture and their relation to visual art and mass media culture. GE credit: ArtHum, Div | AH, VL — II, Pardee

150. Theory and Criticism of Electronic Media (4)
Lecture—3 hours; term paper. Prerequisite: course 24 recommended. Study of electronic media, focusing on critique, application, and relationships to art practice. Analysis of the conceptual basis of electronic media as an artistic mode of expression. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL — II, Pardee

151. Intermediate Sculpture (4)
Studio—6 hours. Prerequisite: course 5. Individualized explorations through multiple projects in a variety of sculpture media and techniques. Builds upon technical skills and concepts covered in course 3. May be repeated two times for credit when topic differs. GE credit: ArtHum | AH, VL — I, II, III, (I, II, III), Bills, Hill, Puls

152A. Advanced Sculpture: Studio Projects (4)
Studio—6 hours. Prerequisite: courses 5, 151. Sculpture for advanced students. Emphasis on concept, idea development and honing technical skills. Approaches and projects will vary according to the instructor. May be repeated for credit one time when topic differs. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Bills, Hill, Puls

152B. Advanced Sculpture: Material Explorations (4)
Studio—6 hours. Prerequisite: courses 5, 151. Primary application and exploration of a single sculpture material chosen by the student. Examination of its properties, qualities, and characteristics. May be repeated for credit one time. Pass 1 restricted Art Studio majors. GE credit: ArtHum | AH, VL — Puls
Asian American Studies

(College of Letters and Science)
Richard S. Kim, Ph.D., Chairperson of the Department

Program Office, 3102 Hart Hall
530752-3625; http://asas.ucdavis.edu

Faculty
Darrell Y. Yamamoto, Ph.D., Professor
Wendy Ho, Ph.D., Senior Lecturer
Richard S. Kim, Ph.D., Associate Professor
Sunaina Maira, Ed.D., Professor
Susette Min, Ph.D., Associate Professor
Robyn Rodriguez, Ph.D., Associate Professor
Caroline Kieu Linh Valverde, Ph.D., Associate Professor
Nolan Zane, Ph.D., Professor

Emeriti Faculty
Iasso Fujimoto, Ph.D., Senior Lecturer Emeritus
Bill Ong Hing, J.D., Professor Emeritus
Stanley Sue, Ph.D., Professor Emeritus

The Major Program
The Asian American Program offers an interdisciplinary major that examines the experiences of various Asian American groups in the United States.

Pertinent to these experiences are the historical, cultural, legal, political, social-psychological, class, racial, and gender contexts for Asian Americans.

The Program. Majors take a prescribed set of lower division and upper division courses in Asian American Studies. These courses offer diverse theoretical and methodological tools to develop and encourage student critical thinking, creative initiative, and independent research about a complex, multiethnic and racialized society in the United States and in a global world.

Career Alternatives. Asian American Studies prepares students for a variety of careers. Given the multicultural nature of society and the increasing relations with different societies, many occupations seek individuals with background and expertise in ethnic relations and cultural issues. Graduates often enter the fields of teaching, research, government service, law, social services, etc., as well as graduate schools for advanced degrees in various disciplines.

A.B. Major Requirements: Preparatory Subject Matter ........................................16 At least two lower division courses from the following departments or programs:
Asian American and African Studies (AAS), Chicana/o Studies (CHI), Middle East and South Asia Studies (ME/SA), Native American Studies (NAS), Women and Gender Studies (WGS) (all lower division courses of at least 4 units are acceptable except those numbered 92, 97T, 98, and 99)..............................8 Methodologies: At least two courses from any of the following methods courses:
Asian American and African Studies 101; American Studies 120; History 104; Art History 5, 100 Art Studio 10; 30; Chicana/o Studies 23; English 42, 110A, 110B; History 101; Human Development 120; Native American Studies 46; Philosophy 5; Political Science 51; Psychology 41; Sociology 46A, 46B; Statistics 13; Women and Gender Studies 104.

Depth Subject Matter ........................................36 Asian American Studies 192 Community Internship (required) ....................................4 Major Emphasis
As part of the depth subject matter requirement, all Asian American Studies majors must develop a major emphasis by choosing either a disciplinary or thematic specialization in consultation with the Student Affairs Officer (SAO) and/or faculty advisors. The major emphasis must include six Asian American Studies upper-division courses and two upper-division elective courses from other departments or programs.
Up to six units in Asian American Studies 198 and or Asian American Studies 199 can be used to satisfy the Asian American Studies upper division course requirements.
At least two upper-division elective courses from other departments or programs that relate to chosen emphasis.........................8 Two courses (of up to eight units) from Study Abroad can be substituted for major

Pre-Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses
Asia Minor Adviser, Brit Sumida, Student Affairs Office (SAO), 530-752-4447 or bsumida@ucdavis.edu

Substitutions for disciplinary track courses will be considered by the Program Director on a case-by-case basis. Likewise, any substitutions of Major/Minor criteria will be considered by the Program Director.

Minor Program Requirements:

- **UNITS**
- **Asian American Studies** 28
- Two courses from Asian American Studies 1, 2, 3, or 4 8
- Five courses from:
  - Asian American Studies 100, 102, 112, 113, 114, 115, 116, 121, 130, 131, 132, 140, 141, 150, 158B, 150C, 150D, 150E, 150F, 158A, 158B, 158C, 180A, 180B, 180C, 189D, 189E, 189F, 192, 198, and 199 (no more than 4 units of 192, 198, and 199 may be counted toward this total) 20

Minor Adviser, Brit Sumida, 530-752-4447 or bsumida@ucdavis.edu

American History and Institutions. This university requirement can be satisfied by one of the following courses in Asian American Studies: 1, 2; see also under University Requirements.

Courses in Asian American Studies (ASA)

(ASA) Direct questions pertaining to the following courses to the instructor or to Asian American Studies Department in 3102 Hart Hall 530-723-9767.

**Lower Division**

1. **Historical Experience of Asian Americans (4)**
   - Lecture—3 hours; discussion—1 hour. Introduction to Asian American Studies through an overview of the history of Asians in America from the 1840s to the present within the context of the development of the United States. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WC, WE.—I, II, III.

2. **Contemporary Issues of Asian Americans (4)**
   - Lecture—2 hours; discussion—1 hour. Prerequisite: course 1. Introduction to Asian American Studies through the critical analysis of the impact of race, racism, ethnicity, imperialism, militarism, and immigration since post-World War II on Asian Americans. Topics may include: sexuality, criminality, class, hate crimes, and inter-ethnic relations. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WC, WE.—I, II, III.

3. **Social and Psychological Perspectives of Asian Americans (4)**
   - Lecture—3 hours; discussion—1 hour. Major psycho-societal issues of Asian Americans. Theories and empirical research that address cultural values, behavior, class, race, ethnic stereotypes, racism, acculturation, ethnic identity development, family communication, stressors and social support systems, academic achievement, interpersonal effectiveness, and psychopathology. GE credit: SocSci, Div, Wrt | ACGH, DD, SS.—II, III.

4. **Asian American Cultural Studies (4)**
   - Lecture—3 hours; discussion—1 hour. This interdisciplinary course examines the multiple ways in which race, class, sex and gender, as well as the recent turn to transnationalism and postcolonial theory, have changed the ways we read Asian American literature and see theater, and film. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, OL, VL, WE.—I, II, III.

5. **Asian American Communities (4)**
   - Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Survey and analysis of Asian American communities within both historical and contemporary perspectives. Prerequisite: GE credit: SocSci, Div | ACGH, AH or SS, DD, VL, WE.—II. Kim, Maira

6. **Theoretical Perspective in Asian American Studies (4)**
   - Lecture/discussion—4 hours. Prerequisite: course 1, 2, 3, or 4 or consent of instructor. Explores major theories of race and its intersections with class, gender, and sexuality from an interdisciplinary perspective. GE credit: SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WE.—I, III. Kim, Maira

**Upper Division**

5. **Asian American Communities (4)**
   - Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Survey and analysis of Asian American communities within both historical and contemporary perspectives. Prerequisite: GE credit: SocSci, Div | ACGH, AH or SS, DD, VL, WE.—II. Kim, Maira

6. **Theoretical Perspective in Asian American Studies (4)**
   - Lecture/discussion—4 hours. Prerequisite: course 1, 2, 3, or 4 or consent of instructor. Explores major theories of race and its intersections with class, gender, and sexuality from an interdisciplinary perspective. GE credit: SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WE.—I, II, III. Kim, Maira

7. **Asian American Women (4)**
   - Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Experiences of Asian American women from major ethnic subgroups comparatively examined in their social, economic and historical contexts using historical and contemporary contexts. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WC, WE.—I, II, III.

8. **Asian American Sexuality (4)**
   - Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Surveys of Asian American sexual identities comparatively examined in their social, economic and historical contexts using historical and contemporary contexts. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WC, WE.—I, II, III.

9. **Asian Diasporas (4)**
   - Lecture—4 hours. Prerequisite: course 1 or 2; upper division status or consent of instructor. Asian diasporic communities and the experiences of its members in the United States and internationally. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WC, WE.—I, II, III.

10. **Asian American Performance (4)**
    - Lecture—4 hours. Prerequisite: course 1 or 2; upper division status or consent of instructor. Asian diasporic communities and the experiences of its members in the United States and internationally. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WC, WE.—I, II, III.

11. **Asian American Youth (4)**
    - Lecture—3 hours; term paper. Prerequisite: course 1, 2, or 3. Social experiences of diverse groups of Asian American youth. Ways in which youth themselves actively create cultural expressions and political interventions. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, OL, WE.—II, III.

12. **Asian American Performance (4)**
    - Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Survey and analysis of Asian American communities within both historical and contemporary perspectives. Prerequisite: GE credit: SocSci, Div, Wrt | ACGH, AH or SS, DD, OL, WE.—II.

13. **Asian American Literature (4)**
    - Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3 or consent of instructor. Works of Asian American literature by writers from the major ethnic subgroups comparatively examined in their social, economic and historical contexts. GE credit: ArtHum, Div | ACGH, AH, DD, OL, WE.—II. Ho, Min

14. **Ethnicity, Culture, and the Self (4)**
    - Lecture—3 hours; discussion—1 hour. Prerequisite: course 1, 2, or 3. Cultural and psychological influences on Asian Americans focusing on the individual. GE credit: SocSci, Div | ACGH, DD, SS.—Zane

15. **Ethnicity, Culture, and the Self (4)**
    - Lecture—3 hours; discussion—1 hour. Prerequisite: course 1, 2, or 3. Cultural and psychological influences on Asian Americans focusing on the individual. GE credit: SocSci, Div | ACGH, DD, SS.—Zane

16. **Health Issues Confronting Asian Americans and Pacific Islanders (4)**
    - Lecture/discussion—4 hours. Health issues confronting Asian Americans and Pacific Islanders. (Same course as Public Health Sciences 132.) GE credit: SocSci | SS—II.

17. **Asian Americans and Media (4)**
    - Lecture—4 hours; term paper; project. Prerequisite: course 1; course 2, 3, or 4 or consent of instructor. Historical, cultural and sociopolitical development of fashion in Asia and the U.S. as it relates to the Asian Diasporas. GE credit: ArtHum, SocSci, Div, Wrt.—II. (I.) Hamamoto, Maira

18. **Asian Americans and the Political Culture of Fashion in the U.S. and Asia (4)**
    - Lecture—4 hours; term paper; project. Prerequisite: course 1 or 2. Examination of the relationship between the Filipino-American community, the Philippine home community and the larger American society through an interdisciplinary perspective. GE credit: ArtHum, SocSci, Div, Wrt.—II. (II.) Hamamoto

19. **Filipino American Experience (4)**
    - Lecture/discussion—4 hours. Prerequisite: course 1 or 2. Examination of the relationship between the Filipino-American community, the Philippine home community and the larger American society through an interdisciplinary perspective. GE credit: ArtHum, SocSci, Div, Wrt.—II. (II.) Hamamoto

20. **Japanese American Experience (4)**
    - Lecture—3 hours; term paper. Prerequisite: course 1 and upper division status or consent of instructor. Analytical approaches to understanding Japanese American history, culture and politics by members of the Japanese American community. GE credit: ArtHum, SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WE.—II, III. Rodriguez

21. **Chinese American Experience (4)**
    - Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Survey and analysis of Chinese American communities within both historical and contemporary perspectives of Chinese in the United States, starting with the gold rush era and concluding with the present day. Prerequisite: GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, VL, WE.—II, III. Rodriguez

Quarter Offered: F=Fall; W=Winter; S=Spring; V=Summer; 2015-2016 offering in parentheses


Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering, SS—Social Sciences; ACGH—American Cultures, DD—Domestic Diversity, OL—Oral Skills, QL—Quantitative, SL—Scientific, VL—Visual, WC—World Cultures; WE—Writing Experience
Asian Studies

Asian Studies

See Physics, on page 466.

Atmospheric Science

(College of Agricultural and Environmental Sciences)

Faculty. See under Department of Land, Air and Water Resources, on page 364.

The Major Program

Atmospheric science is the study of the air that surrounds the planet. It includes all weather phenomena and climate including the chemistry of trace constituents and cloud and particle formation, as well as quantitative studies of severe weather events such as hurricanes and tornadoes. It includes the study of the impacts of human and other biotic activity on the quality of the air we breathe. Changes in regional and global climate are also central to this field of study.

The Program. Modern meteorology is a quantitative science that is becoming increasingly computer dependent. In addition to the study of daily weather events, the program deals with fundamental dynamical and physical processes that involve the general circulation of the atmosphere, turbulent mass and energy transfer at the planetary surface as well as within the free atmosphere, and local and terrestrial radiation throughout the atmosphere; atmospheric interaction with the biosphere; climate variations; and developments in remote sensing using satellites with modern meteorological instrumentation. In addition, the program has significant expertise in the areas of air quality and its related atmospheric chemistry. As well as providing a broad background in meteorology, the major includes an informal minor area to be chosen from mathematics, computer science, environmental studies, resource management or a physical or biological science.

Internships and Career Alternatives. Atmospheric science students have participated in internships with the California Air Resources Board, various county Air Pollution Control Districts, and the National Weather Service. Job opportunities include: national weather service forecasting for broadcast media or private forecasting firms, environmental consulting firms (such as environmental impact reports, wind farm siting), government agencies at all levels from local to national (e.g., planning departments, etc.) to State (Air Resources Board) to national (NOAA), and companies whose operations are impacted by weather (such as airlines, futures markets). About half of our graduates continue their education by seeking the M.S. or Ph.D. degree in atmospheric science or related areas.

B.S. Major Requirements:

**UNITS**

Written Expression, Also counts toward College English Proficiency Requirement.................................3-4

University Writing Program 101 or one course from 102 or 104 sequences or course selected with adviser's approval

Preparatory Subject Matter.........................59-60

Plant Sciences 2......................................4

Chemistry 2A, 2B..................................10

Computer Science Engineering 30 or course selected with adviser's approval ....4


Atmospheric Science 60................................4

Physics 9A, 9B, 9C..................................12

Statistics 10...........................................3

Depth Subject Matter..........................41

Atmospheric Science 110, 111, 111L, 120, 121A, 121B, 124, 128.................................28

Internship-Airflow Science 192 or 199 .................................................................2

Two upper division Atmospheric Science courses selected with adviser's approval, not including courses 192 and 199............7

Engineering 6, Atmospheric Science 150, Civil and Environmental Engineering 152A, or course selected with adviser's approval ....4

Restricted Electives.................................15

Coordinated group of courses (minor area) to be chosen with adviser's approval from mathematics, computer science, environmental studies, communication, resource management, or a physical or biological science (at least 10 upper division units)

Total Units for the Major......................118-120

Major Adviser. Shu-Hua Chen

Advising Center is major, is located in 1150 Plant and Environmental Sciences Building in Land,
Air and Water Resources Teaching Center 530-752-1603; lawravisng@ucdavis.edu.

Note. Alternative options for students who are inter-ested in atmospheric science are to minor in AS or to major in ESM choosing climate change and air pollution track. However, both the ATM minor and the ESM climate change and air quality track do not meet the federal civil service requirements for meteorologists.

Minor Program Requirements:

Minor Program. The minor in Atmospheric Sci-ence provides a broad treatment of weather and cli-mate, with the option to focus on such topics as climate change, meteorological instrumentation, and satellite remote sensing. Students undertaking the minor could have the equivalent of a minimum preparatory work in calculus and physics (Mathematics 16A-6B, Physics 5A or 7A). Some upper division courses in Atmospheric Science have the Mathematics 21 and 22 series and the Physics 9 series as pre-requisites.

UNITs

Atmospheric Science: 20-24

Atmospheric Science 60, 110…………………8
Four courses selected with the approval of the minor program adviser from upper division Atmospheric Science courses (excluding 192 or 199) or Environmental Science and Management 131 …………………… 12-16

Minor Adviser. Shu-Hua Chen

Graduate Study. You can specialize in particular areas of atmospheric science through graduate study and research leading to the M.S. and Ph.D. degrees. For details, see the Atmospheric Science [A Graduate Group], on page 175, and see Graduate Studies, on page 177.

Related Courses. See Environmental Science and Policy 150A; Physics 104A, 104B; Environmental Science and Management 131.

Courses in Atmospheric Science (ATM)
Questions pertaining to the following courses should be directed to the instructor or to the Land, Air and Water Resources Teaching Center in 1150 Plant & Environmental Sciences Building 530-752-1603.

Lower Division

5. Global Climate Change (3)

10. Severe and Unusual Weather (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: high school physics. Introduction to selected topics in atmospheric science, such as: meteorological aspects of air pollution, use of computer models in weather forecasting, theories of global climate change, impact of satellites on meteorology, and modern meteorological instrumentation. (P/NP grading only.) GE credit: ScEn| SE, SL—1. (I.) Anastasio

60. Introduction to Atmospheric Science (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 16A or 21A and Physics 5A, 7A or 9A. Fundamental principles of the physics, chemis-try, and fluid dynamics underlying weather and cli-mate. Solar radiation, the greenhouse effect, and the thermal budget of the Earth. Clouds and their forma-tion, convection, precipitation, mid-latitude storm sys-tems. GE credit: ScEn| QL, SE, VL.—1. (I) Falona

92. Atmospheric Science Internship (1-12)
Internship—3-36 hours. Prerequisite: lower division standing and consent of instructor. Internship off and on campus in atmospheric science. Internship supervised by a member of the faculty. (P/NP grading only)—I, II, III. (I, II, III.) Falona

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)—I, II, III, IV, V, VI. (I, II, III, IV, V, VI.)

99. Special Study for Undergraduates (1-5)
(P/NP grading only)—I, II, III, IV, V, VI. (I, II, III, IV, V, VI.)

Upper Division

110. Weather Observation and Analysis (4)
Lecture—3 hours, laboratory—3 hours. Prerequisite: course 60. Acquisition, distribution and analysis of meteorological data. Vertical sounding analysis, sta-bility indices, probability of local severe weather, weather map analysis. Laboratory—Weather map analysis. (Casted system, including various weather forecast models. GE credit: ScEn| QL, QL, SE, VL.—II. (II.) Nathan

111. Weather Analysis and Prediction (3)
Lecture—3 hours. Prerequisite: courses 110, 121B, 111L (concurrently). Knowledge of a programming language. Tools for analyzing observed properties of mid-latitude weather systems. The analysis-prediction sys-tem, including various weather forecast models. General structure and properties of mid-latitude weather systems. Offered in alternate years. GE credit: ScEn| QL, QL, SE, VL.—II. (II.) Nathan

111L. Weather Analysis and Prediction Laboratory (2)
Laboratory—2 hours, web virtual lecture—4 hours. Prerequisite: course 111 (concurrently). Subjective and objective analysis of weather data. Web-based learning of the analysis-prediction system and various weather forecasting situations. Weather map inter-pretation and forecast discussions. (P/NP grading only) Offered in alternate years. GE credit: ScEn| QL, QL, SE, VL.—II. (II.) Nathan

112. Weather Forecasting Practice (2)
Discussion—2 hours; laboratory—1 hour. Prerequi-site: course 110. Formal practice in preparing local weather forecasts. Analysis of current weather condi-tions and recent model performance. Verification and discussion of prior forecast. Interpretation of cur-rent forecast model guidance. Posting of forecast. May be repeated for credit up to three times. (P/NP grading only)—I. (I.) Nathan

115. Hydroclimatology (3)
Lecture—3 hours. Prerequisite: course 60. Examina-tion of climate as the forcing function for the hydra-logic system. Emphasis on the role of climatic conditions and variations in the relationship between precipitation and evapotranspiration for meso-scale areas. Watershed modeling of floods and drought for evaluating the effects of cli-matic change. GE credit: ScEn| SE, SL—II. (II.) Nathan

116. Climate Change (4)
Lecture—3 hours; extensive writing. Prerequisite: University Writing Program 1; consent of instructor. Climate trends and variability over the past and the future. Emphasis on natural processes that produce climate variations and human influence on these processes. Evidence of climate change and the role of global climate models in understanding cli-mate variability. GE credit: ScEn| QL, SE, WE.—III. (III.) Nathan

120. Atmospheric Thermodynamics and Cloud Physics (4)
Lecture—3 hours, extensive problem solving. Prereq-uisite: Mathematics 21C, Physics 9B, course 60 (may be taken concurrently). Composi-tion and structure, thermodynamics of atmospheric gases, thermal properties of dry and moist air, atmo-spheric stability; cloud nucleation, cloud growth by condensation and collision, droplet coalescence. GE credit: ScEn| QL, SE, VL.—I. (I.) Falona

121A. Atmospheric Dynamics (4)
Lecture—3 hours, extensive problem solving. Prereq-uisite: course 120, Mathematics 21D, Physics 9B. Fundamental forces, the isentropic flow, potential vorticity, reference frames; development of the equations of motion for rotating stratified atmospheres; isobaric and natural coordinate systems; geostrophic flow; thermal wind; circulation and vorticity. GE credit: ScEn| QL, SE.—II. (II.) Nathan

121B. Atmospheric Dynamics (4)
Lecture—3 hours, extensive problem solving. Prereq-uisite: course 121A. Dynamics of fluid motion in geophysical systems; quasi-geostrophic theory, funda-mentals of wave propagation in fluids; Rossby waves; gravity waves; fundamentals of hydrodynam-ic instability; two-level model; baroclinic instabil-ity and cyclogenesis. GE credit: ScEn| QL, SE.—III. (III.) Nathan

124. Meteorological Instruments and Observations (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 60, Physics 5C. Meteorological instruments and their use in meteorological observa-tions and measurements. Both standard and micro-meterological instruments are included. Offered in alternate years. GE credit: ScEn| QL, SE, SL, VL—II. (II.) Nathan

128. Radiation and Satellite Meteorology (4)
Laboratory-discussion—3 hours; extensive problem solving—1 hour. Prerequisite: course 60, Physics 9B, Mathematics 22B, 21D. Concepts of atmospheric radiation and the use of satellites in remote sensing. Emphasis on the modification of solar and infrared radiation by the atmosphere. Emphasis on satellite data of atmospheric variables such as tempera-tures and cloudiness. GE credit: ScEn| QL, SE, VL—II. (II.) Nathan

133. Biometeorology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in a biological discipline and Mathemat-ics 16B or consent of instructor. Atmospheric and biologi-cal interactions. Physical and biological basis for weather, carbon dioxide and energy exchange of the exchange associated with plants and animals, including humans. Microclimate of plant canopies and microclimatic modifications such as frost protection and windshield. GE credit: ScEn| QL, SE, SL, VL—II. (II.) Nathan

149. Air Pollution (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 21D, 228, Chemistry 2B, Atmospheric Science 121A or Engineering 103. Physical and technical aspects of air pollution. Emphasis on geo-physical processes and air pollution meteorology as well as physical and chemical properties of pollut-ants. (Same course as Civil and Environmental Engi-neering 149) GE credit: ScEn| QL, SE, VL.—I. (I.) Cappa

150. Introduction to Computer Methods in Physical Sciences (4)
Lecture—3 hours; lecture/discussion—2 hours. Prerequisite: Mathematics 228, Physics 9B, and a com-puter programming course such as Engineering Computer Science 30. Additional courses in fluid dynamics (course 121A or Engineering 103) and digital Fourier transforms (Mathematics 118C or Physics 104A) are helpful, but not required. Computational techniques used in physical sciences. Integral and differen-tial equation numerical solution: mainly finite

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): Art/Hum: A+Arts and Humanities; SciEng:Science and Engineering, SocSci:Social Sciences; Div=Dominant Diversity; Wrt=Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering, SS=Social Sciences; ACGH=American Cultures, DD=Dominant Diversity, OL=Oral Skills, QL=Quantitative, SL=Scientific, VL=Visual, WC=World Cultures; Wrt=Writing Experience
231. Advanced Air Pollution Meteorology (3)
Lecture—2 hours. Prerequisites: Course 149A, 160 and one course in fluid dynamics. Processes determine transport and dispersion of primary and secondary pollutants. Models of chemical transformation in the atmospheric boundary layer and of mesoscale wind fields, as applicable to pollutant dispersion problems. Offered in alternate years. —(I)

232. Advanced Biometeorology (3)
Lecture/discussion—2 hours. Prerequisite: course 153 or consent of instructor. Current topics in biometeorology. Physical and biological basis for water vapor, other gases, and energy exchange with the atmosphere. Topics include modeling and measuring turbulent transport in the atmosphere, concept of surface temperature and energy budgets, bio-aerosol physics and aerobiology. Offered in alternate years. —(II)

240. General Circulation of the Atmosphere (4)
Lecture/discussion—4 hours. Prerequisite: course 121B. Large-scale, observed atmospheric properties. Radiation, momentum, and energy balances derived and compared with observations. Lectures and homework synthesize observations and theories, then apply them to understand the large-scale circulation. Offered in alternate years. —(I)

241. Climate Dynamics (3)
Lecture/discussion—3 hours. Prerequisite: course 121B. Dynamics of large-scale climatic variations over time periods from weeks to centuries. Description of the appropriate methods of analysis of atmospheric and oceanic systems. Conservation of mass, energy and momentum. Introduction to the range of climate simulations. Offered in alternate years. —(I)

250. Meso-Scale Meteorology (3)
Lecture—2 hours; laboratory —6 hours. Prerequisite: course 121B. Conditions for instability in stratified atmospheres; baroclinic instability, forced topographic Rossby Waves; wave-mean flow interaction theory; tropical dynamics; stratospheric dynamics. Offered in alternate years. —(II)

255. Numerical Modeling of the Atmosphere (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 121B and Engineering 5; course 150 recommended. Principles of numerical modeling of the dynamic, thermodynamic and physical processes of the atmosphere. Hands-on experiments on model development using the shallow water equations and the primitive equations. Operational forecast model experiments. Offered in alternate years. —(I)

260. Atmospheric Chemistry (3)
Lecture—3 hours. Prerequisite: course 160. Chemistry and photochemistry in tropospheric condensed phases (fog, cloud, and rain drops and aerosol particles). Gas-phase and gas-particle partitioning of compounds and effects of reactions in condensed phases on the fates and transformations of tropospheric chemical species. Offered in alternate years. —(II)

270A-G. Topics in Atmospheric Science (1-3)
Discussion—1-3 hours. Applications and concepts in (A) Meteorological Statistics; (B) Computer Modeling of the Atmosphere; (C) Design of Experiments and Field Studies in Meteorology; (D) Solar and Infrared Radiation in the Atmosphere; (E) Aerosol and Cloud Physics; (F) Atmospheric Chemistry; (G) General Meteorology. —(I, II, III)

280A. Air Quality Policy in the Real World (4)
Project. Prerequisite: consent of instructor. Atmospheric Science 149 or Engineering: Civil and Environmental 145A. (I) Air quality policies and regulations and enforcement. Civil and Environmental 242 or equivalent. In-depth investigation of an air quality problem with a team and mentor from government or industry. Science, engineering and policy will be involved. Findings will be presented orally and in writing. Offered irregularly. (Deferred grading only, pending completion of sequence.) —II, III, (II, III)

280B. Air Quality Policy in the Real World (4)
Project. Prerequisite: course 280A; consent of instructor. In-depth investigation of an air quality problem with a team and mentor from government or industry. Science, engineering and policy will be involved. Findings will be presented orally and in writing. (Deferred grading only, pending completion of sequence.) Offered irregularly. —II, III, (II, III)

290. Seminar (1)
Seminar—1 hour. Prerequisite: graduate standing in Atmospheric Science or related field. Current developments in selected areas of atmospheric research. Topics will vary according to student and faculty interests. (S/U grading only.) —I, II, III. —(I, II, III)

291A-F. Research Conference in Atmospheric Science (1-3)
Lecture/discussion—1-3 hours. Prerequisite: consent of instructor. Review and discussion of current literature and research in: (A) Air Quality Meteorology; (B) Biometeorology; (C) Boundary Layer Meteorology; (D) Climate Change; (E) General Meteorology; (F) Atmospheric Chemistry. May be repeated up to a total of 6 units per segment. (S/U grading only.) —I, II, III. —(I, II, III)

298. Group Study (1-5)
Prerequisite: graduate standing and consent of instructor. (S/U grading only.) —I, II, III. —(I, II, III)

299. Research (1-12)
Prerequisite: graduate standing and consent of instructor. (S/U grading only.) —I, II, III. —(I, II, III)

Professional

393. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (P/NP grading only.) —I, II, III. —(I, II, III)

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.) —I, II, III. —(I, II, III)

Atmospheric Science (A Graduate Group)

Ian Falloon, Ph.D., Chairperson of the Group
530-752-2044

Group Office: 1152 Plant and Environmental Sciences Building 530-752-1669
http://atm.ucdavis.edu

Faculty

Cort Anastasio, Ph.D., Professor
Joseph Biello, Ph.D., Associate Professor (Mathematics)
Christopher Cappa, Ph.D., Assistant Professor (Civil and Environmental Engineering)
Shu-Hua Chen, Ph.D., Professor
Ian Falloon, Ph.D., Associate Professor
Richard Grothjahn, Ph.D., Professor
Michael J. Kleeman, Ph.D., Professor
John Lin, Ph.D., Assistant Professor (Environmental Science and Policy)
Terrence R. Nathan, Ph.D., Professor
Bruce White, Ph.D., Professor (Mechanical and Aerospace Engineering)
Zhang, Qi, Assistant Professor (Environmental Toxicology)
Avian Sciences

This major has been discontinued as of Fall 2011; see Animal Science, on page 153.

Graduate Study. The Avian Sciences Graduate Group offers a program of study and research leading to the M.S. and Ph.D. degree in Avian Sciences. The M.S. degree is offered in Avian Sciences. For details, see Graduate Studies, on page 111.

Related Courses. See Agricultural and Resource Economics 130; Animal Science 143, Food Science and Technology 120L, 121L; Molecular and Cellular Biology 150, 150L; Nutrition 123, 123L.

Courses in Avian Sciences (AVS)

Lower Division

11. Introduction to Poultry Science (3) Lecture—3 hours. The mosaic of events that have tied poultry science to other scientific disciplines and poultry to humans. Poultry science techniques and production methods from the time of domestication to the present. One field trip required. GE credit: SciEng. Wrt | I | SE

13. Birds, Humans and the Environment (3) Lecture—2 hours; discussion—1 hour. Interrelationships of the worlds of birds and humans. Lectures, discussions, field trips and projects focus on ecology, avian evolution, physiology, reproduction, flight, behavior, folklore, identification, ecotoxicology and conservation. Current environmental issues are emphasized. Half-day field trip. GE credit: SciEng, Wrt | I | SE, SL — I (I.) King

14L. Management of Captive Birds (2) Fieldwork—3 hours; lecture/discussion—1 hour. Prerequisite: consent of instructor. One weekly discussion and field trip to study practical captive management (housing, handling, equipment, marketing, diseases). Visit facilities rearing birds such as commercial parrots, hobbyist exotics, ostrich, raptors, waterfowl, game birds, poultry and pigeons. GE credit: SciEng | SE, SL

15L. Captive Raptor Management (2) Laboratory—3 hours; independent study—3 hours; one field trip; Hands-on experience handling birds of prey. Students are taught all of the skills required to handle and care for raptors, including their husbandry, biology, habitat requirements, cage design, veterinary care, rehabilitation methods, research potential and long-term care requirements. GE credit: SciEng | SE, SL

16LA-16LB-16LC. Raptor Migration and Population Fluctuations (2-2-2) Fieldwork—3 hours; discussion—1 hour; one Saturday field trip. Prerequisite: consent of instructor. Identify raptors; study effects of weather, crops, agricultural practices on fluctuations in raptor species and numbers. Familiarize with literature; design a project; survey study sites; collect, computerize, analyze data; compare with previous years. Species, observations, emphasis are different each quarter. GE credit: SciEng | SE — I, II, III (I, II, III)

99. Special Study for Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only.) May be repeated for credit with consent of instructor. GE credit: SciEng | SE — I, II, III (I, II, III)

103. Avian Development and Genomics (3) Lecture—3 hours. Prerequisite: Biological Sciences 1A and 1B, or Biological Sciences 2A, B, C. Unique features of avian development: Incubation; Staging; Egg Structure/Function; Fertilization; Pre-oviposition, Oviposition, Cold Torpor; Post-oviposition Development; Organogenesis; Growth; Sex Differentiation; Extramembranous Metabotypes; Mortality/Hatching; Genome Organization; Comparative Avian Genomics; Telomere Biology; Sex Chromosomes/Sex Determination; Advanced Technologies; Genome Manipulation; Mutations. GE credit: SciEng | SE — I. (I.) Delany

115. Raptor Biology (3) Lecture—2 hours. Prerequisite: Biological Sciences 1A, B, C. Captive propagation of birds, including reproduction, genetics, medicine, nutrition, environmental concerns, conservation, legal considerations, rehabilitation, and falconry. Includes two Saturday field trips. GE credit: SciEng | SE

121. Avian Reproduction (2) Lecture—2 hours. Prerequisite: Biological Sciences 1A, B, C. Captive breeding cycles and reproductive strategies, egg and sperm formation and development, imprinting, hormonal control of reproductive behavior and song. Species coverage includes wild and captive birds. Course has a physiological orientation. Offered in alternate years. GE credit: SciEng | SE, SL — II.

123. Management of Birds (3) Lecture—2 hours. Prerequisite: Biological Sciences 1A, B, C. Captive propagation of birds, including reproduction, genetics, medicine, nutrition, artificial incubation, artificial insemination, and related legal aspects, including trade and smuggling, Emphasis on exotic species and the role of captive propagation in conservation. Offered in alternate years. GE credit: SciEng | SE, SL, WE — II.

149. Egg Production Management (2) Lecture—2 hours. Prerequisite: course 11 or the equivalent, or consent of instructor. Management of commercial table egg flocks as related to environment, nutrition, disease control, economics, housing, equipment, egg processing and raising replacement pullets. One Saturday field trip required. Offered in alternate years. GE credit: SciEng | SE

150. Nutrition of Birds (1) Lecture—1 hour. Prerequisite: Animal Biology 103 (may be taken concurrently). Principles of nutrition specific to avian species, including feeding, artificial incubation, artificial insemination, and nutritional support of egg production and growth. Use of computer for feed formulation to support production. Offered in alternate years. GE credit: QL, SciEng | SE — III (I) Klassing

160. Designing and Performing Experiments in Avian Sciences (2) Laboratory—3 hours; 6 hours. Prerequisite: course 100 or Wildlife, Fish, and Conservation Biology 111 or Evolution and Ecology 137 or consent of instructor. Experiments in current problems in avian biology. Introduction to experimental design. Students choose a project; design a protocol; perform an experiment and report their findings. May be repeated for credit with consent of instructor. GE credit: SciEng | SE — I, II, III (I, II, III)

170. Advanced Avian Biology (4) Lecture/discussion—3 hours; project—1 hour. Prerequisite: course 100 or Evolution and Ecology 137 or Wildlife, Fish, and Conservation Biology 111. Ecology, behavior, functional morphology and life-history evaluation of birds. Emphasis on the importance of body size as a principle determinant of most aspects of avian performance from lifespan to reproduction and species abundance. Analytical synthesis and critical thinking are emphasized. Offered in alternate years. GE credit: SciEng | SE

Emeriti Faculty

Thomas A. Cahill, Ph.D., Professor Emeritus
Robert Florence, Ph.D., Professor Emeritus (Crocker Nuclear Laboratory)
Ruth Rock, Ph. D., Professor Emeritus
Bryan Weare, Ph. D., Professor Emeritus

Affiliated Faculty

Lowell Ashbaugh, Ph.D., Associate Researcher
Bob Flocchini, Ph.D., Professor Emeritus (Applied Science)
Ann Dillner, Ph.D., Assistant Researcher
Richard L. Snyder, Ph.D., Biometeorology Specialist
Richard Anthony VanCuren, Ph.D., Professor Emeritus (Air Pollution Research Center)

Graduate Study. The Graduate Group in Atmospheric Sciences offers both the M.S. and Ph.D. degree programs. A student may place emphasis on graduate work in one or more of the following fields: air quality, meteorology, atmospheric chemistry, bio-meteorology, micrometeorology, numerical weather prediction, remote sensing, climate dynamics, large scale dynamics, and meso-scale meteorology. The diverse and extensive backgrounds of the faculty allow opportunities for interdisciplinary training and research.

Preparation. The Graduate Group welcomes applications from students with backgrounds in the physical or natural sciences. Basic qualifications for students entering the Atmospheric Sciences graduate program include mathematics at the level of vector calculus and differential equations, and one year of college-level physics. Flexibility may be allowed for students with high academic potential, but it is expected that deficiencies in preparatory material and in key undergraduate atmospheric science courses be completed within the first year of graduate study.

Graduate Adviser. Terrence North Ph.D.
Graduate Admissions Officer. Christopher Cappa, Ph.D.

Avian Sciences

This major has been discontinued as of Fall 2011; see Animal Science, on page 153.

(College of Agricultural and Environmental Sciences) Faculty. See under Animal Science, on page 153.

Master Adviser. A. J. King

Advising Center for the minor and course offers including peer advising, is located in the Animal Science Advising Center in 1202 Meyer Hall 530-754-7915, http://asac.ucdavis.edu/
190. Seminar in Avian Sciences (1)
Seminar—1 hour. Prerequisite: upper division standing in Avian Sciences and consent of instructor. May be repeated three times for credit. (P/NP grading only.)—I, II, III

192. Internship in Avian Sciences (1-12)
Internship—3-36 hours. Prerequisite: completion of a minimum of 84 units, consent of instructor. Internship on and off campus in poultry, game birds or exotic bird production, management and research; or in a business, industry, or agency concerned with these entities. Compliance with Internship Approval form essential. (P/NP grading only.)

195. Topics in Current Research (1-3)
Lecture/discussion—1-3 hours. Prerequisite: consent of instructor. Discussion of topics of current interest in avian sciences. May be repeated three times for credit.—I, II, III

197. Tutoring in Avian Sciences (1-3)
Tutorial—1-3 hours. Prerequisite: Avian Sciences or related major, advanced standing, consent of instructor. Tutoring of students in lower division avian sciences courses; weekly conference with instructors in charge of courses; written critiques of teaching procedures. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

Graduate

203. Advanced Avian Development and Genomics (1)
Discussion—1 hour. Prerequisite: graduate standing; concurrent enrollment in course 103. In consultation with the instructor, students develop a lecture and associated instructional materials, i.e., lesson plan, including justification, reading and presentation and evaluation aids. The topic must complement a topic covered in Avian Sciences 103 (Avian Development and Genomics).—I, II

209. Seminar (1)
Seminar—1 hour. Reports and discussions of recent advances and selected topics of current interest in avian genetics, physiology, nutrition, and poultry technology.—I, II

209C. Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Major professors lead research discussions with their graduate students. Research papers are reviewed and project proposals presented and evaluated. Format will combine seminar and discussion. (S/U grading only.)—I, II, III

297T. Supervised Teaching in Avian Sciences (1-4)
Prerequisite: graduate standing and consent of instructor. Tutoring of students in lower, upper division, and graduate courses in Avian Sciences; weekly conference with instructor in charge of course; written critiques of teaching methods in lectures and laboratories. (S/U grading only.)

298. Group Study (1-5)
Prerequisite: consent of instructor.

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only.)

Avian Sciences
(A Graduate Group)
Kirk Klasing, Ph.D., Chairperson of the Group

Group Office. 1249 Meyer Hall
530-752-2382; http://aviansciences.ucdavis.edu

Faculty
C. Christopher Calvert, Ph.D., Professor

Animal Science

Thomas P. Coombs-Hahn, Ph.D., Associate Professor

Neurobiology, Physiology, and Behavior

Mary E. Delany, Ph.D., Professor

Animal Science

John M. Eadie, Ph.D., Professor

Wildlife, Fish, and Conservation Biology, Animal Science

Holly B. Ernest, D.V.M., Ph.D., Associate Professor

Veterinary Genetics Laboratory and Population Health and Reproduction; School of Veterinary Medicine

Michelle Hawkins, V.M.D., ABVP, Associate Professor

Medicine and Epidemiology, School of Veterinary Medicine

Joshua M. Hull, Ph.D., Assistant Adjunct Professor

Animal Science

Annie J. King, Ph.D., Professor

Animal Science

Kirk C. Klassing, Ph.D., Professor

Animal Science

Jenella E. Loye, Ph.D., Research Associate

Entomology

Joy A. Munch, Ph.D., Professor

Animal Science

James R. Millam, Ph.D., Professor

Animal Science

Gabrielle Nevitt, Ph.D., Professor

Neurology, Physiology, and Behavior

Joanne R. Paul-Murphy, D.V.M., Ph.D. Professor

Medicine & Epidemiology; School of Veterinary Medicine

Lisa A. Tell, D.V.M., Professor

Medicine and Epidemiology, School of Veterinary Medicine

Andrea Townsend, Ph.D., Assistant Professor

Wildlife, Fish, and Conservation Biology

Emeriti Faculty
Hans Abplanalp, Ph.D., Professor Emeritus

Dan Anderson, Ph.D., Professor

Francine A. Bradley, Ph.D., Specialist Emeritus

Ralph A. Ernst, Ph.D., Specialist Emeritus

Peter Marler, Ph.D., Professor Emeritus

Barry W. Wilson, Ph.D., Professor Emeritus

Graduate Study. The Graduate Group in Avian Sciences offers the M.S. degree program to students who wish to pursue specialized advanced work on avian species. Specializations students may choose include behavior, nutrition, physiology, reproduction, pathology, immunology, toxicology, food chemistry, management, ecology, genetics, comparative incubation, environmental physiology, and cellular and developmental studies using wild and domestic birds as experimental animals. Both master’s degree plans, theses or comprehensive examination, are available.

Preparation. Applicants should have undergraduate preparation in a field appropriate to the course of study selected, including courses in most of the following subjects: general biology, general and organic chemistry, biochemistry, avian biology, genetics, nutrition, physiology, and statistics.


Biochemistry and Molecular Biology
See Biochemistry, Molecular, Cellular and Developmental Biology, on page 177; Molecular and Cellular Biology, on page 430

Biochemistry and Molecular Biology
(A Graduate Group)
The Biochemistry and Molecular Biology program has merged with the Cell and Developmental Biology program to form Biochemistry, Molecular, Cellular, and Developmental Biology (BMCDB); see Biochemistry, Molecular, Cellular and Developmental Biology, on page 177.

Group Office. 2278 Life Sciences
530-752-9091; http://biosci.ucdavis.edu/GradGroups/BMCDB/

Biological Chemistry
See Medicine, School of, on page 396.

Biochemistry, Molecular, Cellular and Developmental Biology
Mitch Singer, Ph.D., Chairperson of the Group

Group Office. 2278 Life Sciences
530-752-9091; http://biosci.ucdavis.edu/GradGroups/BMCDB/

Faculty
Iannis, Adamopoulos, Ph.D., Assistant Professor

[Medical Division of Internal Medicine]

Jawad Al-Bassam, Ph.D., Assistant Professor

[Cell Biology and Human Anatomy]

Shota Atsumi, Ph.D., Assistant Professor

[Pharmacology]

Peter Armstrong, Ph.D., Professor

[Medical Microbiology and Immunology]

Charles Bevins, Ph.D., Professor

[Cell Biology and Human Anatomy]

Donald M. Bers, Ph.D., Professor

[Cell Biology and Human Anatomy]

Linda F. Bisson, D.P., Professor

[Viticulture and Enology]

Eduardo Blumwald, Ph.D., Professor

[Plant Sciences]

Lauri Borodinsky, Ph.D., Assistant Professor

[Physiology and Membrane Biology]

Alexander Borowsky, Ph.D., Associate Professor

[Neurology, Physiology, and Behavior]

Siobhan Mary, Brady, Ph.D., Assistant Professor

[Animal Science]

Ann B. Brit, Ph.D., Professor

[Plant Biology]
Biological and Agricultural Engineering

Courses in Biochemistry, Molecular, Cellular and Developmental Biology (BCB)

Graduate

290. Seminar (1) Seminar—1 hour. Prerequisite: consent of instructor and/or graduate standing. Presentation and discussion of faculty and graduate-student research. [S/U grading only]—I, II, III (I, II, III)

298. Group Study (1-5) Prerequisite: consent of instructor. [S/U grading only]—I, II, III (I, II, III)

299. Research (1-12) Prerequisite: consent of instructor. [S/U grading only]—I, II, III (I, II, III)

Biological Sciences

(Biology Academic Success Center (BASC), 1023 Sciences Laboratory Building; 530-752-0410; http://www.biosci.ucdavis.edu/BASC)

Faculty

The Biological Science major and the Bodega Marine Laboratory Spring Quarter Program are offered jointly by the departments of the college. The faculty in the college are members of the Departments of Evolution and Ecology; Microbiology; Molecular and Cellular Biology; Neurobiology, Physiology, and Behavior; Plant Biology. See each department for a list of their faculty.

The Biological Sciences Major

(Departments of Evolution and Ecology; Microbiology; Molecular and Cellular Biology; Neurobiology, Physiology, and Behavior; and Plant Biology) See each department for a list of their faculty.

The Program.
The Biological Sciences major is broad in concept, spanning the numerous core disciplines of biology for the Bachelor of Science (B.S.) program includes mathematics, general and organic chemistry, physics, and biology. While emphasizing breadth, the B.S. degree program also features an area of emphasis requirement that provides concentrated attention on one facet of biology at the upper division level. Each area of emphasis coincides with one of the departments of the college. The Bachelor of Arts (A.B.) program emphasizes biological diversity, evolution, and ecology, all built on a foundation of general and organic chemistry, physics and biology. Research and internships are encouraged in both programs.

Career Alternatives.
Both degree programs prepare students for admission to graduate schools or professional schools, leading to either a variety of professional health careers or further study in basic and applied biological sciences. They provide suitable preparation for careers in teaching, biological and biotechnological research with various governmental agencies or private companies, government regulatory agencies, environmental consulting, biological illustration and writing, pharmaceutical sales, biological/environmental law, and biomedical engineering.

The A.B. degree program is also appropriate for students interested in health careers or further study in basic biological sciences to achieve a total of 38 or more units; see "Approved Biology Electives" list below. Additional upper division course work in biological sciences to achieve a total of 38 or more units; see "Approved Biology Electives" list below. Upper division course work must include a total of two units or a total of six hours/week of fieldwork or laboratory work.

B.S. Major Requirements:

Preparatory Subject Matter

Pre-requisite requirements for specific Biological Sciences courses are indicated. Students must complete the General Education and Major Program requirements with a cumulative grade point average of 2.0 or higher and a grade of C- or better in the following courses:

A.B. Major Requirements:

Preparatory Subject Matter

Biological Sciences 2A-2B-2C .................................. 14
Chemistry 2A-2B ............................................. 10
Chemistry 8A-8B or 118A-118B-118C .................. 6-12
Physics 1A-1B or 7A-7B-7C .......................... 6-12
Statistics 13, 32, 100, or 102 ............................ 3-4
Recommended: Chemistry 2C and Mathematics 17A-17B or 21A-21B.

Depth Subject Matter

Biological Sciences 101 ......................................... 4
Biological Sciences 102 or 105 .............................. 3
Evolution: One from Evolution and Ecology 100; Evolution and Ecology 101; Plant Biology 117; Plant Biology 119; Plant Biology 101, 112 ......... 3-5
Ecology: One from Environmental Science and Policy 100; Evolution and Ecology 101; Plant Biology 117; Plant Biology 119; Plant Biology 101, 112 ......... 3-5
Philosophy of Biological Science: One from Animal Science 170, Nature and Culture 100, 120; 140; Philosophy 108, Science and Technology Studies 130A, 130B, 131; Veterinary Medicine 170; 4
Physiology: One from Environmental Horticulture 102; Entomology 101, 102; Neurobiology, Physiology, and Behavior 101; Plant Biology 111, 112 ............. 3-5
One course each in animal, microbial and plant diversity ........................................ 1-2
One from Animal Diversity: Entomology 100, 107; Evolution and Ecology 105, 112 and 112s, 134; Nematology 110; Wildlife, Fish, and Conservation Biology 110, 111, 120; Microbial Diversity: Microbiology 101, 162; Pathology, Microbiology, and Immunology 117, 128, Plant Biology 148, Plant Pathology 148; Soil Science 113; Plant Biology: Evolution and Ecology 108, 119, 140; Plant Biology 102, 108, 116, 119, 147
Additional upper division course work in biological sciences to achieve a total of 38 or more units; see "Approved Biology Electives" list below.

Total units for the major ........................................... 74-94

B.S. Major Requirements:

Preparatory Subject Matter

Biological Sciences 2A-2B-2C .................................. 14
Chemistry 2A-2B ............................................. 15
Chemistry 8A-8B or 118A-118B-118C .................. 6-12
Mathematics 17A-17B-17C or 21A-21B .......................... 9-12
Physics 7A-7B-7C ............................................. 12

Depth Subject Matter ........................................... 49
Biological Sciences 101, 105 (or 102+103) .............. 10
"Students in the Molecular and Cellular Biology Area of Emphasis must complete Biological Sciences 102+103. All other students may choose between completing Biological Sciences 105 or 102+103.
Statistics 100 .................................................. 4
Field Requirement, Area of Emphasis Requirement, and additional units (if necessary) to achieve a total of 49 units or more ........................................ 32-35

Note: Although a course may be listed in more than one category, that course may satisfy only one requirement.

Quarter Offered: I, II, III.

Fall 2011 and on Revised General Education (GE): AH–Arts and Humanities; SE–Science and Engineering; SS–Social Sciences; AGCH–American Cultures; DD–Diverse; OR–Oral Skills; VL–Visual Literacy; WC–World Cultures; WE–Writing Experience
Field Requirement: Breadth in biology is achieved by completing one course from each field (a) through (f) below. You must take one course in each field regardless of your area of emphasis. If you plan an area of emphasis in Evolution, Ecology, and Biodiversity; Marine Biology; or Microbiology, please see your emphasis before choosing field requirement classes as specific, designated field courses are required. The required courses are listed under that area of emphasis. Although a course may be listed in more than one category (including the area of emphasis requirements), that course may be used only once and may satisfy only one requirement.

Field Course Lists

(a) Evolution: Anthropology 151, 152, 154A; Evolution and Ecology 100; Geology 107. Plant Biology to satisfy 3-5.
(b) Ecology: Anthropology 154B; Biological Sciences 122; Entomology 104, 156; Environmental Science and Policy 100, 121; Evolution and Ecology 101; Microbiology 120; Wildlife, Fish, and Conservation Biology 151 3-5.
(c) Microbiology: Food Science and Technology 104, Microbiology 101, 104, 140, 150, 162, Pathology, Microbiology, and Immunology 127, 128; Soil Science 111 3-5.
(d) Neurobiology, Physiology, and Behavior: Anthropology 154A, Entomology 102, 104, Neurobiology, Physiology, and Behavior 100, 101, 102, 141 3-5.

Area of Emphasis Requirements: Depth in one area of biology is achieved by completing all requirements for one of the six areas of emphasis listed below. It will consist of a total of two units or a total of six hours/week of fieldwork or laboratory work designated in the area of emphasis. Although a course may be listed in more than one category (including the field requirements), that course may be used only once and may satisfy only one requirement.

Evolution, Ecology and Biodiversity emphasis 12

Students choose to complete Biological Sciences 105 or 102+103 for this emphasis.

Field requirement: Students must take Evolution and Ecology 100 to satisfy Field requirement (a), and Evolution and Ecology 101 to satisfy Field requirement (b).

(1) At least 12 units including at least one course from each of the following two groups 12
   (a) Biodiversity: Entomology 103; Evolution and Ecology 105, 106, 108, 112, 112, 134, 134A, 140; Microbiology 105, 105L, Nematology 110; Plant Biology 116, 147, 148; Wildlife, Fish, and Conservation Biology 110, 110L, 111, 111L, 120, 120L.

(2) Laboratory/Fieldwork Requirement: Included in the above 12 units, complete a total of two units or a total of six hours/week of fieldwork or laboratory work. Courses chosen to satisfy this requirement are: One course from: Evolution and Ecology 105, 106, 108, 112L, 134L; Microbiology 105L; Plant Biology 116, 148; Wildlife, Fish, and Conservation Biology 110L, 111L or two courses from: Evolution and Ecology 117, 119, 134F, 140, 180A, 180B; Plant Biology 147; Wildlife, Fish, and Conservation Biology 120L.

Marine Biology emphasis 12-19

Students choose to complete Biological Sciences 105 or 102+103 for this emphasis.

Field requirement: Students must take Evolution and Ecology 100 to satisfy Field requirement (a), Field requirement (c), and Evolution and Ecology 101 to satisfy Field requirement (b), and Neurobiology, Physiology, and Behavior 102 or 141 to satisfy Field requirement (d).

(1) Ocean Processes: At least three units from Biological Sciences 122, Environmental Sciences and Policy 124, 125, Environmental Science and Policy/Geology 116N, 150A, 150B, 150C; Evolution and Ecology 115; Wildlife, Fish, and Conservation Biology 157 3-4.
(2) Marine Organism: At least three units from Animal Science 119, 131; Evolution and Ecology 106, 110, 112L, 114; Neurobiology, Physiology, and Behavior 141; Plant Biology 118; Wildlife, Fish, and Conservation Biology 120 and 126, 121 3-5.
(3) Immersion Requirement: Complete one of four options listed below, offered in spring quarter or summer sessions at Bodega Marine laboratory, or equivalent. Require residence at Bodega Marine Laboratory 10-11.
   Option 1 (summer session 1): 7
   Select one course from: Environmental Science and Policy 124; Evolution and Ecology 106, 110, 114 3...

Microbiology emphasis 16-20

Students must complete four options listed below or complete an individual option with approval from your faculty adviser.

(1) Microbial Physiology and Molecular Genetics option: 15-18
   Students must complete Microbiology 104 to satisfy Field requirement (c) 9
   Select one course from: Microbiology 170; Molecular and Cellular Biology 121 3
   Select one course from: Microbiology 105 and 105L, 155L, 180L, Pathology, Microbiology, and Immunology 127 3.6
   (2) Microbial Diversity and Ecology option: 15-17
   Students must complete Microbiology 104 to satisfy Field requirement (c) 9
   Select one course from: Microbiology 104L, 105L, 120L 12
   Select one course from: Food Science and Technology 104, Microbiology 140, 150, 162, 170; Pathology, Microbiology, and Immunology 127, 128; Plant Biology 148; Plant Pathology 148; Soil Science 111 3-5
   (3) Biotechnology and Applied Microbiology option: 16-19
   Students must complete Microbiology 104 to satisfy Field requirement (c) 9
   Select two courses from: Microbiology 140, 150, 170 6
   Select one course from: Food Science and Technology 102A, 104 3.4
   Select one course from: Microbiology 155L, Molecular and Cellular Biology 120, 160, 160L 4.6
   (4) Medical Microbiology option 12-20
   Students may choose to complete the Field requirement and the laboratory requirement for this option from: Microbiology 101, or Microbiology 104 and 104L. Students are encouraged to complete Microbiology 101 to satisfy Field and this option’s laboratory requirement simultaneously.

Molecular and Cellular Biology emphasis 12-17

Students must complete Biological Sciences 102+103 for this emphasis.

(1) Molecular Biology and Gene Expression: Molecular and Cellular Biology 121 3
(2) Laboratory Experience: One or more laboratory courses from: Biological Sciences 120P, 180L, Molecular and Cellular Biology 120L, 140L, 160L; or other laboratory course to total 3 units (9 hours of laboratory work) that emphasizes cellular or molecular biology with approval of your faculty adviser 3.6
(3) Restriction Electives 6
   Select two or more courses from: Biological Sciences 10, 11B, 120, 181, 183; Molecular and Cellular Biology 123, 124, 126, 143, 144, 145, 150, 162, 163, 164, 182; Neurobiology, Physiology, and Behavior 103; Pathology, Microbiology, and Immunology 126; Plant Biology 113, 126; or other courses with faculty adviser’s approval.

Neurobiology, Physiology, and Behavior emphasis 12-15

Students choose to complete Biological Sciences 105 or 102+103 for this emphasis.

Although a course may be listed in more than one category (including the field requirements) that course may be used only once and may satisfy only one requirement.

Select courses from at least two of the following three areas and include one laboratory from Neurobiology, Physiology, and Behavior 101, 104, 141P, or 160L 15
(2) Physiology: Anatomy, Physiology, and Cell Biology 100; Entomology 102, Exercise Biology 101, 110, 111, 125; Neurobiology, Physiology, and Behavior 101, 101L, 103, 104L, 105, 106, 111C, 111L, 113, 114, 117, 122, 123, 127, 128, 130, 132, 139, 140, 141, 141P, 152; Pathology, Microbiology, and Immunology 126, Wildlife, Fish, and Conservation Biology 120L.
(3) Behavior: Anthropology 154A, 154C; Entomology 104; Neurobiology,
Biological Sciences

Other Upper Division Courses

There is a limitation on variable-unit courses that may be counted toward the major. Of these courses, up to four units may be counted, and no units of 192 or 197T courses may be counted.

Minor Program Requirements:

UNITS

Biological Sciences ........................................... 18

Complete at least three units from each of the five numbered groups to total at least 18 units. Appropriate alternative courses may be selected with approval of an adviser.

(1) Cell and Molecular Biology: Biological Sciences 101, 102, 105 ............................................. 3-4

(2) Animal Biology: Anthropology 151, Anatomy, Physiology, and Cell Biology 100/Neurobiology, Physiology, and Behavior 123; Entomology 100; Evolution and Ecology 105, 112 and 112L, 134; Nematology 100, 110; Neurobiology, Physiology, and Behavior 100, 101, 102, 112, 117; Wildlife, Fish, and Conservation Biology 110, 111, 120 ............................................. 2-5

(3) Microbiology: Microbiology 101, 102, 162; Pathology, Microbiology, and Immunology 128; Plant Biology/Plant Pathology 148 .................................................. 3-5

(4) Plant Biology: Environmental and Resource Sciences/Plant Sciences 144; Plant Biology 105, 111, 112, 116, 126; Plant Biology/Plant Pathology 148; Plant Sciences 141 ............................................. 171 ............................................. 3-5


Additional courses (if necessary) from above numbered groups to reach 18 units.

Advisers and Advising.

Information on the Biological Sciences major or minor can be obtained at the Biological Academic Success Center (BASC) in 1023 Sciences Laboratory Building; 530-752-0410; http://basc.engineering.ucdavis.edu.

Citation for Outstanding Performance.

The College of Biological Sciences confers Citations for Outstanding Performance on undergraduates majoring in Biological Sciences who have demonstrated superior academic performance and individual achievement in research. Students who wish to be considered for a citation must first meet or exceed a specified grade point average and participate in an appropriate research project.

Teaching Credential Subject Representative.

Associated Director of Teacher Education (School of Education); see the Teaching Credential/M.A. Program on page 115.

Bodega Marine Laboratory Program

See also Biological Sciences, Bodega Marine Laboratory Program, on page 186.

http://bml.ucdavis.edu

A full quarter of undergraduate course work in marine biology is available each spring quarter at the Bodega Marine Laboratory, located in Bodega Bay, California. Course offerings include lecture and laboratory instruction in the developmental biology and physiological adaptation of marine organisms, population biology and ecology, a weekly colloquium, and an intensive individual research experience under the direction of laboratory faculty. (Biological Sciences courses 122, 122B, 125, 123; Neurobiology, Physiology, and Behavior 141, 141P). This is a 15-unit program and course offerings and instructors may vary from year to year. The program is residential, with students housed on the laboratory grounds. Participants are assessed a room and board fee in addition to standard campus registration fees. An application is required. Obtain forms from the Bodega Marine Laboratory website listed above. Applications are due January 31 for spring quarter. Additionally, additional information on the Bodega Marine Laboratory Program is available at the Biological Academic Success Center (BASC) in 1023 Sciences Laboratory Building, or directly from Bodega Marine Laboratory, P.O. Box 247, Bodega Bay, CA 94923 707-875-2211.

Courses in Biological Sciences (BIS)

Lower Division

2A. Introduction to Biology: Essentials of Life on Earth (5)

Lecture—3 hours; discussion—2 hours. Essentials of life including sources and use of energy, information storage, responsiveness to natural selection and cellular origin of life and influence of living things on the chemistry of the Earth. Not open for credit to students who have completed course 1A with a grade of C- or better. GE credit: SciEng | SE—I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII

2B. Introduction to Basic Principles of Ecology and Evolution (5)

Lecture—3 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: grade of C- in course 1A or 2A. Introduction to basic principles of ecology and evolution biology, focusing on fundamental mechanisms that generate and maintain biological diversity across scales ranging from molecules and genes to global processes and patterns. Not open for credit to students who have completed Biological Sciences 1B with a grade of C- or better. GE credit: SciEng | QL, SE, SL, VL—I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII

2C. Introduction to Biology: Biodiversity and the Tree of Life (5)

Lecture—4 hours, laboratory—3 hours. Prerequisite: course 1B or 2B completed with a C- or better. Introduction to organismal diversity, using the phylogenetic tree of life as an organizing theme. Lectures and laboratories cover methods of phylogenetic reconstruction, current knowledge of the tree of life, and the evolution of life’s most important and interesting innovations. Not open for credit to students who have completed course 1C with a grade of C- or better. GE credit: SciEng | QL, QL, SE, SL, VL—I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII

10. General Biology (4)

Lecture/discussion—4 hours. Concepts and issues in biology. Emphasis on composition and structure of organisms, regulation and signaling, heredity, evolution and the interaction and interdependence among life forms and their environments. Designed for students not specializing in biology. Not open for credit to students who have completed course 1A, 2A or 10V. GE credit: SciEng | SE—II, III

10V. General Biology (4)

Web virtual lecture—3 hours; web electronic discussion—1 hour. Concepts and issues in biology. Emphasis on composition and structure of organisms, regulation and signaling, heredity, evolution and the interaction and interdependence among life forms and their environments. Significant writing is required. Designed for students not specializing in biology. Not open for credit to students who have completed course 1A, 2C, 10V, 10V. GE credit: SciEng | SE—II, III

11. Issues in Life Sciences (4)

Lecture—1 hour; discussion—1 hour. Prerequisite: enrollment limited to BUSP students, consent of instructor. The range of subjects and approaches in the field of biology, including both basic and applied research topics. (I, II)

11L. Basic Life Sciences Laboratory (2)

Laboratory—6 hours. Prerequisite: enrollment limited to BUSP students, consent of instructor. Basic laboratory skills in life sciences research, including microbiology, molecular biology, and genetics. (IV, V)
122. Population Biology and Ecology (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: courses 1A, 1B, and 2A, or 2B, 2C; residence at Bodega Marine Laboratory required. Physical and biological processes affecting plant and animal populations in the rich array of habitats at the Bodega Marine Laboratory. Emphasis on field experience, with complementing lectures to address population and community processes. See Bodega Marine Laboratory Program. GE credit: SciEng | OL, QL, SE, VL, WE.—II. (III.) Morgan

122P. Population Biology and Ecology/Advanced Laboratory Topics (5)
Laboratory—12 hours; discussion—1 hour. Prerequisite: course 122 concurrently. Residence at Bodega Marine Laboratory. Seminar in scientific research, from hypothesis testing to publication, including methods of library research. Research related to topic covered in course 122. Final presentation both oral and written. (See Bodega Marine Laboratory Program.) GE credit: SciEng | SE, VL, WE.—III. (III.) Chang, Chen, Morgan

123. Undergraduate Colloquium in Marine Science (1)
Discussion—1 hour. Prerequisite: course 101 concurrently. Discussion of topics that draw on the expertise of several faculty. Emphasis on understanding models, their application both oral and written. (See Bodega Marine Laboratory Program.) GE credit: SciEng | OL, QL, SE, SL.—I. (I.) Brady, Chan, Draper, Dvorak, Engebret, Heyer, Kliebenstein, Langley, O'Neill, Rodriguez, Sanders, Turrelli

101D. Genes and Gene Expression Discussion (1)
Discussion—1 hour. Prerequisite: course 101 concurrently. Discussion of topics that draw on the expertise of several faculty. Emphasis on understanding models, their application both oral and written. (See Bodega Marine Laboratory Program.) GE credit: SciEng | OL, QL, SE, SL.—I. (I.) Brady, Chan, Draper, Dvorak, Engebret, Heyer, Kliebenstein, Langley, O'Neill, Rodriguez, Sanders, Turrelli

102Q. Quantitative Biomolecule Concepts (1)
Project—1 hour; autotutorial. Prerequisite: course 102 (may be taken concurrently). Study of the quantitative concepts and mathematical models fundamental to biochemistry. Offered irregularly. GE credit: SciEng | OL, SE.—II. (II.) Hayl, Thopp

103. Bioenergetics and Metabolism (3)
Lecture—3 hours. Prerequisite: course 102. Fundamentals of the carbon, nitrogen, and sulfur cycles in nature, including key reactions of biomolecules such as carbohydrates, amino acids, lipids, and nucleotides, and of energy production and use in different types of organisms. Principles of metabolic regulation. 1.5 units of credit for students who have completed Animal Biology 102 & 1.5 units of credit for students who have completed Biological Science 105. GE credit: SciEng | OL, SE.—II. (II.) Cheng, Etzler, Gasser, Hilt, Leary

121. Introduction to Dynamic Models in Modern Biology (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: Mathematics 16C, Statistics 13, 1 other lower division course in biology, or the equivalents. Dynamic modeling in the biological sciences, including matrix models, difference equations, differential equations, and complex dynamics. Examples include classic models in ecology, cell biology, physiology, and neurosciences. Emphasis on understanding models, their assumptions, and implications for modern biology. GE credit: SciEng | OL, QL, SE, VL, WE.—IV. (IV.) Gaylord, Hill, largier, Morgan, Sanford

132. Collaborative Studies in Mathematical Biology (3)
Lecture/discussion—3 hours. Prerequisite: Mathematics 16ABC or the equivalent, one course from course 1A, 1B, 2A, 2B, 2C, 3A, 3B, or 10 or the equivalent in biology, consent of instructor. Interdisciplinary research and training that uses mathematics and computation to solve current problems in biology. May be repeated twice for credit. Offered irregularly. GE credit: SciEng | OL, QL, SE, SL, VL, WE.

133. Collaborative Studies in Mathematical Biology (3)
Lecture—3 hours. Prerequisite: courses 1A, 1B, and 1C, or 2A, 2B, and 2C. Chemistry 88B or 118B or 128B. Fundamentals of biochemical processes, with emphasis on protein structure and activity; energy metabolism; catalysis of sugars, amino acids, and lipids; and global regulation. GE credit: SciEng | SE, QL—I, II, III, (I, II, III) Fiehn, Hill, Murphy, Thye

182. Systems Biology: From Biological Circuits to Biological Systems (2)
Lecture/discussion—2 hours; term paper. Prerequisite: course 101 and one course from Molecular and Cellular Biology 121, 161 or Plant Biology 113, Mathematics 16ABC or 17ABC, or consent of instructor. Applying systems theory to understand the properties of biological networks in a variety of model organisms. Emphasis on both local biological circuits, and genome-scale biological networks. Topics include network motifs, robustness, modeling, emergent properties and interactions in networks. GE credit: SciEng | OL, QL, SE, VL.—Brady

180L. Genomics Laboratory (5)
Lecture—2 hours; laboratory—6 hours; discussion—1 hour. Prerequisite: course 181. Course 183 may be taken concurrently. Molecular and Cellular Biology 182. Computational approaches to model and analyze biological information about genomes, transcriptomes, and proteomes. Topics include genome assembly and annotation, RNA profiling, proteomics, protein-DNA and protein-protein interaction networks, network analysis, and comparative genomics. Computer programming experience not required. Students who have received credit for taking Computer Science Engineering 124 or Biotechnology 130 will receive 3 units for completing course 180L. GE credit: SciEng | QL, SE, VL.—II. (III.) Brady, Dawson, Dinesh, Kumar, Harada, Korf, Maloof

181. Comparative Genomics (3)
Lecture—3 hours. Prerequisite: course 101. Comparison of genomes at the population and species level. Genomic techniques for mapping disease (and other) genes, reconstruction of evolutionary history and migration patterns, determination of gene function, prediction of novel protein function, and meta-genomics: determination of community composition and function. GE credit: SciEng | OL, SE, SL—I. (I.) Dawson, Maloof

183. Functional Genomics (3)
Lecture—3 hours. Prerequisite: course 101, course 102 or 105 recommended. Overview of genomic methodologies and key biological findings obtained using genome-wide analyses. RNA profiling, small RNA profiling, epigenomics, chromatin immunoprecipitation, proteomics, protein-DNA interactions, proteomics, and network analysis. GE credit: SciEng | OL, QL, SE, VL.—III. (III.) Brady, Maloof

192. Internship in Biological Sciences (1-12)
Internship—3-36 hours. Prerequisite: upper division standing and consent of instructor. (P/NP grading only)

194H. Research Honors (2)
Independent study—6 hours. Prerequisite: senior standing. Students majoring in Biological Sciences who have completed two quarters (2-3 units per quarter) of 199 and who qualify for the honors program as defined by the current catalog. Opportunity for Biological Sciences majors to pursue intensive research culminating in the writing of a senior thesis with the guidance of faculty advisers. (P/NP grading only) GE credit: SciEng | WE, WE.

195A. Science Teaching Internship Program (4)
Lecture/discussion—2 hours; internship—6 hours. Prerequisite: upper division standing in a science major or consent of instructor. Basic teaching techniques including lesson planning, classroom management, and presentation skills. Interns spend time in K-12 science classrooms working with a master teacher observing, assisting with labs and activities, managing students, and teaching lessons. (P/NP grading only)

195B. Science Teaching Internship (1-5)
Internship—2-15 hours. Prerequisite: course 195A. Reinforcement of teaching techniques learned in 195A with additional classroom experiences in K-12 science classrooms working with a master teacher observing, assisting with labs and activities, managing students, and teaching lessons. May be repeated one time for credit with consent of instructor. (P/NP grading only)
197T. Tutoring in Biological Sciences (1-5)
Discussion—2.6 hours. Prerequisite: upper division standing and consent of instructor. Assisting the
instructor by tutoring students in one of the Biological Sciences’ regular courses. May be repeated for
credit. (P/NP grading only.) —I, II, III. (I, II, III)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

199. Special Study in Biological Sciences (1-5)
Prerequisite: upper division standing and consent of instructor. (P/NP grading only)

Biomedical Engineering
(A Graduate Group)

J. Kent Leach, Ph.D., Chairperson of the Group
530-754-9149

Group Office. 2316 Genome and Biomedical Sciences Facility 530-752-2611;
http://www.bme.ucdavis.edu/graduate/

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(Dermatology)
Cheemeng Tan, Ph.D., Assistant Professor
(Biomedical Engineering)
Alice Tarantal, Ph.D., Professor
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John Werner, Ph.D., Professor
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(NMR Facility)
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(Biomedical Engineering)
Yohei Yokobayashi, Ph.D., Associate Professor
(Biomedical Engineering)

Emeriti Faculty
Maury L. Hull, Ph.D., Professor Emeritus
(Mechanical and Aerospace Engineering, Biomedical Engineering)

Graduate Study. The Graduate Group in Biomedical Engineering offers programs of study and research leading to the M.S. and Ph.D. degrees. The programs of study prepare students for professional work in the effective integration of engineering with medical and biological sciences. Research strengths lie in the areas of imaging, tissue engineering and regenerative medicine, sensor and MEMs systems, cellular and molecular mechanics, computational modeling, targeted therapeutics, orthopedic biomechanics, biofluids and transport, and human movement. This broad interdisciplinary program is best suited for students who are capable of and comfortable with considerable independence. Each student, together with an advisor, defines a specific course of study suited to individual needs.

Preparation. The Group regards strong competence in mathematics and engineering as necessary for successful completion of study. Prior course work in these areas is emphasized in the evaluation of applications. Some undergraduate training can be acquired after admission to the Group, but it may require an additional year of study.

Courses. See Engineering, Biomedical, on page 250.

Biophysics
(A Graduate Group)

Alexei Stuchebrukhov, Ph.D., Chairperson of the Group

Group Office. 310 Life Sciences; 530-752-4863;
http://biosci3.ucdavis.edu/GradGroups/BPH/

Faculty
Jawdat Al-Bassam, Ph.D., Assistant Professor
(Chemistry)
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James B. Ames, Ph.D., Associate Professor (Chemistry)
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R. David Britt, Ph.D., Professor (Chemistry)
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R. Holland Cheng, Ph.D., Professor
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Colleen Clancy, Ph.D., Associate Professor
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Daniel L. Cox, Ph.D., Professor (Physics)
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(Applied Science)
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(Physics)
Robert H. Fairclough, Ph.D., Associate Professor
(Neurology)
Roland Failler, Ph.D., Associate Professor
(Clinical Pharmacology and Therapeutics)
Katherine Ferrara, Ph.D., Professor
(Biomedical Engineering)
Andrew J. Fisher, Ph.D., Professor (Chemistry)
Alla F. Fomin, Ph.D., Assistant Professor
(Physiology and Membrane Biology)
David Goodin, Ph.D., Professor (Chemistry)
293. Introduction to Research Topics (1)
Seminar—1 hour. Presentation of current research activities of the Biophysics Graduate Group faculty. Facilitating the development of students in research interest, and promoting collegial interactions. May be repeated one time for credit. (S/U grading only).—I
298. Group Study (1-5)
(S/U grading only)

Biostatistics (A Graduate Group)
Bruce Rannala, Ph.D. (Evolution and Ecology)
Chih-Ling Tsai, Ph.D. (Statistics)

Group Office. 4118 Mathematical Sciences Building 530-692-5194; http://biostat.ucdavis.edu/

Faculty
Sharil Aly, Ph.D., Assistant Professor (Population Health & Reproduction)
Rahman Azari, Ph.D., Lecturer (Statistics)
Huejung Bang, Ph.D., Associate Professor (Public Health Sciences)
Laurel Beckett, Ph.D., Professor (Public Health Sciences)
Prabir Burman, Ph.D., Professor (Statistics)
Owen Carmichael, Ph.D., Assistant Professor (Neurology)
Hao Chen, Ph.D., Assistant Professor (Statistics)
Andrew J. Clifford, Ph.D., Professor (Nutrition)
Christiana Drake, Ph.D., Professor (Statistics)
Thomas R. Famuca, Ph.D., Professor (Animal Science)
Thomas B. Farver, Ph.D., Professor (Population Health and Reproduction)
Emilio Ferrer, Ph.D., Associate Professor (Psychology)
Valdimir Flinkov, Ph.D., Associate Professor (Computer Science)
Danielle Harvey, Ph.D., Associate Professor (Public Health Sciences)
Fushing Hsieh, Ph.D., Professor (Statistics)
Ana-Maria Iosil, Ph.D., Assistant Professor (Public Health Sciences)
Jiming Jhang, Ph.D., Professor (Statistics)
Philip H. Kass, Ph.D., Professor (Population Health and Reproduction)
Kyounmi Kim, Ph.D., Associate Professor (Public Health Sciences)
Ian Korf, Ph.D., Assistant Professor (Evolution and Ecology)
Thomas Lee, Ph.D., Professor (Statistics)
Chin-Shang Li, Ph.D., Assistant Professor (Public Health Sciences)
Diana Moore, Ph.D., Professor (Public Health Sciences)
Brian Moore, Ph.D., Assistant Professor (Evolution and Ecology)
Hans-Georg Muller, M.D., Ph.D., Professor (Statistics)
Debashis Paul, Ph.D., Associate Professor (Statistics)
Jie Peng, Ph.D., Associate Professor (Statistics)
Richard Plant, Ph.D., Professor Emeritus (Plant Sciences)
Lihong Qi, Ph.D., Associate Professor (Public Health Sciences)
Bruce Rannala, Ph.D., Professor (Evolution and Ecology)
David M. Rocke, Ph.D., Professor (Public Health Sciences)
Francisco J. Samaniego, Ph.D., Professor Emeritus (Statistics)
Chih-Ling Tsai, Ph.D., Professor (Graduate School of Management)
Jianling Wang, Ph.D., Professor (Statistics)
Keith Widaman, Ph.D., Professor (Psychology)
Graduate Study. Biostatistics is a field of science that uses quantitative methods to study life sciences related problems that arise in a broad array of fields. The program provides students with, first, solid training in the biostatistical core disciplines and theory, second, with state-of-the-art knowledge and skills for biostatistical data analysis, third, substantial exposure to the biological and epidemiological sciences; and fourth, with a strong background in theoretical modeling, statistical techniques and quantitative as well as computational methods. Programs of study and research are offered leading to the M.S. and Ph.D. degrees. The program prepares students for interdisciplinary careers ranging from bioinformatics, environmental toxicology and stochastic modeling in biology and medicine to clinical trials, drug development, epidemiological and medical statistics. The program draws on the strengths of the Biostatistics faculty at UC Davis.

Preparation. Students should have one year of calculus, a course in linear algebra or one year of biological course work; facility with a programming language; and upper-division work in at least one of Mathematics, Statistics and Biology.

Graduate Adviser. Jie Peng (Statistics)

Courses in Biostatistics (BST)

Graduate

222. Biostatistics: Survival Analysis (4) Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: Statistics 131C. Incomplete data; life tables; nonparametric methods; parametric methods; accelerated failure time models; proportional hazards models; partial likelihood; advanced topics. (Same course as Statistics 222.)—II, III.

223. Biostatistics: Generalized Linear Models (4) Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: Statistics 131C. Likelihood and linear regression; generalized linear model; Binomial regression; cluster-randomized studies; dose-response and bioassay; Poisson regression; Gamma regression; quasi-likelihood models; estimating equations; multivariate GLMs. (Same course as Statistics 223.)—II.

224: Analysis of Longitudinal Data (4) Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course/Statistics 222, 223, Statistics 232B or consent of instructor. Standard and advanced methodology, theory, algorithms, and applications relevant to the analysis of repeated measurements and longitudinal data in biostatistical and statistical settings. (Same course as Statistics 224.)—III.

225. Clinical Trials (4) Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course/Statistics 223 or consent of instructor. Basic statistical principles of clinical designs, including bias, randomization, blocking, and masking. Practical applications of widely-used designs, including dose-finding, comparative and cluster randomization designs. Advanced statistical procedures for analysis of data collected in clinical trials. (Same course as Statistics 225.) Offered in alternate years. —III.

226. Statistical Methods for Bioinformatics (4) Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course 131C or consent of instructor; data analysis experience recommended. Standard and advanced statistical methodology, theory, algorithms, and applications relevant to the analysis of omic data. (Same course as Statistics 226.) Offered in alternate years. —III.

252. Advanced Topics in Biostatistics (4) Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course 222, 223. Biostatistical methods and applications focused on at least one of the following: genetics, bioinformatics and genomics; longitudinal or functional data; clinical trials and experimental design; analysis of environmental data; dose-response, nutrition and toxicology; survival analysis; observational studies and epidemiology; computer-intensive or Bayesian methods in biostatistics. May be repeated for credit with consent of adviser when topic differs. (Same course as Statistics 252.) Offered in alternate years. —III.

290. Seminar in Biostatistics (1) Seminar—1 hour. Seminar on advanced topics in the field of biostatistics. Presented by members of the Biostatistics Graduate Group and other guest speakers. May be repeated for up to 12 units of credit. (S/U grading only).—I, II, III.

298. Directed Group Study (1-5) Prerequisite: consent of instructor. (S/U grading only).

299. Special Study for Biostatistics (1) Prerequisite: consent of instructor. (S/U grading only).

299D. Dissertation Research (1-12) Prerequisite: advancement to Candidacy for Ph.D. and consent of instructor. Research in biostatistics under the supervision of major professor. (S/U grading only).

Biotechnology

[College of Agricultural and Environmental Sciences]

Faculty. Faculty includes members of the Department of Animal Science, on page 153; Engineering: Chemical Engineering and Materials Science, on page 255; Computer Science, on page 216; Engineering: Biological and Agricultural, on page 245; Food Science and Technology, on page 313; Land, Air and Water Resources, on page 364, Plant Pathology, on pages 476, Viticulture and Enology, on page 541; and the College of Biological Sciences, on page 179.

The Major Program

Every living organism, from the smallest and most primitive bacteria to every plant, insect, animal or human being, contains DNA as the primary genetic material. DNA directs all cellular processes, creating the incredible variety and diversity of living organisms in the biosphere. Biotechnology focuses on the mechanics of life processes and their application. Biotechnology means "life technology" and represents an integrated, multidisciplinary field, with a profound impact today on almost every aspect of human endeavor.

Preparatory Requirements. UC Davis students who wish to change their major to Biotechnology must complete the following courses (representing the subject areas of Biological Sciences, Chemistry, and Mathematics) with a grade point average of at least 2.50 in each subject area. All of these courses must be taken for a letter grade:

- Biological Sciences 2A, 2B, 2C, 15
- Chemistry 2A, 2B, 2C, 15
- Mathematics, one of the following groups: 6-8
  - Mathematics 16A, 16B
  - Mathematics 17A, 17B
  - Mathematics 21A, 21B

The Program. In the first two years, students develop a strong and general background in biological science with an emphasis on fundamental concepts and basic principles of genetics, molecular biology and cell biology. Four options, Animal Biotechnology, Plant Biotechnology, Fermentation, Microbial Biotechnology, and Bioinformatics, provide in-depth training and specialized knowledge in an aspect of biotechnology. Each option has a strong laboratory component to reinforce the theoretical concepts. Students also do an internship in a biotechnology company or university or government laboratory.

Internships and Career Opportunities. In the last decade, more industries are turning to biotechnology to solve problems and improve products, creating a growing job market for individuals trained in biotechnology in the agricultural, food and beverage, health care, chemical, pharmaceutical and bio-chemical, and environmental and bioremediation industries. Graduates trained in the technologies designed for biotechnology will find their training applicable to advanced research in molecular biology, genetics, biochemistry, and the plant and animal sciences.

B.S. Major Requirements:

Preparatory Subject Matter................. 57-69
- Biological Sciences 2A-2B-2C............. 15
- Chemistry 2A-2B-2C......................... 15
- Mathematics 16A, 16B, or 17A, 17B, or 21A, 21B............................................. 6-8
- Physics 7A-7B.................................. 8
- Plant Sciences 120 or Statistics 100........ 4
- Biotechnology................................. 4
- Select one course from: .............................
  - University Writing Program 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 102H, 102I, 102J, 102K, 102L, 102M, 104A, 104B, 104C, 104D, 104E, 104F, 104I, 104T [may overlap with college composition requirement, may be waived by passing the upper division composition exam]

Depth Subject Matter......................... 16-20
- Biological Sciences 101................... 4
- Biological Sciences 104................... 4
- Molecular and Cellular Biology 121 or 161 4
- Biotechnology 187......................... 3
- Internship or independent research; course 192 or 199 or Biotechnology 189L........ 3
- Undergraduate research proposal:
  - Biotechnology 188 (optional).............. 3
  - Honors undergraduate thesis (optional) .. 1

Areas of Specialization (choose one)

- Fermentation/Microbiology Biotechnology Option............................................. 38-45
  - Microbiology 104; Biological Sciences 102 and 103; Animal Biology 102 and 103; Microbiology 104L or Food Science and Technology 104L; Molecular and Cellular Biology 160L or Biological Sciences 160L;/Biotechnology 104, 115; 120, 140, 150, 170, 180, 181, 182, 183, 188, 190; Molecular Biology 182........... 23-30
  - Restricted Electives......................... 15
  - Select from:

- Plant Biotechnology Option............... 38-45
  - Microbiology 101, Molecular and Cellular Biology 126, Plant Sciences 152, Biotechnology 160, 161A, 161B, Biochemistry: Biology 105; or Biological Sciences 102 and 103, or Animal Biology 102 and 103........ 28-35
  - Restricted Electives......................... 10
  - Select at least one course from each of the following areas:
    - (a) Pests, Pathogens and Production: Biological Sciences 181, 183, Biotechnology 150, 161L, Viticulture and Enology 130A, 130B, Engineering: Computer Science

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer: 2013-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): ArtHum—Art and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; AchArt—American Cultures; DD—Diverse Domestic; Wrt—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGN—American Cultures; DD—Diverse Domestic; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
Bodega Marine Laboratory Program

http://bml.ucdavis.edu/

See also Biological Sciences, Bodega Marine Laboratory Program, on page 181.

In the 2014-2015 meeting the B.S. in Marine and Coastal Science (MCS) major will major and the MCS field requirement can be fulfilled by any of the courses below.

Spring Quarter Program

A full quarter (15 units) of undergraduate course work in marine biology is available each spring quarter at the Bodega Marine Laboratory, located in Bodega Bay, California. Course offerings include lecture and laboratory instruction in the development of biology and physiological substrates of marine organisms, and population biology and ecology; a weekly colloquium; and an intensive individual research experience under the direction of laboratory faculty. Biological Sciences courses 120, 120P, 122, 122P, 123, 124, 141, and 141P. This is a 15 unit program and course offerings and instructors may vary from year to year. Applications are due January 31.

For more course detail, see full description under appropriate academic department listing or http://bml.ucdavis.edu/.

Summer Session Courses

This integrated program offers students a multidisciplinary understanding of coastal ecosystems through intensive, hands on lab and field courses taught at Bodega Marine Laboratory. The program offers students three sequences of instruction with up to 10 units each. Two sequences occur during the first Summer Session and one sequence in the second Summer Session. Applications are due April 15.

For more course detail, see full description under appropriate academic department listing or http://bml.ucdavis.edu/.

Sequences are:

1. Marine Organisms and Ecology of the California Peninsula
   Evolution and Ecology 106, 114, 111, 110; Biological Sciences 124
2. Effects of Coastal Pollution on Marine Organisms
   Environmental Toxicology
3. Oceanography: Environmental Science and Policy 152; Geology/Environmental Science and Policy 150C, Biological Sciences 124

Course offerings, sequence structure and instructors may vary from year to year.

Bodega Marine Laboratory spring and summer programs are residential, with students housed on the laboratory grounds. Participants are assessed a
Business Management

See Managerial Economics, on page 386, for undergraduate study; and Management, Graduate School of, on page 382.

Cantonese

See Asian American Studies, on page 171.

Cell Biology

See Molecular and Cellular Biology, on page 430.

Cell and Developmental Biology (A Graduate Group)

The Cell and Developmental Biology program has merged with the Biochemistry and Molecular Biology program to form Biochemistry, Molecular, Cellular, and Developmental Biology (BMCDB); see Biochemistry, Molecular, Cellular, and Developmental Biology, on page 177.

Group Office. 2278 Life Sciences 530-752-9091; http://biosci3.ucdavis.edu/GradGroups/BMCDB/

Cell Biology and Human Anatomy

See Medicine, School of, on page 396.

Chemistry

(College of Letters and Science)

Susan M. Kauzlarich, Ph.D., Chairperson of the Department
Neil E. Schore, Ph.D., Vice-Chairperson of the Department (Undergraduate Matters)
Frank E. Ostleroh, Ph.D. Vice-Chairperson of the Department (Graduate Matters)
David Goodin, Ph.D., Vice-Chairperson of the Department (Safety)

Department Office. 108 Chemistry Building 530-752-8900, Fax 530-752-8995; http://www.chem.ucdavis.edu/

Faculty

James Ames, Ph.D., Professor
Shota Asumi, Ph.D., Assistant Professor
Matthew P. Augustine, Ph.D., Professor
Alon L. Balch, Ph.D., Professor
Enoch Baldwin, Ph.D., Associate Professor
Peter Beal, Ph.D., Professor
Louise A. Berben, Ph.D., Assistant Professor
R. David Britt, Ph.D., Professor
William Casey, Ph.D., Professor
Xi Chen, Ph.D., Professor
Stephen Cramer, Ph.D., Professor
Sheila David, Ph.D., Professor
Andrew J. Fisher, Ph.D., Professor
Annaliese K. Franz, Ph.D., Associate Professor
Jacquelyn Gervay Hague, Ph.D., Professor
David Goodin, Ph.D., Professor
Ting Guo, Ph.D., Professor
Susan M. Kauzlarich, Ph.D., Professor

Distinguished Graduate Mentoring Award

Peter B. Kelly, Ph.D., Professor
Kirill Kowpr, Ph.D., Assistant Professor
Mark J. Kurth, Ph.D., Professor
Donald P. Land, Ph.D., Professor
Delmar Larsen, Ph.D., Associate Professor
Carillo B. Lebrilla, Ph.D., Professor
Gang-Yu Liu, Ph.D., Professor
C. William McCurdy, Ph.D., Professor
Mark Mascal, Ph.D., Professor
Krishnan P. Nambiar, Ph.D., Associate Professor

Distinguished Graduate Mentoring Award

Alexandra Navrotsky, Ph.D., Professor
Cheuk-Yiu Ng, Ph.D., Professor
Marilyn Olmstead, Ph.D., Professor
Frank Ostleroh, Ph.D., Professor
Philip P. Power, FRS, Ph.D., Professor
Neil E. Schore, Ph.D., Professor

Academic Senate Distinguished Teaching Award

Jared T. Shaw, Ph.D., Associate Professor
Justin Siegel, Ph.D., Assistant Professor
Alexei P. Stuchebrukhov, Ph.D., Professor
Dean Tambillo, Ph.D., Professor

Academic Senate Distinguished Teaching Award

Michael Toney, Ph.D., Professor

Emeriti Faculty

Thomas L. Allen, Ph.D., Professor Emeritus
W. Ronald Fawcett, Ph.D., Professor Emeritus
William H. Fink, Ph.D., Professor Emeritus
Edwin Friedman, Ph.D., Professor Emeritus
Hakan Hope, Cand. Real., Professor Emeritus
William M. Jackson, Ph.D., Professor Emeritus
Gerald N. Lakhta, Ph.D., Professor Emeritus
Claude F. Meares, Ph.D., Professor Emeritus
W. Kenneth Musker, Ph.D., Professor Emeritus
Carl W. Schmid, Ph.D., Professor Emeritus
James H. Swinehart, Ph.D., Professor Emeritus
Dino S. Tink, Ph.D., Professor Emeritus
Nancy S. True, Ph.D., Professor Emeritus
George S. Zweifel, Sc.D., Professor Emeritus

Affiliated Faculty

Toby Allen, Ph.D., Adjunct Professor
Giulia Galli, Ph.D., Adjunct Professor

The Major Programs

Chemistry studies the composition of matter, its structure, and the means by which it is converted from one form to another.

The Program. The Department of Chemistry offers several degree programs leading to the Bachelor of Arts and the Bachelor of Science. The curriculum leading to the A.B. degree offers a substantive program in chemistry while allowing students the freedom to take more courses in other disciplines and pursue a broad liberal arts education. Students who have a deeper interest in chemistry normally elect one of the several programs leading to the B.S. degree. The standard B.S. program, the only chemistry program accredited by the American Chemical Society, is appropriate for students who are interested in chemistry as a profession. The B.S. in Chemical Physics, the B.S. in Pharmaceutical Chemistry, and the two B.S. Applied Chemistry emphases are slightly less intense in chemistry, and draw on significant course materials from areas relevant to their particular focus but outside of a classical chemistry degree. Students following the A.B. or one of the B.S. programs may consider taking advantage of the Education Abroad Program. Our major adviser can assist students in planning a curriculum while abroad that assures regular progress in the major. A minor program in chemistry is also available.

Career Alternatives. Chemistry graduates with bachelor’s degrees are employed extensively throughout various industries in quality control, research and development, production supervision, technical marketing, and other areas. The types of industries employing these graduates include chemical, energy, pharmaceutical, genetic engineering, biotechnology, food and beverage, petroleum and petrochemical, paper and textile, electronics and computer, and environmental and regulatory agencies. The bachelor’s programs also provide chemistry graduates with the rigorous preparation needed for an advanced degree in chemistry and various professional schools in the health sciences.

Chemistry

A.B. Major Requirements:

Preparatory Subject Matter..................36-42

Chemistry 2A-2B-2C or 2AH-2BH-2CH..15

Physics 7A-7B-7C or 9A-9B-9C............12-15

Mathematics 16A-16B-16C or 17A-17B-17C or 21A-21B-21C........................................9-12

Depth Subject Matter.......................43


At least 11 additional upper division units in chemistry (except Chemistry 107A or 107B) or related areas, including one course with formal lectures. Courses in related areas must be approved in advance by the major adviser. See Chemistry Major Adviser for details. At least 11

Total Units for the Major....................79-85

Chemistry

ACS Preparatory Program

B.S. Major Requirements:

Preparatory Subject Matter...............53

Chemistry 2A-2B-2C or 2AH-2BH-2CH..15

Physics 7A-7B-7C or 9A-9B-9C............12-15


Depth Subject Matter.......................54

Chemical Physics

At least seven additional upper division units in chemistry [except Chemistry 107A, 107B], including one course with formal lectures. 

Total Units for the Major 107

Recommended

Physics 9D

Chemistry

Applied Chemistry-Environmental Chemistry emphasis

B.S. Major Requirements:

Chemistry Placement Examination. Students who enroll in Chemistry 2A, 2AH or Workbench Chemistry 41C must achieve the appropriate score on the Chemistry Placement Exam. In addition to the Chemistry Placement Exam, students are also required to pass the Mathematics Placement Exam with a satisfactory score appropriate to the Chemistry class they have placed into. See the Department of Chemistry website (http://chemistry.ucdavis.edu/undergraduate/chemplacement.html) for additional information on placement requirements. 

Total Units for the Major 107

Chemical Physics

B.S. Major Requirements:

Preparatory Subject Matter

Chemistry 2A-2B-2C or 2AH-2B-2CH ....... 2

Mathematics 1A-1B-1C or 1B-1C-1C ....... 12

Physics 7A, 7B, 7C or 9A-9B-9C ....... 12

Preparatory Subject Matter


Physics 10A, 105A, 105B, 105C ....... 12

At least one course from: Physics 105B, 110B, 112, 115A, 140A ....... 4

At least two additional upper division units in chemistry [except Chemistry 107A, 107B] ....... 2

Total Units for the Major 110

Pharmaceutical Chemistry

B.S. Major Requirements:

Preparatory Subject Matter

Chemistry 2A-2B-2C or 2AH-2B-2CH ....... 3

Mathematics 1A-1B-1C or 1B-1C-1C ....... 12

Physics 7A, 7B, 7C or 9A-9B-9C ....... 12

Preparatory Subject Matter


Physics 10A, 105A, 105B, 105C ....... 12

At least one course from: Physics 105B, 110B, 112, 115A, 140A ....... 4

At least two additional upper division units in chemistry [except Chemistry 107A, 107B] ....... 2

Total Units for the Major 110

Lower Division

2A. General Chemistry (5)

Lecture — 3 hours, laboratory — discussion — 4 hours. Prerequisite: High school chemistry and physics or satisfactory score on diagnostic examinations. Periodic table, stoichiometry, chemical equations, physical or their equivalents. Stu. concept of the atomic theory of gases, atomic and molecular structure and chemical bonding. Laboratory experiments in stoichiometric relations, properties and collection of gases, atomic spectroscopy, and introductory qualitative analysis. Only 3 units of credit allowed to st. who have completed course 9. GE credit: SciEng | QL, SE — I, II, III, IV

2B. General Chemistry (5)

Lecture — 3 hours, laboratory — discussion — 4 hours. Prerequisite: High school chemistry and physics. Satisfactory score on diagnostic examinations. Mathe. 21A (may be taken concurrently) or consent of instructor. Limited enrollment with a more rigorous treatment of material covered in course 2A. Students completing course 2B can continue with course 2B8 or 2C. — I, II

2B8. Honors General Chemistry (5)

Lecture — 3 hours, laboratory — discussion — 4 hours. Prerequisite: course 2A or 2AH. Continuation of course 2A. Condensed phases and intermolecular forces, chemical thermodynamics, chemical equilibria, acids and bases, solution properties, laboratory experiments in thermoclinometry, equilibria, and quantitative analysis using volumetric methods. GE credit: SciEng | QL, SE — I, II, III, IV, V

2BH. Honors General Chemistry (5)

Lecture — 3 hours, laboratory — discussion — 4 hours. Prerequisite: course 2AH or consent of instructor or course 2AH with a grade of C or better; and Mathe. 21B (may be taken concurrently) or consent of instructor. Limited enrollment with a more rigorous treatment of material covered in course 2B. Students completing course 2BH can continue with course 2C or 2C — II, III, IV

2C. General Chemistry (5)

Lecture — 3 hours, laboratory — discussion — 4 hours. Prerequisite: course 2B or 2B8. Continuation of course 2B. Kinetics, electrochemistry, spectroscopy, structure and bonding in transition metal compound. Applications, principles and chemical reactions. Laboratory experiments in selected analytical methods and syntheses. GE credit: SciEng | QL, SE — I, II, III, IV, V

2CH. Honors General Chemistry (5)

Lecture — 3 hours, laboratory — discussion — 6 hours. Prerequisite: course 2C or 2CH with a grade of C or better; and Mathematics 21C (may be taken concurrently) or consent of instructor. Limited enrollment with a more rigorous treatment of material covered in course 2CH. — II, III, IV, V

8A. Organic Chemistry: Brief Course (2)

Lecture — 2 hours. Prerequisite: course 2B with a grade of C— or higher. With course 8B, an introduction to the nomenclature, structure, chemistry, and mechanisms of organic compounds. Intended for students majoring in areas other than organic chemistry. — III, IV, V

8B. Organic Chemistry: Brief Course (4)

Lecture — 3 hours, laboratory — 3 hours. Prerequisite: course 2B or 2CH. Continuation of course 2B. Laboratory concerned primarily with organic laboratory techniques and the chemistry of the common classes of organic compounds. — I, II, III, IV, V

10. Concepts of Chemistry (4)

Lecture — 4 hours. A survey of basic concepts and contemporary applications of chemistry. Designed for non-science majors and not as preparation for Chemistry 2A. Course Not open for credit to stu.
students who have had Chemistry 2A; but students with credit for course 10 may take Chemistry 2A for full credit. GE credit: SciEng | VL, SE, WE.—I, II, III. (I, II, III.)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. Primarily for lower division students. (P/NP grading only.)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

Upper Division

100. Environmental Water Chemistry (3)
Lecture—3 hours. Prerequisite: course 2C. Practical aspects of water chemistry in the environment, including thermodynamic relations, coordination chemistry, solubility calculations, redox reactions and rate laws. Computer modeling of the evolution in water chemistry from contact with minerals and gases. —II. (II.) Casey

104. Forensic Applications of Analytical Chemistry (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 2C. Theory and application of standard methods of chemical analysis to evidentiary samples. Use and evaluation of results from screening tests, FTIR, GC and GCMS to various sample types encountered in practice. —I. (I.)

105. Analytical and Physical Chemical Methods (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 10OA (may be taken concurrently) or courses 107A or 107B. Fundamental theory and laboratory techniques in analytical and physical chemistry. Errors and data analysis methods. Basic electrical circuits in instruments. Advanced solution equilibria. Potentialometric, colorimetric, and polarographic separations. UV-visible spectroscopy. Lasers. GE credit: SciEng | QL, SE, WE.—I, II, III. (I, II, III.)

107A. Physical Chemistry for the Life Sciences (3)
Lecture—3 hours. Prerequisite: course 2C, Mathematics 16C or 21C, one year of college level physics. Physical chemistry intended for majors in the life science area. Introductory development of classical and statistical thermodynamics including equilibria processes and solutions of both non-electrolytes and electrolytes. The thermodynamic basis of electrochemistry and membrane potentials. —I. (I.)

107B. Physical Chemistry for the Life Sciences (3)
Lecture—3 hours. Prerequisite: course 107A. Continuation of course 107A. Kinetic theory of gases and transport processes in liquids. Chemical kinetics, enzymatic kinetics and theories of reaction rates. Introduction to quantum theory, atomic and molecular structure, and spectroscopy. Application to problems in the biological sciences. —II. (II.)

108. Molecular Biochemistry (3)
Lecture—3 hours. Prerequisite: course 128C. Pass One open to Chemistry majors. Chemical principles and experimental methods applied to the biological sciences to understand the molecular structure and function of proteins, nucleic acids, carbohydrates, and membrane lipids. —III. (III.)

110A. Physical Chemistry: Introduction to Quantum Mechanics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2C, Mathematics 16C or 21C, one year of college physics. Introduction to the postulates and general principles of quantum mechanics. Approximations based on variational method and time independent perturbation theory. Application to harmonic oscillator, rigid rotor, one-electron and many-electron atoms, and homo-and hetero-nuclear diatomic molecules. GE credit: SciEng | QL, SE.—I, II, III. (I, II, III.)

110B. Physical Chemistry: Properties of Atoms and Molecules (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 110A. Group theory. Application of quantum mechanics to polyatomic molecules and molecular spectroscopy. Intramolecular forces and the gas, liquid and solid states. Distributions, ensembles and partition function properties. —I, II, III. (I, II, III.)

110C. Physical Chemistry: Thermodynamics, Equilibria and Kinetics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 110B. Development and application of the general principles of thermodynamics and statistical thermodynamics. Chemical kinetics, rate laws for chemical reactions and reaction mechanisms. —II, III. (II, III.)

115. Instrumental Analysis (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: courses 105 and 110B (may be taken concurrently) or 107A or 107B. Intermediate theory and laboratory techniques in analytical and physical chemistry. Advanced data analysis methods and goodness-of-fit criteria. Fourier transform spectroscopic methods and instrumentation. Mass spectrometry. Electrochemistry. Liquid and gas chromatography and spectroscopy. GE credit: SciEng, Wrt | QL, SE, WE.—I, II, III. (I, II, III.)

118A. Organic Chemistry for Health and Life Sciences (4)
Lecture—3 hours; laboratory/discussion—1.5 hours. Prerequisite: course 110B with a grade of C– or higher. The 118A, 118B, 118C series is for students planning professional school studies in health and life sciences. A rigorous, in-depth presentation of basic principles with emphasis on stereochemistry and spectroscopy and preparations and reactions of nonaromatic hydrocarbons, haloaldehydes, alcohols and ethers. —I, II, III. (I, II, III.)

118B. Organic Chemistry for Health and Life Sciences (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 118A. Continuation of course 118A, with emphasis on spectroscopy and the preparation and reactions of aromatic hydrocarbons, organometallic compounds, aldehydes and ketones. —I, II, III. (I, II, III.)

118C. Organic Chemistry for Health and Life Sciences (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 118B. Continuation of course 118B, with emphasis on the preparation, reactions and identification of carboxylic acids and their derivatives, aldehyd and acyl amines, β-dicarbonyl compounds, and various classes of naturally occurring, biologically important compounds. —I, II, III. (I, II, III.)

121. Introduction to Molecular Structure and Spectra (4)
Lecture—4 hours. Prerequisite: course 110B. Modern theoretical and experimental methods used to study problems of molecular structure and bonding; emphasis on spectroscopic techniques. —III. (III.)

122. Chemistry of Nanoparticles (3)
Lecture—3 hours. Prerequisite: course 110C (may be taken concurrently). Chemical and physical aspects of inorganic nanoparticles. Topics include synthesis, structure, colloidal behavior, catalytic activity, size and shape dependency of physical properties, analytical methods and applications. —III. (III.) Osterloh

124A. Inorganic Chemistry: Fundamentals (3)
Lecture—3 hours. Prerequisite: course 2C. Symmetry, molecular geometry and structure, molecular orbital theory of bonding (polyatomic molecules and transition metals), solid state chemistry, energetics and spectroscopy of inorganic compounds. —I. (I.)

124B. Inorganic Chemistry: Main Group Elements (3)
Lecture—3 hours. Prerequisite: course 124A. Synthesis, structure and reactivity of inorganic and hetero-organic molecules containing the main group elements. —II. (II.)

124C. Inorganic Chemistry: d and f Block Elements (3)
Lecture—3 hours. Prerequisite: course 124A. Synthesis, structure and reactivity of transition metal complexes, organometallic and bioinorganic chemistry, the lanthanides and actinides. —III. (III.)

124L. Laboratory Methods in Inorganic Chemistry (2)
Laboratory—6 hours. Prerequisite: course 124B or 124C (may be taken concurrently). The preparation, purification and characterization of main group and transition metal inorganic and organometallic compounds. —III. (III.)

125. Advanced Methods in Physical Chemistry (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 110C (may be taken concurrently) and 115. Advanced theory and laboratory techniques in analytical and physical chemistry. Advanced spectroscopic methods. Thermodynamics. Kinetics. Chemical literature. Digital electronics and computer interfacing. Laboratory measurements and vacuum techniques. GE credit: SciEng; Wrt | QL, SE, WE.—II, III. (II, III.)

128A. Organic Chemistry (3)
Prerequisite: course 128B or consent of instructor, course 129A strongly recommended; chemistry majors should enroll in course 129A concurrently. Continuation of course 128A with emphasis on aromatic and aliphatic substitution reactions, elimination reactions, and the chemistry of carbonyl compounds. Introduction to the application of spectroscopic methods to organic chemistry. —II, III. (II, III.)

128B. Organic Chemistry (3)
Prerequisite: course 128B, chemistry majors should enroll in course 129C concurrently. Continuation of course 128B with emphasis on enolate condensations and the chemistry of amines, phenols, and sugars; selected biologically important compounds. —I, II, III. (I, II, III.)

129A. Organic Chemistry Laboratory (2)
Laboratory—1 hour; lecture—3 hours. Prerequisite: course 2C with a grade of C or higher; or course 129A concurrently. Continuation of course 129A with emphasis on enolate condensations and the chemistry of amines, phenols, and sugars; selected biologically important compounds. —I, II, III. (I, II, III.)

129B. Organic Chemistry Laboratory (2)
Laboratory—6 hours. Prerequisite: courses 128B (may be taken concurrently) and 129A. Continuation of course 129A. Emphasis is on methods used for synthesis and isolation of organic compounds. —II, III. (II, III.)

129C. Organic Chemistry Laboratory (2)
Laboratory—6 hours. Prerequisite: course 128C (may be taken concurrently) and 129B. Continuation of course 129B.—I, II, III. (I, II, III.)

130A. Pharmaceutical Chemistry (3)
Lecture—3 hours. Prerequisite: course 110C or 128C. Examination of the design principles and experimental methods used in pharmaceutical and medicinal chemistry. —II. (II.)

130B. Pharmaceutical Chemistry (3)
Lecture—2 hours; lecture/laboratory—1 hour. Prerequisite: course 130A. Continuation of course 130A with emphasis on case studies of various drugs and the use of computational methods in drug design. —III. (III.)

130C. Case Studies in Pharmaceutical Chemistry (1)
Seminar—2 hours; independent study. Prerequisite: courses 130A and 130B concurrently. Seminar. Exploration of medicinal and pharmaceutical chem-
Chemistry

131. Modern Methods of Organic Synthesis (3)
Lecture—3 hours. Prerequisite: course 128C. Introduction to modern synthetic methodology in organic chemistry with emphasis on stereoselective reactions and application to multistep syntheses of organic molecules containing functional groups. (P/NP grading only.—I. [III])

135. Advanced Bio-organic Chemistry Laboratory (3)
Lecture—1 hour; laboratory—6 hours. Prerequisite: course 118C or 129C. Separation, purification, identification and biological evaluation of organic compounds using modern methods of synthesis, computational chemistry and instrumentation. Emphasis on pharmaceutical and medicinal substances.—I. [II] [III]

150. Chemistry of Natural Products (3)
Lecture—3 hours. Prerequisite: course 128C. Chemistry of terpenes, steroids, acetogenins, and alkaloids: isolation, structure determination, biosynthesis, chemical transformation, and total synthesis. GE credit: SciEng, Wrt | SE, WE.—III. (II)

192. Internship in Chemistry (1-6)
Internship—3-18 hours. Prerequisite: upper division standing; project approval by faculty sponsor prior to enrollment. Supervised internship in chemistry requires a final written report. May be repeated for credit for a total of 6 units. (P/NP grading only.)

194HA-194HB-194HC. Undergraduate Honors Research (2-2-2)
Independent study.—2 hours. Prerequisite: open only to chemistry majors who have completed 135 units and who qualify for the honors program. Original research under the guidance of a faculty adviser, culminating in the writing of an extensive report. [Deferral grading only, pending completion of sequence.]

195. Careers in Chemistry (1)
Seminar—2 hours. Prerequisite: junior or senior standing in Chemistry. Designed to give Chemistry undergraduate students an indepth appreciation of career opportunities with a bachelors degree in chemistry. Professional chemists (and allied professionals) describe research and provide career insights. (P/NP grading only.)

197. Projects in Chemical Education (1-4)
Discussion and/or laboratory. Prerequisite: consent of instructor. Participation may include development of laboratory experiments, lecture demonstrations, autotutorial modules or assistance with laboratory sessions. May be repeated for credit for a total of 12 units. (P/NP grading only.)—I, II, III. (I, II, III)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor based upon adequate preparation in chemistry, mathematics and physics. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor based upon adequate preparation in chemistry, mathematics and physics. (P/NP grading only.)

Graduate

201. Chemical Uses of Symmetry and Group Theory (3)
Lecture—3 hours. Prerequisite: course 124A and 110B, or consent of instructor. Symmetry elements and applications, point groups, representations of groups. Applications to molecular orbital theory, ligand field theory, molecular vibrations, and angular momentum. Crystallographic symmetry.—I. [I]

204. Mathematical Methods in Chemistry (3)

205. Symmetry, Spectroscopy, and Structure (3)
Lecture—3 hours. Prerequisite: course 201 or the equivalent. Vibrational and rotational spectra; electronic spectra and determination of electron spectroscopy; magnetic, electron spin and nuclear quadrupole resonance spectroscopy; nuclear magnetic resonance spectroscopy; other spectroscopic methods.—II. [III]

209. Special Topics in Physical Chemistry (3)
Lecture—3 hours. Prerequisite: courses 210A and 211A. Graduate standing in Chemistry. Advanced topics in physical chemistry or chemical physics chosen from areas of current research interest. May be repeated for credit.

210A. Quantum Chemistry: Introduction and Stationary-State Properties (3)
Lecture—3 hours. Prerequisite: courses 110B and 110C or consent of instructor. Stationary-state quantum chemistry: postulates of quantum mechanics, simple solutions, central field problems and angular momentum, hydrogen atom, perturbation theory, variational theory, atoms and molecules.—II. [III]

210B. Quantum Chemistry: Time-Dependent Systems (3)
Lecture—3 hours. Prerequisite: course 210A. Matrix mechanics and quantum chemistry: stationary quantum chemistry: matrix formulation of quantum mechanics, Heisenberg representation, time-dependent perturbation theory, selection rules, density matrices, and miscellaneous molecular properties.—I, III. [II]

210C. Quantum Chemistry: Molecular Spectroscopy (3)
Lecture—3 hours. Prerequisite: course 210B. Molecular spectroscopy: Born-Oppenheimer approximation, rotational, vibrational and electronic spectroscopy, spin systems, and molecular photophysics.—I. [I]

211A. Advanced Physical Chemistry: Statistical Thermodynamics (3)
Lecture—3 hours. Prerequisite: consent of instructor. Principles and applications of statistical mechanics; ensemble theory; statistical thermodynamics of gases, solids, liquids, electrolyte solutions and polymers; chemical equilibrium.—I. [I]

211B. Advanced Physical Chemistry (3)
Lecture—3 hours. Prerequisite: course 211A. Statistical mechanics of nonequilibrium systems, including the rigorous kinetic theory of gases, continuum mechanics transport in dense fluids, stochastic processes, bifurcations, and linear response theory. Offered in alternate years.—II.

212. Chemical Dynamics (3)
Lecture—3 hours. Prerequisite: consent of instructor. Introduction to modern concepts in chemical reaction dynamics. Emphasis will be placed on experimental techniques as well as emerging physical models for characterizing chemical reactivity at a microscopic level. Offered in alternate years.—II.

215. Theoretical and Computational Chemistry (3)
Lecture—3 hours. Prerequisite: courses 211A and 210B or consent of instructor. Mathematics of wide utility in chemistry as methods for guidance or alternative to experiment, and modern formulations of chemical theory. Emphasis will vary in successive years. May be repeated for credit when topic differs.—II, III. [II, III]

216. Magnetic Resonance Spectroscopy (3)
Lecture—3 hours. Prerequisite: courses 210A, 210B (may be taken concurrently). Quantum mechanics of spin and orbital angular momentum, nuclear magnetic resonance, theory of chemical shift and multiple structures, electron spin resonance, theory of g-tensor in organic and transition ions, spin Hamiltonians, nuclear quadrupolar resonance, spin relaxation processes. Offered in alternate years.—III. [III]

217. X-Ray Structure Determination (3)
Lecture—3 hours. Prerequisite: consent of instructor. Introduction to x-ray structure determination, crystals, symmetry, diffraction geometry, sample preparation and handling, diffraction apparatus and data collection, methods of structure solution and refinement, presentation of results, text, tables and graphics, crystallographic literature.—III. [III]

218. Macromolecules: Physical Principles (3)
Lecture—3 hours. Prerequisite: courses 110A, 110B, 110C or the equivalent. Relationship of higher order macromolecular structure to subunit composition; equilibrium properties and macromolecular dynamics; physical chemical determination of macromolecular structure. Offered in alternate years.—II.

219. Spectroscopy of Organic Compounds (4)
Lecture—3 hours; laboratory—2.5 hours. Prerequisite: course 128C or the equivalent. Identification of organic compounds and investigation of stereochemical and reaction mechanism phenomena using spectroscopic methods—principally NMR, IR and MS.—I, II. [III]

219L. Laboratory in Spectroscopy of Organic Compounds (1)
Laboratory—2.5 hours. Prerequisite: course 219 (may be taken concurrently). Restricted to Chemistry graduate students only (or consent of instructor). Practical application of NMR, IR and MS techniques for organic molecules.—II, III.

221A-H. Special Topics in Organic Chemistry (3)
Lecture—3 hours. Selected topics of current interest in organic chemistry. Topics will vary each time the course is offered, and it is open for credit to students the research interests of the staff member giving the course.—I. [I]

221B. Special Topics in Organic Chemistry (3)
Lecture—3 hours. Prerequisite: course 124A or the equivalent. Electronic structures, bonding, and reactivity of transition metal compounds. Offered every third year.—II.

221B. Special Topics in Organic Chemistry (3)
Lecture—3 hours. Prerequisite: course 124A or the equivalent. Electronic structures, bonding, and reactivity of transition metal compounds. Offered every third year.—II.

222. Principles of Transition Metal Chemistry (3)
Lecture—3 hours. Prerequisite: course 124A or the equivalent. Electronic structures, bonding, and reactivity of transition metal compounds. Offered every third year.—II.

228A. Bio-inorganic Chemistry (3)
Lecture—3 hours. Prerequisite: course 226 or consent of instructor. Defines role of inorganic chemistry in the functioning of biological systems. Emphasis is on principles from the current literature. Not open for credit to students who have taken course 122.—III. [I] Osterloh

226. Principles of Transition Metal Chemistry (3)
Lecture—3 hours. Prerequisite: course 124A or the equivalent. Electronic structures, bonding, and reactivity of transition metal compounds. Offered every third year.—II.

228B. Main Group Chemistry (3)
Lecture—3 hours. Prerequisite: course 226 or consent of instructor. Synthesis, physical properties, reactions and bonding of main group compounds. Discussions of concepts of electron deficiency, hyperconjugation, and non-classical bonding. Chemistry of the main group elements will be treated systematically. Offered every third year.—II.

228C. Solid-State Chemistry (3)
Lecture—3 hours. Prerequisite: courses 124A, 110B, 226, or the equivalent. Design and synthesis, structure and bonding of solid-state compounds; physical properties and characterization of solids, topics of current interest such as low-dimensional materials, inorganic polymers, materials for catalysis. Offered every third year.—II.

228D. Homogeneous Catalysis (3)
Lecture—3 hours. Prerequisite: course 226. Overview of homogeneous catalysis and related methods, with emphasis on kinetics, mechanisms, and applications for organic synthesis. The related meth-
oads may include cluster, colloid, phase transfer, enzymatic, heterogeneous and polymer-supported catalysts. Offered every third year.—II. (II.)

231A. Organic Synthesis: Methods and Strategies (4)
Lecture—3 hours; lecture/discussion—3 hours. Prerequisite: course 128C or equivalent. Current strategies and methods in synthetic organic chemistry. Focus on construction of carbon frameworks, control of relative and absolute stereochemistry and retro-synthetic strategies. Use of databases and molecular mechanics to design multipurpose strategies. Only one unit of credit for students who have completed course 131. Not open for credit to students who have taken course 231.—I, II, III.

231B. Advanced Organic Synthesis (3)
Lecture—3 hours. Prerequisite: course 231A. Current strategies and methods in synthetic organic chemistry. Continuation of course 231A. Organic synthesis of complex target molecules. Stereochemical considerations and asymmetric synthesis. Organometallics for selective transformations. Carbocyclic and heterocyclic ring formation. Not open for credit to students who have taken course 231.—I, II, III.

232. Physical-Organic Chemistry (3)
Lecture—3 hours. Prerequisite: courses 128A-128B-128C and 110A-110B-110C or the equivalent. Introduction to elementary concepts in physical-organic chemistry and the application of simple numerical techniques in characterizing and modeling organic reactions.—I. (I.)

233. Organometallic Chemistry in Organic Synthesis (3)
Lecture—3 hours. Prerequisite: course 128C. Current trends in use of organometallics for organic synthesis; preparations, properties, applications, and limitations of organometallic reagents derived from transition and/or main group metals. Offered in alternate years.—III.

236. Chemistry of Natural Products (3)
Lecture—3 hours. Prerequisite: course 128C or the equivalent. Advanced treatment of chemistry of naturally occurring complex molecules isolated from a variety of sources. Topics will include isolation, structure determination, chemical transformations, total synthesis, biological activity, and biosynthesis. Biosynthetic origin will be used as a unifying theme.—II. (II.)

237. Bio-organic Chemistry (3)
Lecture—3 hours. Prerequisite: course 128C or the equivalent. Structure and function of biomolecules; molecular recognition, enzyme reaction mechanisms, design of artifical enzymes and application of enzymes in organic synthesis. Offered in alternate years.—I.

238. Introduction to Chemical Biology (3)
Lecture—2 hours. Prerequisite: course 118C or 128C, or the equivalent; course 130A & B and Biological Sciences 102, 103, & 104, or the equivalents recommended. Synthesis of complex molecules in nature. Use of biosynthetic pathways in synthesis of new chemical entities. Applications of small molecules in chemical genetics and structural biology. Solving biological problems using synthetic biomolecules.—I, II, III.

240. Advanced Analytical Chemistry (3)
Lecture—3 hours. Prerequisite: courses 110A and 115 or the equivalent. Numerical treatment of experimental data; thermodynamics of electrolyte and nonelectrolyte solutions; complex equilibria; aqueous and nonaqueous solutions; potentiometry and specific ion electrodes; mass transfer in liquid solutions; fundamentals of separation science, including column, thin-layer, and liquid chromatography.—I, II, III.

241A. Surface Analytical Chemistry (3)
Lecture—3 hours. Prerequisite: course 110C or the equivalent. Concepts of surfaces and interfaces: physical properties, unique chemistry and electronic effects. Focus on gas-solid interfaces, with some discussion of liquid-solid interfaces. Offered in alternate years.—I.

241B. Laser and X-ray Spectroscopy (3)
Lecture—3 hours. Prerequisite: course 110B or the equivalent. Concepts and mechanisms of light-matter interactions. Chemical applications of modern spectroscopic methods, including multiphoton laser spectroscopy, time-resolved laser and x-ray photolysis, and phase-contrast x-ray imaging. Offered in alternate years.—I.

241C. Mass Spectrometry (3)
Lecture—3 hours. Prerequisite: course 110C and 115 or the equivalent. Mass spectrometry and related methods with emphasis on ionization methods, mass analyzers, and detectors. Related methods may include in-molecular dissociation of organic and bio-organic compounds, and applications in biological and environmental analysis. Offered in alternate years.—II.

241D. Electroanalytical Chemistry (3)
Lecture—3 hours. Prerequisite: course 110C and 115 or the equivalent. Electroanalytical chemistry with consideration of mass transfer and electrode kinetics for polarizable electrodes. Current-potential curves for a variety of conditions, including both potentiostatic and galvanostatic control, and their application in chemical analysis. Offered in alternate years.—II.

241E. Microscopy and Imaging Techniques (3)
Lecture—3 hours. Prerequisite: course 110C and 115 or the equivalent. Introduction to modern microscopic techniques: scanning tunneling, atomic force, far-field optical, fluorescence, scanning near-field optical, and scanning electron microscopy. Application to nanoscience and analytical and bioanalytical chemistry. Some laboratory demonstrations. Offered in alternate years.—II.

245. Mechanistic Enzymology (3)
Lecture—3 hours. Advanced topics in chemical kinetics relevant to enzymes, enzyme kinetics, theory of enzyme catalysis, and the analysis of a selection of organic enzyme reaction mechanisms by the tools introduced in the first part of the course.—I. (I.)

261. Current Topics in Chemical Research (2)
Lecture—2 hours. Prerequisite: graduate standing in Chemistry or consent of instructor. Designed to help chemistry graduate students develop and maintain familiarity with the literature in their immediate field of research and related areas. May be repeated for credit when topics differ.—I, II, III.

263. Introduction to Chemical Research Methodology (3)
Laboratory/discussion—9 hours. Prerequisite: course 293 and graduate student standing in Chemistry; consent of instructor. Introduction to identification, formulation, and solution of meaningful scientific problems including experimental design and/or theoretical analyses of new and prevailing techniques, theories and hypotheses. May be repeated for credit when topics differ. (S/U grading only)—I, II, III.

264. Advanced Chemical Research Methodology (6)
Laboratory/discussion—18 hours. Prerequisite: courses 263 or consent of instructor. Applications of the methodology developed in Chemistry 263 to experimental and theoretical studies. Advanced methods of interpretation of results are developed. Includes the preparation and presentation for publication. May be repeated for credit when topics differ. (S/U grading only)—I, II, III.

280. Seminar in Ethics for Scientists (2)
Seminar—2 hours. Prerequisite: graduate standing in any department of Science or Engineering. Studies of topical and historical issues in the ethics of science, possibly including issues such as proper authorship, peer review, fraud, plagiarism, responsible collaboration, and conflict of interest. Offered as needed. (Same course as course in Biological Chemistry and Materials Science 280 and Physics 280.) (S/U grading only)—III.

290. Seminar (2)
Seminar—2 hours. Prerequisite: consent of instructor. (S/U grading only)—I, II, III, IV.

293. Introduction to Chemistry Research (1)
Discussion—2 hours. Designed for incoming graduate students preparing for higher degrees in chemistry. Group and individual discussion of research activities in the Department and research topic selection. (S/U grading only)—I. (I.)

294. Presentation of Chemistry Research (1)
Seminar—2 hours. Prerequisite: graduate standing; restricted to graduate students in Chemistry who have not yet given their departmental presentation. Introduces first- and second-year Chemistry graduate students to the process of giving an effective research presentation. Advanced Ph.D. students give formal seminars describing the design and execution of their research projects. May be repeated three times for credit. (S/U grading only)—I, II, III.

295. Careers in Chemistry (1)
Seminar—2 hours. Prerequisite: graduate standing in Chemistry. Designed to give Chemistry graduate students an in-depth appreciation of career opportunities with a M.S. or Ph.D. degree in chemistry. Professional chemists (and allied professionals) give seminars describing both research and career insights. May be repeated for credit 3 times. (S/U grading only)—I.

296. Research in Pharmaceutical Chemistry (6)
Laboratory—18 hours. Prerequisite: courses 130A and 130B, 135, and 233 (may be taken concurrently). Restricted to students in the Integrated B.S./M.S. Program in Chemistry. The laboratory provides qualified graduate students with the opportunity to pursue original investigations in Pharmaceutical Chemistry and allied fields in order to fulfill the letter-graded research requirement of the Integrated B.S./M.S. Program in Chemistry (Pharmaceutical Chemistry Emphasis). May be repeated three times for credit.—I, II, III, IV, V, VI.

298. Group Study (1-5)
II. (III.)

299. Research (1-12)
The laboratory is open to qualified graduate students who wish to pursue original investigation. Students wishing to enroll should confer with the department well in advance of the quarter in which the work is to be undertaken. (S/U grading only.)

Professional

300. Methods of Teaching Chemistry (2)
Lecture—1 hour; discussion—1 hour. Prerequisite: graduate student standing in Chemistry and consent of instructor. Practical experience in methods and problems of teaching chemistry. Includes analyses of texts and supporting material, discussion of teaching techniques, preparing for and conducting of discussion sessions and student laboratories. Participation in the teaching program required for Ph.D. in Chemistry. May be repeated for credit. (S/U grading only)—I, II, III, IV, V, VI.

302. Advanced Methods of Teaching Chemistry (2)
Lecture—2 hours. Prerequisite: course 390. Advanced topics in teaching chemistry. Analysis and discussion of curricular design, curricula materials, teaching methods and evaluation. For students who are planning a career in teaching chemistry. (P/NP grading only)—III.

Quarter Offered: I-Fall; II-Winter; III-Spring; IV-Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): Art/Hum:Arts and Humanities; Sci/Eng:Science and Engineering; Soc/Sci:Social Sciences; Div:Domestic Diversity; Wrt:Writing Experience
Fall 2011 and on Revised General Education (GE): AH:Arts and Humanities; SE:Science and Engineering; SS:Social Sciences; AGCH-American Cultures; DD-Domestic Diversity; OL-Oral Skills; QL-Quantitative; SL-Scientific; VL-Visual; WC-World Cultures; WE-Writing Experience
Chicana/Chicano Studies

Majors and Minor Requirements:

Academic Year: 2011 Fall Quarter

Preparation for Majors and Minors:

1. Preparation for Majors and Minors:

   Preparatory Subject Matter: 16-31
      - Preparatory Subject Matter: 20-35

   Courses in Chicana/o Studies:
      - Spanish 1, 2, 3, or 28, 31, 32 or the equivalent: 0-15

   Depth Subject Matter: 40
      - One course from Chicana/o Studies 150, 181, History 165, 166B, 169A, 169B: 4
      - Two courses from Chicana/o Studies 100, 110, 111, 112, 130, 131, 132, 181: 8

   Comparative ethnicity, gender: two upper division courses selected from two of the following areas: African American and African Studies, Asian American Studies, Native American Studies, or Women's Studies: 8

2. Total Units for the Major: 56-71

Social/Policy Studies Emphasis:

Preparatory Subject Matter: 20-35

Chicana/o Studies 10, 50: 8

One course from Chicana/o Studies 60, 65, 70, or 73: 4

One course from Chicana/o Studies 23, 140A Sociology of Medicine, 41A: 4

Spanish 1, 2, 3, or 28, 31, 32 or the equivalent: 0-15

Depth Subject Matter: 40

One course from Chicana/o Studies 150, 181, History 165, 166B, 169A or 169B: 4

Two courses from Chicana/o Studies 154, 155, 156, 160, 165, 171, or 172: 8

Comparative ethnicity, gender: two upper division courses selected from two of the following areas: African American and African Studies, Asian American Studies, Native American Studies, or Women's Studies: 8

Total Units for the Major: 60-75

Minor Adviser: A. Martinez

Minor Program Requirements:

This minor provides a broad overview of the historical, social, political, and artistic expression of Chicana/os. It is intended for students with an interest in Chicana/o studies and several courses taught from a variety of disciplinary perspectives. Majors may specialize in one of two emphases for the A.B. degree. The Chicana/o Studies composition integrates Chicana/o Studies with Chicana/o and Chicano History. This minor is open to all students with an interest in Chicana/o Studies.

Total Units for the Major: 60-75

Chicana/o Studies: 24

Chicana/o Studies 10 or 50: 4

Chicana/o Studies 150 or 181 or History 165 or 169B: 4


Minor Adviser: A. Martinez

Courses in Chicana/o Studies (CHI)

Lower Division

10. Introduction to Chicana/o Studies (4)

Lecture—3 hours; discussion—1 hour. Analysis of the situation of the Chicana/o (Mexican-American) people, emphasis on American culture, political movements, education and related areas. GE credit: Div, Wrt | ACGH, AH or SS, DD, OL, WE.—I, II.
relationship to the emergence of U.S. Latino cinema. Emphasis on representation and social identity including gender, sexuality, class, race and ethnicity. GE credit: ArtHum, Div | AH, VL, WC, WE. — de la Mora

70. Survey of Chicana/o Art (4)
Lecture—4 hours. Survey of contemporary Chicana/o art in context of the social turmoil from which it springs. Includes political use of the poster and the mural, the influence of the Mexican mural and graphic movement, and social responsibility of the artist. GE credit: Div | ACGH, AH, DD, VL, WC, WE. — I. Jackson, M. Montoya

73. Chicana/o Art Expression Through Silk Screen (4)
Studio—8 hours; laboratory—4 hours. Introductory level studio course using silk screen and basic printing techniques to explore and develop images of Chicana/o cultural themes and expressions. Students will experiment with images and symbols from their immediate environment/culture. Integral approach to Chicana/o philosophy of art. GE credit: ACGH, AH, DD, OL, VL, WC, WE. — I. Jackson

92. Internship (1-12)
Internship—3-36 hours. Prerequisite: course 10 or consent of instructor. Academic guidance combined with internship in community agencies serving Mexican/Latino/Latinx Chicana/o clients. Use of bilingual skills and knowledge of history, culture, economics, politics and social issues. May be repeated for credit up to 12 units. (P/NP grading only.)

98. Directed Group Study (1-5)
(P/NP grading only)

99. Special Study for Undergraduates (1-5)
(P/NP grading only)

Upper Division

100. Chicana/o Chicano Theoretical Perspective (4)
Lecture/discussion—3 hours; term paper. Prerequisite: courses 10 and 50. Critical examination of emerging Chicana/o Studies theoretical perspectives in light of contemporary intellectual frameworks in the social sciences, arts, and humanities. Includes an analysis of practices of self-representation, and socio-cultural developments in the Chicana/o community. GE credit: ACGH, DD, SS, WC, WE. — III. Chabram, Deeb-Sossa

110. Sociology of the Chicana/o Experience (4)
Lecture/discussion—4 hours. Prerequisite: course 10 or Sociology 1. The Chicana/o experience in the American society and economy viewed from theoretical perspectives. Immigration, history of integration of Chicana/o labor into American class structure, education inequality, ethnicity, the family and Chicana/o political culture. GE credit Sociology 110J. GE credit: SocSci, Div, Writ | ACGH, DD, OL, SS, WE. — II. Deeb-Sossa

111. Chicana/Mexicanas in Contemporary Society (4)
Lecture/discussion—4 hours. Prerequisite: course 10 or 50, Women’s Studies 50 or History 169B. Analysis of the role and status of Chicanas/Mexicanas in contemporary society. Special emphasis on their historical role, the Chicano/a movement, and the sociopolitical and economic changes that affect their status and their contributions to society and their community. (Former course 102J) GE credit: ArtHum | ACGH, DD, SS, WE. — Deeb-Sossa

112. Globalization, Transnational Migration, and Chicana/o and Latina/o Communities (4)
Lecture—4 hours. Prerequisite: course 10, Chicana/o and Latina/o migration experiences within a global context. Topics include national and/or transnational migration in Mexico, Central America, and the United States. GE credit: SocSci, Div, Writ | ACGH, DD, OL, SS, WE

113. Latin American Women’s Engagement in Social Movements (4)
Lecture/discussion—3 hours; term paper. Examination of how women of different racial/ethnic and class backgrounds in Latin America challenge their marginalization. Exploration of U.S. foreign policy, its effects on Latin America, and on Latin American women. GE credit: ACGH, DD, SS, WE, Writ. — I. Jackson

114. Women of Color Reproductive Health and Reproductive Politics in a Global Perspective (4)
Lecture/discussion—3 hours; term paper. Study contemporary issues in reproductive health and reproductive politics, both globally and in the U.S., for women of color. Offered in alternate years. GE credit: SocSci | ACGH, DD, SS, WC, WE. — Deeb-Sossa

120. Chicana/o Psychology (4)
Lecture—2 hours; discussion—2 hours. Prerequisite: course 21; introductory psychology recommended. Introduction to the field of Chicana/o psychology. Analysis of sociocultural context of Chicana/os and Latinas/os. Special attention to issues of ethnic identity development, bilingualism, and development of self esteem. Impact of minority experience, migration, acculturation are examined. GE credit: SocSci, Div | ACGH, DD, SS, WE. — Flores

121. Chicana/o Community Mental Health (4)
Lecture—3 hours; term paper. Prerequisite: course 10 or 20. Mexican health care problems and service utilization patterns of Chicana/os and Latinas/os will be analyzed. An analysis of social service policy, and the economic context of mental health programs. Offered Alternate Years. GE credit: SocSci, Div, Writ | ACGH, DD, OL, SS, WE. — Flores

122. Psychology Perspectives Chicana/o and Latina/o Family (4)
Lecture—4 hours. Prerequisite: course 10, introductory psychology highly recommended, and/or consent of instructor. Role of migration and acculturation on family structure and functioning. From a psychological and Chicana/o Studies perspective, contemporary gender roles and variations in family structures are examined. Special topics include family violence, addiction, family resilience and coping strategies. GE credit: SS, Writ. — I. Flores

122S. Psychology Perspectives Chicana/o and Latina/o Family (4)
Lecture—4 hours. Role of migration and acculturation on family structure and functioning. From a psychological and Chicana/o Studies perspective, contemporary gender roles and variations in family structures are examined. Special topics include family violence, addiction, family resilience and coping strategies. This course is taught abroad. Not open for credit to students who have completed course 122. GE credit: SciEng | ACGH, DD, OL, SS, WE. — Flores

123. Psychological Perspectives on Chicana/o and Latina/o Children and Adolescents (4)
Lecture—3 hours; term paper. Prerequisite: course 10 or 21, and upper division standing. Psychological and educational development of Chicana/Latino children and adolescents, with particular attention to the formation of ethnic, gender, class, race, and sexual identities. GE credit: SocSci, Div, Writ | ACGH, DD, OL, SS, WE. — Flores

125S. Latinas in Politics and Public Policy (4)
Lecture/discussion—3 hours; term paper. Special attention to the factionalization of Latina women within the political process and current political influence and participation of Latinas. GE credit: ACGH, DD, OL, SS, WE. — I. Chabram, de la Torre

131. Chicanas in Politics and Public Policy (4)
Lecture/discussion—4 hours. Prerequisite: course 30 or Political Science 1. Historical and political analysis of Chicana/Latina political involvement and activities in the general political system, Chicanas/o movement, Chicana/o movement. Course also examines the public policy process and the relationship of Chicanas/Latinas to current public policy formation. Offered in alternate years. GE credit: SocSci, Div | ACGH, DD, OL, SS, WE. — Weça

131S. Transnational Latina/o Political Economy (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: Spanish 3 or equivalent, or consent of instructor; Economics 1A and 1B recommended. Intensive reading, discussion and research on selected topics from Latin America and the US with regard to immigrant and native communities. Topics include comprehensive immigration and macroeconomic policies in the US and Latin America. Offered in a Spanish speaking country. GE credit: Div, Writ

140A. Quantitative Methods: Chicano/ Latino Health Research (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: Spanish 2 or equivalent high school algebra or the equivalent in college. Focuses on measuring Chicano/Latino health and health disparities approach. Assesses main types of study designs and addresses measurement of disease frequency and health effects. GE credit: SciEng | ACGH, DD, OL, SS, WE

145S. Bi-National Health (5)
Lecture—5 hours. Prerequisite: Biological Sciences 1A/1B-1C, Spanish 21 or 31 or consent of instructor; upper division standing only. Examination of health status and interventions in the context of border health, social and political factors. GE credit: Div, Writ | ACGH, DD, OL, SS, WE. — I. Flores, de la Torre

1465. Public Health in Latin America (5)
Lecture/discussion—4 hours; term paper. Critical examination of emerging Public Health issues in Latin America in light of economic, political and social conditions. Contemporary behavioral frameworks used in public health. Includes analysis of clinical medicine and health care systems. — de la Torre
1475. Indigenous Healing and Biodiversity in Latin America (5) Lecture—1 hour; term paper. Contrast between western and traditional healing practices in Latin America and the role of the natural environment in creating sustainable health delivery systems. Questions of health status attributable to public health and environmental risk factors. GE credit: OL, WC, WE. — I. de la Torre

150. The Chicana and Chicano Movement (4) Lecture—2 hours; term paper. Development of the Chicano Movement within the context of the socio-political movements of the 1960's in a national and global perspective. Ideological/political perspectives and the implications for political strategies. GE credit: ArtHum, Div, Wrt | ACGH, AH or SS, DD, WC, WE. — II. 8

154. The Chicana/o Novel (4) Lecture—4 hours. Prerequisite: Intermediate Spanish or consent of instructor. Introduction to the forms and themes of the Chicana/o novel with special attention to the construction of gender, nationality, sexuality, social class, and the family by contemporary Chicanas/o novelists. Bilingual readings, lectures, discussions, and writing. (Former course Spanish 126A.) GE credit: ArtHum, Div | ACGH, AH, DD, OL, WC, WE. — II. Chabram, M. Montoya

155. Chicana/o Theater (4) Lecture—4 hours. Prerequisite: Intermediate Spanish or consent of instructor. Examination of the formal and thematic dimensions of Chicana/o theater in the contemporary period with special emphasis on El Teatro Campesino and Chicana Feminist Theater. Bilingual readings, lectures, discussions, and writing in Spanish. (Former course Spanish 126B.) GE credit: ACGH, AH, DD, OL, WC, WE. — Chabram.

156. Chicana/o Poetry (4) Lecture—4 hours. Prerequisite: Intermediate Spanish or consent of instructor. Survey of Chicana/o poetry with special emphasis on its thematic and formal dimensions. Bilingual readings, lectures, discussions, and writing in Spanish; term paper. GE credit: ACGH, AH, DD, OL, WC, WE. — II. Chabram

157. Chicana and Chicano Narrative (4) Lecture/discussion—3 hours; term paper. Exploration of contemporary forms of the Chicana and Chicano narrative, encompassing visual art, fiction, poetry, film, theater, and creative nonfiction. Exposure to a variety of artists and scholars whose work shapes our evolving understanding of the Chicana/o experience. GE credit: ArtHum | ACGH, AH, DD, OL, WC, WE. — I. Chabram

160. Mexican Film and Greater Mexican Identity (4) Lecture/discussion—4 hours; film viewing—1 hour. Prerequisite: Intermediate Spanish. Survey of the role Mexican cinema plays in consolidation and contestation of post-revolutionary Mexican state and in the formation of a Greater Mexican cultural identity including Chicana/o identity. Showcases genres, periods, auteurs, movements, and emphasis on gendered and sexuality narratives. GE credit: ArtHum, Div | ACGH, AH, DD, OL, WC, WE. — de la Mora

165. Chicanas, Latinas and Mexicanas in Commercial Media (4) Lecture/discussion—4 hours; laboratory—2 hours. Prerequisite: course 60 or other film or feminist theory course; conversational fluency in Spanish. The portrayal of Chicanas, Latinas and Mexicanas in commercial media. The relation between the representation of Chicanas, Latinas, and Mexicanas women in commercial media, television and cinema and the role of women in Mexican and U.S. societies. Offered in alternate years. GE credit: AH, VI, WC, WE. — de la Mora


171. Mexican and Chicana Mural Workshop (4) Studio—8 hours; independent study—1 hour. Prerequisite: course 70 and/or written consent of instructor. The mural: a collective art process that empowers students and people through design and execution of murals. Students in the tradition of the Mexican Mural Movement; introduces materials and techniques. May be repeated one time for credit. (Same course as Art Studio 171.) GE credit: ArtHum | AH, VL, WE. — I. de la Torre, M. Montoya

172. Chicana/o Voice/Poster Silk Screen Workshop (4) Studio—8 hours; independent study—1 hour. Prerequisite: course 70 and/or written consent of instructor. The poster as a voice art form used by Chicanas/o and other people of color to point to the defects of social and political existence and the possibility for change, from the Chicana/o art/artist perspective. May be repeated one time for credit. GE credit: AH, OL, VI, WC. — II. Jackson

180. Grant Writing in the Chicana/o/Latina/o Community (4) Lecture—4 hours. Prerequisite: course 10, 23 or consent of instructor. Upper division standing. Overview of key elements for grant writing. Topics include community needs assessments, development of human subjects protocols, data collection, methods, evaluation designs, and foundation based methodologies for grant development applications in the Latino community. — de la Torre

181. Chicanas and Latinas in the U.S.: Historical Perspectives (4) Lecture/discussion—4 hours. Prerequisite: course 10 or Women’s Studies 50. Historical issues in the lives of Chicanas, PuertoRichenanas, and Cubans in the U.S. and their countries of origin. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, OL, SS, WE. — I. Chabram

182. Race and Juvenile Justice (4) Lecture—4 hours. Prerequisite: course 10, Women’s Studies 10, or Sociology 10, or equivalent. Individual and institutional responses to “troublesome” youth of color through history and in contemporary society. Emphasis on how race, as well as ethnicity, class, and gender have informed the treatment of “delinquent” youth. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH, DD, OL, SS, WE. — de la Torre

184. Latina Youth Gangs in Global Perspective (4) Lecture—3 hours; term paper. Comparative analysis of Latina youth gangs in Jackie, Latin America, and the United States. Social, economic, political, and cultural factors leading to youth gangs as well as the responses are considered within a global perspective. Not open for credit to students who have completed course 1845. Offered in alternate years. GE credit: SocSci | ACGH, DD, OL, SS, WC, WE. — de la Torre

1845. Latino Youth Gangs in Global Perspective Lecture—12 hours. Comparative analysis of Latin youth gangs in Europe, Latin America, and the United States. Social, economic, political, and cultural factors leading to youth gangs as well as the responses to youth gangs are considered within a global perspective. Not open for credit to students who have completed course 184. Offered irregularly. GE credit: SocSci | ACGH, DD, OL, SS, WC, WE. — de la Torre

192. Internship in the Chicana/Chicano/Latina/Latino Community (1-12) Internship—3-36 hours. Prerequisite: course 10, 21, or 50, Spanish 3 or equivalent. Academic guidance combined with internship in community agencies serving Mexican/Latina/Latina/Chicana/Chicano clients. Use of bilingual skills and knowledge of history, culture, economics, politics and social issues. Internship project required. May be repeated for credit up to 12 units. (P/NP grading only.)

1925. Internship (1-12) Internship. Prerequisite: consent of instructor; course 10, 21, or 50; Spanish 3 or equivalent. May be repeated for credit (P/NP grading only.)

194HA-194HB-194HC, Senior Honors Research Project (2-5) Independent study—6-15 hours. Prerequisite: senior standing in Chicana/o Studies major. Student is required to read, research, and write Honors Thesis on Chicana/o Studies topics. (Deferred grading only, pending completion of sequence.) GE credit: OL, WE.

198. Directed Group Study (1-5) Prerequisite: upper division standing and consent of Program Chairperson. (P/NP grading only.)

1985. Directed Group Study (1-5) Prerequisite: consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5) Prerequisite: upper division standing and consent of Program Chairperson. (P/NP grading only.)

1995. Special Study for Advanced Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only.)

Graduate

230. Chicano/Latino Hispanic Politics (4) Seminar—3 hours; term paper. Prerequisite: two undergraduate courses in Chicano/o Studies or consent of instructor. Examination of Chicano/Latino political experiences. Evaluate theories, ideology, and practice of Chicano politics. Brief history of Chicano/Latino/Hispanic political activity, comparisons among political modes, gendered politics, and understanding relationships among Chicanos, Mexicans, and American and world politics. —Chabram

292S. Group Study for Graduate Students (1-5) Prerequisite: graduate standing, consent of instructor. May be repeated for credit when topic differs. (S/U grading only.)

299. Special Study for Graduate Students (1-12) Prerequisite: graduate standing and consent of instructor. (S/U grading only.)

Professional

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)

Child Development (A Graduate Group)

Katherine J. Conger, Ph.D., Group Chairperson

Group Office. 1315 Hart Hall

530-754-4109; http://humandevelopment.ucdavis.edu/

Faculty. See Human Development (A Graduate Group), on page 345.

Graduate Study. The Graduate Group in Child Development offers a multidisciplinary program leading to an M.S. degree. The program provides students with an opportunity to pursue a coordinated course of graduate study in the field of child development which cuts across departmental boundaries. Students may work with children and families in the community, as well as the University’s Center for Child and Family Studies. Recipients of the fellowship gain sufficient background to engage in professions that directly (e.g., preschool, 4-H) or indirectly (e.g., social policy) involve children and...
families, obtain positions in teaching or research settings, or pursue further study leading to a doctorate in child development, human development, clinical psychology, or related fields.

Applicants seeking admissions and fellowships consideration must submit all materials by our priority December 15 deadline. The final admissions deadline is March 1. See our website for more details.

Graduate Adviser. Contact Group office.

Chinese

See Asian American Studies, on page 171; East Asian Languages and Cultures, on page 223; and East Asian Studies, on page 228.

Cinema and Technocultural Studies

(College of Letters and Science)

Michael Neff, Ph.D., Program Director
Krisa Ravetto-Biagioli, Ph.D., Program Director

Committee in Charge
Sarah Pia Anderson, B.A. (Cinema and Technocultural Studies)
Jesse Drew, Ph.D. (Cinema and Technocultural Studies)
Joe Durnin, Ph.D. (Anthropology)
Jaimey Fisher, Ph.D. (German and Russian, Cinema and Technocultural Studies)
Colin M. Milburn, Ph.D. (English)
Michael Neff, Ph.D. (Computer Science, Cinema and Technocultural Studies)
Bob Ostertag, Ph.D. (Cinema and Technocultural Studies)
Krisa Ravetto-Biagioli, Ph.D. (Cinema and Technocultural Studies)
Eric Smoodin, Ph.D. (American Studies)
Julie Wyman, M.F.A. (Cinema and Technocultural Studies)

Faculty
Sarah Pia Anderson, B.A.
Jesse Drew, Ph.D.
Jaimey Fisher, Ph.D.
Colin M. Milburn, Ph.D.
Michael Neff, Ph.D.
Bob Ostertag, Ph.D.
Krisa Ravetto-Biagioli, Ph.D.
Julie Wyman, M.F.A.

Emeriti Faculty
Frances Dyson, Ph.D., Professor Emerita
Lynn Hershman, M.A., Professor Emerita

The Film Studies Major Program

The interdisciplinary major in Film Studies takes one of the most influential art forms of the twentieth century and today as its object of study. The field of Film Studies addresses the history, theory, and culture of this art form and asks questions about film texts themselves: modes of production (including everything from filmmakers’ aesthetic choices to the role of the global economic, historical, national, and cultural contexts); and spectators and audiences. Questions of gender, race, sexuality, and nationality, in all of these areas, have been central to Film Studies almost since its inception and continue to shape much of the work in the field. While the program emphasizes film history, criticism, and theory, students also have opportunities to explore film/video production.

The Program. Students majoring in Film Studies take upper-division courses in film history and film theory, as well as in at least three of five general areas of study. Students also develop a thematic emphasis, in consultation with an advisor, that draws on courses from at least two different departments/programs and that allows them to pursue their particular interests within the field of Film Studies. Students have the option of completing a senior thesis (either a written paper or an original film/video) within this emphasis.

Career Alternatives. The A.B. degree in Film Studies prepares students for a variety of careers in media industries: for example, local and national film and television producers, independent companies, local television newsrooms, community television stations, computer graphic companies, advertising and marketing companies, public relations departments, and film distribution and production companies wishing to pursue graduate work will be prepared to go on in film studies, as well as a variety of other fields that draw on interdisciplinary study: for example, American studies, English, history, and languages, drama, communication, computer science, cultural studies, women and gender studies, and ethnic studies programs. Many film studies students also choose to go on to law school, and the analytical skills, writing abilities, and familiarity with theoretical thought developed through the film major prepare them well for the study and practice of law.

A.B. Major Requirements:

Preparatory Subject Matter...........................................20-40

Film Studies 1 .................................................. 4
Film Studies 124 ........................................ 4

A four-course sequence in a single language or equivalent.............................................0-20

One course from: African American and African Studies 15, 50; American Studies 1A, 21, 30, Studio 30; Chicana/o Studies 50, 60; Design 1; French 50; Humanities 60; Italian 50; Japanese 25; Native American Studies 32; Textiles and Clothing 7; Women’s Studies 20, 25 ............................................. 4

One course from: African American and African Studies 10, 15, 50; Asian American Studies 1A, 1B, 1C, 1D; Chicana/o Studies 10, 50, 60; Native American Studies 1, 10, 12, 33; Women’s Studies 20, 25, 50, 70, 80 ............................................. 4

Two courses from: Art History 1A, 1B, 1C, 1D; Asian American Studies 2; Chinese 10, 11; Classics 10; Comparative Literature 3, 4, 5, 6, 7; Dramatic Art 1, 20; English 43, 44, 48; German 4C, 10C, 17B, 72B; Humanities 5, 6; Japanese 10; Music 10, 18; Native American Studies 33; Russian 41, 42 ............................................. 8

Note: One course may be from Design 15, 16 or Dramatic Art 10, 21A, 21B, 24.

Depth Subject Matter .............................................36-40

One course from: English 161A, 161 B or Film Studies 124 ........................................ 4
One course from: English 162; Film Studies 127, Philosophy 127; Women and Gender Studies 162 ............................................. 4
One course from: English 163; Media Studies 128; Textiles and Clothing 7; Women’s Studies 164 ............................................. 4

A current list of approved classes is available from the Advising office and from the faculty adviser.

UMT 16-20 units in one of the two breadth areas not used to satisfy the breadth requirement, or development of a thematic area in consultation with a faculty adviser........ 16-20

Qualified students who complete 20 units and have an overall GPA of 3.500 may choose the senior thesis option (194H-196H) for 8 of those 20 units. No course may be counted for more than one requirement for the major.

Total Units for the Major...........................................56-80

Minor Adviser. See Program office.

Minor Program Requirements:

Film Studies ..........................................................24

Upper division courses selected from the following list, with no more than two courses from any one category.................. 20

(a) Problems and Themes in Cinema: Anthropology 136, Classics 102, Dramatic Art 115, English 160, 161A, 161B, 162, Film Studies 124, 125, Women’s Studies 162

(b) Cinema, Nation and Nationality: German 119, 142, Film Studies 176A, 176B, Italian 150, Japanese 106, Russian 129, Spanish 148

(c) Film and Social Identities: African American and African Studies 170, 171, Film Studies 120, Jewish Studies 120, Women’s Studies 160, 164

(d) Film/Video Production: Art Studio 116, 117, 150

(e) Popular and Visual Culture: American Studies 130, 132, 133, 139, Art Studio 150, Communicative Science 165, Textiles and Clothing 107, Women’s Studies 139

Minor Adviser. See Program office.

The Technocultural Studies Major Program

The Technocultural Studies major is an interdisciplinary integration of current research in cultural history and theory with innovative hands-on production in digital media and “low-tech.” It focuses on the fine and performing arts, media arts, community media, literature and cultural studies as they relate to technology and science. Backed by critical perspectives and the latest forms of research and production skills, students enjoy the mobility to explore individual research and expression, project-based collaboration and community engagement.

The Program

Preparatory course work involves a solid introduction to the history, ideas and current activities of technocultural studies. For depth subject matter, students in the major select to concentrate on either critical studies or creative production emphases, and work toward a final project. All majors are required to take at least one course from another department or program relevant to their area of study, upon approval from Technocultural Studies, and may take more courses with approval. The final project for the critical studies emphasis consists of a substantial research paper. The final project for the creative production emphasis will be a major individual or collaborative work. Plans for final projects must be approved in advance.

Career Paths. Technocultural Studies is designed to prepare graduates to be highly adaptable, collaborative, multi-skilled and current with the latest developments. Perhaps most importantly is self-motivation: students do best when fueled by their own passions and plot their own directions, while held to very high standards. We feel this is the best education for living and working in a complex, rapidly changing world. Final research papers and creative production portfolios will provide graduate school admissions committees, employers or clients with tangible evidence of Technocultural Studies graduates’ track records and talents.

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): ACHV-American Cultures, DD-Domestic Diversity, Div;Wrt-Writing Experience

Fall 2011 and on Revised General Education (GE): AH-Arts and Humanities; SC-Science and Engineering; SS-Social Sciences, AGCH-American Cultures, DD-Domestic Diversity, OL-Oral Skills, QL-Quantitative, SL-Scientific, VL-Visual, WC-World Cultures, WE-Writing Experience
162. Surveillance Technologies and Social Media (4)
Lecture—3 hours; film viewing—3 hours; term paper.
Prerequisite: Technocultural Studies 1 or Science & Technology Studies 20. Study of the ubiquitous presence of CCTV, face recognition software, global positioning systems, biosensors, and data mining practices that have made surveillance part of our daily life. Study boundaries between security and control, information and spying. (Same course as Science & Technology Studies 162.) Offered in alternate years. GE credit: ACGH, AH or SS, Div, OL, VL, WE. —Ravetto

176A. Classic Weimar Cinema (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: Humanities 1. German Weimar (1919-1933) cinema. Fritz Lang, F.W. Murnau, and G.W. Pabst among others. Influence on world-wide (esp. Hollywood) film genres such as film noir, horror, science fiction, and melodrama. Not open for credit to students who have completed Humanities 176. Offered in alternate years. (Same Course as German 176A.) GE credit: ArtHum, Wrt | AH, OL, VL, WE, Div—II

176B. Postwar German Cinema (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 1. Exploration of German cinema from 1945 to 1980, when the Nazi past was a central theme. Study of postwar “Rubella films,” escapist “homeland films,” and New German Cinema of the 1970s (including films by Fassbinder, Kluge, Syberberg, and Herzog). Not open for credit to students who have completed Humanities 176. Offered in alternate years. GE credit: ArtHum, Wrt | AH, OL, VL, WE—II

189. Special Topics in Film Studies (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 1, upper division standing, or consent of instructor. Study of a special topic in film studies in a small class setting. May be repeated for credit if topic differs. (P/NP grading only.)—I, II, III. (I, II, III.)

190. Internship (1-12)
Supervised internship off and on campus in areas of Film Studies. May be repeated for credit. (P/NP grading only.)

194H. Special Study for Honors Students (1-5)
Variable—1.5 hours; independent study—3.5 hours. Prerequisite: senior standing, GPA of at least 3.500; consent of instructor. Guided research on a topic in Film Studies in preparation for the writing of an honors thesis in course 195H. May be repeated two times for credit. (P/NP grading only.)—I, II, III. (I, II, III.)

195H. Honors Thesis (1-5)
Independent study—3.5 hours. Prerequisite: course 194H, and consent of instructor; GPA of at least 3.500; senior standing. Writing of an honors thesis on a topic in Film Studies under the direction of a faculty member. May be repeated two times for credit. (P/NP grading only.)—I, II, III. (I, II, III.)

196H. Honors Project (1-5)
Project—3.5 hours. Prerequisite: course 194H and consent of instructor; GPA of at least 3.500; senior standing. Creation of an honors film, video, or mixed-media project under the direction of a faculty member. May be repeated two times for credit. (P/NP grading only.) GE credit: AH, VL, WE, Div—II, III. (I, II, III.)

1977. Tutoring in Film Studies (1-5)
Tutorial—3-15 hours. Prerequisite: consent of program director. Leading of small voluntary discussion groups affiliated with one of the program’s courses. May be repeated for credit. (P/NP grading only.)

198. Directed Group Study (1-5)
(P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.)

Professional
396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit (S/U grading only.)

Courses in Technocultural Studies (TCS)
Lower Division
1. Introduction to Technocultural Studies (4)
Lecture—3 hours; extensive writing. Contemporary developments in the fine and performing arts, media arts, digital and network arts, and literature as they relate to technological and scientific practices. GE credit: ArtHum | AH, VL, WE—Oster Tag

2. Critiques of Media (4)
Lecture/discussion—3 hours; term paper. Introduction to digital image and visual communication, with focus on creative responses to the media within visual arts, media arts, and net culture. Response of artists to the power of mass media, from early forms of photojournalism through contemporary “culture-jamming” and alternative media networks. GE credit: ArtHum | AH, VL, WE—Wymann

4. Parallels in Art and Science (4)
Lecture—3 hours; term paper. Issues arising from historical and contemporary encounters between the arts and science, with emphasis on comparative notions of research, experimentation, and progress. GE credit: ArtHum | AH, VL, WE.

5. Media Archaeology (4)
Lecture/discussion—3 hours; term paper. Evolution of media technologies and practices beginning in the 19th Century as they relate to contemporary digital arts practices. Special focus on the reconstitution of the social and artistic possibilities of lost and obsolete media technologies. GE credit: ArtHum or SciEng | AH or SE, VL, WE.

6. Technoculture and the Popular Imagination (4)
Lecture—3 hours, extensive writing. Issues of technological and scientific developments as conveyed through mass media and popular culture with special attention to public spectacle, exhibitions, broadcasts, performances, and literary and journalistic accounts. GE credit: ArtHum | AH, VL, WE—Kahn

7A-E. Technocultural Workshop (1)
Seminar—1 hour. Workshops in technocultural digital skills: (A) Digital Imaging; (B) Digital Video; (C) Digital Sound; (D) Web Design; (E) Topics in Digital Production. GE credit: VL | I, (I.)

Upper Division
100. Experimental Digital Cinema I (4)
Lecture/discussion—3 hours; laboratory—3 hours. Experimental approaches to the making of film and video in the age of digital technologies. Opportunities for independent producers arising from new media: Instruction in technical, conceptual, and creative skills for taking a project from idea to fruition. GE credit: VL—Wymann

101. Experimental Digital Cinema II (4)
Lecture/discussion—3 hours; laboratory—3 hours. Prerequisite: course 100. Continuation of course 100 with further exploration of digital cinema creation. Additional topics include new modes of distribution, streaming, installation and exhibition. GE credit: VL—Wymann

103. Interactivity and Animation (4)
Lecture/discussion—3 hours; laboratory—3 hours. Fundamentals of creating interactive screen-based work. Theories of interactivity, linear versus nonlinear story structures, and audience involvement and participation. Use of digital production tools to produce class projects. GE credit: VL—Wymann

104. Documentary Production (4)
Lecture/discussion—3 hours; project. Prerequisite: course 78 or the equivalent, course 155. Traditional and new forms of documentary, with focus on technocultural issues. Skills and strategies for producing work in various media. GE credit: VL. The theoretical and stages of production, from conception through post-production to critique. GE credit: VL—Drew, Wyman

110. Object-Oriented Programming for Artists (4)
Lecture/discussion—3 hours; laboratory—3 hours. Prerequisite: course 1. Introduction to object-oriented programming for artists. Focus on understanding the metaphors and potential of object-oriented programming for video, sound, performance, and interactive installations. GE credit: VL—I, II, III. Oster Tag

111. Community Media Production (4)
Lecture/discussion—3 hours; laboratory—3 hours. Use of video and new media tools to address social issues among neighborhood and community groups. Students will use basic video, sound, and lighting techniques as they work with local groups in a group video project. GE credit: VL—II, III.

112. New Radio Features and Documentary (4)
Lecture/discussion—3 hours; laboratory—3 hours. New feature and documentary production for radio and other audiophonic media, including podcasting and streaming Web sites and installation. Emphasis on new and experimental approaches to audio production for broadcast on community radio and in international arts programming.

113. Community Networks (4)
Lecture/discussion—3 hours; laboratory—3 hours. Impact and implications of computer-based networks in community, civic, and social life. Subjects may include community access computer sites, neighborhood, and other peer networks, the digital divide, open-source software, and citizen action.

115. Electronics for Artists (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 1. Creative application of electronic technology relevant to media and fine arts involving both electronic principles and hands-on application. GE credit: VL.—III. (III.)

120. History of Sound in the Arts (4)
Lecture—3 hours; term paper. Prerequisite: course 1. A survey of the use of sound, voice, noise, and noise in the modernist, avant-garde, and experimental arts, from the late 19th Century to the present. Focus on audiosonic and audiovisual technologies. GE credit: VL—Kahn

121. Introduction to Sonic Arts (4)
Lecture/discussion—3 hours; lecture/ laboratory—3 hours. Prerequisite: course 7C. Introduction to the use of sound within the arts. Techniques and aesthetics of experimental contemporary practices. Creation of original sound works. GE credit: VL.

122. Intermediate Sonic Arts (4)
Lecture/discussion—3 hours; laboratory—3 hours. Prerequisite: course 121. Creative application of electronic technology to media production, editing, mixing, and synthesis to combine voice, field recordings, and electronic signals. Incorporating live, recorded, and found sounds to create multi-dimensional stories. Techniques of live performance, audio recording, and sound installation. GE credit: VL.

123. Sight and Soundtrack (4)
Lecture/discussion—3 hours; laboratory—3 hours. Prerequisite: courses 7C, 121. A survey of the use of sound to articulate, lend mood or subconsciously underscore visual, environmental or performative situations,
125. Advanced Sound: Performance and Improvisation (4) Lecture/discussion—3 hours; term paper. Focus on telepresence, and simulated experience. Focus on the evolution of modern technolog-ies. Media as the cohesive and persuasive force of mass culture. GE credit: VL.—Dyson
158. Media Subcultures (4) Lecture/discussion—3 hours; term paper. Relationships between subcultural groups and media technol-ogies. GE credit: Div | ACGH, VL.—Dyson
160. Ghosts of the Machine: How Technology Rewires our Senses (4) Lecture—3 hours; extensive writing. Consent of instructor. Lecture and intensive workshop teaching small-scale film production. Appointments as an/ah director, actor of photography, actor, writer, lighting designer, sound designer and other critical positions are used to produce and submit a short film to a film festival. (Same course as Dramatic Art 175.) May be repeated two times for credit.—III. (III.) Anderson, Drew
190. Research Methods in Technocultural Studies (4) Lecture/discussion—3 hours; project. Introduction to basic research methods for Technocultural Studies: electronic and archived images, sounds and data, satellite downlinking, radiowave scanning, and oral histories. GE credit: VL. WE. —Drew
191. Writing Across Media (4) Lecture/discussion—3 hours; extensive writing. Introduction to experimental approaches to writing for different media and artistic practices. How written texts relate to the images, sounds, and performances in digital and media production. GE credit: WE. —Jones
197. Tutoring in Technocultural Studies (1-5) Tutorial—3-15 hours. Prerequisite: consent of instruc-tor. Undergraduates assist the instructor by tutoring students in one of the department’s regularly sched-uled courses. May be repeated for credit up to eight units. (P/NP grading only.)—I, II, III. (I, II, III.)
198. Directed Group Study (1-5) Prerequisite: consent of instructor. (P/NP grading only.)
199. Special Study for Advanced Undergraduates (1-5) Prerequisite: consent of instructor. Guided study with faculty member in independent scholarly activity. May be repeated for credit up to eight units. (P/NP grading only.)

Classics

(Conference of Letters and Science)
Rex Stem, Ph.D., Program Director
Department Office. Classics Program
215 Sprout Hall
530/572-0835; http://classes.ucsd.edu

Faculty
Don Abbott, Ph.D., Professor (English) Emily Albu, Ph.D., Professor
Noha Radwan, Ph.D., Associate Professor
(California Literature)
Lynn E. Reller, Ph.D., Professor (Art History)
Carey Seal, Ph.D., Assistant Professor
Jocelyn Sharlet, Ph.D., Associate Professor
(California Literature)
Rex Stem, Ph.D., Associate Professor

Emeriti Faculty
Seth L. Schein, Ph.D., Professor Emeritus
David A. Traill, Ph.D., Professor Emeritus
Wesley E. Thompson, Ph.D., Professor Emeritus

Affiliated Faculty
Tim Brelnski, Ph.D., Lecturer
Poonam Chauhan, M.A. Lecturer
Galia Frano, M.A. Lecturer
Shayma Hassouna, M.A. Lecturer
Valentina Papescu, Ph.D., Lecturer
John Rudin, Ph.D., Lecturer

The Major Program
Classical Civilization is an interdisciplinary major that examines the ancient Mediterranean cultures of Greece, Rome and the Near East, with courses offered on the languages, history, literature, religi-ons, myths, and archaeology of these societies, their achievements in rhetoric and philosophy, and their political and social institutions. Minor programs in Classical Civilization, Greek, and Latin, and many General Education courses are offered also.

The Program. The major has two tracks: (1) Classical and Mediterranean Civilizations, and (2) Classical Languages and Literatures. The core of both major tracks consists of two years of Latin, Greek or Hebrew, the introductory sequence on the ancient Mediterranean world (Classics 1, 2, 3), the advanced seminar (Classics 190), and a number of electives. The Classical and Mediterranean Civilizations track allows students to choose their electives from a broadly balanced program in history, art and archaeology, literature, philosophy and rhetoric. The Classical and Mediterranean Civilizations track focuses more intensively on language and literature, requiring the study of two languages and allowing fewer electives. Students planning to go on to graduate work in Classics should take Track 2 and study as much Latin and Greek as possible. They should make a point of talking to an advisor early in their undergraduate program. They are also advised to acquire a reading knowledge of French or German.

Career Opportunities. A degree in Classical Civil-ization represents a solid liberal arts education that provides an excellent foundation for a wide variety of careers. In the last twenty-five years, many majors have applied to law or medical schools and nearly all have been accepted. Additional career options include library and museum work, teaching, journalism, and graduate study in Classics, art, archaeology, history, literature, philosophy, and religion.

Classical Civilization

A. B. Major Requirements: UNITS
Classical and Mediterranean Civilizations track
Prerequisite Subject Matter.................. 26-27
Latin 1-2-3, or Greek 1-2-3, or Hebrew 1-2-3

Quarter Offered: I=Fall; II=Winter; III=Spring; IV=Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Domestic Diversity; Writ—Writing Experience
Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures, DD—Domestic Diversity, OL—Oral Skills, QL—Quantitative, SL—Scientific, VL—Visual, WC—World Cultures; Writ—Writing Experience
Hons Program. Candidates for high or highest honors in Classical Civilization must write a senior honors thesis under the direction of a faculty member in Classics. Potential candidates for the honors program must enroll in Classics 194HA and 194HB, normally during the first two quarters of the senior year. Enrollment is limited to upper division students with a minimum of 125 units, and a 3.50 grade point average in courses in the Classical Civilization major. For further information, students should consult with the major advisor or program director. The requirements for the honors program are in addition to the regular requirements for the major in Classical Civilization.

Graduate Study. The Department offers a master's degree in Classics with emphasis on either Greek or Latin, however, admission into the graduate program has been suspended.

Prerequisite credit. Credit will not normally be given for a lower division course in Latin or Greek if it is the prerequisite already successfully completed. Exceptions can be made by the Program Director only.

Courses in Arabic, Classics, Greek, Hebrew, Hindi-Urdu, and Latin follow in alphabetical order.

Courses in Arabic (ARB)

Lower Division

1. Elementary Arabic 1 (5)
Lecture/discussion—5 hours. Introduction to basic Arabic. Interactive and integrated presentation of listening, speaking, reading, and writing skills, including the alphabet and basic syntax. Focus on standard Arabic with limited use of spoken Egyptian and/or one other colloquial dialect. GE credit: ArtHum | AH. —Hassouna

2. Elementary Arabic 2 (5)
Lecture/discussion—5 hours. Prerequisite: course 1 or with instructor after taking all parts of the course 1 final exam. Continues introduction to basic Arabic from course 1. Interactive and integrated presentation of listening, speaking, reading, and writing skills, including syntax. Focus on standard Arabic with limited use of spoken Egyptian and/or one other colloquial dialect. GE credit: ArtHum | AH. —II. (II.) Hassouna

3. Elementary Arabic 3 (5)
Lecture/discussion—5 hours. Prerequisite: course 1 and 2 or with consent of instructor after taking all components of the course 1 final exam. Continues introduction to basic Arabic from courses 1 and 2. Interactive and integrated presentation of listening, speaking, reading, and writing skills, including syntax. Focus on standard Arabic with limited use of spoken Egyptian and/or one other colloquial dialect. GE credit: ArtHum | AH. —III. (III.) Hassouna

22. Intermediate Arabic 22 (5)
Lecture/discussion—5 hours. Prerequisite: course 21 or with consent of instructor after taking all parts of course 21 exam. Continues from course 21. Interactive and integrated presentation of listening, speaking, reading, and writing skills, including idiomatic expression. Focus on standard Arabic with limited use of Egyptian and/or one other colloquial dialect. GE credit: ArtHum | AH. —II. (III.) Hassouna

23. Intermediate Arabic 23 (5)
Lecture/discussion—5 hours. Prerequisite: course 22 or with consent of instructor after completing all parts of the final exams for courses 21 and 22. Continues from courses 21 and 22. Interactive and integrated presentation of listening, speaking, reading, and writing skills, including idiomatic expression. Focus on standard Arabic with limited use of Egyptian and/or one other colloquial dialect. GE credit: ArtHum | AH. —III. (III.) Hassouna

Upper Division

121. Advanced Arabic (4)
Lecture/discussion—3 hours. Term paper. Prerequisite: course 23 or consent of instructor. Review, refinement, and development of skills learned in intermediate Arabic through work with texts, video, and audio on cultural and social issues. Integrated approach to reading, writing, listening, and speaking standard Arabic. GE credit: ArtHum | AH, WC. —I. (I.) Sharlet

122. Advanced Arabic (4)
Lecture/discussion—3 hours. Prerequisite: course 121 or permission of instructor. Continuation of course 121. Further development of advanced skills in reading, writing, listening, and speaking standard Arabic through work with texts, video, and audio on cultural and social issues. Limited use of one colloquial dialect. GE credit: ArtHum | AH, WC. —II. (II.) Radwan

123. Advanced Arabic (4)
Lecture/discussion—3 hours. Prerequisite: course 122 or permission of instructor. Continuation of course 122. Further development of advanced skills in reading, writing, listening, and speaking standard Arabic through work with texts, video, and audio on cultural and social issues. Limited use of one colloquial dialect. GE credit: ArtHum | AH, WC. —III. (III.) Radwan

144. A Story for a Life: The Arabian Nights (4)
Lecture/discussion-3 hours; term paper. In-depth investigation of the best-known work of pre-modern Arabic literature, taught in translation. Not open for credit to students who have taken Middle East/South Asia Studies 121A. (Same course as Middle East/South Asia Studies 121A.) Offered in alternate years. GE credit: ArtHum | AH, OL, WC, WE. —I. (I.) Sharlet

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. Development of reading, writing, speaking, and listening skills in advanced Arabic. Materials may include al-Kitaab Part Two or Three, news articles and broadcasts, short stories, poetry, novels, essays, scripture, pro-phectic traditions, audio recordings, and television and film. May be repeated four times for credit if content differs. (P/NP grading only).—I, II, II, III.

Graduate

299. Individual Study (1-12)
Prerequisite: graduate standing. Restricted to Gradu- ate students. May be repeated for credit. (S/U grading only).—I, II, III. (I, II, III.)

Professional

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. Restricted to Gradu- ate students. May be repeated 18 times for credit. (S/U grading only).—I, II, III. (I, II, III.)
Courses in Classics (CLA)

**Lower Division**

   Lecture—3 hours; term paper. Introduction to the literature, art, and social and political institutions of ancient Mesopotamia, Egypt, Palestine, and early Greece from 3000 to 500 B.C.E. GE credit: ArtHum, Wrt | AH, WC, WE.—II. (II) Popescu

2. **Ancient Greece and the Near East: 500 to 146 B.C.E. (4)**
   Lecture—3 hours; term paper. Introduction to the literature, art, and thought and the political and social institutions and values of Greece and its eastern Mediterranean neighbors—the Persians, Egyptians, and Jews. GE credit: ArtHum, Wrt | AH, WC, WE.—II. (II) Stem

   Lecture—3 hours; discussion—1 hour. Introduction to the history, literature, culture, political and social institutions and values of Roman Civilization, with an emphasis on the development of the Roman Empire and the interactions of Roman culture with other Mediterranean cultures. GE credit: ArtHum | AH, WC, WE.—II. (II) Stem

4. **Greek, Roman, and Near Eastern Mythology (3)**

5. **Women in Classical Antiquity (4)**
   Lecture/discussion—3 hours; term paper. Lives and roles of women and men in ancient Greece and Rome. Readings from history, philosophy, medical and legal documents, literature and myth. Offered irregularly. GE credit: ArtHum | AH, VL, WC, WE.—Seal

6. **Pompeii AD 79 (4)**
   Lecture—3 hours; term paper. Roman life in an urban community at the time of the eruption of Vesuvius. Slide presentations of the archeological evidence will be supplemented by selected readings from Petronius’ Satyricon and other ancient authors. Offered irregularly. GE credit: ArtHum, Wrt | AH, VL, WC, WE.

7. **The Classical Heritage in America (4)**
   Lecture/discussion—3 hours; term paper. Classical heritage. Notes on the influence of ancient Greece and Rome, and the United States from its colonial past to the present day. The reception of Greco-Roman thought and values as expressed in art, architecture, education, law, government, literature, and film. Offered irregularly. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—Albu

8. **Greek and Latin Elements in English Vocabulary (3)**
   Lecture—3 hours. Knowledge of Latin and Greek not required. Elements of Greek and Latin vocabulary for increased understanding of English word formation and improved ability to understand and retain unfamiliar words. Emphasis on Greek and Latin elements but other languages not neglected. Not open for credit to students who have completed course 30F. GE credit: ArtHum | AH.—I, II, III, IV. (I, II, III, IV) Albu, Popescu, Rundin

9. **Greek and Latin Elements in Technical Vocabulary (3)**
   Lecture—3 hours. Knowledge of Greek and Latin not required. Elements of Greek and Latin vocabulary to increase understanding of English word formation in medical, scientific and technical terminology and improve ability to understand and retain unfamiliar terms. GE credit: ArtHum | AH.

10. **The Rise of Science in Ancient Greece (4)**
    Lecture/discussion—3 hours; term paper. Prerequisite: Mathematics 16A or the equivalent. Study of the emergence of scientific rationality in ancient Greece and its political and social context; concentration on four areas: mathematics, medicine, cosmology, and psychology. Reading from the Presocratics, Hippocrates, Plato, Aristotle, and Hellenistic philosophers. GE credit: ArtHum, Wrt | AH, WC, WE.

**Upper Division**

101A. **Readings in Arabic: 600-1850 (4)**
    Discussion—3 hours; extensive writing. Prerequisite: course 123 or the equivalent; students who have not completed course 123 should consult the instructor in advance of their application. Reading in Arabic. Poetry, prose literature, and selections from texts on religion, history, politics, science, philosophy and mysticism. Students can repeat the course one time if the instructor decides that they would benefit from additional practice working on the different selections from the same texts or if 50% or more of the texts are different. Offered irregularly. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, OL, WC, WE.—Hassouna, Radwan, Sharlet

101B. **Topics in Greek Civilization (4)**
    Lecture/discussion—3 hours; term paper. Prerequisite: one course in Classics, Latin or Greek or consent of instructor. Considered by time or place (e.g. the world of Homer) or by thematic genre (e.g. the Greek war of art). May be repeated two times for credit with topic different. Offered irregularly. GE credit: ArtHum | AH, WC, WE.—Albu

101C. **Topics in Roman Civilization (4)**
    Lecture/discussion—3 hours; term paper. Prerequisite: one course in Classics, Latin or Greek or consent of instructor. Topics may be ordered by time or place (e.g. Julius Caesar around age 18) or by thematic genre (e.g. gladiators: blood in the arena). May be repeated two times for credit with topic different. Offered irregularly. GE credit: ArtHum | AH, WC, WE.—Albu

101D. **Topics in Classical Receptions (4)**
    Lecture/discussion—3 hours; term paper. Prerequisite: one course in Classics or consent of instructor. Topics in classical reception from late antiquity to the present. Topics may be ordered by place (e.g. the classical tradition in Washington, D.C.) or by thematic genre (e.g. cinematic representations of the ancient world). May be repeated twice for credit when topic differs. Offered irregularly. GE credit: ArtHum | AH, WC, WE.—Albu

102. **Film and the Classical World (4)**
    Lecture—3 hours; film viewing—2.5 hours. Prerequisite: any Classics course except 30 or 31. The Classical World as portrayed in films. Viewings and discussions of modern versions of ancient dramas, modern films set in the ancient world, and films imbued with classical themes and allusions. Supplementary readings in ancient literature and mythology. GE credit: ArtHum, Wrt | AH, WE.—I, II Albu

110. **Origins of Rhetoric (4)**
    Lecture—3 hours; term paper. Prerequisite: one course in ancient history or consent of instructor. Issues in the development of rhetoric from its origins in ancient Greece to A.D. 430. Special attention to works of Plato, Aristotle, Cicero, and Quintilian. Role of grammar and rhetoric in schools of Roman Empire. The Christian rhetoric of Saint Augustine. Not open for credit to students who have completed Rhetoric and Communication 110 or Communication 110. GE credit: ArtHum, Wrt | AH, WE.—III.

120. **Greek and Roman Historiography (4)**
    Lecture/discussion—3 hours; term paper. Survey of Greek and Roman historical writing in English translation. Authors to be read may include Herodotus, Thucydides, Sallust, and Polybius. Focus on the development of historical writing as a literary genre. GE credit: ArtHum | AH, WC, WE. Offered in alternate years.—Seal

125. **Roman Political Thought (4)**
    Lecture—3 hours; term paper. Survey of Roman thinking about politics, as expressed both in formal theorizing and in a variety of contexts, including oratory, historiography, and epic. Study of Roman political reflection in its historical, cultural, and literary context. GE credit: ArtHum | AH, WC, WE. Offered in alternate years.—Seal

140. **Homer and Ancient Epic (4)**
    Lecture/discussion—3 hours; term paper. Prerequisite: course 10 or Comparative Literature I. Reading of the classical epics of Homer (Iliad, Odyssey) and Virgil (Aeneid) in English. Discussion of techniques of composition, the beliefs and values of their respective societies, and the generic tradition of ancient epic. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE.—Popechu

141. **Greek and Roman Comedy (4)**
    Lecture—3 hours; conference—1 hour. Readings in Aristophanes, Menander, Plautus, and Terence; lectures on the development of ancient comedy. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE.—Popechu

142. **Greek and Roman Novel (4)**
    Lecture—3 hours; term paper. Examination of the ancient Greek romances and their development into the grotesque realism of Petronius, and the religious mysticism of Apuleius’ The Golden Ass. GE credit: ArtHum, Wrt | AH, WE, WE.—Schein

143. **Greek Tragedy (4)**
    Lecture/discussion—3 hours; term paper. Prerequisite: course 10. Reading in modern plays of Aeschylus, Sophocles, and Euripides. Discussion of the development and influence of Athenian tragedy. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE.—Seal

150. **Socrates and Classical Athens (4)**
    Lecture/discussion—3 hours; term paper. Study of the major sources of our knowledge of Socrates, assessment of his role in the politics and culture of ancient Athens, his methods of analysis and his place in Western thought. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—Seal

171. **Mediterranean Bronze Age Archaeology (4)**
    Lecture—3 hours; extensive writing. Prerequisite: one of course 1, 2, 10, 15, Art History 1A, or Anthropology 3 recommended. Archaeological monuments of the ancient Near East, including Egypt and Mesopotamia, and of Greece and Crete during the Bronze Age. Special emphasis on the problems of state formation and on the co-existence and collapse of Bronze Age societies. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, WE, WE.—Roller

172A. **Early Greek Art and Architecture (4)**
    Lecture—3 hours; term paper. Examination of the origin and development of the major monuments of Greek art and architecture from the eighth century to the mid-fifth century B.C. Not open for credit to students who have completed Art History 154A. (Same course as Art History 172A.) Offered in alternate years. credit: ArtHum, Wrt | AH, VL, WC, WE.—Roller

172B. **Later Greek Art and Architecture (4)**
    Lecture—3 hours; term paper. Study of the art and architecture of later Classical and Hellenistic Greece, from the mid-fifth century to the first century B.C. Not open for credit to students who have completed Art History 154B. (Same course as Art History 172B.) Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—Roller

173. **Roman Art and Architecture (4)**
    Lecture—3 hours; term paper. Art and architecture of Rome and the Roman Empire, from the founding of Rome through the fourth century C.E. (Same course as Art History 173.) Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—Roller

174. **Greek Religion and Society (4)**
    Lecture—3 hours; term paper. Prerequisite: a lower division Classics course, except Classics 3, 20, 30, or 31. Cults, festivals, and rituals of Greek religious practice and their relationship to Greek social and
175. Architecture and Urbanism in Mediterranean Antiquity (4)
Lecture—3 hours; extensive writing. Prerequisite: a lower division course except 30, 31; Art History 1A recommended. Architecture and urban development in the ancient Near East, Greece, and Rome. Special emphasis on the social structure of the ancient city as expressed in its architecture, and on the interaction between local traditions and the impact of Greco-Roman urbanism. (Same course as Art History 175.) Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE.—Ruller

190. Senior Seminar (4)
Seminar—3 hours; term paper. Prerequisite: completion of one upper division course in Latin, Greek or Hebrew or consent of instructor. Advanced interdisciplinary study of a problem in the ancient Mediterranean world using the techniques of history, archaeology, art history and philology. May be repeated for credit with consent of instructor. GE credit: ArtHum, Wrt | AH, WE.—I. Roller

194HA-194HB. Special Study for Honors Students (3-3)
Discussion—1 hour, independent study; term paper. Prerequisite: admission to the honors program and consent of faculty member supervising honors thesis. Directed reading, research, and writing culminating in the completion of a senior honors thesis under the direction of a faculty adviser. (Deferral grading only; pending completion of sequence. P/NP grading only.) GE credit: AH.—II. Ill.

197C. Community Tutoring in Classical Languages (1-5)
Tutoring—1-5 hours. Prerequisite: consent of instructor. Supervised instruction of Greek or Latin in nearby schools by qualified students in department. May be repeated for credit up to 5 units. (P/NP grading only)

198. Directed Group Study (1-5)
Prerequisite: upper division standing. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: upper division standing and consent of instructor. (P/NP grading only)

Graduate

200A. Approaches to the Classical Past (4)
Seminar—3 hours; term paper. Survey of major areas of classical scholarship, with special emphasis on the continuing impact of Mediterranean antiquity on later literature, history, art, and culture. Offered in alternate years. GE credit: ArtHum, Wrt.—I. Albu

200B. Approaches to the Classical Past (4)
Independent study—4 hours. Prerequisite: course 200A; graduate student status. Research project on major area of Classical scholarship, with special emphasis on the continuing impact of Mediterranean antiquity on later literature, history, art, and culture. Limited enrollment. Offered in alternate years. —III. Albu

201. Introduction to Classical Philology (4)
Seminar—3 hours; term paper. Survey of major contemporary areas of classical scholarship with special attention devoted to current problems in literary and textual criticism.

202. Homer (4)
Seminar—3 hours; term paper. Readings in the Iliad and Odyssey: the origins and transmission of the poems.

203. Vergil (4)
Seminar—3 hours; term paper. Reading of selected books of the Eclogues, Georgics, and Aeneid. Emphasis will be placed on the study of Vergilian poetic language.—Traill

204. Greek and Roman Comedy (4)
Seminar—3 hours; term paper. Historical and critical problems of Aristophanes or New Comedy. May be repeated for credit.

205. Latin Lyric and Elegy (4)
Seminar—3 hours; term paper. Critical examination of the works of Catullus, Horace, or Propertius. May be repeated for credit.

206. Greek Historiography (4)
Seminar—3 hours; term paper. Development of historical writing in Greece. May be repeated for credit.

207. Greek Drama (4)
Seminar—3 hours; term paper. Literary and philosophical analysis of Euripides, Sophocles, or Aeschylus. May be repeated for credit.

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only)

Professional

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III.)

Courses in Greek (GRK)

Lower Division

1. Elementary Greek (5)
Lecture—5 hours. Introduction to the basic grammar and vocabulary of Classical and New Testament Greek. Development of translation skills with emphasis on Greek-English. (Students who have successfully completed Greek 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student's P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed.) GE credit: ArtHum | AH.—I. (I.) Popescu

2. Elementary Greek (5)
Lecture—5 hours. Prerequisite: course 1. Continuation of course 1. GE credit: ArtHum | AH.—II. (II.) Popescu

2NT. Elementary New Testament Greek (1)
Lecture—1 hour. Prerequisite: course 2 (concurrently). Supplementary study of New Testament Greek. GE credit: ArtHum | AH.—II. (II.) Popescu

3. Intermediate Greek (5)
Lecture—5 hours. Prerequisite: course 2. Continuation of course 2. Selected readings from Greek authors. GE credit: ArtHum | AH.—III. (III.) Popescu

3NT. Elementary New Testament Greek (1)
Lecture—1 hour. Prerequisite: course 3 (concurrently). Supplementary study of New Testament Greek. GE credit: ArtHum | AH.—III. (III.) Popescu

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Upper Division

100. Readings in Greek Prose (5)
Lecture/discussion—4 hours; term paper. Prerequisite: course 2 or 3. GE credit: ArtHum, Wrt | AH, WE.—I. (I.) Seal

101. Plato (4)
Lecture—3 hours; term paper. Prerequisite: course 3. GE credit: ArtHum, Wrt | AH, WE.—II. (II.) Seal

102. Euripides (4)
Lecture—3 hours; term paper. Prerequisite: course 101. GE credit: ArtHum, Wrt | AH, WE.—III. Popescu

103A. Homer: Iliad (4)
Recitation—3 hours; term paper. Prerequisite: course 3. GE credit: ArtHum, Wrt | AH, WE.—II. (II.) Schein

103B. Homer: Odyssey (4)
Recitation—3 hours; term paper. Prerequisite: course 3. GE credit: ArtHum, Wrt | AH, WE.—II. (II.) Schein

104. Menander (4)
Lecture—3 hours; term paper. Prerequisite: course 3. GE credit: ArtHum, Wrt | AH, WE.

105. Attic Orators (4)
Lecture—3 hours; term paper. Prerequisite: course 100 or equivalent. Selected readings from the orators of 4th and 5th century Athens. May be repeated for credit if topic differs and with consent of instructor. Offered irregularly. GE credit: ArtHum | AH, WE.

110. Readings in the Greek Novel (4)
Lecture—3 hours; term paper. Prerequisite: course 100N. Selected readings from Greek prose fiction of the late classical, Hellenistic and imperial periods. Offered in alternate years. May be repeated two times for credit with consent of instructor. GE credit: Wrt.—III.

111. Sophocles (4)
Lecture—3 hours; term paper. Prerequisite: course 103. GE credit: ArtHum, Wrt | AH, WE.—(II.) Schein

112. Aristophanes (4)
Lecture—3 hours; term paper. Prerequisite: course 103. GE credit: ArtHum, Wrt | AH, WE.

113. Thucydides (4)
Lecture—3 hours; term paper. Prerequisite: course 103. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE.—Popescu

114. Lyric Poetry (4)
Lecture—3 hours; term paper. Prerequisite: course 103. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE.—Popescu

115. Aeschylus (4)
Lecture—3 hours; term paper. Prerequisite: course 103. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE.—Schein

116. Herodotus (4)
Lecture—3 hours; term paper. Prerequisite: course 103. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE.—Schein

121. Greek Prose Composition (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100 or equivalent. Intensive grammar and vocabulary review through exercises in Greek prose composition. Offered in alternate years. GE credit: ArtHum | AH.

130. Readings in Later Greek (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100 or equivalent. Translation and discussion of selected readings from Hellenistic to Byzantine Greek literature. Offered in alternate years. GE credit: ArtHum | AH, WE.

198. Directed Group Study (1-5)
(P/NP grading only).

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only)

Courses in Hebrew (HEB)

Lower Division

1. Elementary Hebrew (5)
Lecture/discussion—4 hours; laboratory—1 hour. Speaking, listening, comprehension, reading and writing fundamentals of modern Hebrew. (Students who have successfully completed, with a C- or better, Hebrew 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student’s P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed.) GE credit: ArtHum | AH.

1. Accelerated Intensive Elementary Hebrew (5)
Lecture/discussion—15 hours. Special 12 week accelerated, intensive summer session course that combines the work of courses 1, 2, and 3. Introduces to Hebrew grammar and development of language skills in a cultural context with emphasis on
2. Elementary Hindi/Urdu II (5)
Lecture/discussion—5 hours. Prerequisite: course 1. An introduction to Hindi and Urdu in which students will learn vocabulary and grammar in both Devanagari and Urdu scripts, and will practice skills in reading, writing, speaking and listening. GE credit: ArtHum | AH. —II. (II.) Franco

3. Elementary Hindi/Urdu III (5)
Lecture/discussion—5 hours. Prerequisite: course 2. An introduction to Hindi and Urdu in which students will learn vocabulary and grammar in both Devanagari and Urdu scripts, and will practice skills in reading, writing, speaking and listening. GE credit: ArtHum | AH. —III. (III.) Franco

21. Intermediate Modern Hebrew I (5)
Lecture/discussion—5 hours. Prerequisite: course 2 or the equivalent. Speaking, listening, comprehension, reading and writing fundamentals of modern Hebrew. GE credit: ArtHum | AH. —II. (II.) Franco

22. Intermediate Modern Hebrew II (5)
Lecture/discussion—5 hours. Prerequisite: course 21 or consent of instructor. Continued development and refinement of grammar, composition, and language skills required for reading literary texts and conversing about contemporary topics at an advanced level. History of the Hebrew language, taught to students who have taken courses 100 or 100A. —I. (I.) Franco

23. Intermediate Modern Hebrew III (5)
Lecture/discussion—5 hours. Prerequisite: course 22 or consent of instructor. Continued development and refinement of grammar, composition, and language skills required for reading literary texts and conversing about contemporary topics at an advanced level. History of the Hebrew language. Further development of writing and translating skills. Not open to students who have taken course 100C or 102. —II. (III.) Franco

Upper Division
100AN. Advanced Modern Hebrew I (4)
Lecture/discussion—3 hours, term paper. Prerequisite: course 23 or consent of instructor. Students who have taken course 100A as 2nd year Hebrew may take course 100AN. Third year Hebrew. Advanced grammar and composition. Focus on reading of literary texts, oral skills and accuracy in writing. GE credit: ArtHum | AH. —I. (I.) Franco

100BN. Advanced Modern Hebrew II (4)
Lecture/discussion—3 hours, term paper. Prerequisite: course 100AN or consent of instructor. Students who have taken course 100B as 2nd year Hebrew may take course 100BN. Third year Hebrew. Advanced grammar and composition. Focus on reading of literary texts, oral skills and accuracy in writing. GE credit: ArtHum | AH. —II. (II.) Franco

100CN. Advanced Modern Hebrew III (4)
Lecture/discussion—3 hours, term paper. Prerequisite: course 100BN. Students who have taken course 100C or 2nd year Hebrew may take course 100CN. Third year Hebrew. Advanced grammar and composition. Focus on reading of literary texts, oral skills and accuracy in writing. GE credit: ArtHum | AH. —III. (III.) Franco

Courses in Hindi (HIN)

Lower Division
1. Elementary Hindi/Urdu I (5)
Lecture/discussion—5 hours. An introduction to Hindi and Urdu in which students will learn vocabulary and grammar in both Devanagari and Urdu scripts, and will practice skills in reading, writing, speaking and listening. GE credit: ArtHum | AH. —I. (I.) Chauhan

2. Elementary Hindi/Urdu II (5)
Lecture/discussion—5 hours. Prerequisite: course 1. An introduction to Hindi and Urdu in which students will learn vocabulary and grammar in both Devanagari and Urdu scripts, and will practice skills in reading, writing, speaking and listening. GE credit: ArtHum | AH. —II. (II.) Chauhan

3. Elementary Hindi/Urdu III (5)
Lecture/discussion—5 hours. Prerequisite: course 2. An introduction to Hindi and Urdu in which students will learn vocabulary and grammar in both Devanagari and Urdu scripts, and will practice skills in reading, writing, speaking and listening. GE credit: ArtHum | AH. —III. (III.) Chauhan

Lecture/discussion—5 hours. Prerequisite: course 21. An intermediate level course for students who have completed Elementary Hindi/Urdu or the equivalent. Students will continue to practice their skills in listening, speaking, reading and writing in Hindi and Urdu. GE credit: ArtHum | AH. —II. (II.) Chauhan

22. Intermediate Hindi/Urdu II (5)
Lecture/discussion—5 hours. Prerequisite: course 22. An intermediate level course where students will continue to practice their skills in listening, speaking, reading and writing in Hindi and Urdu. GE credit: ArtHum | AH. —III. (III.) Chauhan

23. Intermediate Hindi/Urdu III (5)
Lecture/discussion—5 hours. Prerequisite: course 22. An intermediate level course where students will continue to practice their skills in listening, speaking, reading and writing in Hindi and Urdu. GE credit: ArtHum | AH. —III. (III.) Chauhan

Courses in Latin (LAT)

Lower Division
1. Elementary Latin (5)
Lecture—5 hours. Introduction to basic grammar and vocabulary and development of translation skills with emphasis on Latin to English. Students who have successfully completed Latin 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student's P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed. GE credit: ArtHum | AH. —I. (I.) Popescu, Rundin

2. Elementary Latin (5)
Lecture—5 hours. Continuation of course 1. GE credit: ArtHum | AH. —II. (II.) Rundin

3. Intermediate Latin (5)
Lecture—5 hours. Prerequisite: course 2. Continuation of course 2. Selected readings from Latin authors. GE credit: ArtHum | AH. —III. (III.) Rundin

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Upper Division
100. Readings in Latin Prose (4)
Lecture/discussion—4 hours. Prerequisite: course 3 or the equivalent. Review of Latin morphology, grammar, and vocabulary. Readings in prose authors, including Julius Caesar. GE credit: ArtHum | AH. —I. (I.) Stem

101. Livy (4)
Lecture—3 hours, term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE. —II. (II.) Stem

102. Roman Comedy (5)
Lecture—4 hours, term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE. —II. (II.) Albu

103. Vergil: Aeneid (4)
Lecture—3 hours, term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE. —II. Albu, Seal

104. Sallust (4)
Lecture—3 hours, term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE. —III. Stem

105. Catullus (4)
Lecture—3 hours, term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE. —III. Albu

106. Horace: Odes and Epodes (4)
Lecture—3 hours, term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE. —III. Albu

108. Horace: Satires and Epistles (4)
Lecture—3 hours, term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE. —III. Seal

109. Roman Elegy (4)
Lecture—3 hours, term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE. —III. Seal

110. Ovid (4)
Lecture/discussion—3 hours, term paper. Prerequisite: course 100 or equivalent. Translation and discussion of selected readings from the works of Ovid. May be repeated one time for credit if readings vary and with consent of instructor. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE, —IV. Albu

111. Lucrceius (4)
Lecture—3 hours, term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE. —IV. Albu

112. Cicero (4)
Lecture—3 hours, term paper. Prerequisite: course 100 or equivalent. Translation and discussion of selected readings from the works of Cicero. May be repeated one time for credit if readings vary and with consent of instructor. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE. —IV. Albu

115. Vergil: Eclogues and Georgics. (4)
Lecture—3 hours, term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE. —IV. Albu

116. Roman Historians (4)
Lecture/discussion—3 hours, term paper. Prerequisite: course 100 or equivalent. Readings in Latin from one or more of the major Roman historians and biographers. Authors may include Sallust, Nepos, Livy, Tacitus, Suetonius, and Ammianus Marcellinus. Offered in alternate years. GE credit: ArtHum | AH, WC, WE. —Seal

119. Readings in Republican Latin Literature (4)
Lecture/discussion—3 hours, term paper. Prerequisite: course 100 or equivalent. Translation and discussion of selected readings from Republican Latin literature. May be repeated for credit when topics vary. Offered in alternate years. GE credit: ArtHum | AH, WC, WE. —IV. Seal

120. Readings in Imperial Latin Literature (4)
Lecture/discussion—3 hours, term paper. Prerequisite: course 100 or equivalent. Readings in Imperial Latin literature. May be repeated two times for credit when topics differ. Offered in alternate years. GE credit: ArtHum | AH, WC, WE. —IV. Seal

121. Latin Prose Composition (4)
Lecture—3 hours, term paper. Prerequisite: course 100 or equivalent. Prose composition. Offered in alternate years. GE credit: ArtHum | AH, WE. —IV. Albu

125. Medieval Latin (4)
Lecture—3 hours, term paper. Prerequisite: course 3 and two upper division courses in Latin. Selected readings from the Vulgate and various medieval authors provide an introduction to the developments in the Latin language and literature from the fourth to the fifteenth centuries. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE. —IV. Albu
Clinical Nutrition

(College of Agricultural and Environmental Sciences)

Faculty. See the Department of Nutrition, on page 454.

The Major Program

The Clinical Nutrition major provides students with training in normal and therapeutic nutrition, biological and social sciences, food science, communication, business management and food service management. This major fulfills the academic requirements for admission into a dietician internship or the equivalent, which must be completed before qualifying for registration as a dietician.

The Program. The Clinical Nutrition major (formerly Dietetics) includes the same basic core of nutrition classes as the Nutrition Science major, but includes additional courses such as food service management, education, sociology, and communication. This prepares students to work with the public. Clinical Nutrition students spend the first two years completing preparatory coursework in the basic biological sciences, along with several of the social sciences. In the final two years, students take courses in normal and clinical nutrition, food science, biochemistry, and management techniques.

Entering freshman or transfer students are assumed to have basic computer skills and to demonstrate mathematics competency adequate to pass the Math Placement Exam with a minimum score of 25.

Career Alternatives. The Clinical Nutrition major qualifies students to apply for a dietetic internship accredited by the Accreditation Council for Education in Nutrition and Dietetics enabling them to become a Registered Dietitian, the professional credential necessary to work in a clinical setting. Once becoming a Registered Dietitian, the professional credential is required for work in a clinical setting. Once completion of preparatory coursework in the basic biological sciences, along with several of the social sciences, in the final two years, students take courses in normal and clinical nutrition, food science, biochemistry, and management techniques.

B.S. Major Requirements:

<table>
<thead>
<tr>
<th>Subject</th>
<th>UNITS</th>
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</thead>
<tbody>
<tr>
<td>Written/Oral Expression</td>
<td>8</td>
</tr>
<tr>
<td>English 3 or University Writing Program 1</td>
<td>4</td>
</tr>
<tr>
<td>Communication</td>
<td>4</td>
</tr>
<tr>
<td>Preparatory Subject Matter</td>
<td>47-48</td>
</tr>
<tr>
<td>Biological Sciences 2A &amp; 2B</td>
<td>10</td>
</tr>
<tr>
<td>Chemistry 2A, 2B, 2C, 8A, 8B, ...</td>
<td>21</td>
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<tr>
<td>Economics 1 or 1B</td>
<td>4</td>
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<tr>
<td>Psychology 1</td>
<td>4</td>
</tr>
<tr>
<td>Sociology 1 or 3 or Anthropology 2</td>
<td>4-5</td>
</tr>
<tr>
<td>Statistics 13</td>
<td>4</td>
</tr>
<tr>
<td>Depth Subject Matter</td>
<td>81</td>
</tr>
<tr>
<td>Agricultural and Resource Economics</td>
<td>112</td>
</tr>
</tbody>
</table>

Clinical Nutrition and Metabolism

See Internal Medicine (IMD), on page 406.

Clinical Psychology

See Medicine, School of, on page 396.

Clinical Research (A Graduate Group)

David M. Rocke, Ph.D., Chairperson of the Group

Group Office. CTSC, 2921 Stockton Blvd., Sacramento, CA 95817 916-703-9124

Faculty

Timothy Albertson, M.D., Ph.D. (Internal Medicine: Pulmonary and Critical Care Medicine)

Aaron Sair, M.D. (Emergency Medicine)

Laurel Beckett, Ph.D. (Public Health Sciences)

Lars Berglund, M.D., Ph.D. (Internal Medicine: Endocrinology, Clinical Nutrition, and Vascular Medicine)

Catherine Cansino, M.D., M.P.H.

David M. Rocke, Ph.D. (Psychiatry and Behavioral Sciences)

Fernando Fierro, Ph.D. (Cell Biology and Human Anatomy)

James F. Holmes, Jr., M.D. (Pediatrics)

Raylin Riveluk Isseroff, M.D. (Dermatology)

Nicholas J. Kenyon, M.D. (Internal Medicine: Pulmonary and Critical Care Medicine)

Kyoungmi Kim, Ph.D. (Public Health Sciences)

Richard Kravitz, M.D. (Internal Medicine: Cardiology, Metabolism and Molecular Medicine, Internal Medicine: Hematology and Oncology)

Kathleen Lane, M.D. (Internal Medicine: General Medicine)

Primo Nery Lara, Jr., M.D. (Internal Medicine: Hematology and Oncology)

Joy Melnikow, M.P.H. (Family and Community Medicine)

Fred Meyers, M.D. (Internal Medicine: Hematology and Oncology)

John M. Olichney, M.D. (Neurology)

Sally Ozonoff, Ph.D. (Psychiatry and Behavioral Sciences)

David Pleasure, M.D. (Neurology)

Richard Pollard, M.D. (Internal Medicine: Infectious and Immunologic Diseases)

David M. Rocke, Ph.D. (Public Health Sciences, Biomedical Engineering)

Michael A. Rogawski, M.D., Ph.D. (Neurology)

Patrick Romano, M.D., M.P.H.

Saul Schaefer, M.D. (Internal Medicine: Cardiovascular Medicine)

Julie Schweitzer, Ph.D. (Psychiatry and Behavioral Sciences)

Tony J. Simon, Ph.D. (Psychiatry and Behavioral Sciences)

Dan Tancredi, Ph.D. (Pediatrics)

Alice F. Tarantal, Ph.D.

Mark Yarborough, Ph.D. (Internal Medicine)

Graduate Study. Graduate Group in Clinical Research (GGCR) is an interdisciplinary graduate group in clinical research with a Master of Advanced Study degree in Clinical Research. The GGCR provides a solid clinical/translational, patient-oriented research foundation for junior faculty, clinical and pre-clinical fellows, and post-doc scholars. The program centers around three core elements: didactic instruction, mentored research, and special experiences.

Mandatory course work includes biostatistics, epidemiology, patient-oriented research, health services research, data management/informatics, scientific communication, research management, responsible conduct of research and career development. The instruction includes a 12-week summer curriculum followed by a one- or two-year core curriculum and electives that can be tailored to best meet each scholars career development needs.

Degree Offered. M.A.S. Plan II

Requirements:

Candidates must meet the following minimum requirements:

- High level of interest and potential to pursue innovative preclinical/translational or clinical research as a major focus of career plan, and a long-term goal of entering clinical research career.
- Submission of an application: 2-page research proposal, Description of training plan with identified mentor, Curriculum vitae, and letters of support.

Coaching Principles and Methods

(College of Letters and Science)

The Coaching Principles and Methods minor is an interdisciplinary minor open to undergraduates in all four colleges. Students must complete a statement of interest to assist in placing them in future internships. This form is available in the Physical Education Program Office, in 264 Hickey Gym, and may be turned in at any time.

Minor Program Requirements:

<table>
<thead>
<tr>
<th>Coaching Principles and Methods</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Education 1</td>
<td>1</td>
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<tr>
<td>Physical Education 2</td>
<td>2</td>
</tr>
<tr>
<td>Physical Education 3</td>
<td>3</td>
</tr>
</tbody>
</table>
Communication

[College of Letters and Science]

George A. Barnett, Chairperson of the Department
Department Office. 469 Kerr Hall; 530-752-9933

Faculty
George A. Barnett, Ph.D., Professor
Robert A. Bell, Ph.D., Professor
Joel Chao, Ph.D., Associate Professor
Bo Feng, Ph.D., Assistant Professor
Hyoung Hwang, Ph.D., Assistant Professor
Nicholas A. Palomares, Ph.D., Associate Professor
Jorge Petells, Ph.D., Assistant Professor
Lamari Taylor, Ph.D., Associate Professor
Narine Yegiyan, Ph.D., Assistant Professor

Emeriti Faculty
Rina Alcalay, Ph.D., Professor Emerita
Charles R. Berger, Ph.D., Professor Emeritus
Michael T. Matley, Ph.D., Professor Emeritus
James J. Murphy, Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award
Ralph S. Pomeroy, Ph.D., Professor Emeritus
John L. Vols, M.A., Senior Lecturer Emeritus

Affiliated Faculty
Virginia O. Hamilton, Ph.D., Lecturer
Catherine Puckering, M.A., Lecturer
Alisa Shubb, M.A., Lecturer
John Theobald, M.A., Lecturer

The Major Program

The major in communication focuses upon human symbolic behavior in interpersonal and mediated contexts. The Program. The program of study in communication examines communication processes at several different levels of analysis. Courses dealing with communication at the individual, interpersonal, organizational and societal levels of analysis are offered.

Required Minor Electives

A minimum of eight units with courses at least two different departments. One course must be taken from both a race/class or gender list. Second course can be from race/class, gender list or from sociocultural issues and settings list.

Race/Class/Gender List: One course from:

Sociocultural Issues and Settings List: American Studies 115, 130, 152, Anthropology 1418, Education 115, 122, 153, Exercise Biology 102, 121, 122, Human Development 100B, 110, Native American Studies 156, Physical Education 120, Psychology 126, 140, 151, 157, 158, 161, 162, 168, Sociology 122, 123, 124, 131, 135, Women’s Studies 140.

PHE 192 has a prerequisite of junior/senior standing. PHE 192 cannot be taken until after a student has completed more than 90 total units. PHE 192 internship must be in a coaching or teaching setting. Setting must be approved IN ADVANCE by the coaching minor advisor before a CRN will be issued.

Minor Adviser. Lou Bronzan, 530-752-5541 or slbronzan@ucdavis.edu

Advising Center. 289 Hickey Gym

Graduate Adviser. N. Palomares

Courses in Communication (CMN)

Students must have satisfied the Entry Level Writing requirement before taking any course in Communication.

Lower Division

1. Introduction to Public Speaking (4)
   Lecture—1 hour; discussion—3 hours. Practice in the preparation and delivery of speeches based on contemporary principles and techniques of organization and persuading audiences. GE credit: Wrt | OL—I, II, III, (I, II, III) Shub

2. Interpersonal Communication Competence (6)

5. Global English and Communication (4)
   Lecture—2 hours; discussion—2 hours. English as a global language and its uses in intercultural communication. Cultural, historical, and political dimensions of varieties of English spoken around the world. Experiential grounding in strategies for increasing interpretive and verbal communicative competence for a globalized world. (Same course as Linguistics 5) GE credit: ArtHum or SocSci | AH or SS, OL. WC.—II. (II.) Farrell, Feng, Ramanathan

99. Special Study for Undergraduates (1-5)
   Prerequisite: consent of instructor. [IP/NP grading only]

Upper Division

101. Communication Theories (4)
   Lecture—3 hours; discussion—1 hour. Forms, functions, development, and testing of communication theory, with emphasis on social scientific approaches. Survey and comparison of significant micro and macro theories and models of face-to-face and mediated communication. Application of theories to real world problems. GE credit: SocSci | SS—I, II, III, IV, (I, II, III, IV) Feng

102. Empirical Methods in Communication (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: course 101 and Statistics 13 or equivalent. Social scientific research methods commonly employed in Communication. Topics include data design, measurement, sampling, questionnaire construction, survey research, experimental design, evaluation research, content analysis and qualitative field methods. GE credit: SocSci | SS—I, II, III, IV, (I, II, III, IV) Bell, Palomares, Yegiyan

103. Gender Differences in Communication (4)
   Lecture—4 hours; prerequisite: course 101 and course 102 or an equivalent course in research methods. Pass One open to Communication majors only. Examination of communication differences between men and women as sources of male/ female stereotypes, miscommunications, dilemmas, and difficulties (real and imagined). Treatment of genders as cultures. Topics include male/female differences in discursive practices and patterns, language attitudes, and relational dynamics. GE credit: SocSci | SS—I, II, Palomares

105. Semantic and Pragmatic Functions of Language (4)
   Lecture—4 hours. Prerequisite: course 101 and course 102 or an equivalent course in research methods. Pass One open to Communication majors only. The role of language in shaping attitudes and perceptions of self and others. The use and abuse of verbal symbols in communicative situations. Concepts of meaning in discourse. GE credit: SS—I, II, III, (II, III) Palomares

134. Interpersonal Communication (4)
   Lecture—4 hours. Prerequisite: course 101 and course 102 or equivalent are required. Pass One open to Communication majors only. Communication...
tion between individuals in social and task settings. One-to-one communication, verbal and nonverbal, in developing relationships. Consideration of theory and research on relevant variables such as shyness, selfdisclosure, reciprocity, games, and conflict. GE credit: SocSci | SS.— II, III, IV, (II, III, IV) Feng, Jenkins

135. Nonverbal Communication (4)
Lecture—4 hours. Prerequisite: course 101 and 102 (or equivalent course in research methods). Pass One open to Communication majors only. Examination of the interaction between nonverbal communication and verbal communication channels and the impact of new communication technologies on interpersonal and mediated communication contexts. Underlying functions served by nonverbal communication also considered. GE credit: SocSci | SS.— II, III, IV, (II, III, IV) Berge, Fucckering

136. Organizational Communication (4)
Lecture—4 hours. Prerequisite: course 101 and 102 (or equivalent course in research methods). Pass One open to Communication majors only. Organizational communication theory and practice is examined with an emphasis on the use of effective communication strategies for achieving organizational goals. GE credit: SocSci | SS.— II, IV, (II, IV) Barnett, Hamilton

137. Intercultural Communication (4)
Seminar—3 hours; term paper. Prerequisite: course 134. Major concepts and theories of intercultural communication. Examines the impact of diversity and differences in verbal and nonverbal communication; dimensions of cultural variations, barriers to intercultural communication, and intercultural communication competence. GE credit: SocSci | SS, DD— III (III) Feng

138. Communication and Cognition (4)
Lecture/discussion—4 hours. Prerequisite: course 101 and 102 (or equivalent course in research meth- ods). Pass One open to Communication majors only. Relationship between communication and cognition. Models of discourse comprehension and production, the influence of language attitudes on social judgments, and the effects of information processing on decision making are explored. GE credit: SocSci | SS—I, II, (II) Berger, Yegiyan

139. Advanced Organizational Communication (4)

140. Introduction to Mass Communication (4)

141. Media Effects: Theory and Research (4)
Lecture/discussion—4 hours. Prerequisite: course 101, 102 (or equivalent course in research meth- ods). Pass One open to Communication majors only. Social scientific studies of the effects of mass media messages on audience members’ actions, attitudes, beliefs, and emotions. Topics include the cognitive processing of media messages, television violence, political socialization, cultivation of beliefs, agenda-setting, and the impact of new technologies. GE credit: SocSci | SS—I, II, III, (II, III) Cho, Hwang, Taylor

Lecture—4 hours. Prerequisite: course 101, 102 (or equivalent course in research methods). Topics include the cognitive processing of media messages, television violence, political socialization, cultivation of beliefs, agenda-setting, and the impact of new technologies. GE credit: SocSci | SS—I, II, III, (II, III) Feng, Jenkins

125. News Media (4)
Lecture—4 hours. Prerequisite: course 101, 102 (or equivalent course in research methods). Topics include the cognitive processing of media messages, television violence, political socialization, cultivation of beliefs, agenda-setting, and the impact of new technologies. GE credit: SocSci | ACGH, SS—I, II, III, (II, III) Hwang, Theobald

143. Analysis of Media Messages (4)
Lecture/discussion—3 hours; term paper. Prerequi- site: course 101, 102 (or equivalent course in research methods). Examines the relationship between communication and cognition. Topics include the cognitive processing of media messages, television violence, political socialization, cultivation of beliefs, agenda-setting, and the impact of new technologies. GE credit: SocSci, Wrt | ACGH, SS, Wrt—I, II, III, (II, III) Bell, Fucckering

144. Media Entertainment (4)
Lecture/discussion—3 hours; term paper. Prerequi- site: course 101, 102 (or equivalent course in research methods). Examines the relationship between communication and cognition. Topics include the cognitive processing of media messages, television violence, political socialization, cultivation of beliefs, agenda-setting, and the impact of new technologies. GE credit: SocSci, Wrt | ACGH, SS, Wrt—I, II, III, (II, III) Taylor

145. Political Communication (4)
Lecture/discussion—4 hours. Prerequisite: course 101 and 102 or equivalent course in research methods. Examines the use of communication in political campaigns. GE credit: SocSci | ACGH, SS—Cho

146. Communication Campaigns (4)
Lecture/discussion—3 hours; term paper. Prerequi- site: course 101, 102 (or equivalent course in research methods). Examines the use of communication in political campaigns. GE credit: SocSci | ACGH, SS—Cho

148. Contemporary Trends in Media (4)
Lecture/discussion—4 hours. Prerequisite: course 101 and 102 (or equivalent course in research methods). Examines the use of communication in political campaigns. GE credit: SocSci | ACGH, SS—Cho

150. Current Topics in Communication (4)
Lecture/discussion—4 hours. Prerequisite: course 101 and 102 (or equivalent course in research methods). Examines the use of communication in political campaigns. GE credit: SocSci | SS—I, II, (III) Barnett

153. Proseminar in Social Interaction (4)
Seminar—3 hours; term paper. Prerequisite: course 101, 102, 136; consent of instructor. Open to Communication majors only. Reading, discussion, research, and writing on a selected topic in the specialty of social interaction. Potential topics include relationship initiation, maintenance, and deterioration; communication failure; nonverbal communication; conversational management; semantics and pragmatics of language, and family/marital communication. May be repeated for credit when topic differs. Offered in alternate years. GE credit: SocSci, Wrt | SS, WE—III, (III) Berger, Feng, Jenkins, Palomo

159. Proseminar in Mass Communication (4)
Seminar—3 hours; term paper. Prerequisite: course 101, 102, 136; consent of instructor. Open to Communication majors only. Reading, discussion, research, and writing on a selected topic in the specialty of social interaction. Potential topics include relationship initiation, maintenance, and deterioration; communication failure; nonverbal communication; conversational management; semantics and pragmatics of language, and family/marital communication. May be repeated for credit when topic differs. Offered in alternate years. GE credit: SocSci, Wrt | SS, WE—III, (III) Berger, Cho, Hwang, Taylor, Yegiyan

165. Media and Health (4)
Lecture/discussion—4 hours. Prerequisite: course 101, 102 (or equivalent course in research meth- ods). Survey of how communication technologies transform our lives at the individual and society level. Topics include human-computer interaction, social media; the effects of communication technologies in education, health, and business; and social and political implications of technological development. GE credit: SocSci | ACGH, V, SS—III, (III) Theobald

170. Communication, Technology, and Society (4)
Lecture/discussion—3 hours; term paper. Prerequi- site: course 101 and 102 (or equivalent course in research methods). Examines the use of communication in political campaigns. GE credit: SocSci | SS—I, II, (III) Taylor

175. Computer-Mediated Communication (4)
Lecture/discussion—3 hours; term paper. Prerequi- site: course 101 and 102 (or equivalent course in research methods). Examines the use of communication in political campaigns. GE credit: SocSci | SS—I, II, (III) Peña

180. Current Topics in Communication (4)
Lecture/discussion—4 hours. Prerequisite: course 101 and 102 (or equivalent course in research methods) . Examines the use of communication in political campaigns. GE credit: SocSci | SS—I, II, (III) Taylor

189A. Proseminar in Social Interaction (4)
Seminar—3 hours; term paper. Prerequisite: course 101, 102, 136; consent of instructor. Open to Communication majors only. Reading, discussion, research, and writing on a selected topic in the specialty of social interaction. Potential topics include relationship initiation, maintenance, and deterioration; communication failure; nonverbal communication; conversational management; semantics and pragmatics of language, and family/marital communication. May be repeated for credit when topic differs. Offered in alternate years. GE credit: SocSci, Wrt | SS, WE—III, (III) Berger, Feng, Jenkins, Palomo

189B. Proseminar in Mass Communication (4)
Seminar—3 hours; term paper. Prerequisite: course 101, 102, 136; consent of instructor. Open to Communication majors only. Reading, discussion, research, and writing on a selected topic in the specialty of social interaction. Potential topics include relationship initiation, maintenance, and deterioration; communication failure; nonverbal communication; conversational management; semantics and pragmatics of language, and family/marital communication. May be repeated for credit when topic differs. Offered in alternate years. GE credit: SocSci, Wrt | SS, WE—III, (III) Berger, Cho, Hwang, Taylor, Yegiyan

190C. Proseminar in Health Communication (4)
Seminar—3 hours; term paper. Prerequisite: course 101, 102, 140; consent of instructor. Reading, dis- cussion, research, and writing on a selected topic in the specialty of mass communication. Potential topics include, agenda-setting, the cultivation of beliefs, television violence, and health communication. One credit to upper-divisional groups, mediated political discourse, interactive technologies, and international/global communication. May be repeated for credit when topic differs. Offered in alternate years. GE credit: SocSci, Wrt | SS, WE—III, (III) Berger, Cho, Hwang, Taylor, Yegiyan

Quarter Offered: Fall—W. Winter—III. Spring—IV, Summer—2015-2016 offering in parenthesis.


Fall 2011 and on Revised General Education (GE): AH|Arts and Humanities; SE|Science and Engineering; SS|Social Sciences; ACGH|American Culture; DD—Domestic Diversity; DL—Oral Skills; QL—Quantitative, SL—Scientific, V—Visual, WC—World Cultures, WE—Writing Experience

Communication 205
physician-patient interaction, uses of communication technologies in health settings, and health-related advertising. May be repeated for credit when topic differs. Offered in alternate years. GE credit: Sci/Soc, Writ | SS, WE.—IIll. Bell, Ferguson

190D. Proseminar in Organizational Communication (4) Seminar—3 hours; term paper. Prerequisite: course 101, 102, 136; consent of instructor. Open to Com- munication majors only. Reading, discussion, research, and writing on a selected topic in the spe- cialty of organizational communication. Potential topics include organizational networks, organizational conflict and its resolution, mediation, bargaining and negotiation, superior-subordinate interaction, leadership styles, and interpersonal communication. May be repeated for credit when topic differs. Offered in alternate years. GE credit: Sci/Soc, Writ | SS, WE.—IIIl. Barnett

192. Internship in Communication (1-6) Internship—3-18 hours. Prerequisite: communication majors who have completed 20 units of upper-division communication courses. Open to Communication majors only. Supervised work experience requiring the application of communication principles and strategies or the evaluation of communication practices in a professional setting. Relevant experiences include public relations, advertising, sales, human relations, health promotion, political campaigns, journalism, and broadcasting. May be repeated up to 6 units of credit. (P/NP grading only.)—II, III, IV, (I, III, IV)

194H. Senior Honors Thesis (4) Seminar—1 hour; individual tutoring on research project—3 hours. Prerequisite: senior standing and approval by Honors Committee. Directed reading, research, and writing culminating in the preparation of honors thesis under the supervision of faculty adviser. GE credit: Sci/Soc | SS, WE.

197T. Tutoring in Communication (2-4) Seminar—1-2 hours; laboratory—1-2 hours. Prereq- uisite: upper division standing with major in Commu- nication and consent of Department Chairperson. Tutoring in undergraduate Communication courses, including leadership of discussion groups affiliated with departmental courses. May be repeated for credit up to a total of six units. (P/NP grading only.)

198. Directed Group Study (1-5) Prerequisite: consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.)

Graduate

201. Theoretical Perspectives on Strategic Communication (4) Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Explores the intentional use of discourse and nonverbal behavior to reach goals. Explores theories and models that elucidate the processes that enable the execution of intentions in message plans and discourse. —I. (I)


203. Scientific Methods for Communication (4) Seminar—3 hours; term paper. Prerequisite: 201, 202, Psychology 204A, 204B or equivalent. Social scientific research methods commonly employed in Communication. Topics include research design methods; sampling; questionnaire construction; survey research experimental design evaluation; research content analysis and qualitative field methods. —IV. Palomares, Yegian

204. Measurement Sampling Questionnaire Construction (4) Seminar—4 hours. Prerequisite: course 101, 102, 136; consent of instructor. Open to Com- munication majors only. Reading, discussion, research, and writing on a selected topic in the spe- cialty of questionnaire construction. Potential topics include organizational networks, organiza- tional conflict and its resolution, mediation, bargaining and negotiation, superior-subordinate interaction, leadership styles, and interpersonal communication. May be repeated for credit when topic differs. Offered in alternate years. GE credit: Sci/Soc, Writ | SS, WE.—IIIl. Bell, Ferguson

210. Methods and Analysis in Communication (4) Lecture—2 hours; lab—2 hours. Prerequisite: graduate standing; one course in inferential statistics; consent of instruc- tor. Experimental designs in communication. Topics include: causation; threats to validity; conceptualiza- tion, operationalization; measurement; hypothesis testing; ethics; data analysis software focusing on the analysis of variance and planned contrasts; and the practical and effective implementation and writ- ing of experiments. —I. (I) Palomares

211. Survey Research Methods in Communication (4) Seminar—4 hours. Prerequisite: graduate standing; one course in inferential statistics; consent of instruc- tor. Methods for designing personal interview, phone, mail, and web-based surveys in communica- tion. Topics include: sampling strategies, sources of error and bias in survey designs, questionnaire con- struction, cognitive interviewing, interviewer behav- ior, and perspectives on attitude change and persua- sion. Application of persuasion theories and prin- ciples to the message design in applied contexts. —III. (I)

212. Communication and Cognition (4) Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Theories of individual and group behavior. Theories and models of individual risk information processing. Media depictions of threats and risk-related information and their poten- tial effects on audiences. Implications for the design and implementation of messages concerning threat and risk. Offered irregularly.

230. Social Interaction Theory and Research (4) Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Survey of theories and research on social interaction and interpersonal communica- tion. Covers communication of individual differ- ences in communication, communication and relationship development, family communication, conflict, cognitive and emotional processes underlying social interaction, social influence, intercultural communication, and nonverbal behavior. —II. (I) Yegian

231. Tactics of Interpersonal Influence (4) Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Achievement of interpersonal goals in social interaction. Topics include message production, tactics, strategies and planning; antici- pating potential obstacles; resisting and thwarting tactics; plan recognition; informal data detection. Exam- ined goals include compliance gaining, attitude change, ingratiation, information seeking, comfort- ing, and deception. Offered in alternate years. —III. (I)

232. Health Communication (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Health commu- nication theories and research traditions. Topics include consumer health information seeking; physi- cian-patient interaction; social marketing; "education," and media advocacy campaigns; social networks and coping; media influ- ences on health; and new communication technolo- gies in health promotion and healthcare delivery. (Same course as Public Health Science 232.) Offered in alternate years. —II. (I) Bell

233. Communication in Medicine (4) Seminar—3 hours; term paper. Restricted to gradu- ate standing. Survey of research on communication between patients and health care providers. Topics include verbal and nonverbal behavior, power and influence, empathy and support, and conflict man- agement. Cultural, social, organizational, and tech- nological influences on these topics are also examined. Offered in alternate years. —IIl. Bell

234. Media and Health (4) Seminar—3 hours; term paper. Restricted to gradu- ate standing. Survey of research on media and health. Topics include health communication prac- tices of health care providers, and the influence of gaming and other new media on health behaviors. Offered irregu- larly. —IIl. (I) Bell, Taylor

244. Organizational Communication (4) Seminar—4 hours. Prerequisite: graduate standing and consent of instructor. Theory and research on communication processes in organizations. —Barnett

245. The Political Economy of Urban and Regional Development (4) Lecture—4 hours. Prerequisite: course 157, 244, or the equivalent. How health, political and economic restructuring and national and local policies are mediated by community politics; social production of urban form; role of the state in uneven development; dynamics of urban growth and decline, regional development in California. (Same course as Geogra- phy 245) —II. (III)

250. Mediated Communication Theory and Research (4) Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Survey of major theories on the intended and unintended effects of mediated commu- nication. Topics include media’s effects on learn- ing, political behavior, interpersonal violence, sexual socialization, consumer behavior, race relations, gender socialization, and cultural processes. —II. (I) Cho, Taylor, Yegian

251. Communication, Technology, and Society (4) Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Transformation of life at the individual and societal levels by communication technologies. Topics include the digital divide, media convergence in news and entertainment, human-computer interaction, distance learning, elec- tronic commerce, distributed work and e-democracy. Offered in alternate years. —II. (I) Taylor

252. Computer-Mediated Communication (4) Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. The effects of computer-mediated communication on the ways in which people express themselves, form impressions about strang- ers, develop and maintain relationships, collaborate on group work, and expand social network, espe- cially in comparison to face-to-face communication. Offered in alternate years. —II. (III) Pettit

253. Negotiation (4) Seminar—4 hours. Prerequisite: graduate standing and consent of instructor. Theory and research on negotiating.

254. Communication Campaigns (4) Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Strategic uses of media and interpersonal channels to promote social change through social marketing, information, and media advocacy campaigns. Focus on theory-based inter- ventions in a variety of applied contexts. Offered in alternate years. —II. Barnett, Bell

260. Communication Applications (2-4) Discussion—1 hour; supervised field work—3-9 hours. Prerequisite: course 250 or permission. Work in communication. Organization and implementation of a research project for a specific application of a communication program. May be repeated one time for credit. (S/U grading only.)
Community and Regional Development

The Major Program
The Community and Regional Development major (formerly Applied Behavioral Sciences) aims to provide a broad comparative understanding of theories, methodologies, and issues relevant to the study of communities and the people in them. The program focuses on the ways that economic, political, and socio-cultural forces are transforming regions and local communities. The Community and Regional Development major offers students the opportunity to explore how knowledge can be used to improve the quality of community life.

The Program
Principal subjects of study within the major are community and organizational development, social change processes, the role of culture and ethnicity in shaping community life, community research methodologies, the impacts of innovation and technology on community development, and the effects of social, economic and political systems on communities. The major is organized to allow students to develop fields of concentration that meet their career goals.

Internships and Career Alternatives
Community and Regional Development students are required to complete an internship in their field before graduation. Internships have been arranged with local, county, and state planning units, health departments, schools, housing offices, and community education programs. Community and Regional Development graduates are prepared for occupations in community development, social research, program evaluation, organizational and educational consulting, city and regional planning, and for-profit organizations. The major also provides effective preparation for graduate or professional study in the social and behavioral sciences, or for professional degrees.

B.S. Major Requirements:

Preparatory Subject Matter............22-25
Community and Regional Development
1, 2 .................................................... 8
Plant Sciences 21 or Computer Science Engineering 15 ............................ 3-4
Economics 1A or 18 .................................. 4
Anthropology 2 or Sociology 1 .......................... 4-5
Statistics 13 or 32 or Sociology 468 : 3-4

Depth Subject Matter .................39-40
Core Issues in Community Development: Three courses from: Community and Regional Development 142, 152, 153A or 153B or 153C, 164, 172, 176, or 180 ........ 12
Economics of Community Change: Two courses from: Community and Regional Development 147, 149, 154, 157, 158, or 171 ........................................... 8
Political Processes and Community Change: Two courses from: Community and Regional Development 147, 152, 153, 154, 157, 158 ........................................... 8
**Note on substitutions: supplementary list of pre-approved substitutions available in Advising Office.
Internship: Community and Regional Development 192 ............................. 4

Areas of Specialization
Take 20 units from each of two options, including at least one Community and Regional Development course from each option, or 40 units from one option, including at least two Community and Regional Development courses. These courses cannot overlap with the depth subject. Up to 4 units of variable-unit course work may be counted toward this requirement; e.g., community and Regional Development 192.

Global Communities Option .............40
Students must consult with a faculty adviser to identify an emphasis within the option and to select suitable courses.

Gender and Development: Sociology 132, 145B, Anthropology 126B, Women and Gender Studies 102, 182
Globalization and Politics: Political Science 124, 130, 131, 175
Experiential Learning, Area Studies, and Language: Total number of units in Experiential learning, Area Studies, and Language courses cannot exceed 32
Up to 12 credits transferred from any accredited foreign program or foreign internship, including UCD EAP and Summer Abroad programs.
Up to 12 credits in regional area studies classes; e.g., Middle East, China, Latin America
Up to 12 credits for foreign language.

Organization and Management Option ..................................................40
Students must consult with a faculty adviser to identify an emphasis within the option and to select suitable courses.

Administration: Community and Regional Development 157, 158, 194HA and 194HB, Agricultural and Resource Economics 100A, 171A, Economics 115A, Political Science 100, 105, 142A, 142B, 155, 183
Communication: Communication 134, 136, 140, 152, Community and Regional Development 147, 176, Education 120, 163
Human Resources: Community and Regional Development 151, 157, Economics 151B, Sociology 120, 128, 129
Policy, Planning, and Social Services Option .............................................40
Students must consult with a faculty adviser to identify an emphasis within the option and to select suitable courses.

General: Community and Regional Development 118, 142, 151, 153, 154, 156, 162, 176, 180, 194HA and 194HB, Political Science 100, 105, 108, 109, 142A, 142B, 154, 155, 183, Sociology 120, 140, 154, 155, 185
Community Health and Counseling: Communication 134, 135, 165, Community and Regional Development 164, Education 160A, 160B, 163, Public Health Sciences 10, Human Development 120, 121, 120, Psychology 123, 126, 151, 154, 162, 168, Sociology 154
Education and Community: Agricultural Education 100, 160, Communication 146, Education 100, 110, 120, 151, 152, 150, Psychology 100, 132, Sociology 124

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses;
Pre-Fall 2011 General Education (GE): A—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; D—Diverse; Dv—Domestic Diversity; Wr—Writing Experience
Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACHG—American Cultures; DD—Domestic Diversity; OL—Oral Skills; OL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
Family and Community: American Studies 152, Community and Regional Development 147, Human Development 100A, 100B, 100C, 101, 102, 103, 110, 130, 140, 140L, 141, 143, 160, 161, 162, Psychology 140, Sociology 122, 131, 134, 135, 152

English Composition Requirement .......................... 4


Minor Adviser. M. Kenney

Advising center for the major is located in 1303 Hart Hall 530-752-2244.

Honor Program. An Honors Program available to Community and Developmental majors who have demonstrated excellence in their field of study. Entrance into the honors program requires that a student have completed a minimum of 125 units with a minimum grade point average of 3.500 in upper division courses. Honors Program requires that a student have demonstrated excellence in their field of study. Examination of non-profit organizations, citizen participation, approaches to reducing poverty, community needs assessment, and regional development strategies. GE credit: SocSci, Div | AGCH, DD, OL, SS, VL, WE.—I. (II.) Hirtz

151. Community Field Research: Theory and Analysis (4)

Lecture—4 hours, extensive writing; project. Prerequisite: course 1 and any upper division Community and Regional Development courses are recommended. Emphasis on the design and analysis of community research considering the relationship between theory and practice. Study of community research methods, including empirical analysis, ethnographic approaches. Course requires design and completion of field research project. GE credit: SocSci, Div | AGCH, DD, OL, SS, VL, WE.—I. Hirtz

152. Community Development (4)

Lecture—4 hours, Prerequisite: course 1 or 151, Sociology 2, Anthropology 2, Asian American Studies 100, Chicana/o Studies 132, Geography 5, or Anthropology, American and African Studies 101 or consent of instructor. Introduction to principles and strategies of community organizing and development. Examination of non-profit organizations, citizen participation, approaches to reducing poverty, community needs assessment, and regional development strategies. GE credit: SocSci, Div | AGCH, DD, SS, WL, WE.—I. Hirtz

153A. International Community Development: Asia (4)

Lecture—4 hours. Prerequisite: course 1, Anthropology 2, International Agricultural Development 10. Examination and analysis of community development efforts in Japan and their impact on environmental and social justice movements in the United States and around the world. Offered in alternate years. GE credit: SocSci, Div | AGCH, DD, OL, SS, VL, WE.—I. Hirtz

153B. International Community Development: Europe (4)

Lecture—4 hours. Prerequisite: course 1 or 2, Anthropology 2, International Agricultural Development 10; course 164 or the equivalent recommended. Examination and analysis of community development efforts in Europe and the impact of global forces in different settings. Alternative strategies with emphasis on self-reliance and locally controlled development. Course is based in Kyoto, Japan, and includes field trips. GE credit: SocSci, Div | OL, SS, VL, WE.—Fujimoto

153C. International Community Development: Africa (4)

Lecture—2 hours; fieldwork—2 hours. Prerequisite: course 1 or 2, Anthropology 2. Comparative overview of International Agricultural Development 10; course 141 or equivalent recommended. Examination and analysis of community development efforts in Africa and the impact of global forces in urban and rural settings. Focus on strategies that promote self-reliance and locally controlled development. Course based in South Africa, includes field trips. GE credit: SocSci, Div | SS, VL, WC.—Benne

154. Social Theory and Community Change (4)

Lecture/discussion—4 hours; extensive writing; project; term paper. Prerequisite: course 1, Sociology 1, or Anthropology 2. Comparative overview of the dominant social science paradigms for the study of community development and change. Among the paradigms discussed are functionalism, conflict theory/ Marxism, structuralism, methodological individualism, reflexive modernity. GE credit: SocSci, Div | AGCH, DD, OL, SS, VL, WE,—I. (II.) Hirtz

156. Community Economic Development (5)

Lecture—4 hours; laboratory—2 hours. Prerequisite: Plant Sciences 21 or Engineering Computer Sciences 15 and course 152 or consent of instructor. How low income communities work together to improve their economic well-being, how communities change over their economic lives, and build community power.
and decision-making. Includes techniques to analyze community economic potential and identification of appropriate investment tools. Group project. GE credit: SocSci. | QS, SS, WE. —II. (II.) Benner

157. Politics and Community Development (4)
Lecture—4 hours. Prerequisite: prior course work in sociology or political science recommended. Analyzes political, economic and sociocultural forces shaping the form and function of local communities in the U.S. Considers theories of the state, the community and social change and case studies of actual community development in comparative historical perspective. GE credit: SocSci, Div, Writ | ACGH, DD, SS, WE. —II. (II.)

158. Small Community Governance (4)
Lecture—4 hours; fieldwork—3 hours. Prerequisite: course 151 or 160 or Political Science 100. Governing institutions and political processes in rural and small urban places. Local government organization, community and regional development. Restricted to upper division standing; eight units of Sociology, Anthropology, or Community and Regional Development. Prerequisite: upper division standing. Analysis of the relationship between work, technology, and human experience. Theories of the causes and consequences of labor process change; impact of race, ethnicity, class, gender, and citizenship status on work; responses of workers, communities, and policy-makers to workplace changes. —III. (III.)

162. People, Work and Technology (4)
Lecture—4 hours. Prerequisite: upper division standing and completion of eight units of coursework in Sociology, Anthropology, or Community and Regional Development. Restricted to upper division standing. Analysis of the relationship between work, technology, and human experience. Theories of the causes and consequences of labor process change; impact of race, ethnicity, class, gender, and citizenship status on work; responses of workers, communities, and policy-makers to workplace changes. —II. (II.)

164. Theories of Organizations and Their Roles in Social and Economic Change (5)
Lecture—4 hours; laboratory—2 hours. Prerequisite: course 1 or 2 or other equivalent social science course and Statistics 13 or equivalent. Planned changes with respect to community organizations. Private voluntary organizations, local community associations, and local government. Relationship between community organizations and social capital. Collaborative original data gathering and professional report writing. GE credit: SocSci | ACGH, DD, OL, SS, VL, WE. —II. (II.)

171. Housing and Social Policy (4)
Lecture—4 hours; term paper. Prerequisite: upper division standing, social impact, economics, and politics of housing in the United States. Special attention given to federal, state, and local policy and program strategies to produce and preserve affordable housing and inclusive neighborhoods. —III. (III.)

172. Social Inequality: Issues and Innovations (4)
Lecture/discussion—4 hours; extensive writing; term paper; project. Prerequisite: upper division standing and completion of eight units of course work in Anthropology, Sociology, or Community and Regional Development. Focus on the dimensions, causes, and consequences of altering social inequality in the U.S. Examination and analysis of major theories and forms (class, race/ethnicity, gender, and citizenship status) of inequality. Policy-based and grass-roots approaches to project. —III. (III.)

176. Comparative Ethnicity (4)
Lecture—4 hours; term paper. Prerequisite: upper division standing, eight units of Sociology, Anthropology, or combination. Role of ethnicity in shaping social organizations. Analytical approaches to issues arising from the study of ethnicity, through utilization of data from a range of different societies. GE credit: SocSci, Div, Writ | ACGH, DD, SS, WE. —II. (II.)

180. Transnational Community Development (4)
Lecture/discussion—4 hours; extensive writing; project; term paper. Prerequisite: course 1, or Anthropology 2, or Sociology 1. The effects of grassroots, non-state, non-corporate actors from abroad on local, national and international development. Socioeconomic, political, and cultural implications of transnational actions undertaken by international non-governmental organizations, individual migrants, and migrant grassroots civic organizations. GE credit: SocSci, Div, WTC, WE. —III. (III.) Guarnizo

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: completion of 84 units and consent of instructor. Supervised internship, off and on campus, in community and institutional settings. (P/NP grading only.)

194HA-194HB. Special Study for Honors Students (4-4)
Independent study—3 hours; seminar—1 hour; project; term paper. Prerequisite: completion of 135 units at the time of enrollment; GPA 3.500 in the major; GPA 3.300 in overall standing; completion of at least four upper division courses; agreement of a faculty member to serve as thesis adviser; consent of instructor. Honors is a program of direct reading, research and writing culminating in the preparation of a Senior Honors Thesis under the direction of a faculty adviser. (Deferred grading only, pending completion of a minimum of 18 semester units at the time of enrollment; GPA 3.500 in the major; GPA 3.300 in overall standing. Analysis of the relationship between work, technology, and human experience. Theories of the causes and consequences of labor process change; impact of race, ethnicity, class, gender, and citizenship status on work; responses of workers, communities, and policy-makers to workplace changes. —I. (I.)

197T. Tutoring in Community and Regional Development (1-5)
Lecture/discussion—4 hours. Introduction to theories of community development and different concepts of community, poverty, and development. Emphasis on building theory, linking theory and development techniques to theory, evaluating development policy, and examining case studies of community development organizations and projects. [Same course as Geography 240T.] —II. (II.)

241. The Economics of Community Development (4)
Seminar—4 hours. Prerequisite: graduate standing. Economic theories and methods of planning for communities. Human resources, community services and infrastructure, industrialization and technological change, and regional growth. The community’s role in the greater economy. —I. Kenney

242. Community Development Organizations (4)
Seminar—4 hours. Prerequisite: course 240. Theory and praxis of organizations with social change agendas at the community level. Emphasis on non-profit organization and philanthropic foundations. —III. (III.)

242S. Community Development Fieldwork—10 hours; lecture—5 hours, workshop—5 hours. Prerequisite: course 240. Theory and praxis of organizations with social change agendas at the community level. Emphasis on local governance, non-profit organizations and philanthropic foundations at an intermediate level. Limited enrollment. —IV. (IV.)

244. Political Ecology of Community Development (4)
Lecture—4 hours. Prerequisite: graduate standing. Community development from the perspective of geographical political ecology. Social and environmental outcomes of the dynamic relationship between communities and land-based resources, and between social groups. Causes of community conservation and development in developing and industrialized countries. [Same course as Geogra- phy 254.] —II. (II.)

245. The Political Economy of Urban and Regional Development (4)
Lecture—4 hours. Prerequisite: course 157, 244, or the equivalent. How global, political and economic restructuring and national and state policies are mediated by community and regional development at the urban form; role of the state in uneven development; dynamics of urban growth and decline; regional development in California. [Same course as Geogra- phy 245.] —II. (II.)

246. The Political Economy of Transnational Migration (4)
Lecture—4 hours. Prerequisite: graduate standing. Theoretical perspectives and empirical research on social movement, transnational and economic processes of transnational migration to the U.S. Discussion of conventional theories will precede contemporary comparative perspectives on class, race, ethnicity, citizenship, and the ethnic economy. [Same course as Geography 246.] —I. (I.)

247. Transformation of Work (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing in history or social science degree program or consent of instructor. Exploration of the ways that the experience, organization, and systems of work are being reconfigured in the late twentieth century. The impacts of economic restructuring on local communities and workers. —III. (III.)

248A. Social Policy, Welfare Theories and Communities I (2)
Seminar—2 hours. Prerequisite: graduate standing. Theories and comparative histories of modern welfare states and social policy in relation to legal/normative, organizational, and administrative aspects of welfare. Analysis of specific social issues within the U.S./California context. Not open for credit to students hav- ing completed Community & Regional Development 248A and 248B. (Same course as Geography 248.) Offered in alternate years. —III. (III.)

248B. Social Policy, Welfare Theories and Communities II (2)
Seminar—2 hours. Prerequisite: graduate standing, course 248A concurrently. Analysis of a specific set of social issues within the U.S./California context. Issues may include poverty, hunger, housing, health, family, disability, economic opportunity, affirmative action orientations, gender, age, or special social groups. Offered in alternate years.—Hirtz

249. Media Innovation and Community Development (4)
Seminar—4 hours. Restricted to Graduate Students. Role of innovative media technologies in the process of social change. Studies historical, practical and theoretical issues involving media in community organizing, social justice movements, democracy initiatives, and economic justice. —III. (III.)

250. Professional Skills for Community Development (4)
Lecture/discussion—2 hours; project—2 hours, field- work; extensive writing or discussion. Prerequisite: course 240. Priority enrollment for M.A. and Ph.D. students in Community and Regional Development. Help students develop the practical skills needed to work professionally in organizations that are involved in community development. Provides an overview of community development practice, project management, and consultation skills. —II. (II.)

Benner, Hirtz, London
Community Development (A Graduate Group)

Michael Rios, Ph.D., Chairperson of the Group

Group Office, Carrie Armstrong-Ruport, Student Affairs Officer; 133 Hunt (Community Development Graduate Group), 530-752-4119; caruport@ucdavis.edu
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Robin Hill, Ph.D., Professor (Art, Art History)
Franck Hritz, Ph.D., Lecturer SOE (Human Ecology)
Carlos Jackson, M.F.A., Associate Professor and Chair (Chicana/o Studies)

Community Nutrition

See Nutrition Science, on page 458.

Comparative Literature

[College of Letters and Science]
Juliana Schisarci, Chairperson of the Department
Department Office, 213 Sproul Hall; 530-752-1219; http://complit.ucdavis.edu

Faculty
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Emeriti Faculty
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Scott McLean, Ph.D., Lecturer
Seth L. Schein, Ph.D., Professor Emeritus
Robert M. Torrance, Ph.D., Professor Emeritus

The Major Program
Comparative literature is a dynamic major whose own self-definition is constantly shifting. Once mostly limited to the study of Western European literature and its Greco-Roman classical past, today Comparative Literature has become a global interdisciplinary study of literature in original languages and other media (including cinema, television, fine arts, and opera, for example). Thus, we can define Comparative Literature as the study of literature and culture across national boundaries and throughout historical time.

The Program. Both the major and the minor programs in Comparative Literature allow students to combine courses in one or more nationality departments with courses in Comparative Literature. The introductory course sequence (COM 1 through...
4) provides both an overview of ancient to contemporary literature and film and offers intensive practice in a major foreign language. In addition, any of the courses in the sequence satisfies the university composition requirement. All readings in undergraduate Comparative Literature courses are in English, but majors take upper division courses in at least one foreign language in the original language.

Students majoring in Comparative Literature choose a first and second literature of concentration, one of which may be English. After the introductory sequence, each student's major coursework is divided between courses in the two literatures of concentration and Comparative Literature courses. These Comparative Literature courses encourage students to take a broad view of a historical or cultural period, a theme, a genre, or a literary movement. The wide variety of options in the program permits great flexibility and encourages interdisciplinary connections among literature, art, linguistics, history, and the arts. Each student's plan of study must be approved by the major adviser at the beginning and end of each calendar year.

Career Alternatives. A Comparative Literature major offers excellent enhancement to pre-professional training, preparing students for graduate study in medicine, dentistry, veterinary medicine, and other science fields as well as law and business, besides coursework in translation and publishing, teaching, or graduate study in literature.

A.B. Major Requirements: Units

Preparatory Subject Matter

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparative Literature 1 or 2; 3 or 4</td>
<td>8</td>
<td>Two other lower division courses in Comparative Literature (selected from 1-53C excluding the 10 series). Cannot include the two required courses in the 1-4 series. It is recommended that students who do not use a European language toward the major take one of the remaining required lower division courses in the 3 series, preferably the 53 course that relates to the region of the language the student is using to satisfy the upper division language requirement in the major.</td>
</tr>
<tr>
<td>Comparative Literature 141 (recommended for the junior year)</td>
<td>3</td>
<td>Comparative Literature 195 (to be taken in the spring quarter before graduation)</td>
</tr>
<tr>
<td>Comparative Literature 1 or 2; 3 or 4</td>
<td>8</td>
<td>Three upper division literature courses in a language other than English.</td>
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</tbody>
</table>

Depth Subject Matter

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literary Analysis</td>
<td>4</td>
<td>Five upper division Comparative Literature courses including at least one course in a major period (such as 166A-166B-166C-167D), movement (such as 168A-168B, 169) or genre (such as 160A-160B, 161A-161B, 163, 166A-166B) and including the following required courses: Comparative Literature 141 (recommended for the junior year).</td>
</tr>
<tr>
<td>Comparative Literature 195 (to be taken in the spring quarter before graduation)</td>
<td>3</td>
<td>Two additional upper division literature courses in Comparative Literature or in any other program including English or literature in translation.</td>
</tr>
</tbody>
</table>

Total Units for the Major: 56-58

Major Adviser. Consult the Department office.

Minor Program Requirements: The minor in Comparative Literature allows students to combine courses in Comparative Literature with courses in a national literature, including English or foreign literature in translation. There is no foreign language requirement for the minor.

Comparative Literature: 24

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparative Literature 1, 2, 3, 4</td>
<td>4</td>
<td>At least five upper division literature courses, at least four of which are in Comparative Literature; Comparative Literature 141 and 195 recommended.</td>
</tr>
</tbody>
</table>

Courses in Comparative Literature (COM)

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<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Books of Western Culture: The Ancient World</td>
<td>4</td>
<td>Lecture/discussion — 4 hours. Prerequisite: completion of Entry Level Writing Requirement. Introduction, through class discussion and frequent written assignments, to major literary works from the eighteenth to the mid-twentieth century. GE credit: ArtHum, Wrt</td>
</tr>
<tr>
<td>Major Books of Western Culture: The Modern Crisis</td>
<td>4</td>
<td>Lecture/discussion — 4 hours. Prerequisite: completion of Entry Level Writing Requirement. Introduction, through class discussion and frequent written assignments, to major literary works from the late eighteenth to the mid-twentieth century. GE credit: ArtHum, Wrt</td>
</tr>
<tr>
<td>Major Books of the Contemporary World</td>
<td>4</td>
<td>Lecture/discussion — 4 hours. Prerequisite: completion of Subject A Requirement. Comparative study of selected major Western and non-Western texts composed in the period from 1945 to the present. Intensive focus on writing about these texts, with frequent papers written about these texts. GE credit: ArtHum, Div, Wrt</td>
</tr>
<tr>
<td>Fairy Tales, Fables, and Parables</td>
<td>4</td>
<td>Lecture—3 hours, discussion—1 hour. An introduction to fairy tales, fables as recurrent forms in literature, with such readings as tales from Aesop and Grimm, Chaucer and Shakespeare, Kafka and Borges, Buddhist and Taoist parables, the Arabian Nights, and Aesop. GE credit: ArtHum, Div, Wrt</td>
</tr>
<tr>
<td>Myths and Legends</td>
<td>4</td>
<td>Lecture—3 hours, discussion—1 hour. Introduction to the comparative study of myths and legends, excluding those of Greece and Rome, with readings from Near Eastern, Teutonic, Celtic, Indian, Japanese, Chinese, African and Central American literary sources. GE credit: ArtHum, Div, Wrt</td>
</tr>
<tr>
<td>Literature of Fantasy and the Supernatural</td>
<td>4</td>
<td>Lecture—3 hours, discussion—1 hour. The role of fantasy and the supernatural in literature, tales of magic, hallucination, ghosts, and metamorphosis, including diverse authors such as Shakespeare, F. Scott Fitzgerald, Kafka, Kawabata, Fuentes, and Morrison. GE credit: ArtHum, Div, Wrt</td>
</tr>
<tr>
<td>Utopias and their Transformations</td>
<td>4</td>
<td>Lecture/discussion — 3 hours, term paper. Prerequisite: satisfaction of the Subject A requirement. A consideration of literary works from different ages, of visionary and rational perceptions of a lost paradise, Golden Age, or Atlantis—and of the inhuman nightmares that can result from perversions of the utopian dream of perfection. GE credit: ArtHum, Wrt</td>
</tr>
<tr>
<td>The Short Story and Novella</td>
<td>4</td>
<td>Lecture/discussion — 3 hours, term paper. An introduction to shorter forms of prose fiction by major authors of different countries and periods with emphasis on the modern period. GE credit: ArtHum, Div, Wrt</td>
</tr>
<tr>
<td>10A-N. Master Authors in World Literature</td>
<td>24</td>
<td>Lecture/discussion — 1 two-hour session. Designed primarily to acquaint the non-literature major with a cross-section of writings by the world's most important authors; readings in English translation. Content alternates among the following segments: [A] Gilgamesh, Ramayana, Beowulf,ibelunglied; [B] Metamorphoses, Decameron, Arabian Nights, Canterbury Tales; [C] Chanson de Roland, El Cid, Igors Kampaganai, Morte d'Arthur, [D] Sung-Ling, Kafka, Kawabata, Fuentes, and Morrison. GE credit: ArtHum, Div, Wrt</td>
</tr>
</tbody>
</table>
Lecture/discussion—3 hours;  term paper. Changing tic, national, and cultural traditions. Offered in alternate from different historical periods and different linguistic traditions of the ancient world, and the non-Jew. Draws upon Russian, German, Yiddish, and American traditions. GE credit: ArtHum, Div | AH, WC, WE.—II. (II.) Larsen, Radwan

140. Thematic and Structural Study of Literature (4)
Lecture/discussion—3 hours; term paper. Interpretation of selected works illustrating the historical evolution of themes, as well as formal and structural elements. May be repeated for credit when subst- of course varies. GE credit: ArtHum, Div | AH, WC, WE.—II. (II.) Larsen, Radwan

141. Introduction to Comparative Critical Theory (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one upper Division literature course or consent of instructor. Introduction to comparative critical theory and its use for interpreting literary texts, film, and media forms in global culture. (Same course as Critical Theory 101.) GE credit: ArtHum, Div | AH, WC, WE.—Blanchard, Larsen

142. Critical Reading and Analysis (4)
Lecture/discussion—3 hours; term paper. Prerequisite: consent of instructor. Close reading of selected texts; scrutiny of very limited amount of material, with attention to the problems of texts in translation. GE credit: ArtHum | AH, WC, WE.

143. Literary Traditions of the City (4)
Lecture—2 hours; discussion—1 hour. Writing. Exploration of the representation of the city in major translated literary texts from a variety of literary traditions and periods. Emphasis on the diversity of urban experience in literature. Topics include public and private space, memory, and gender. Offered in alternate years. GE credit: ArtHum, Div | AH, WC, WE.—I. Radwan, Sharlet

144. The Grotesque (4)
Lecture/discussion—3 hours; term paper. Prerequisite: completion of Subject A requirement and at least one course in literature. Study of the various stylistic devices and media forms in global culture. (Same course as Comparative Literature 145.) GE credit: ArtHum, Div | AH, WC, WE.—II. (II.) Lu

145. Representations of the City (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 6 and at least one course in literature. Study of the various stylistic devices and media forms in global culture. (Same course as Comparative Literature 141.) GE credit: ArtHum, Div | AH, WC, WE.—II. (II.) Radwan, Sharlet

146. Myth in Literature (4)
Lecture—3 hours, term paper. Prerequisite: course 6 recommended. Comparative study of different versions of one or more central myths, with attention to their cultural settings, artistic and literary forms of representation, as well as to their psychological dimensions. GE credit: ArtHum, Div | AH, WC, WE.—II. (II.) Radwan, Sharlet

147. Modern Jewish Writers (4)
Lecture/discussion—3 hours; term paper. Prerequisite: completion of the Subject A requirement and at least one additional course in literature. Study of selected modern writers of Jewish descent. GE credit: ArtHum, Div | AH, WC, WE.—II. (II.) Radwan, Sharlet

148. Mystical Literatures of South Asia and the Middle East (4)
Lecture/discussion—3 hours; term paper. Exploration of the comparative mystical literatures of major religious traditions, with a focus on those produced in South Asia and the Middle East, although including other traditions. Offered in alternate years. GE credit: ArtHum, Div | AH, WC, WE.—I. Venkatesan

151. Colonial and Postcolonial Experience in Literature (4)
Lecture—3 hours, term paper. Prerequisite: completion of Subject A requirement and at least one course in literature. A literary introduction to the cultural issues of colonialism and postcolonialism through reading, discussion and writing on narrative texts which articulate diverse perspectives on the new. GE credit: ArtHum, Div | AH, WC, WE.—II. (II.) Larsen, Radwan

152. Literature of the Americas (4)
Lecture/discussion—3 hours; term paper. Prerequisite: completion of Subject A requirement and at least one course in literature. Study of the various sty-
153. The Forms of Asian Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: upper division standing. Introduction to distinctive Asian literary forms, such as haiku, noh, the Chinese novel and tale, through reading of major texts. GE credit: ArtHum, Div, Wrt | AH, WC, WE. —I. (I) Larsen

154. African Literature (4)
Lecture—3 hours; term paper. Prerequisite: completion of Entry Level Writing Requirement and at least one course in literature, or consent of instructor. Various stylistic, historical, social, and cultural factors that contribute to a hemispheric vision of American literature, encompassing works by Canadian, United States, Caribbean, Brazilian, and Spanish-American writers. Course taught abroad. May be repeated one time for credit. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE. —III, IV, (III, IV) Larsen

155. Classical Literatures of the Islamic World 600-1800 (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Subject A or consent of instructor. Major classical texts of the Islamic world with attention to intermingling of diverse cultural influences and historical context. Includes epic, romance, lyrical, mystical narrative, fairy tales, essays. Texts from Arabic, Persian, Ottoman Turkish, and Urdu literature. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, WC, WE. —II. (II) Sharlet

156. The Ramayana (4)
Lecture—3 hours; term paper. Exploration of the Indian epic, Ramayana, through the lens of literature, performance and visual art. Emphasis on the text's diversity and its contemporary global relevance. Topics include Ramayanas in Southeast Asia, and in various South Asian diaspora communities. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, WC, WE. —II. (II) Venkatesan

157. War and Peace in Literature (4)
Lecture/discussion—3 hours; term papers. Prerequisite: course 1, 2, or 3, or consent of instructor. Through a study of a few major works from Western and non-Western literature the course seeks to illuminate the ways in which literature from antiquity to the present has dealt with the antinomy peace/war through a variety of approaches. GE credit: ArtHum, Div, Wrt | AH, WC, WE. —II. (II) Radwan

158. The Detective Story as Literature (4)
Lecture—3 hours; term paper. Study of the origins, literary and social background, development and importance of the genre of detective in comparative context. GE credit: ArtHum, Div, Wrt | AH, WC, WE. —I.

159. Women in Literature (4)
Lecture—3 hours; term paper. Prerequisite: course 1, 2, or 3, or consent of instructor. Study of women in literature, including selected heroines who represent a particular theme, period, or genre. Texts range around the globe and from ancient to modern works, such as Lyttelton, Emma, Hedda Gabler, The Makiki Sisters, and Top Girls. GE credit: ArtHum, Div, Wrt | AH, WC, WE.

160A. The Modern Novel (4)
Lecture/discussion—3 hours; term paper. The changing image of man and his world as seen in novels by such writers as Proust, Strindberg, Chekhov, Pirandello. GE credit: ArtHum, Wrt | AH, WC, WE. —III. (III)

160B. The Modern Drama (4)
Lecture/discussion—3 hours; term paper. Readings of representative authors such as Strindberg, Chekhov, Pirandello, Ibsen. GE credit: ArtHum, Wrt | AH, WC, WE. —I. (II) Finney

161A. Tragedy (4)
Lecture/discussion—3 hours; term paper. Persistent and changing aspects of the tragic vision in literature from ancient times to the present. GE credit: ArtHum, Wrt | AH, WC, WE.

161B. Comedy (4)
Lecture/discussion—3 hours; term paper. Comic attitudes towards life in literary works of different ages. GE credit: ArtHum, Wrt | AH, WC, WE.

163. Biography and Autobiography (4)
Lecture/discussion—3 hours; term paper. Portrayals of a human life in biographies and/or autobiographies of different countries and ages. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE. —II. (II)

164A. The European Middle Ages (4)
Lecture/discussion—3 hours; term paper. Prerequisite: Subject A, Medieval literary genres as the foundation for modern literary forms. Topics and themes as love, God, vision, nature, history and politics, and sign theory. GE credit: ArtHum, Wrt | AH, WC, WE. —I. (I) Schlegel

164B. The Renaissance (4)
Lecture/discussion—3 hours; term paper. Prerequisite: Subject A, Literature, science, gender, politics, and exploration in European Renaissance. Readings in Petrarch, Machiavelli, Montaigne, Tasso, Ariosto, Stampa, Shakespeare, Ibsen, and Aphra Behn. GE credit: ArtHum, Wrt | AH, WC, WE. —II. (II) Schiesari

164C. Baroque and Neoclassicism (4)
Lecture/discussion—3 hours; term paper. Readings in major authors such as Calvini, Corneille, Pascal, Racine, Milton, and Grimmsenhausen, with consideration of the tension between the expansive energies of the "baroque" and the constraints of dogma and reason. GE credit: ArtHum, Wrt | AH, WC, WE.

164D. The Enlightenment (4)
Lecture/discussion—3 hours; term paper. Prerequisite: Subject A. Enlightenment writers such as Swift, Voltaire, Sterne, Voltaire, Rousseau, and Kant. Emphasis on the revolutionary impact of eighteenth century philosophical ideas and literary forms on modern political, social, and aesthetic culture. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE.

165. Caribbean Literatures (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Comparative approach to the multilingual, multicultural literatures of the Caribbean. Works from English, French, and Spanish speaking regions with special attention to problems of identity, diaspora and resistance, class, gender, race. Not open for credit to students who have completed course 165S. GE credit: ArtHum, Div, Wrt | AH, WC, WE. —II. (II)

165B. Caribbean Literatures (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Comparative approach to the multilingual, multicultural literatures of the Caribbean. Works from English, French, and Spanish speaking regions with special attention to problems of identity, diaspora and resistance, class, gender, race. Taught at the University of Havana, Cuba. Not open for credit to students who have completed course 165S. GE credit: ArtHum, Div, Wrt | AH, WC, WE. —II. (II)

165C. Caribbean Literatures (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Comparative approach to the multilingual, multicultural literatures of the Caribbean. Works from English, French, and Spanish speaking regions with special attention to problems of identity, diaspora and resistance, class, gender, race. Taught at the University of Havana, Cuba. Not open for credit to students who have completed course 165S. GE credit: ArtHum, Div, Wrt | AH, WC, WE. —II. (II)

166. Literatures of the Modern Middle East (4)
Lecture/discussion—3 hours; term paper. Major translated works in modern Middle Eastern and North African literature, including Arabic, Hebrew, Persian, and Turkish. Social and historical formation, with topics such as conflict and coexistence, journeys, and displaced peoples. GE credit: ArtHum, Wrt | AH, WC, WE. —I. (I) Radwan

166A. The Epic (4)
Lecture/discussion—3 hours; term paper. Study of various forms of epic poetry in both the oral and literary traditions. May be repeated for credit in different subject area. GE credit: ArtHum, Wrt | AH, WC, WE. —II.

166B. The Novel (4)
Lecture/discussion—3 hours; term paper. Prerequisite: Subject A. The novel as global genre: picaresque, epistolary, Bildungsroman, historical novel, contemporary forms. May be repeated one time for credit. GE credit: ArtHum, Wrt | AH, WC, WE. —II.

167. Comparative Study of Major Authors (4)
Lecture/discussion—3 hours; term paper. Prerequisite: consent of instructor. Pivotal works of authors in the Western mainstream, such as Dante, Shakespeare, Goethe, Tolstoi, Proust, and Joyce. GE credit: ArtHum, Wrt | AH, WC, WE.

168A. Romanticism (4)
Lecture—3 hours; term paper. Prerequisite: any course in literature, or consent of instructor. Romanticism, with topics such as conflict and coexistence, journey and non-Western literature the course seeks to illuminate the ways in which literature from antiquity to the present has dealt with the antinomy peace/war through a variety of approaches. GE credit: ArtHum, Wrt | AH, WC, WE. —II. (II)

168B. Realism and Naturalism (4)
Lecture—3 hours; term paper. Prerequisite: consent of instructor. Novels and plays by Dickens, Zola, Flaubert, Dreiser, Ibsen, and Strindberg investigate marriage and adultery, the city and its perils, the hardships of industrialization, the war between the sexes, the New Woman, and other 19th-century themes. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE. —II. Finney

169. The Avant-Garde (4)
Lecture/discussion—3 hours; term paper. Studies in movements such as surrealism, expressionism and the absurd. GE credit: ArtHum, Wrt | AH, WC, WE.

170. The Contemporary Novel (4)
Lecture—3 hours; term paper. Study of important novels from different parts of the world, including Asia, Africa, Latin America, Europe, and the United States, in the period from the Second World War to the present. GE credit: ArtHum, Wrt | AH, WC, WE.

180. Selected Topics in Comparative Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: completion of Subject A requirement and at least one course in literature. Study of a selected topic or topics appropriate to student and faculty interests and areas of specialization of the instructor. May be repeated one time for credit when topic differs. GE credit: ArtHum, Wrt | AH, WC, WE.

Lecture/discussion—6 hours, extensive writing, fieldwork—6 hours. Prerequisite: Subject A; at least one course in literature, or consent of instructor. Study of selected topics appropriate to student and faculty interests and areas of specialization of the instructor. May be repeated one time for credit when topic differs. GE credit: ArtHum, Wrt | AH, WC, WE. —IV. (IV)

192. Internship in Comparative Literature (1-12)
Internship—1-12 hours. Prerequisite: completion of 84 units; consent of instructor. Restricted to Comparative Literature majors. Internships in fields where
students can practice their skills. May be repeated for credit. (P/NP grading only.)—I, II, III. (I, II, III.)

194H. Special Study for Honors Students (1-5)
Independent study—1-5 hours. Prerequisite: open only to majors of senior standing who qualify for honors. Guided research, under the direction of a faculty member approved by the Program Director, leading to a senior honors thesis on a comparative topic. May be repeated for credit. (P/NP grading only.) GE credit: AH, WE.

195. Seminar in Comparative Literature (4)
Seminar—3 hours; term paper. Prerequisite: senior standing as a Comparative Literature major or minor or consent of instructor. Open only to Comparative Literature majors or minors in or consent of instructor. Advanced study of selected topics and texts in Comparative Literature, with explicit emphasis on the theoretical and interpretive approaches that define Comparative Literature as a discipline. May be repeated for credit for a total of 6 units. (P/NP grading only.)

198. Directed Group Study for Advanced Undergraduates (1-5)
(P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.)

Graduate

210. Topics and Themes in Comparative Literature (4)
Discussion—3 hours; term paper. Prerequisite: graduate standing in Comparative Literature, English, or a foreign-language literature, or consent of instructor. Comparative, interpretive study of the treatment of specific topics and themes in literary works from various periods, societies, and cultures, in light of these works’ historical and sociocultural contexts. May be repeated for credit when topic differs. —III. (II.)

214. Approaches to Lyric Poetry (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing in Comparative Literature, English, or a foreign-language literature, or consent of instructor. Study of major theoretical developments in the understanding of poetic discourse. Offered in alternate years. —III. (II.)

215. Forms of the Spiritual Quest (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Analysis and interpretation of poetic texts in different historical periods and national literatures, with consideration of major theoretical developments in the understanding of poetic discourse. Offered in alternate years. —III. (II.)

220. Literary Genres (4)
Discussion—3 hours; term paper. Prerequisite: graduate standing in Comparative Literature, English, or a foreign-language literature, or consent of instructor. Comparative study of literary works in a particular genre from various linguistic, national, and cultural traditions, with particular attention to historical development within the genre and to genre theory. May be repeated for credit when topic differs. —I.

238. Gender and Interpretation (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Study of how literary texts from different periods, societies, and cultures represent gender roles and gender hierarchy, building on recent work on gender in anthropolog- 

250. Research in First Literature or Special Topic (4)
Project. Individually guided research, under the supervision of a faculty member, in the first literature of concentration or on a special topic culminating in a paper. Required of Ph.D. candidates.—I, II, III. (I, II, III.)

250B. Research in Second Literature or Special Topic (4)
Project. Individually guided research in the second literature of concentration, under the supervision of a faculty member, culminating in a paper. Required of Ph.D. candidates.—I, II, III. (I, II, III.)

250D. Dissertation Prospectus (4)
Independent study. Individually guided writing of the dissertation prospectus under supervision of a faculty member. Must be taken prior to completion of the qualifying exam. Required of Ph.D. candidates. (S/U grading only)—I, II, III. (I, II, III.)

255. Colloquium (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing. Oral presentation and critique of research papers; discussion of current problems in teaching and research in Comparative Literature. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III.)

260. Contexts of the 19th-Century Novel (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Development in 19th-century history, culture, and society in relation to major trends in the 19th-century novel. Offered in alternate years. —III.

298. Directed Group Study (1-5)
Prerequisite: graduate standing. (S/U grading only.)

299. Individual Study (1-12)
(S/U grading only.)

299D. Special Study for the Doctoral Dissertation (1-12)
(S/U grading only.)

Professional

390. Teaching Comparative Literature in College (3)
Lecture—1 hour; discussion—2 hours. Methods of teaching Comparative Literature courses and specific assign- 

392. Teaching Internship in Comparative Literature (1)
Discussion—1 hour. Regular consultations between the student instructor teaching Comparative Litera- 

396. Teaching Assistant Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III.)

Comparative Pathology (A Graduate Group)

Dori Borjesson, Ph.D., Chairperson of the Group

Group Office. 5218, Vet Med 3A
530-752-3737; http://www.vetmed.ucdavis.edu/ pm/comppath/

Faculty

Verena Affolter, D.V.M., Ph.D., Professor (Pathology, Microbiology and Immunology)
Robert Anwill, D.V.M., M.P.V.M., Ph.D., Professor (Population Health and Reproduction)
Danika Bannach, D.V.M., Ph.D., Associate Professor (Population Health and Reproduction)
Andrew Baumele, Ph.D., Professor (Microbiology and Immunology)
Alexander Borovisky, M.D., Associate Professor (Department of Pathology and Laboratory Medicine)
Peter A. Barry, Ph.D., Associate Professor (Pathology and Oncology)
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Aaron C. Braht, Ph.D., Assistant Professor (Pathology, Microbiology and Immunology)
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Robert J. Brosnan, D.V.M., Ph.D., Assistant Professor (Surgical and Radiological Sciences)
Barbara A. Byrne, D.V.M., Ph.D., Assistant Professor (Pathology, Microbiology, and Immunology)
Robert D. Cardiff, M.D., Ph.D., Professor (Pathology and Oncology)
Kermitt Carraway, Ph.D., Professor (Biochemistry and Molecular Medicine)
Veronica Cerdeno, Ph.D., Assistant Professor (Pathology and Laboratory Medicine)
Hongwu Chen, Ph.D., Associate Professor (Cancer Center, Basic Sciences)
Tsang-Yu Chen, M.D., Ph.D., Associate Professor (Cancer Center, Basic Sciences)
Xinbin Chen, B.V.M., Ph.D., Professor (Surgical and Radiological Sciences)
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Patricia A. Conrad, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Beate Crossley, D.V.M., Ph.D., M.P.V.M., Assistant Professor (Department of Medicine and Epidemiology)
James S. Cullor, D.V.M., Ph.D., Professor (Population Health and Reproduction)
Fitz Roy E. Curry, B.E., Ph.D., Professor (Biomedical Engineering)
Satya Dandeekar, Ph.D., Professor (Microbiology and Immunology)
WeiLin Deng, B.M., M.S., Ph.D., Assistant Professor (Cell Biology and Human Anatomy)
Peter Dickinson, D.V.M., Ph.D., Associate Professor (Neurology/Neurosurgery)
Thomas B. Farver, Ph.D., Professor (Population Health and Reproduction)
Janet Foley, M.S., D.V.M., Ph.D., Assistant Professor (Medicine and Epidemiology)
Computer Science

(College of Letters and Science)

Nina Amenta, Ph.D., Chairperson of the Department

Faculty. For complete faculty listing, please see Engineering: Computer Science, on page 268.

The Major Program

The Department of Computer Science administers two majors: Computer Science and Engineering (CSE), in the College of Engineering, and Computer Science (CS), in the College of Letters and Science. It also administers two minors: Computer Science, in the College of Letters and Science, and Computational Biology, in the College of Engineering. For information on the Computer Science and Engineering curriculum and the minor in Computational Biology, see Engineering: Computer Science, on page 268.

The primary differences between the CSE and CS majors are the extent of hardware coverage and curricular flexibility. The CSE major develops a solid understanding of the entire machine, including hands-on experience with its hardware components. The CS major teaches some hardware, at the digital design level, on simulators. The CSE major has fewer lower-level courses and a more generous menu of electives making it easier to complete a minor or double major.

Students in the CS major receive a solid grounding in the fundamentals of computer languages, operating systems, computer architecture, and the mathematical abstractions underpinning computer science. Students are prepared for both industry and postgraduate study.

B.S. Major Requirements:

Preparatory Subject Matter ............... 50-55
Mathematics 21A-21B-21C, 22A or 67 ..................................................... 15-16
Computer Science Engineering 20, 30, 40, 60 ..................................................... 16
Computer Science Engineering 50 or
Electrical and Computer Engineering 70  ......................................................... 4
One series from the following four: 15-19 (a) Chemistry 2A-2B-2C
(b) Chemistry 2A-2B and Biological Sciences, 1A-1B
(c) Chemistry 2AH-2BH-2CH
(d) Physics 9A-9B-9C and Mathematics 21D

Depth Subject Matter ....................... 51-54
Computer Science Engineering 122A, 120 or 122B, 140A, 140B, 150, 154A, 154B
Computer Science Engineering 132 or
Mathematics 135A or Statistics 131A ....... 4
Computer Science electives ................. 27-30
Minimum of 7 courses, including at least one mathematics or statistics course, from:
Computer Science Engineering courses numbered between 120 and 189 inclusive;
Computer Science and Engineering 193AB (counts as one); one approved course of 3 or 4 units from Computer Science and Engineering 192 or 199; Electrical and Computer Engineering 171, 172, 180A, 180B; Linguistics 177; Mathematics courses numbered between 100 and 189, excluding Mathematics 111, Statistics 131A, 131B, 132B.

Note: No course can count as both a required course and a Computer Science elective.

Total Units for the Major ................. 101-109


Minor Program Requirements: UNITS

Computer Science Engineering 60 ........... 4
Upper division Computer Science
Engineering courses ................................ 20
Select any upper-division Computer Science Engineering courses. A single approved course of 3 or 4 units from Computer Science and Engineering 192 or 199 is allowed.

Note. Computer Science Engineering 60 has a prerequisite chain of 20, 30, 40, 60 or 21A.

Graduate Study. See Graduate Studies, on page 111.

Computer Science

(A Graduate Group)

Kwan-Liu Ma, Ph.D., Chairperson of the Group

Graduate Office, 2063 Kemper Hall 530-752-7004, gradinfo@cs.ucdavis.edu http://www.cs.ucdavis.edu

Faculty

Venkatesh Akella, Ph.D., Professor (Electrical and Computer Engineering)
Nina Amenta, Ph.D., Professor (Computer Science)
Zhaonjun Bai, Ph.D., Professor (Computer Science)
Matthew Bishop, Ph.D., Associate Professor (Computer Science)
Hemanth B rangavala, Ph.D., Professor (Computer Science)
Harry Cheng, Ph.D., Professor (Mechanical and Aerospace Engineering)
Robert Faris, Ph.D., Assistant Professor (Computer Science)
Vladimir Filkov, Ph.D., Assistant Professor (Computer Science)
Matthew Franklin, Ph.D., Professor (Computer Science)
Prem Devanbu, Ph.D., Associate Professor (Computer Science)
Matthew Farrens, Ph.D., Professor (Computer Science)
Daniel Gasfield, Ph.D., Professor (Computer Science)
Francois Gygi, Ph.D., Professor (Computer Science)
Berdin Hamann, Ph.D., Professor (Computer Science)
Michael Hagan, Ph.D., Associate Professor (School of Medicine)
Greta Hsu, Ph.D., Assistant Professor (Graduate School of Management)
Sanjay Joshi, Ph.D., Assistant Professor (Mechanical and Aerospace Engineering)
Kenneth Joy, Ph.D., Professor (Computer Science)
Louise Kellogg, Ph.D., Professor (Geology)
Patrice Koehl, Ph.D., Professor (Computer Science)
Mathias Koeppke, Ph.D., Assistant Professor (Mathematics)
Karl Levit, Ph.D., Professor (Computer Science)
Xin Liu, Ph.D., Associate Professor (Computer Science)
Kwan-Liu Ma, Ph.D., Professor (Computer Science)
Charles Martel, Ph.D., Professor (Computer Science)
Norman Matloff, Ph.D., Professor (Computer Science)
Robert Nie, Ph.D., Professor (Computer Science)
Peter Linz, Ph.D., Professor (Civil and Environmental Engineering)
Prasant Mohapatra, Ph.D., Professor, Chair (Computer Science)
Biswaanath Mukherjee, Ph.D., Professor (Computer Science) (Distinguished Graduate Mentoring Award)
Michael Neff, Ph.D., Assistant Professor (Computer Science)
Ronald Olsson, Ph.D., Professor (Computer Science)
John Owens, Ph.D., Assistant Professor (Electrical and Computer Engineering)
Raju Pandey, Ph.D., Associate Professor (Computer Science)
Sean Peisert, Ph.D., Assistant Adjunct Professor (Computer Science)
Bahram Ravani, Ph.D., Professor (Mechanical and Aerospace Engineering)
Robert Redinbo, Ph.D., Professor (Electrical and Computer Engineering)
David Rocke, Ph.D., Professor (Applied Science)
Gary Rodrigue, Ph.D., Professor (Applied Science)
Phillip Rogaway, Ph.D., Professor (Computer Science)
Oliver Staadt, Ph.D., Assistant Professor (Computer Science)
Henning Thoma, Ph.D., Assistant Professor (Molecular and Cellular Biology)
Zhendong Su, Ph.D., Associate Professor (Computer Science)
Ilias Tagkopoulos, Ph.D., Assistant Professor (Computer Science)
Susan Ustin, Ph.D., Professor (Land, Air and Water Resources)
V. Rao Vemuri, Ph.D., Professor (Applied Science)
S. Felix Wu, Ph.D., Professor (Computer Science)
Rao Vemuri, Ph.D., Professor (Applied Science)
Kent Wilken, Ph.D., Associate Professor (Electrical and Computer Engineering)
David Woodruff, Ph.D., Professor (Graduate School of Management)
Catherine Yang, Ph.D., Assistant Professor (Graduate School of Management)
Ben Yoo, Ph.D., Professor (Electrical and Computer Engineering)

Emeriti Faculty

Ralph Algaizy, Ph.D., Professor Emeritus
Meera Bhatnagar, Ph.D., Professor Emeritus
S.L. Hakimi, Ph.D., Professor Emeritus
Peter Linz, Ph.D., Professor Emeritus
Manfred Kuschnitzka, Ph.D., Professor Emeritus
Michael Soderstrand, Ph.D., Professor Emeritus
Donald Topp, Ph.D., Professor Emeritus
Richard Walters, Ph.D., Professor Emeritus

Affiliated Faculty

Owen Carmichael, Ph.D., Assistant Professor (Med: Neurology)

Graduate Study. The Graduate Group in Computer Science offers programs of study leading to the M.S. and Ph.D. degrees in Computer Science. The varied nature of the faculty brings a wide variety of research interests to the program. Research strengths lie in algorithms, computational biology, computer architecture, computer graphics and visualization, database systems, computer security and cryptography, computer networks, program specifications and
Conservation Biology

See Ecology (A Graduate Group), on page 229; Environmental Biology and Management, on page 293; and Wildlife, Fish, and Conservation Biology, on page 344.

Consumer Science

[College of Agricultural and Environmental Sciences]

Faculty. See under the Division of Textiles and Clothing, on page 525.

Major Programs. The Consumer Food Science option under the Food Science major is a related program. See also Food Science and Technology, on page 525, and Textiles and Clothing, on page 525.

Graduate Study. For graduate study, see Graduate Studies, on page 111.

Courses in Consumer Science (CNS)

Questions pertaining to the following courses should be directed to the Division of Textiles and Clothing Advising office in 129 Everson Hall.

Lower Division

92. Internship in Consumer Science (1-12) Internship—3-36 hours. Prerequisite: consent of instructor. Internship on and off campus in a consumer science related area. (P/NP grading only.)

Upper Division

100. Consumer Behavior (3) Lecture—3 hours. Prerequisite: preparation in areas of psychology or sociology and economics recommended. Provides a set of behavioral concepts and theories useful in understanding consumer behavior on the part of the individual, business, and social organizations. Conceptual models to help guide and understand consumer research will be presented. GE credit: SocSci, Div, Wrt | AH, WC, WE.—III. (III.)

192. Internship in Consumer Science (1-12) Internship—3-36 hours. Prerequisite: completion of a minimum of 84 units; consent of instructor. Internship on and off campus in a consumer science related area. (P/NP grading only.)

198. Directed Group Study (1-5) (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only)

Graduate

299. Research (1-12) (S/U grading only)

Professional

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III. (I, II, III)

Contemporary Leadership

[College of Agricultural and Environmental Sciences]

The Science and Society Program offers a minor in Contemporary Leadership, open to all undergraduates regardless of major. The minor provides a broad overview of leadership theory and practice, and engages students in critical thinking, self-reflection, problem solving and multicultural education.

Students should contact the minor adviser for course selection and approval.

Consult advisors often to insure timely enrollment in Science and Society 192 and 190X as courses with fewer than ten students will not be taught.

Minor Program Requirements:

UNITS

Contemporary Leadership......................... 24
Core Leadership Courses
Science and Society 130 .......................... 4
Science and Society 192 (must be taken concurrently with an approved internship) ......................... 2
Science and Society 190X .......................... 2

Preparatory Subject Matter

Students are required to complete four units from each of the following four categories. All courses are four units unless specified in parentheses:

Communication, Interpersonal Relationships and Human Behavior: Sociology 139AN, Communication 134, 135, 136, Community and Regional Development 172, 174, Linguistics 163, Psychology 151, Sociology 126, 128, University Writing Program 104 (AF) ......................... 4
Organization Structure and Cultures: American Studies 125, Anthropology 105, 123BHN, Community and Regional Development 152, 154, 158, 164, Sociology 10A (3), 156, 180A, 180B, 183, 185, 186, 188, 194, 199, 201, 202 .......................... 4
Multiculturalism, the Global Community and Social Change: American Studies 133, 153, 156, Community and Regional Development 176, English 179, History 173, 178A, 178B, Native American Studies 134, Political Science 124, 125, 130, Textiles and Clothing 174 .......................... 4

Minor Adviser. The list of appropriate courses changes over time. Consult Elvira Galvan Hack in Science and Society (Plant Pathology) to request an advising appointment at egnhack@ucdavis.edu.
Cultural Studies (A Graduate Program)

Robert Irwin, Ph.D., Director of the Group
Group Office. 2201 Hart Hall
530-752-1548; http://culturalstudies.ucdavis.edu

Committee in Charge
Marisol de la Cadena, Ph.D. (Anthropology)
Omnia el Shakry, Ph.D. (History)
Kathleen Frederickson, Ph.D. (Anthropology)
Laura Grindstaff, Ph.D. (Sociology)
Kriss Ravetto-Biagioli, Ph.D. (Design)
Sarah Perrault, Ph.D. (Education)

Affiliated Faculty
Moradewun Adejunmobi, Ph.D., Professor
(African American and African Studies)
Mario Biagioli, Ph.D., Professor
(East Asian Languages and Cultures)
Lawrence Bogad, Ph.D., Associate Professor
(Theatre and Dance)
Angie Chabram, Ph.D., Professor
(Comparative Studies)
Christina Cogdell, Ph.D., Associate Professor
(Design)
Elizabeth Constable, Ph.D., Associate Professor
(Literary and Cultural Studies)
Allison Couvert, Ph.D., Associate Professor
(Religious Studies)
Xiaomei Chen, Ph.D., Professor
(History)
Diana K. Davis, Ph.D., Associate Professor
(History)
Marisol de la Cadena, Ph.D., Associate Professor
(Anthropology, Science and Technology Studies)
Sergio de la Mora, Ph.D., Associate Professor
(Anthropology, Science and Technology Studies)
Carolyn de la Peña, Ph.D., Professor
(American Studies)
Gregory Dobbins, Ph.D., Associate Professor
(Anthropology)
Donald Donham, Ph.D., Professor
(Anthropology)
Joseph Dumit, Ph.D., Associate Professor
(Anthropology, Science and Technology Studies)
Omnia El Shakry, Ph.D., Associate Professor
(History)
Gail Finney, Ph.D., Professor
(Cinema and Technocultural Studies, German and Russian)
Jaime Fisher, Ph.D., Associate Professor
(Cinema and Technocultural Studies, German and Russian)
Kathleen Frederickson, Ph.D., Assistant Professor
(Anthropology)
Elizabeth Freeman, Ph.D., Professor
(Cinema and Technocultural Studies, German and Russian)
Danielle Heard, Ph.D., Assistant Professor
(Cinema and Technocultural Studies, German and Russian)
Wendy Ho, Ph.D., Associate Professor
(Cinema and Technocultural Studies, German and Russian)
Jason Jackson, Ph.D., Assistant Professor
(Philosophy, Science and Technology Studies)
Sunaina Maira, Ph.D., Professor
(Anthropology, Science and Technology Studies)
Richard Kim, Ph.D., Associate Professor
(Anthropology, Science and Technology Studies)
Elizabeth Krimmer, Ph.D., Professor
(Spanish and Portuguese)
Neil Larsen, Ph.D., Professor
(Comparative Literature, Critical Theory)
Michael Lazzarato, Ph.D., Associate Professor
(Spanish and Portuguese)
Sheldon Lu, Ph.D., Professor
(Comparative Literature)
Sunaina Maira, Ph.D., Professor
(Anthropology, Science and Technology Studies)
Betina Ngweno, Ph.D., Associate Professor
(American Studies)
Sudipta Sen, Ph.D., Professor
(Science and Technology Studies)
Madhavi Sunder, J.D., Professor
(Antropology)
Suzanne Sawyer, Ph.D., Associate Professor
(Technocultural Studies, French and Italian)
Michael F. Smith, Ph.D., Professor
(Sociology)
Sudipta Sen, Ph.D., Professor
(Cinema and Technocultural Studies)

Courses in Cultural Studies (CST) Graduate

200A. Histories of Cultural Studies (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing or consent of instructor. Undergraduate coursework in the humanities or social sciences recommended. Histories and traditions of cultural studies internationally; multiple legacies of cultural studies as a field of inquiry in various geographical contexts; foregrounds important critical perspectives resulting from social and intellectual movements worldwide.—I. [III]

200B. Theories of Cultural Studies (4)
Lecture/discussion—4 hours. Prerequisite: course 200A or consent of instructor. Definitions of “critical” scholarship and examination of various contexts in which cultural studies theory has emerged worldwide. Both mainstream and alternative theoretical traditions, such as those developed by people of color and by other minoritized groups.—II. [III]

200C. Practices of Cultural Studies (4)
Lecture/discussion—4 hours. Prerequisite: courses 200A and 200B or consent of instructor. Methodological and practical applications of cultural studies research. Critical analyses of ethnography, textual

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): A-Humanities; S—Science and Engineering; S-Social Sciences; DD—Domestic Diversity; WR—Writing Experience
Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences;
analysis, social change, community development, and identity formation. Emphasis given to students' unique perspectives in cultural studies practice.—I, II, III. 204. History and Theory of Sexualities (4) Lecture/discussion—4 hours. Prerequisite: course 200A (may be taken concurrently) or consent of instructor. Studies of sexuality in feminist, literary, historical, social, and cultural contexts, focusing on the political, economic, and historical dimensions of the concept of “sexuality.” Offered in alternate years.—I, II.

205. Studies in the Rhetorics of Culture (4) Lecture/discussion—4 hours. Prerequisite: course 200A (may be taken concurrently) or consent of instructor. Theories and practices of rhetoric, focusing on the production and reception of cultural texts. Offered in alternate years.—I, II.

206. Studies in Race Theory (4) Lecture/discussion—4 hours. Prerequisite: course 200A (may be taken concurrently) or consent of instructor. Theories and practices of race and ethnicity, focusing on the production and reception of cultural texts. Offered in alternate years.—I, II.

207. Studies in Nationalism, Transnationalism, and Late Capitalism (4) Lecture/discussion—4 hours. Prerequisite: course 200A (may be taken concurrently) or consent of instructor. Theories and practices of nationalism, transnationalism, and late capitalism, focusing on the production and reception of cultural texts. Offered in alternate years.—I, II.

208. Studies in Memory, Culture, and Human Rights (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Restricted to graduate students. A critical examination of memory, culture, and human rights. Offered every fall.—I.

210. Memory, Culture, and Human Rights (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Restricted to graduate students. A critical examination of memory, culture, and human rights. Offered every fall.—I.

212. Studies in the Rhetorics of Culture (4) Lecture/discussion—4 hours. Prerequisite: course 200A (may be taken concurrently) or consent of instructor. Theories and practices of rhetoric, focusing on the production and reception of cultural texts. Offered in alternate years.—I, II.

214. Studies in Political and Cultural Representations (4) Lecture/discussion—4 hours. Prerequisite: course 200A (may be taken concurrently) and consent of graduate advisor. Framework for the analysis of political and cultural representations. Emphasis on concepts, theories, and methodologies illuminating dominant and vernacular cultural representations, appropriation, and innovation in transnational contexts. May be repeated for credit up to 4 times when electives offered irregularly.—I, II.

230. Research Seminar (4) Seminar—4 hours. Prerequisite: courses 200A and 250C or consent of instructor. Designed to facilitate student interaction and promote student research. Students present significant through the production of a publishable essay. Essays submitted, distributed, and discussed by seminar participants. May be repeated up to 12 units of credit.—I, II.

270A-270B-270C. Individual Guided Research Studies (1-4-4) Discussion—1 hour; independent study—2 hours; extensive writing. Prerequisite: course 200C, 250, consent of instructor. Individual guided research, under the supervision of a faculty member, on a cultural studies topic related to the student's program; dissertation project to produce a dissertation prospectus.—I, II, III, III, III.

270D. Dissertation Research (1-12) Individual study—3-3.6 hours. Prerequisite: advancement to doctoral candidacy. May be repeated for credit. (S/U grading only.)—I, II, III, II, III.

Professional

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III, II, III.

Dermatology

See Medicine, School of, on page 396.

Design

(College of Letters and Science)

Timothy McNeil, M.A., Chairperson of the Department

Department Office, 107 Art Building

530-752-6244; http://design.ucdavis.edu

Faculty

Susan Avila, M.F.A., Professor

Christina Coggold, Ph.D., Associate Professor

Glenda Drew, M.A., Associate Professor

James Housefield, Ph.D., Assistant Professor

Mark Kessler, M.Arch., Associate Professor

Timothy McNeil, M.A., Associate Professor

Konstantinos Papamichalou, Ph.D., Professor

Simon Sadler, Ph.D., Professor

An Savageaux, M.F.A., Professor

Michael Siminovich, Ph.D., Professor

Brett Snyder, M.Arch., Assistant Professor

Susan Verba, M.F.A., Associate Professor

Emeriti Faculty

Richard Beauxteaux, B.Arch., M.S., Professor Emeritus

Dolph Godsell, M.A., Professor Emeritus

Patricia Harrison, M.Arch., Professor Emerita

Gary Laky, M.A., Professor Emerita

Helge B. Olsen, Senior Lecturer Emeritus

Victoria Z. Rivers, M.A.C.T., S.C.T., Professor Emerita

Katherine W. Rossbach, M.A., Professor Emerita

Barbara Shawcroft, M.F.A., Professor Emerita

JoAnn C. Stabb, M.A., Senior Lecturer Emerita

Kathryn Sylva, M.F.A., Professor Emerita

Affiliated Faculty

John Driscoll, M.F.A., Lecturer

Barbara Malloy, M.F.A., Lecturer

Bob Morgan, B.S., Lecturer

Gale Okumura, B.A., Lecturer

D. R. Wagner, M.F.A., Lecturer

Adelle Zhang, M.F.A., Lecturer and Design Collection Curator

The Major Program

The Department of Design offers a creative, challenging, and flexible approach to the study of design with emphasis on socially responsible, human centered, and sustainable practice.

The Program.

Foundation courses: Design and Visual Culture; Design Drawing, Form and Color, and Graphic Design and Computer Technology; are required of all design majors. One additional course in the student's area of study is required for Preparatory Subject Matter. Depth Subject Matter courses provide: (1) further exploration of design principles and concepts, formal and technical issues, (2) conceptual and critical development through a series of history and theory classes; (3) in-depth studio experiences with projects that demonstrate a research-based, iterative design process. Optional capstone class. A more detailed explanation is available through the Design Advising office in 107 Art Building: 530-752-6244.

Preparatory Requirements. Before declaring a major in Design, students must complete the following courses with a combined grade point average of at least 2.60 at the University of California. All courses must be taken for a letter grade.

Preparatory Subject Matter......................... 28

Design 1 ............................................. 4

Design 15 ............................................ 4

Design 40A, 40B, or 40C ......................... 4

University Writing Program 11, 18 or 19 . 4

Portfolios. Portfolios are not required for admission to the major. However, it is highly recommended that design students maintain a portfolio of visual work for faculty and professional evaluation and consideration for enrollment in specialized courses, including independent study, group study, and internship.

Internships, Careers, and Study Abroad.

Design students are encouraged to supplement their coursework with internships in design firms, museums, and design-related businesses. Design graduates go directly from this program into further graduate study, or professional work including exhibition, fashion, information, interior architecture and product (lighting and furniture), textiles, visual communications (digital, environmental and print) and sustainable design. In addition, students have become entrepreneurs through freelance and commissioned work in many related areas. The Department of Design encourages students to experience design abroad through a variety of sponsored programs. For more information, contact UC Davis Study Abroad.

A.B. Major Requirements:

UNITS

Art 2 or Design 14................................. 4

Design 15 ............................................ 4

Design 16 ............................................ 4

University Writing Program 11, 18 or 19 . 4

Design 40A, 40B, or 40C ......................... 4

One course from the following:

Design 21, 31, 37, 50, 60, 70, 77, 90 4

Depth Subject Matter......................... 44

Two courses, at least one of which must be a Design course, from the following:

Art 101A, 101B, 1108, 1109; Design 107, 115, 117, 127B, 150A; Dramatic Art 128; Technocultural Studies 100, 101 10

Three courses, at least two of which must be Design courses, from the following:

Art 162B, 163, 164; Design 101, 115, 127B, 150A; Drama 112, 114, 116, 128; Technocultural Studies 100, 101 10

Three courses, at least two of which must be Design courses, from the following:

Art 162B, 163, 164; Design 101, 115, 127B, 150A; Drama 112, 114, 116, 128; Technocultural Studies 100, 101 10

Choose six courses from the lists below: 24

Quarter Offered: I=Fall, II= Winter, III=Spring, IV=Summer; Fall 2011 and on Revised General Education (GE): AH=Art and Humanities; SC=Science and Engineering; SS=Social Sciences; AGCH=American Cultures, DD=Dominic Diversity, OL=Oral Skills, QL=Quantitative, SL=Scientific, VL=Visual, WC=World Cultures, WE=Writing Experience.
Design


List B: Capstone Option (these courses are the most advanced in the major and prerequisites are strictly enforced): Design 154, 157, 159, 179, 180B, 187

Note: Substitutions for the listed courses may be allowed under certain circumstances with prior departmental approval.

Total Units for the Major …………….. 72

Major Adviser. Information on the current Aademic Advisers can be obtained by contacting the Undergraduate Advisor at 530-752-6244.

Graduate Study. The graduate program in Design leading to the Master of Fine Arts The UC Davis Master of Fine Arts (M.F.A.) in Design unifies theory and practice, offering graduate students a unique opportunity to work with a dedicated and renowned design faculty within one of the nation’s top public research universities. This two-year program encourages an interdisciplinary approach. Design includes a design theory, exhibition, fashion, history, interior architecture, lighting, textiles, and visual communication (environmental, information, print and screen-based design) to collaborate with outstanding faculty inside and outside the department whose work covers a broad array of disciplines. Graduate students in Design blend individually focused research and practice with collaborative work to develop a deep understanding of key design issues in history, theory, research methodology, and sustainable practices. The M.F.A. degree culminates in a project-based thesis and exhibition. For more information, see http://arts.ucdavis.edu/design/graduate-program.

Graduate Adviser. Please contact the Program at 530-752-8710.

Courses in Design (DES)

Questions pertaining to the following courses should be directed to the instructor or to the Design Advising office in 107 Art 530-752-6244. Scheduling of classes subject to change; please contact the Advising office to confirm when a course is offered.

Lower Division

1. Introduction to Design (4)
   Lecture—3 hours; discussion—1 hour. Priority given to Design majors. Introduction to design discipline through readings, writing, visual problem solving, and critical analysis. Topics: design principles and elements, vocabulary, color theory, Gestalt principles, conceptualization strategies. Role of designer and products in contemporary culture including social responsibility and sustainability. GE credit: ArtHum | AH, VL—I, II, III, IV. (I, II, III, IV.) Satter

2. Design Studio (4)
   Studio—4 hours; lecture/discussion—2 hours. Priority given to Design majors. Design concept development and detailing as it relates to the making of objects, structures and models using form, scale and materials. Product design and rapid prototyping methods using a range of techniques for advancing the design process. GE credit: ArtHum | AH, VL—I, II, III, IV, (I, II, III, IV.) Snyder

3. Graphic Design and Computer Technology (4)
   Studio—4 hours; lecture/discussion—2 hours. Priority given to Design students. Introduction to digital tools with emphasis on graphic design including theory, practice and technology. Includes principles of color, resolution, pixels, vectors, image enhancement, layout, visual organization, visual typographic. GE credit: ArtHum | AH, VL—I, II, III, IV. (I, II, III, IV.) Kessler

4. Design Drawing (4)
   Studio—4 hours; lecture/discussion—2 hours. Priority given to course 1, 14, 15, 16 or consent of instructor. Pass One priority given to Design majors. Visual communication and digital imaging techniques using black and white, and color. Critical analysis of photographic and the role of photography in society combining theoretical perspectives with practical applications. Elements, vectors, image enhancement, layout, visual organization, visual typographic. GE credit: ArtHum | AH, VL—I, II, III, IV. (I, II, III, IV.) Drew

5. Drafting and Perspective (4)
   Studio—4 hours; lecture/discussion—2 hours. Priority given to course 1, 14, 15, 16 or consent of instructor. Introduction to mechanical drafting, including scaled drawing, orthogonal projection, isometric, axonometric and perspective. Includes basic rendering techniques. GE credit: ArtHum | AH, VL—I, II, III, IV.

6. Photography for Designers (4)
   Studio—4 hours; lecture/discussion—2 hours. Priority given to course 1, 14, 15, 16 or consent of instructor. Pass One priority given to Design majors. Visual communication and digital imaging techniques using black and white, and color. Critical analysis of photographic and the role of photography in society combining theoretical perspectives with practical applications. Elements, vectors, image enhancement, layout, visual organization, visual typographic. GE credit: ArtHum | AH, VL—I, II, III, IV. (I, II, III, IV.) Drew

7. Coding for Designers (4)
   Studio—4 hours; lecture/discussion—2 hours. Priority given to course 1, 14, 15, 16 or consent of instructor. Pass One priority given to Design majors. Programming concepts and skills as applied for visual design. Algorithm-based design and development, flowcharts, pseudocode, entry level scripting or programming. Principles of coding, logic, syntax, structure. Analysis of historical examples of code-based design. Development, iteration, presentation of design projects. GE credit: VL—I, IV. (I, II, IV.) Drew

8. Energy, Materials, and Design Over Time (4)
   Lecture—3 hours; discussion—1 hour. Priority to Design majors. Global history of design across time viewed through the lens of the effects of the creation and discovery of new energy sources, processes and materials on design. Not open for credit to students who have taken course 40 or 140. GE credit: ArtHum | AH, DD, WE—Avila

9. Ideologies of Design (4)
   Lecture—3 hours; discussion—1 hour. Priority to Design majors. Introduction to the history and theory of design in particular relation to political, philosophical, cultural, social, economic, and environmental debates and objectives. GE credit: ArtHum | AH, WE—Avila, WE—III. (III.) Satter

10. Design for Aesthetics and Experience (4)
    Lecture—3 hours; discussion—1 hour. Priority to Design majors. Global historical survey of design’s engagement with changing notions of aesthetics and experience. Relates transformations in the theory, production, and usage of design (objects, landscapes, architectures, etc.) to larger cultural, social, and political contexts. Not open for credit to students who have taken course 40 or 140. GE credit: ArtHum | AH, DD, WE—Avila, WE—III. (III.) House"
127A. Sustainable Design (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Priority to Design majors. Principles, prac-
tice and materials of contemporary sustainable design in the context of environmental crisis. History of sustainable design in relation to the fields of text-
tiles, visual communication, interior architecture, exhibition design and visual. GE credit: ArtHum | AH—II. (I.) Savageau

127B. Studio Practice in Sustainable Design (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: consent of instructor. Priority to Design-
majors. Analysis and practice of sustainable design within studio context. Design project that incorporate the reuse of post consumer waste, standard materials and expressive qualities. Cradle to Cradle philosophy and practice. Field trips required. GE credit: ArtHum | AH, VL—III. (III.) Sav-

gage

131T. Global Fashion and Product Design (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: course 1, 14, 15, 16; course 77 recom-

dended or consent of instructor. Priority given to Design majors. Exploration of materials, embellish-
ments, and structural techniques derived from his-
toric and contemporary world cultures. Emphasis on unique expressions of individual application applied to hand made textiles, fashion and textile products. Offered irregularly. GE credit: ArtHum | AH, VL—Avila

132A. Textile Design: Woven Structures (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: course 1, 14, 15, 16; course 60 recom-

dended or consent of instructor. Foundation course in handwoven textile structure and design, emphasizing yarn identifi-
cation, basic drafting, basic weaves and their derivations expressed in original color effects and yarn combinations. May be repeated one time for credit with consent of instructor. Offered irregularly. GE credit: ArtHum | AH, VL—Avila

132B. Loom-Constructed Textile Design (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: course 1, 14, 15, 16; course 132A recom-
dended or consent of instructor. Priority to Design majors. Intermediate level study of complex fabric structure and design with emphasis on pattern in relation to sub-
title, dimension, and material. May be repeated one time for credit with consent of instructor. Offered irregularly. GE credit: ArtHum | AH, VL—Avila

134A. Introduction to Interior Design—Residential Environments (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: courses 1 and 21; courses 14, 15, 16 recom-
dended or consent of instructor. Priority to Design majors. Introduction to the theory and practice of interior design with focus on residential spaces. Basic methods of design conceptualization, develop-
ment, and presentation. GE credit: ArtHum | AH, VL—I. (I.) Kessler

134B. Introduction to Interior Design—Commercial and Technical Spaces (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: course 1 and 21; 14, 15, 16 recommended or consent of instructor. Priority given to Design majors. Introduction to the theory and practice of interior design with focus on commercial and technological spaces. Archetypal spaces and non-residential building systems. ADA ac-
sibility, design programming and research methods. GE credit: ArtHum | AH, VL—I. III. (II.) Kessler

135A. Furniture Design and Detailing (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: course 1, 14, 15, 16 recommended or consent of instructor. Priority given to Design majors. Development of designs for contem-
porary furniture. Consideration of behavioral and physical requirements, and cultural and historic expres-
sion, and structural and aesthetic qualities. Process includes research, drawings, and construction of scale models. Required field trip. GE credit: ArtHum | AH, VL—II. (II.) Kessler

135B. Furniture Design and Prototyping (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: course 1, 14, 15, 16; course 21 recom-
dended or consent of instructor. Priority given to Design majors. Design and construction of full size prototype furniture based on preliminary work com-
pleted in course 135A. Material technology, con-
struction methods assessed. Development of shop drawings and furniture con-
struction. Required field trip. Offered irregularly. GE credit: ArtHum | AH, VL

136A. Lighting Technology and Design (4)
Laboratory—4 hours; lecture/discussion—2 hours. Pre-
requisite: course 1, 14, 15, 16; course 21 recom-

mended or consent of instructor. Priority to Design majors. Introduction to lighting design and technol-
ology. Understanding the role of lighting and vision, luminous and thermal comfort, health and energy efficiency. GE credit: ArtHum | AH, VL—II. (II.) Siminovitch

136B. Designing with Light—Industrial Design (4)
Laboratory—4 hours; lecture/discussion—2 hours. Pre-
requisite: course 1, 14, 15, 16, 136A; course 21 recom-
mended or consent of instructor. Priority to Design majors. Emphasis on understanding the effect of day-
light on the perception of interior designs as well as on vision, luminous and thermal comfort, health and energy efficiency. GE credit: ArtHum | AH, VL—II. (II.) Papamichael

137A. Daylighting and Interior Design (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: course 1, 14, 15, 16; 21 recommended or consent of instructor. Priority to Design majors. Emphasis on understanding the effect of day-
lighting on design incorporating sustainable design strategies. Lecture—3 hours; discussion—1 hour. Prerequisite: course 1, Art History 1A, 1B, or 1D recommended or consent of instructor. Social contexts, meanings, aesthetics, stylistic developments, and methods significant in eastern hemisphere textiles. Offered irregularly. GE credit: ArtHum | AH, VL—II. (III.) Avila

137B. Daylighting Design Studio (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: course 1, 14, 15, 16 and 137A recom-
mended or consent of instructor. Priority to Design majors. Introduction to daylighting design and observation of its effects on interior designs using scale models with light and photogra-
photographing them outdoors and in CITC’s Heliodon to understand year-round performance. GE credit: ArtHum | AH, VL—III. (III.) Papamichael

138. Materials and Methods in Interior Design (4)
Lecture/discussion—3 hours; project—1 hour. Pre-
requisite: course 1, 14, 15, 16 or consent of instruc-
tor. Priority to Design majors. Introduction to the functional and aesthetic impact of interior and exterior spaces. Industrial design projects exploring light and light distribution characteristics, and structural techniques. afforded in alternating years. GE credit: ArtHum | AH, VL, WE

142A. World Textiles: Eastern Hemisphere (4)
Lecture—4 hours. Prerequisite: course 1; Art History 1A, 1B, 1C, or 1D recommended. Social contexts, meanings, aesthetics, stylistic developments, and methods significant in eastern hemisphere textiles. Lecture—3 hours; discussion—1 hour. Prerequisite: course 1, 14, 15, 16 or consent of instructor. Social contexts, meanings, aesthetics, stylistic developments, and methods significant in eastern hemisphere textiles. Emphasis on the Middle East, Europe, and the Americas up to cont-
emporary times. Two required field trips. GE credit: ArtHum | Div—Savageau

143. History of Fashion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1; Art History 1A, 1B or 1C recommended or consent of instructor. Priority to Design majors. Social contexts, meanings, aesthetics, stylistic developments and methods significant in western hemisphere textiles. Emphasis on the Middle East, Europe, and the Amer-
icas up to contemporary times. Two field trips required. GE credit: ArtHum | AH, VL, WE—II. (III.) Avila

144. History of Interior Architecture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Pass One priority to Design majors. The-
matic survey of interior design with emphasis on dwellings in their cultural settings and development of modern interior design theories. Interiors consid-
ered in relation to buildings’ exteriors, sites, and use. Offered irregularly. GE credit: ArtHum | AH, WE—II. (III.) Drew

145. History of Visual Communication (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing or consent of instructor. Restricted to students with upper division standing. Design principles and visual strategies for effective information display; analysis of contemporary and historical examples of visual representations and visual narratives in science, humanities, and the arts; emerged of digital methods for interactive data presentation. GE credit: ArtHum | AH, VL—II. (III.) Verba

150A. Computer-Assisted Drawing for Designers (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: courses 1 and 21; 14, 15, 16 recom-
dended or consent of instructor. Priority to Design majors. Computer assisted drawing and modeling using a mid-level, multi-use CAD program. Basic architectural and mechanical drawing technique in both two-dimensional and three-dimensional environments. Not open for credit to students who have taken course 150. GE credit: ArtHum | AH, VL—I. (I) Kessler

150B. Computer-Assisted Presentations for Interior Architects (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: courses 1 and 21; 14, 15, 16 recommended or consent of instructor. Priority to Design majors. Computer assisted drawing and modeling using a mid-level, multi-use CAD program. Basic architectural and mechanical drawing technique in both two-dimensional and three-dimensional environments. Not open for credit to students who have taken course 150. GE credit: ArtHum | AH, VL—I. (I) Housefield

151. Type in Motion (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-
requisite: courses 1, 14, 15, 16; course 115 recom-
dended or consent of instructor. Priority given to Design majors. Fundamentals of creating motion-based, screen-based typography. Consideration of narrative structures, movement assembly, and traditional and non-traditional methods of understanding typography within digital space. GE credit: ArtHum | AH, VL—I. III. (III.) Drew
on design for social awareness/interaction/benefit.
Creation of public visual-media campaign. Not open for credit to students who have completed course 1528. GE credit: ArtHum | AH, VL—II, III. (III.) Verba

155A. Pattern, Form and Surface (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-requisite: course 1, 14, 15, 16, 117; course 115 recommended or consent of instructor. Priority to Design majors. Technical and conceptual aspects of creating web sites that address current trends in such as CSS for type and position and interactivity with ActionScript. Attention to conceptual framework, visual design and user interaction design. Research and written pre-production materials required. Experimental. GE credit: ArtHum | AH, VL—II, III. (III.) Drew

159. Design for Understanding (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-requisite: course 1, 14, 15, 16, 117; 115 recommended or consent of instructor. Priority to Design majors. Exploration of fashion design processes for presenting in a public fashion show. Not open for credit to students who have taken more than 8 units of course 191A. May be repeated one time for credit. GE credit: ArtHum | AH, VL—II, III. (III.) Avila

160A. Advanced Interior Design: Institutional Spaces (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-requisite: course 1, 14, 15, 16; courses 50, 115, 150A recommended or consent of instructor. Priority to Design majors. Advanced exploration of fashion design with an emphasis on professional portfolio development and presentation. Emphasis on conceptualizing, designing, and fabricating a cohesive line of wearable garments suitable for presenting in a public fashion show. Not open for credit to students who have taken more than 8 units of course 191A. May be repeated one time for credit. GE credit: ArtHum | AH, VL—II, III. (III.) Avila

160B. Advanced Interior Architecture (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-requisite: course 1, 14, 15, 16; courses 50, 115, 150A recommended or consent of instructor. Priority to Design majors. Advanced problems in interior architectural design emphasizing space planning for corporate and institutional environments. Field trips required. GE credit: ArtHum | AH, VL—II, III. (III.) Kesler

170. Experimental Fashion & Textile Design (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-requisite: course 1, 14, 15, 16; course 60 or 70 recommended or consent of instructor. Priority to Design majors. Use of traditional and contemporary processes to create images and patterns on fabric using a variety of dyes, including direct applications, bound and unbound resist. Emphasis on individual exploration and interpretation of processes and techniques. May be repeated for credit one time with consent of instructor. GE credit: ArtHum | AH, VL—II, III. (III.) Avila

161. Textile Surface Design: Screen and Digital Printing (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-requisite: course 1, 14, 15, 16; course 60 or 70 recommended or consent of instructor. Priority to Design majors. Design of textiles and screen printing on fabrics; soft-product development; integration of handmade and digitally generated imagery on cloth. GE credit: ArtHum | AH, VL—II, III. (III.) Avila

170. Experimental Fashion & Textile Design (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-requisite: course 1, 14, 15, 16; course 60 or 70 recommended or consent of instructor. Priority to Design majors. Design of textiles and screen printing on fabrics; soft-product development; integration of handmade and digitally generated imagery on cloth. GE credit: ArtHum | AH, VL—II, III. (III.) Avila

171. Fashion Drawing: Technical and Illustration (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-requisite: course 1, 14, 15, 16; course 77 recommended or consent of instructor. Priority to Design majors. Exploration of fashion design processes for industry within the social and physical context. Emphasis on two-dimensional conceptualization of ideas, garment construction, and idea processes utilizing commercial textiles. Field trip required. GE credit: ArtHum | AH, VL—II, III. (III.) Avila

177. Computer-Assisted Fashion Design (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-requisite: course 1, 14, 15, 16; courses 50, 115, 150A recommended or consent of instructor. Priority to Design majors. Advanced exploration of fashion design with an emphasis on professional portfolio development and presentation. Emphasis on conceptualizing, designing, and fabricating a cohesive line of wearable garments suitable for presenting in a public fashion show. Not open for credit to students who have taken more than 8 units of course 191A. May be repeated one time for credit. GE credit: ArtHum | AH, VL—II, III. (III.) Avila

179. Fashion Design: Signature Collection (4)
Studio—4 hours; lecture/discussion—2 hours. Pre-requisite: course 77, 107, 170 or 177 or consent of instructor. Priority to Design majors. Advanced exploration of fashion design with an emphasis on professional portfolio development and presentation. Emphasis on conceptualizing, designing, and fabricating a cohesive line of wearable garments suitable for presenting in a public fashion show. Not open for credit to students who have taken more than 8 units of course 191A. May be repeated one time for credit. GE credit: ArtHum | AH, VL—II, III. (III.) Avila

Graduate

221. Theory and Issues in Design (4)
Seminar—3 hours; independent study. Prerequisite: graduate standing in Design or consent of instructor. Perspectives on theoretical and aesthetic issues related to the design professions such as methodology in historical and contemporary contexts, implications of technology on design theory and practice, and design relationships to environmental sustainability, recycling, and other social issues. May be repeated one time for credit. I—II. (I.)

222. Research Methods and Critical Writing for Design (4)
Seminar—3 hours; independent study. Prerequisite: course 221; graduate standing in Design or consent of instructor. Focuses on research methods and critical writing related to design topics including case studies, original and secondary source research, and critical reviews. Expectation of a paper meeting professional standards suitable for publication from each student at end of course. May be repeated one time for credit. I—II. (I.)
through case studies, guest lectures and field trips, and readings. Short written assignments and presentations will be required. —I, II, III.

224. Seminar in Design Research and Teaching (4)
Independent study—6 hours; extensive writing—4 hours; discussion—2 hours. Prerequisite: courses 221, 222, 223; concurrent academic appointment (TA) in courses 142A, 142B, 143, 144, 145; graduate standing in Design; consent of instructor. Student will work closely with instructor on a research and writing project related to subject matter of undergraduate history courses noted above with the goal of introducing student to advanced historical research processes and development of writing skills. May be repeated two times for credit. —I, II, III.

225. Studio Practice in Design (4)
Studio—3 hours. Prerequisite: course 221. Class size limited to graduate standing in Design or consent of instructor. Students work together on an explorative project to experience the multiple phases of design through an iterative process. Design projects will be geared towards relevance in contemporary social, cultural and political contexts. Credit limited to 12 units. May be repeated two times for credit. —II.

290. Seminar in Design (4)
Seminar—4 hours. Prerequisite: standing or consent of instructor. Selected topics in design methodology, research, communication, and education. May be repeated for credit. —III. (III.)

292. Practicum in Design (1-12)
Prerequisite: graduate standing in Design or consent of instructor. Interaction with a working professional in the student's field of interest to apply theories and concepts to working practice. (S/U grading only.)

298. Directed Group Study for Graduate Students (1-5)
Studio. Prerequisite: consent of instructor. (S/U grading only.)

299. Individual Focused Study (1-12)
Prerequisite: graduate standing in Textile Arts and Costume Design or consent of instructor. Advanced study in studio practice on independent projects with faculty consultation. May be repeated for credit.

299D. Project Concentration (1-12)
Prerequisite: graduate standing in Textile Arts and Costume Design or consent of instructor. A minimum of 22 units must be taken in Project Concentration and Individual Focused Study. Student creates a body of original work at a professional level, with written and visual documentation of process and concepts underlying the project, culminating in public presentation. (S/U grading only.) —I, II, III.

Professional

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.) —I, II, III, IV, I, II, III.

Dietetics

See Clinical Nutrition, on page 203.

Dramatic Art

See Theatre and Dance, on page 526.

Earth and Planetary Sciences

Earth and Planetary Sciences

[College of Letters and Science]
Louise H. Kellogg, Ph.D., Acting Chairperson of the Department
David A. Osleger, Ph.D., Vice-Chairperson of the Department

Department Office, 2119 Earth and Physical Sciences Building 530-752-0350; http://www.geology.ucdavis.edu

Faculty
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Kari M. Cooper, Ph.D. Associate Professor
Eric S. Cowgill, Ph.D., Associate Professor
Howard W. Day, Ph.D., Professor
Graham E. Fogg, Ph.D., Professor (Land, Air and Water Resources)
Tessa M. Hill, Ph.D., Associate Professor
Louise H. Kellogg, Ph.D., Professor
Charles E. Lockett, Ph.D., Professor
James S. McClain, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Isabel P. Montañez, Ph.D., Professor
Ryojuku Matani, Ph.D. Professor
Sujoy Mukhopadhyay, Ph.D., Professor
Alexandra Navrotsky, Ph.D., Professor (Chemistry)
Michael E. Oskin, Ph.D., Associate Professor
David A. Osleger, Ph.D., Lecturer SOE
Academic Senate Distinguished Teaching Award
John B. Rundle, Ph.D., Professor (Physics, Earth and Planetary Sciences)
Howard J. Spera, Ph.D., Professor
Sarah T. Stewart, Ph.D., Professor
Dawn Y. Sumner, Ph.D., Professor
Donald L. Turcotte, Ph.D., Professor
Geerat J. Vermeij, Ph.D., Professor
Kenneth L. Verosub, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Qing-zhu Yin, Ph.D., Professor
Robert A. Zierenberg, Ph.D., Professor

Emeriti Faculty
Richard Cowen, Ph.D., Senior Lecturer Emeritus, Academic Senate Distinguished Teaching Award
John F. Dewey, Ph.D., Professor Emeritus
James A. Doyle, Ph.D., Professor Emeritus (Evolution and Ecology)
Richard G. Higgins, Ph.D., Professor Emeritus
Eldridge M. Moores, Ph.D., Professor Emeritus
Jeffrey F. Mount, Ph.D., Professor Emeritus
James R. Rusk, Ph.D., Professor Emeritus
Peter Schiffman, Ph.D., Professor Emeritus
Donald L. Turcotte, Ph.D., Professor Emeritus
Robert J. Twitch, Ph.D., Professor Emeritus

Major Programs. See Geology, Marine and Coastal Science, and Natural Sciences.

Graduate Study. The department offers programs of study and research leading to the M.S. and Ph.D.

degrees in Geology. For more information visit geology.ucdavis.edu/students/grad

Courses. See courses listed under Geology.

Earth Sciences

See Earth and Planetary Sciences, on page 203; Environmental and Resource Sciences, on page 298; Hydrologic Sciences (A Graduate Group), on page 347; Hydrology, on page 348; Soil and Water Science, on page 511; and Soil Science, on page 509.

East Asian Languages and Cultures

[College of Letters and Science]
Michelle Yeh, Ph. D., Chairperson of the Department

Department Office. 209 Sproul Hall 530-752-4999; http://chinese.ucdavis.edu; http://japanese.ucdavis.edu

Faculty
Chaobing Chang, Ph.D., Professor (Japanese)
Xiaomei Chen, Ph.D., Professor (Chinese)
Chengzhi Chu, Ph.D., Associate Professor (Chinese)
David Gundry, Ph.D., Assistant Professor (Japanese)
Mark Halpern, Ph.D., Associate Professor (Japanese)
Yuming He, Ph.D., Assistant Professor (Chinese)
Nobuko Kayama, Ph.D., Assistant Professor (Japanese)
Joseph Sorensen, Ph.D., Assistant Professor (Japanese)
Michelle Yeh, Ph.D., Professor (Chinese)

Emeriti Faculty
Robert Borgen, Ph.D, Professor Emeritus
Donald A. Gibbs, Ph.D, Professor Emeritus

Affiliated Faculty
Junko Ito, Lecturer (Japanese)
Jiao Li, Lecturer (Chinese)
Ling-Yu Lu, Lecturer (Chinese)
Mayumi Saito, Lecturer (Japanese)
Haruko Sakakibara, Lecturer (Japanese)
Miyo Uchida, Lecturer (Japanese)
Chun Xia Wang, Lecturer (Chinese)
Shan Xiang, Lecturer (Chinese)
Moeko Watanabe, Lecturer (Japanese)
Bin bin Yang, Lecturer (Chinese)
Jie Yuan, Lecturer (Chinese)

The Major Program

The department offers a core language program in both Chinese and Japanese and courses in literature and culture. The core language program in Chinese has two tracks: one for students who have no background whatsoever and one for students with prior language background.

The Program. A student elects to major in either Chinese or Japanese. Practical language skills are taught using the most modern methods so that upon entering the upper division a student will have attained substantial fluency in the spoken language (hearing and speaking) and the written language (reading and writing). Upper-division courses balance the need to further language skills with the need to understand and appreciate the cultural richness of either Chinese or Japanese civilization. All students are encouraged to combine their study of...
A.B. Major Requirements:

Preparatory Subject Matter ................. 0-30

Chinese 1, 2, 3, 4, 5, 6; OR 1BL, 2BL, 3BL, OR 1CN, 2CN, 3CN; OR equivalent as determined by a required language placement exam. Recommended but NOT required: Chinese 10, 11, 50; Comparative Literature 14, Japanese 10, Linguistics 1, History 9A.

Depth Subject Matter ............................. 40

Chinese 106, 107, 111, 112, 113, 114, 160................................. 28

Note: With prior approval of the undergraduate adviser, students already proficient in Chinese at any third-year level (111-112-113) must offer upper-division Chinese courses to replace language course(s).

Three* courses selected from Chinese 100A, 101, 102, 103, 104, 105, 108, 109A, 110, 115, 116, 120**, 130**, 131, 132, 133A, 133B, 194A, 194B, 194C; or other approved substitutions; *one of the three courses must be from Chinese 101, 102, 103, 104, 109G. .................................................... 28

Chinese 120, 130, 133, 140 and 150 can be repeated when the contents are different.

Recommended substitutions: Japanese 101, 102, 103, 104, 105, 106; Anthropology 148A or 148B; Art History 163A or 163B; East Asian Studies 113; History 191A-F; Religious Studies 172; or other advanced literature and culture courses selected in consultation with the undergraduate adviser.

Total Units for the Chinese Major ..... 40-70

Major Advisors in Chinese. M. Halperin, Y. He, M. Yeh

Japanese A.B. Major Requirements:

Preparatory Subject Matter ................. 0-30

Japanese 1, 2, 3, 4, 5, 6 OR equivalent as determined by a language placement exam. Recommended but NOT required: Japanese 10, 15, 25, Chinese 10, 11, 50, Linguistics 1, History 9B.

Depth Subject Matter ............................. 40

Japanese 101, 102, 103, 111, 112, 113, 151................................. 28

Note: With prior approval of the undergraduate adviser, students already proficient in Japanese at any third-year level (111-112-113) must take other upper division Japanese courses to replace language course(s).

Three courses selected from the following: Japanese 104, 105, 106, 107, 108, 109, 114A-C, 115, 121, 122, 123, 130, 131, 132, 133A, 133B, 135, 136, 137, 138, 141, 152, 156, 157, Anthropology 149A, 149B; Art History 164; Chinese 170, 172; or other advanced literature and culture courses selected in consultation with the undergraduate adviser.

Total Units for the Japanese Major ..... 40-70


Minor Program Requirements:

Minors are offered in Chinese and in Japanese for students wishing to follow a formally recognized program of study in those languages and literatures.

UNITS

Chinese ...................................................... 20

20 All upper-division courses, including both language courses and literature in translation courses, may be used to meet this requirement. OR lower division course (Chinese 10, 11, or 50; Japanese 10, 25, 50) may also be used. In addition, students must demonstrate their language proficiency, normally through completion of Chinese 3BL or 6 or Japanese 6. Only four units from 192, 198, and 199 may be applied to the minor. For details, consult the undergraduate adviser.

Honors Program. Candidates for high or highest honors in Chinese or Japanese must enroll in Chinese 199 or JPN 199 and complete a research project or a scholarly paper under the direction of a faculty member. The project will have a minimum duration of two quarters and carry a minimum of 6 units of credit. Additionally, entrance into the honors program requires completion of at least 35 units with a minimum GPA of 3.500 in courses counted toward the major. Interested students should consult with the faculty in their field of interest in their junior year and undertake the program during the first two quarters of their senior year. Other arrangements must be authorized in advance by the department chair.

Students who complete the honors thesis receive departmental citation, and if their overall GPA qualifies them, may be recommended by the faculty for honors, high honors or highest honors at graduation.

Education Abroad Program. The university maintains study abroad programs in China, Japan, Hong Kong, and Taiwan. They offer excellent opportunities for students to polish their language skills and experience Asian cultures firsthand. Students are encouraged to participate. Appropriate courses taken abroad can be applied toward the major or the minor. For details, consult the department's undergraduate adviser, the Education Abroad Program office or the UC Davis Study Abroad Office.

Related Courses. See East Asian Studies course list.

Prerequisite Credit. No student may repeat a course if that course is a prerequisite for a course that has already been completed with a grade of C- or better.

Placement. Chinese 1 and Japanese 1 are intended for beginning students with no prior knowledge of those languages. Students who do have some knowledge but wish to improve their skills should meet with one of the advisers to discuss appropriate placement. Students must follow department guidelines for placement in all language courses and instructor approval is required for enrollment.

Backtracking. Satisfactory completion of a language course is evidence that a student’s language skills are beyond those expected in that prerequisite course. Accordingly, students who have completed a language course cannot go back and take its prerequisites. If the prerequisite courses are required for the major, students may substitute other upper division courses. Students who are not sure how this requirement applies to them should speak to the undergraduate adviser.

Waived Language Courses. Students with exceptional language ability may waive required courses. If lower division courses have been waived, students will not have to take courses in their place. If upper division courses have been waived, students can use other appropriate courses to earn the units they need to complete the major. Consult the undergraduate adviser regarding selection of appropriate courses.

Courses in Chinese (CHN)

Lower Division

1. Elementary Chinese (CHN)

Lecture/discussion—5 hours. Introduction to Chinese grammar and development of all language skills in a cultural context with special emphasis on communication. (Students who have successfully completed Chinese 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NF grading basis only. Although a passing grade will be charged to the student’s P/NF option, no petition is required. All other students will receive a letter grade unless a P/NF petition is filed.)—I, II, III. (I, II, III.)

1A. Accelerated Intensive Elementary Chinese (CHN)

Lecture—15 hours. Prerequisite: place-ment exam required. Special nine week accelerated, intensive summer session course that combines the work of courses 1, 2, and 3. Introduction to Chinese grammar and development of all language skills in a cultural context with emphasis on communication.

1BL. Accelerated Written Chinese I (CHN)

Lecture—5 hours. Prerequisite: ability to understand and speak Mandarin Chinese at an elementary level. Trainings on all the communicative skills of listening, speaking, reading, and writing for students who already have elementary level ability to understand and speak Mandarin Chinese. Emphasizes on standard Mandarin pronouns, specific Chinese characters, and discourse level conversations. Not open for credit to students who have completed course 8. GE credit: ArtHum | AH, OL, WC.—I. (I)

1CN. Mandarin for Cantonese Speakers I (CHN)

Lecture—5 hours. Prerequisite: ability to read and write Chinese characters at the elementary school level. Accelerated training in spoken Mandarin, particularly in the phonetic transcription system known as pinyin, for students who already can read and write Chinese. Course assumes no knowledge of spoken Mandarin Chinese. Not open for credit to students who have completed course 7. (Former course 7.)—I. (I)

2. Elementary Chinese (CHN)

Lecture/discussion—5 hours. Prerequisite: course 1. Continuation of course 1 in the areas of grammar and basic language skills.—I, II, III. (I, II, III.)

2BL. Accelerated Written Chinese II (CHN)

Lecture—5 hours. Prerequisite: course 1BL or advanced placement with Chinese Placement Exam. Further trainings on all the communicative skills of listening, speaking, reading, and writing for students that already have elementary level ability to understand and speak Mandarin Chinese. Emphasizes on standard Mandarin pronunciation, Chinese characters, and discourse level conversations. Not open for credit to students who have completed course 18. GE credit: ArtHum | AH, OL, WC.—II. (II)

2CN. Mandarin for Cantonese Speakers II (CHN)

Lecture—5 hours. Prerequisite: course 1CN. Continuation of course 1CN. Training in spoken Mandarin for students who already can read and write Chinese. Not open for credit to students who have completed course 17. (Former course 17.)—II. (II)

3. Elementary Chinese (CHN)

Lecture/discussion—5 hours. Prerequisite: course 2. Continuation of course 2. Completion of grammar sequence and continuing practice of all language skills.—I, II, III. (I, II, III.)
Offered in alternate years. [Same course as Reli-
Gious Studies 173A] GE credit: ArtHum, Div, Writ | AH, WC.—II. (II.) Yeh

101. Chinese Film (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: History 9A or any course on traditional China; upper division standing. English language survey of Chinese America, starting at the end of the twentieth century. Chinese films as important texts for understanding national, transnational, racial, gender, and class politics of modern China. (Same course as Cinema & Cultural Studies 147A) GE credit: ArtHum, Div | AH, VL, WC.—Chen

102. Chinese American Literature (in English) (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: a course in Chinese history recommended; upper division standing. English language survey of Chinese American literature which reflects cultural roots in China, the impact of immigration, and the diaspora experience in the United States after immigration. Memory, nostalgia, national identities, cross-cultural communication, globalization, and trans-national politics. GE credit: ArtHum, Div, Writ | AH, WC.—II, III. (II, III) Chen

103. Modern Chinese Drama (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: a course in Chinese history recommended; upper division standing. English language survey of modern Chinese spoken drama in the twentieth century and its major playwrights, in the context of Chinese history and the interaction of Chinese culture with other cultures. GE credit: ArtHum, Div, Writ | AH, VL, WC.—II, III. (II, III) Chen

104. Modern Chinese Fiction (in English) (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 10 or a course in Chinese history recommended. English language survey of Chinese fiction as it evolved amidst the great historical, social and cultural changes of the twentieth century. Thorough study of the most influential writers and genres. GE credit: ArtHum, Div, Writ | AH, WC.—III. (III) Chen

105. Western Influences on Twentieth-Century Chinese Literature (in English) (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 10 or History 9A recommended. Introduction of Western literary thought into modern China, the experimentation with Western literary forms and techniques, and the development of Marxism in contemporary literature, surveyed in alternate years. GE credit: ArtHum, Div, Writ | AH, WC.—III. (III) Chen

106. Chinese Poetry (in English) (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: History 9A or any course on traditional China recommended. Organized topically and chronologically, the lyric tradition is explored from the dawn of folk songs down to modern expressions of social protest. Topics include friendship, love, oppression, war, parting, death, ecstasy and beauty. All readings are in English. GE credit: ArtHum, Div, Writ | AH, WC.—I. (I) Yeh

107. Traditional Chinese Fiction (in English) (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 10 or a course in Chinese history. English-language survey of Chinese literature's development down to modern times. Combine survey with readings of key short stories or novels. GE credit: ArtHum, Div, Writ | AH, WC.—II. (II) Halperin, He

108. Poetry of China and Japan (in English) (4)
Lecture—3 hours; discussion—1 hour. A comparative approach to Chinese and Japanese poetry, examining poetry in oral and written cultures; includes a general outline of the two traditions, plus study of poetic forms, techniques, and distinct treat-ments of universal themes: love, nature, war, etc.

Offered in alternate years. [Same course as Japa-
nese 108] GE credit: ArtHum, Div, Writ | AH, WC.—II. (II) Yeh

109A, C-E, G-T. Topics in Chinese Literature (in English) (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: depending on topic, course 10, 11, 104, 106, 107, or a course in Chinese history. Topics in Chinese lit-
erature may include: [A] crime and punishment; [C] women writers; [D] the kingly errant; [E] the city in fiction; [G] the literature of twentieth-century Taiwan; [T] popular literature; [I] I the scholar and the courtes-
ian. Offered in alternate years. GE credit: ArtHum, Div, Writ | AH, WC.—III. (III) Chen, Halperin, Yeh

110. Great Writers of China: Texts and Context (in English) (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: any course from the General Education Literature Preparation List, or consent of instructor. Examination of major theoretical concepts and interpretive meth-
ods in the study of literature by using examples from the Chinese tradition; discussions of classical and modern works with an emphasis on the relations between literature, author, society, and culture. GE credit: ArtHum, Div, Writ | AH, WC.—II, III. (II, III) Chen, Halperin, Yeh

111. Modern Chinese: Reading and Discussion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 6 or 3BL or AA; or successful completion of Chinese Placement Exam and with placement at the third-
year level. Not open for students who have completed course 111, 112, or 113. Nine-week intensive sum-
mer course combines courses 111, 112, and 113. Training at intermediate-high and advanced-low level in spoken and written Chinese in cultural and communicative contexts based on lan-
guage skills developed in course 6. GE credit: ArtHum | AH, OL, WC.—I. (I)

111A. Intensive Third-Year Chinese (12)
Lecture/discussion—13.3 hours. Prerequisite: course 6 or 3BL or AA; or successful completion of Chinese Placement Exam and with placement at the third-
year level. Not open for students who have completed course 111, 112, or 113. Nine-week intensive sum-
mer course combines courses 111, 112, and 113. Training at intermediate-high and advanced-low level in spoken and written Chinese in cultural and communicative contexts based on lan-
guage skills developed in course 6. GE credit: ArtHum | AH, OL, WC.—I–VI.

112. Modern Chinese: Reading and Discussion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 111. Readings in modern Chinese newspaper articles, essays, and short stories, based on lan-
guage skills developed in course 111. GE credit: ArtHum | AH, WC.—II. (II)

113. Modern Chinese: Reading and Discussion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 112. Continuation of CHN 112, further developing communication skills in Modern Standard Mandarin-speaking environments. Reading of dialogues/articles pertaining to contempo-
rary China. GE credit: ArtHum | AH, OL, WC.—I. (I)

114. Introduction to Classical Chinese: Confucius (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 6 or consent of instructor. Texts from the Con-
fcucian canon are read with the assistance of pre-
pared word glossaries so that the student can learn to read classical Chinese, the people and the king and the court, the city; the scholars and the courtes-
ians. GE credit: ArtHum | AH, OL, WC.—III. (III)

115. Introduction to Classical Chinese: Mencius (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 114. Continues course 114 by reading selec-
tions from the text of the Mencius. GE credit: ArtHum | AH, WC.—II. (II)

38L. Accelerated Written Chinese III (5)
Lecture—5 hours. Prerequisite: course 2BL. Advanced written styles and syntax in Chinese. Stu-
dents completing this course proceed to course 111, which starts the third-year Chinese, or to some other appropriate upper-division course. Not open for students who have completed course 28. (Former course 28.—III. (III.)

3CN. Mandarin for Cantonese Speakers III (5)
Lecture—5 hours. Prerequisite: course 2CN. Continu-
ation of course 2CN. Prepares students for entering upper division courses in Chinese. Not open for students who have completed course 27. (Former course 27.—III. (III.)

4. Intermediate Chinese (5)
Lecture/discussion—5 hours. Prerequisite: course 3 or the equivalent. Intermediate-level training in spoken and written Chinese in cultural contexts, based on language skills developed in course 3. GE credit: W.C.—I. (I)

4A. Accelerated Intermediate Chinese (15)
Prerequisite: course 3 or 1A or placement exam. Special nine-week accelerated, intensive summer session course that combines the work of courses 4, 5, and 6 into an intensive level training in spoken and written Chinese in cultural and communicative contexts, based on language skills developed in course 3 or 1A. Not open to students who have completed course 4, 5, or 6. GE credit: ArtHum | AH, OL, WC.—IV. (IV)

6. Intermediate Chinese (5)
Lecture/discussion—5 hours. Prerequisite: course 5 or the equivalent. Intermediate-level training in spoken and written Chinese in cultural contexts, based on language skills developed in course 5. GE credit: ArtHum | AH, OL, WC.—II, III. (II, III, II, III)

10. Modern Chinese Literature (In English) (4)
Lecture—3 hours; term paper or discussion—1 hour. Introductory course requiring no knowledge of Chi-
inese language or history. Reading and discussion of short stories and novels and viewing of two films. Designed to convey a feeling for what China has experienced in the twentieth century. Not open for students who have already taken, or are taking concurrently, course 104. GE credit: ArtHum, Div, Writ | AH, WC.—II. (II) Chen

11. Great Books of China (in English) (4)
Lecture—3 hours; discussion—1 hour. Selected read-
ings in English translation are supplemented with background information on periods, authors and the interactions of literature, culture, and historical and cultural change. Methods of analysis are introduced and applied in class discussions. GE credit: ArtHum, Div, Writ | AH, WC.—I. (I) Halperin, He

50. Introduction to the Literature of China and Japan (4)
Lecture/discussion—4 hours. Methods of literary analysis and their application to major works from the various genres of Chinese and Japanese litera-
ture (in translation), including film. East Asian cul-
tural traditions will also be introduced. (Same course as Japanese 50.) GE credit: ArtHum, Div, Writ | AH, WC.—I, II, (I, II) Gundy

98. Directed Group Study (1-5)
(P/NP grading only)

99. Special Study for Undergraduates (1-5)
(P/NP grading only)
116. Introduction to Classical Chinese: Narrative Styles (4)
Lecture—4 hours; discussion—1 hour. Prerequisite: course 115. Course 115 counts as 2 of the 4 credits required. This course focuses on the development of narrative structures in Chinese literature. It covers a variety of narrative forms, including historical, fictional, and philosophical genres. GE credit: ArtHum | AH—II, III, IV, (I, II, III).

120. Advanced Chinese (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 113 or consent of instructor. Selected readings from all genres to develop advanced skills in reading, writing, oral comprehension, and translation. GE credit: ArtHum | AH—I, II, III. (II, III, IV)

130. Readings in Traditional Chinese Fiction (4)
Lecture—1 hour; discussion—3 hours. Prerequisite: course 112 or the equivalent; course 114 recommended. Close reading in Chinese of representative works from the Tang Dynasty (618-907) to modern times. May be repeated one time for credit when content varies. GE credit: ArtHum | AH—I, II, III. (II, III, IV; III, IV; IV)

132. Readings in Modern Chinese Poetry (4)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 6 or consent of instructor. Chinese poetry and reflect the modernity of the twentieth century. GE credit: ArtHum | AH, WC, VI—II. (II, III)

133. Readings in Modern Chinese Prose and Drama (4)
Lecture—4 hours. Prerequisite: course 113 or equivalent language proficiency based on placement exam. Literary works and scholarly essays on selected topics of Chinese prose and drama, development of a deep understanding of Chinese culture and society through the exploration of traditional reading materials. May be repeated two times for credit when topic differs. GE credit: ArtHum | AH, WC—IV. (IV)

134. Chinese Film in Chinese Language (4)
Lecture—3 hours; film viewing—3 hours. Prerequisite: course 120 or fourth level Chinese placement exam. Chinese film and scholarly essays on Chinese cinema and film history. Develop a deep understanding of Chinese culture and society through the viewing and studying Chinese films in the Chinese language. GE credit: ArtHum or SocSci | AH or SS, OL, VI—IV; WC—IV. (IV)

140. Readings in Classical Chinese (4)
Lecture/discussion—3 hours; term paper. Prerequisite: consent of instructor. Study and philological analysis of selected texts from the first millennium of Chinese literature. May be repeated two times for credit. GE credit: ArtHum | AH—I, II, III. (II, III, IV)

150. Fifth-Year Chinese: Selected Topics in Chinese Language, Literature, and Culture (4)
Lecture/discussion—4 hours. Prerequisite: successful completion of course 120, or course 123 after Spring 2012, or fifth-year level Chinese placement exam. Literary works and scholarly essays on selected topics of Chinese culture and society. Development of a deep understanding of Chinese culture and society through sophisticated Chinese speaking and writing exercises. May be repeated three times for credit when topic differs. Offered irregularly. GE credit: ArtHum, Div; Wrt | AH, OC, WC—II, III. (II, III, IV) Chaudhuri

160. Chinese Language (4)
Lecture/discussion—4 hours. Prerequisite: course 6 (may be taken concurrently). Linguistics 1 recommended. The Chinese language viewed in its linguistic context, synchronically and diachronically. Historical phonology, classical and literary language, rise of written vernacular, descriptive gram-

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6. Intermediate Japanese (5)
Lecture/discussion—5 hours. Prerequisite: successful completion of course 5 or the equivalent. Intermediate-level training in spoken and written Japanese in cultural context, based on language skills developed in course 5. GE credit: ArtHum | AH, OL, WC—II, III.

75. Intensive Intermediate Japanese (20)
Lecture/discussion—20 hours. Special intensive course that combines the work of courses 3, 4, 5, and 6. Introduction to Japanese grammar and development of all language skills in a cultural context with emphasis on communication. Taught in Japanese. GE credit: ArtHum | AH, OL, WC—II. (III)

10. Masterworks of Japanese Literature (in English) (4)
Lecture—2 hours; discussion—1 hour. Introduction to Japanese literature: readings and discussion in English of important works from earliest times to the present. GE credit: ArtHum, Div, Wrt | AH, WC, WE—Sorensen

155. Introduction to Japanese Culture (2)
Lecture/discussion—2 hours; fieldwork. Restricted to students enrolled in units for the Kyoto Quarter Abroad program. Aspects of Japanese culture: literature, history, religion, art, language, and society. Conducted in English; taught in Japan. (P/NP grading only) GE credit: ArtHum | AH, WC—III. (III; Sorensen)

25. Japanese Language and Culture (in English) (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or Linguistics 1 or Anthropology 4 recommended. Classification and communication of experience in Japanese culture; principles of language use in Japanese society. Speech levels and honorific language, language and gender, minority languages, literacy. Role of Japanese in artificial intelligence and computer science. Offered in alternate years. GE credit: ArtHum or SocSci, Div; Wrt | AH or SS, WC, WE—I, II. (II, III)

98. Directed Group Study (1-5)
(P/NP grading only) GE credit: AH.

99. Special Study for Undergraduates (1-5)
(P/NP grading only)

Upper Division
101. Japanese Literature in Translation: The Early Period (4)
Lecture—2 hours; discussion—1 hour. Study of early Japanese literature from the Nara to the end of the Heian period through a broad survey of the major literary genres such as lyric poetry, court diaries, prose narratives, poems, and classical Chinese writings. GE credit: ArtHum, Div; Wrt | AH, WC, WE—I. (II, III, IV) Gundry

102. Japanese Literature in Translation: The Middle Period (4)
Lecture—2 hours; discussion—1 hour. Study of the major literary genres from the twelfth century to the second half of the nineteenth century including poetry, linked-verse, military chronicles, no drama, Buddhist literature, hashi, harukas, kabuki, bunraku, plays and Edo prose narratives. GE credit: ArtHum, Div; Wrt | AH, WC, WE—I. (II, III, IV) Sorensen

Lecture—3 hours; discussion—1 hour. Modern Japanese literature from the 1870s to the 1970s. Surveys representative literary works and ideas against the social and intellectual background of the Meiji, Taisho, and Showa periods. GE credit: ArtHum, Div; Wrt | AH, WC, WE—I. (II, III, IV) Chang
104. Modern Japanese Literature: War and Revolution (3)
Lecture/discussion—3 hours. Perspectives and sensibilities with which major modern Japanese writers have interpreted the traumatic and often poignant experiences of war and socio-political upheavals from the late nineteenth century to the 1970s. Lectures, discussions, and readings in English. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, WC.—I. Chang

105. Modern Japanese Literature: Hero and Anti-Hero (3)
Lecture/discussion—4 hours. The ways in which representative hero and anti-hero protagonists in modern Japanese literature perceive, confront, challenge, and resolve a wide array of social, political, and moral problems of their times. Course taught in English. GE credit: ArtHum, Div, Wrt | AH, WC.—I. Chang

106. Japanese Culture Through Film (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: upper division standing or consent of instructor. Aspects of Japanese culture such as love, sexuality, war, the military, the family, the position of women, growing up and death as portrayed in Japanese cinema. Lectures, discussions, and readings in English. Films with English subtitles. GE credit: ArtHum, Div, Wrt | AH, VL, WC.—III. (I.) Chang

107. Modern Japanese Autobiographies (in English) (4)
Lecture—3 hours; term paper/discussion—1 hour. Prerequisite: upper division standing or consent of instructor. Aspects of Japanese culture such as love, sexuality, war, the military, the family, the position of women, growing up and death as portrayed in Japanese cinema. Lectures, discussions, and readings in English. Films with English subtitles. GE credit: ArtHum, Div, Wrt | AH, WC.—I. Chang

108. Poetry of China and Japan (in English) (4)
Lecture—3 hours; discussion—1 hour. A comparative approach to Chinese and Japanese poetry, examining poetic practice in the two cultures, includes a general outline of the two traditions, plus study of poetic forms, techniques, and distinct treatments of universal themes: love, nature, war, etc. Offered in alternate years. [Same course as Chinese 108.] GE credit: ArtHum, Div, Wrt | AH, WC.—I, II. Gundy

Lecture—3 hours; discussion—1 hour; film viewing—3 hours. Japanese popular culture, from its medieval and traditional antecedents to contemporary incarnations. Emphasis on the major forms of twentieth-century popular culture, including genre films, popular theater, TV manga (cartoons), animation and video game, fiction. GE credit: ArtHum, Div | AH, VL, WC.—III. Sorensen

111. Modern Japanese: Reading and Discussion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 6. Repeaper division standing or consent of instructor. Aspects of Japanese culture such as love, sexuality, war, the military, the family, the position of women, growing up and death as portrayed in Japanese cinema. Lectures, discussions, and readings in English. Films with English subtitles. GE credit: ArtHum, Div, Wrt | AH, WC.—I. Chang

112. Modern Japanese: Reading and Discussion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 111. Continuation of course 111. GE credit: ArtHum | AH, OL, WC.—II. (I.)

113. Modern Japanese: Reading and Discussion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 112. Continuation of course 112. GE credit: ArtHum | AH, OL, WC.—III. (I.)

114. Spoken Japanese (2)
Discussion—2 hours. Prerequisite: course 6 or the equivalent. Training in spoken Japanese for students with a basic working knowledge of the language. (P/NP grading only.) GE credit: OL.—I. (I.)

114B. Spoken Japanese (2)
Discussion—2 hours. Prerequisite: course 114A or consent of instructor. Continuation of course 114A. Training in spoken Japanese for students with a basic working knowledge of the language. (P/NP grading only.) GE credit: OL.—II. (I.)

114C. Spoken Japanese (2)
Discussion—2 hours. Prerequisite: course 114B or consent of instructor. Continuation of course 114B. Training in spoken Japanese for students with a basic working knowledge of the language. (P/NP grading only.) GE credit: OL.—III. (I.)

115. Japanese Composition (2)
Lecture—2 hours. Prerequisite: course 6 or consent of instructor. Development of skills in the techniques of writing Japanese. Practice in short essay writing with an aim toward mastery of the vocabulary and syntax of written style Japanese.—I. (I.)

1175. Intensive Modern Japanese: Reading and Discussion (17)
Lecture/discussion—17 hours. Prerequisite: course 5. Introduction to basic Japanese grammar and development of more advanced reading, writing, and conversation skills in a cultural context. Combination of courses 6, 111, 112, and 113 taught intensively in Japanese. Not open to students who have taken courses 1, 2, 3, or 4, an exception can be made for students who have taken course 6 or its equivalent, provided that those five units are deducted from the 17 total unit load. GE credit: ArtHum | AH, OL, WC.—III. (II.)

131. Readings in Modern Japanese Literature: 1920-1945 (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 112 or the equivalent. Four-year-level reading of representative modern Japanese literature including short stories, novels, diaries, memoirs, poetry and excerpts from novels and plays from 1920 through the militaristic era, to the end of the war years in 1945. GE credit: ArtHum | AH.—II. (II.) Chang

Lecture—3 hours; discussion—1 hour. Prerequisite: course 113 or the equivalent. Continuation of course 131, but may be taken independently. Covers selected texts from the immediate post-war years beginning in 1945 down to 1970 and the post-war recovery. GE credit: ArtHum | AH.—II. (II.) Chang

133. Readings in Modern Japanese Literature: 1970 to Present (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 113 or the equivalent. Continuation of course 132, but may be taken independently. Covers selected texts from 1970 to the present. Offered in alternate years. GE credit: ArtHum | AH, WC.—I. Chang

134. Readings in the Humanities: Traditional Culture (4)
Lecture—3 hours; discussion—1 hour or term paper. Prerequisite: course 113. Fourth-year level reading of modern works by major specialists on traditional Japanese culture: history, religion, thought, art, international relations, and literary history and criticism. Focus is equally on developing reading skills and learning about Japanese culture. GE credit: ArtHum | AH, WC.—II. (II.)

135. Readings in the Humanities: The Modern Period (4)
Lecture—3 hours; term paper. Prerequisite: course 113. Fourth-year level reading of authentic modern writings on Japan and Japanese culture: history, philosophy, politics, society, religion, law, politics, international relations, aesthetics, and comparative culture by prominent critics, commentators, and scholars. GE credit: AH, WC.—III. (I.)

136. Readings in Newspapers and Magazines (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 113 or the equivalent. Fourth-year level reading of newspaper and magazine reports, articles, and editorials on domestic and international affairs relating to contemporary Japan. Offered in alternate years. GE credit: ArtHum | AH, WC.—III. (II.)

137. Readings in Contemporary Japanese Literature (4)
Lecture/discussion—4 hours. Prerequisite: course 113 or equivalent (placement exam or consent of the instructor). Readings of selected literary works by contemporary writers. Representative writers include Yoshimoto Banana, Otsuchi, Suzuki Koji, Kyogoku Natsumiko, Ogawa Yoko, and Murakami Haruki. Readings and discussions in Japanese with emphasis on translation into English. Offered in alternate years. GE credit: AH, WC.—III. Sorensen

141. Introduction to Classical Japanese (4)
Lecture/discussion—4 hours. Prerequisite: one advanced Japanese reading course such as Japanese 113, 132, or the equivalent reading knowledge of Japanese. The basic features of classical Japanese grammar through careful reading of selected literary texts such as Hojoki or Tsurezuregusa. Offered in alternate years.—III. Sorensen

151. Japanese Linguistics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1, 2, and 3 or equivalent. Introduction to Japanese linguistics, featuring writings on Japanese language. Analysis of Japanese from the perspectives of phonology, syntax, discourse analysis, sociolinguistics and psycholinguistics. GE credit: ArtHum or SocSci.—I. (I.) Koyama

152. Traditional Japanese Drama (4)
Lecture—3 hours; discussion—1 hour. Survey in English of Japanese drama, focusing on traditional forms: noh, kyogen, bunraku puppet theater, and kabuki, with some attention to modern theater. Tests of plays and secondary works on performance techniques and the composition of plays. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.—III. Sorensen

156. Japanese Literature on Film (4)
Lecture/discussion—3 hours; film viewing—2 hours. Survey of films based on works of Japanese literature, emphasis on pre-modern and early modern texts. Introduction to major directors of Japan, with a focus on cinematic adaptation. Lectures and readings in English. Films in Japanese with English subtitles. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.—III. Sorensen

192. Japanese Internship (1-12)
Internship—3-36 hours to be arranged. Prerequisite: upper division standing and consent of instructor. Work experience in Japanese language, with analytical term paper on a topic approved by instructor. (P/NP grading only.)

1977. Tutoring in Japanese (1-5)
Tutoring—1-5 hours. Prerequisite: consent of Department chairman. Leading of small voluntary discussion groups affiliated with one of the Program's regular courses. May be repeated for credit, but only 2 units may be applied to the minor. (P/NP grading only.)

198. Directed Group Study (1-5)
(P/NP grading only.) GE credit: AH, WC.

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.) GE credit: AH, WC.

Graduate
291. Seminar in Modern Japanese Literature: Major Writers (4)
Seminar—4 hours. Prerequisite: any one of courses 131, 132, 133, 134, 135, or the equivalent. In-depth reading and critical analysis of major works by and critical literature on one or two prominent modern or contemporary writers such as Natsume Soseki, Mori Ogui, Shimmazaki Toton, Akiyagawa Ryunosuke, Tanizaki Junnosuke, Abe Kobo and Oe Kenzaburo. Offered in alternate years.—II. Chang

299. Research (1-12)
(S/U grading only.)

Quarter Offered: =Fall, =Winter, =Spring, =Summer; 2015-2016 offering in parentheses
=Domestic Diversity; =Oral Skills; =World Cultures; =Writing Experience
=Arts and Humanities; =Science and Engineering; =SecSci-Social Sciences; =African-American Cultures; =Domestic Diversity; =Oral Skills; =Quantitative; =Scientific; =Visual; =World Cultures; =Writing Experience

East Asian Languages and Cultures 227
East Asian Studies

[College of Letters and Science]

Katharine Burnett, Ph.D., Program Director

Program Office, 1277 Social Science and Humanities Building; 530-752-4046; http://eastasian.ucdavis.edu

Committee in Charge
Katharine Burnett, Ph.D., Associate Professor (Art History)
Becky Bossler, Ph.D., Professor (History)
David Gundry, Ph.D., Assistant Professor (East Asian Languages & Cultures)
Kyu Hyun Kim, Ph.D., Associate Professor (History)
Sheldon Lu, Ph.D., Professor (Comparative Literature)
Ethan Scheiner, Ph.D., Professor (Political Science)
Xiaoling Shu, Ph.D., Professor (Sociology)
Eddy U., Ph.D., Associate Professor (Sociology)
L. Zhang, Ph.D., Professor (Anthropology)

The Major Program
The East Asian Studies major gives the student an understanding of East Asia (especially China and Japan) through interdisciplinary studies that combine sustained work in an East Asian language with courses on East Asian countries.

The Program
The program offers core courses in East Asian history, humanities, social sciences, and languages. After taking the core courses in conjunction with two years of either Chinese or Japanese language study, the student chooses additional courses focusing on a special field of interest, such as anthropology or history.

Programs, Internships, and Career Alternatives.
To enhance the student’s understanding of East and Southeast Asia, our majors are strongly encouraged to participate in UC Davis’s Study Abroad Program, which gives students the opportunity to live and experience a culture within East or Southeast Asia. Our majors are also encouraged to work with UC Davis’s Internship and Career Center, which provides customized assistance for EAS students to obtain legislative, legal, and business internships and careers. Likewise, the UC Davis Sacramento and UC Washington Centers arrange internships and run full-credit academic programs in Sacramento and Washington D.C. These programs provide opportunities for our majors. Graduating EAS majors are prepared for employment in government agencies (such as Foreign Service), state agencies, international or non-governmental organizations (NGO, such as the United Nations), foundations, journalism, teaching, counseling, and companies with international business interests, trade, or finance. The broad-based and multidisciplinary components of this major program enhance career prospects in jobs that demand knowledge of cultures of East and Southeast Asia.

A.B. Major Requirements:

<table>
<thead>
<tr>
<th>UNITs</th>
<th>Preparatory Subject Matter</th>
<th>41-42</th>
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<tbody>
<tr>
<td>History 9A and 9B</td>
<td>One course of: Art History 1D, Chinese 10, 11, Comparative Literature 53A, Japanese 10, 25, Religious Studies 70.</td>
<td>75</td>
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Two years (or the equivalent) of Chinese or Japanese language study (Chinese 1-2-3-4-5-6; Japanese 1-2-3-4-5-6) | 30 |

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<tr>
<th>UNITs</th>
<th>Depth Subject Matter</th>
<th>36</th>
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<tbody>
<tr>
<td>Must include at least eight units of core courses from each of the following three categories: History: History 191A, 191B, 191C, 191D, 191E, 191F; 194A-194B or 194B-194C. Social Science: Anthropology 148A, 148B, 149A, 149B. Economics 171. Geography 127. Political Science 148A, 148B, Sociology 147. Humanities: Art History 163A, 163B, 163C, 164; Chinese 104, 106, 107, 109, 131, 137; Japanese 101, 102, 103. Religious Studies 172. At least 12 additional units must be selected from the above courses, or from the following: Anthropology 110, 112, 117, 119, 120, 122, 123, 124, 128; Chinese [any upper division course]; Economics 115A, 115B, 116, 160A, 160B, 162; Geography 143; History 102G, 102H, 102N; Japanese [any upper division course]; Linguistics 100; Political Science 127, 133, 138, 145, 148C; Sociology 118, 141, 170, 183 [for other appropriate courses, including individual and group study courses (198, 199), as approved by the Committee in charge].</td>
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Total Units for the Major: 77-78

Major Adviser, East Asian Studies Undergraduate Advising Committee, Social Science & Humanities Building: 530-752-9241; easugadvisor@ucdavis.edu.

Minor Program Requirements:
Courses taken for the minor are expected to reflect a predominant interest in East Asia or Southeast Asia. All upper division courses counting towards the East Asian Studies major may be used to fulfill the requirements for the minor program, as long as they deal predominantly with East Asia or Southeast Asia.

Minor Program: East Asian Studies: History 9B and 18 upper division units, of which at least 12 must be courses focusing on China; OR History 9A and 18 upper division units, of which at least 12 must be in courses focusing on Japan. | 22 |

Courses in East Asian Studies: The following courses count toward the major and are open to students throughout the campus. See departmental listings for course descriptions.

Anthropology
148A. Culture and Political Economy in Contemporary China
148B. Contemporary Japanese Society

Art History
1D. Asian Art
163A. Chinese Art
163B. Chinese Painting
163C. Painting in the People’s Republic of China
164. The Arts of Japan

Chinese
All courses

Comparative Literature
53A. Literature of China and Japan
153. The Forms of Asian Literature

Economics
171. Economy of East Asia

History
9A. History of East Asian Civilization (China)
9B. History of East Asian Civilization (Japan)
102G. Undergraduate Proseminar: China to 1800
102H. Undergraduate Proseminar: China since 1800
102N. Undergraduate Proseminar: Japan
191A. Classical China
191B. High Imperial China
191C. Late Imperial China
191D. Nineteenth-Century China
191E. The Chinese Revolution
191F. History of the People’s Republic of China, 1949 to the Present

Quarter Offered: I-Fall; II-Winter; III-Spring; IV-Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): AH=Arts and Humanities; SL=Social Sciences; DL=Diverse Domains; VW=Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SC=Science and Engineering; SS=Social Sciences; AGM=American Cultures; DD=Diverse Domains; OL=Oral Skills; QL=Quantitative; SL=Social, VL=Visual; WC=World Cultures; WE=Writing Experience

194A. Aristocratic and Feudal Japan through 16th Centuries
194B. Early Modern Japan, 17th-19th Centuries
194C. Modern Japan: 20th Centuries
194D. Business and Labor in Modern Japan
194E. Education and Technology in Modern Japan
195B. History of Modern Korea

Japanese
All courses.

Political Science
148A. Government and Politics in East Asia: China
148B. Government and Politics in East Asia: Pacific Rim
148C. Government and Politics in East Asia: Southeast Asia

Religious Studies
75. Chinese Philosophy: An Introduction
170. Introduction to Buddhism
172. Ch’an (Zen) Buddhism

Sociology
147. Sociological Perspectives on East Asia
188. Social Stratification in China

Courses in East Asian Studies (EAS)

Lower Division
88. Korean Society: Late 19th Century to the Present (4)
Lecture/discussion—4 hours. Modern Korean society [late 19th Century to contemporary period], emphasizing the perseverance and transformations of traditional social and cultural patterns. GE credit: ArtHist, Div, Wrt. — II. Kim

Upper Division
113. Cinema and Society in China (4)
Lecture—3 hours, discussion—1 hour. Prerequisite: one course from History 190B, 193, or consent of instructor. Knowledge of Chinese not required. Viewing and analysis of one Chinese film with English subtitles each week, followed by discussion and short essays. Cinematic technique, social values and film topics from 1930s to today. Not open for credit to students who have completed Chinese 113. GE credit: ArtHist, Div, Wrt. — III. (III.)

190. East Asian Studies Seminar (4)
Seminar—3 hours; term paper. Prerequisite: upper division standing or consent of instructor. Political, social, cultural, and economic issues in East Asia. Topic varies each year. May be repeated for credit if topic differs. Offered irregularly.

192. East Asian Studies Internship (1-12)
Internship—3-36 hours; term paper. Prerequisite: upper division standing and consent of instructor. Work experience in the East Asian Studies field, with analytical term paper on a topic approved by the instructor. (P/NP grading only.)

194H. Special Study for Honors Students (1-5)
Independent study—1-5 hours. Prerequisite: open only to majors of senior standing who qualify for honors program. Guided research, under the direction of a faculty member, leading to a senior honors thesis on a topic in East Asian Studies culture, society, or language. (P/NP grading only.)

196A-196B. Honors Seminar (4-6)
Seminar—2 hours; conference—2 hours. Prerequisite: a GPA of 3.50 in the major, senior standing, and consent of instructor. A two-quarter research project culminating in an Honors thesis. A grade of B or higher must be earned to qualify the student for honors distinction at graduation. (Deferred grading only, pending completion of sequence.)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)
Ecological Management and Restoration

(College of Agricultural and Environmental Sciences)

Faculty. See Plant Sciences, on page 476.

The Major Program

This major is designed for students who are interested in understanding how to manage and restore wildland and rangeland plant communities. Courses are selected to provide an interdisciplinary background that encompasses ecology, applied plant biology, and the social sciences. Students will acquire a core understanding of natural and managed ecosystems and how they function, interact with the natural environment, are connected with human society and social change, and are restored and managed.

The Program. The curriculum provides depth in the ecological and botanical sciences directed toward an integrated understanding of how communities and ecosystems function and how this knowledge assists in their management and restoration. Courses in environmental policy and law expose the students to the social drivers and constraints of ecosystem management. All students gain practical experience through practical field courses and a required internship. Students may also pursue an Honors thesis in their senior year.

Career Alternatives. Graduates from this program are prepared to pursue a wide range of careers, including positions in ecological restoration and ecosystem management; rangeland and reserve management; environmental consulting; public, private, or non-profit agencies concerned with restoration and natural resource management; Cooperative Extension; teaching; information and communication services. Graduates are qualified to pursue advanced studies in fields such as ecology, agroecology, environmental studies, geography or weed science.

B.S. Major Requirements:

Preparatory Subject Matter. 51-61

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<th>SCIS</th>
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<td>6-12</td>
<td>16A, 16B or Mathematics 17A, 17B or Mathematics 21A, 21B</td>
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Depth Subject Matter. 60-80

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<td>146 or Soil Science 105 or 111 or 112 or 118</td>
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<td>6-8</td>
<td>7-17</td>
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<td>16</td>
<td>15, 150, Environmental Science and Policy 147, 147, Plant Sciences 131, 144, Soil Science 156, 157</td>
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<td>160 or 161</td>
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<td>149, 150, Plant Sciences 130, 135, 150, Environmental Science and Policy 127, 155L, Wildlife, Fish, and Conservation Biology 154, 155</td>
<td>8-10</td>
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<td>16</td>
<td>15, 150, Environmental Science and Management 100, Geology 143, 147, 151</td>
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Plant Sciences 100C or one from each of these two lists: 3-9

| Plant Sciences 100C, Soil Science 109, Hydrology 110 or 124 | 4 | 8-10 | 16 | 12 | 4-5 | 150 | 3-4 |
| Environmental Science and Management 141 | 4 | 8-10 | 16 | 12 | 4-5 | 150 | 3-4 |
| Plant Sciences 100C, Soil Science 109, Hydrology 110 or 124 | 4 | 8-10 | 16 | 12 | 4-5 | 150 | 3-4 |
| Environmental Science and Management 141 | 4 | 8-10 | 16 | 12 | 4-5 | 150 | 3-4 |

Total Units for the Major. 111-141

Major Adviser. T. P. Young

Advising Center for the major, including peer advising, is located in 1220 Plant and Environmental Sciences 530-752-7175.

Ecology (A Graduate Group)

S.P. Lawler, Ph.D., Chairperson of the Group


Faculty

Gwen Arnold, Ph.D., Assistant Professor (Environmental Science and Policy)
Heidi L. Ballard, Ph.D., Associate Professor (School of Education)
Marissa L. Baskett, Ph.D., Associate Professor (Environmental Science and Policy)
Alison M. Berry, Ph.D., Professor (Plant Sciences)
Robert L. Bettinger, Ph.D., Professor (Anthropology)
Monique Borgerhoff Mulder, Ph.D., Professor (Anthropology)
Louis W. Botfsford, Ph.D., Professor (Wildlife, Fish, and Conservation Biology)
Walter M. Boyce, Ph.D., Professor (Pathology, Microbiology, and Immunology)
Patrick H. Brown, Ph.D., Professor (Plant Sciences)
Mary Cadensso, Ph.D., Associate Professor (Plant Sciences)
James Carey, Ph.D., Professor (Entomology)
Tim Caro, Ph.D., Professor (Wildlife, Fish, and Conservation Biology)
Edward P. Caswell-Chen, Ph.D., Professor (Nematology)
Ernest S. Chang, Ph.D., Professor (Bodega Marine Laboratory)
Tom Coooms-Hahn, Ph.D., Professor (Neurobiology, Physiology, and Behavior)
Anthony V. Cornell, Ph.D., Associate Professor (Entomology)
Howard V. Cornell, Ph.D., Professor Emeritus (Environmental Science and Policy)
Margaret Crofoot, Ph.D., Assistant Professor (Anthropology)
Randy A. Dahlgren, Ph.D., Professor (Land, Air and Water Resources)
Academic Senate Distinguished Teaching Award
Christyann M. Darwent, Ph.D., Associate Professor (Wildlife, Fish, and Conservation Biology)
John M. Eadie, Ph.D., Professor (Wildlife, Fish, and Conservation Biology)
Jonathan Eisen, Ph.D., Professor (Evolution and Ecology)
Deborah L. Elliott-Fisk, Ph.D., Associate Professor (Plant Sciences)
Yufang Jin, Ph.D., Assistant Professor (Plant Sciences)
Nadi A. Jasieniuk, Ph.D., Associate Professor (Animal Science)
Emilio A. Laca, Ph.D., Professor (Plant Sciences)
John Largier, Ph.D., Professor (Environmental Science and Policy)
Andrew M. Latimer, Ph.D., Assistant Professor (Plant Sciences)
Sharon P. Lawler, Ph.D., Professor (Entomology)
Edwin E. Lewis, Ph.D., Professor (Nematology)
C. -Y. Cynthia Lin, Ph.D. Associate Professor (Environmental Science and Policy, Bodega Marine Laboratory)
Andrew Marshall, Ph.D., Associate Professor (Anthropology)
Brenda McCowan, Ph.D., Professor (Wildlife, Fish, and Conservation Biology)
Michael R. Miller, Ph.D., Assistant Professor (Animal Science)
Frank M. Miltoenher, Ph.D., Associate Professor (Animal Science)
Steven G. Morgen, Ph.D., Professor (Environmental Science and Policy, Bodega Marine Laboratory)
Peter B. Moyle, Ph.D., Professor (Wildlife, Fish, and Conservation Biology)
Steven A. Nadler, Ph.D., Professor (Nematology)
Gabrielle Nevitt, Ph.D., Professor (Neurobiology, Physiology, Behavior)
Richard L. McElreath, Ph.D. Associate Professor (Civil and Environmental Engineering)
Gregory Pasternack, Ph.D., Professor (Wildlife, Fish, and Water Resources)
Gail L. Patricelli, Ph.D., Assistant Professor (Evolution and Ecology)
Katy Thaw Pau, U. Ph.D., Professor (Land, Air and Water Resources)

Nann A. Fangue, Ph.D., Assistant Professor (Wildlife, Fish Conservation Biology)
Hossein Farzini, Ph.D., Professor (Agricultural and Resource Economics)
Howard Ferris, Ph.D., Professor (Nematology)
Albert Fischer, Ph.D., Professor (Plant Sciences)
James E. Foley, Ph.D., Professor (VM: Epidemiology)
Brian Gaylord, Ph.D., Associate Professor (Evolution and Ecology)
Shu Geng, Ph.D., Professor (Plant Sciences)
Paul Gepts, Ph.D., Professor (Plant Sciences)
Matthew E. Gilbert, Ph.D., Assistant Professor (Plant Sciences)
Steven E. Greco, Ph.D., Associate Professor (Environmental Sciences and Policy)
Richard Grosberg, Ph.D., Professor (Evolution and Ecology)
Susan L. Handy, Ph.D., Professor (Environmental Science and Policy)
Alan Hastings, Ph.D., Professor (Environmental Science and Policy)
Robert Hijmans, Ph.D., Associate Professor (Environmental Science and Policy)
Tessa Hill, Ph.D., Associate Professor (Geology)
Marcel Holyoak, Ph.D., Professor (Environmental Science and Policy)
William Horwath, Ph.D., Professor (Land, Air and Water Resources)
Benjamin Z. Houlton, Ph.D., Assistant Professor (Land, Air and Water Resources)
Silas S. O. Hung, Ph.D., Professor (Animal Science)
Louise E. Jackson, Ph.D., Professor (Land, Air and Water Resources)
Marie A. Jasieniuk, Ph.D., Associate Professor (Animal Science)

Quarter Offered: Fall, Winter, Spring, Summer; Fall, 2011 and on Revised General Education (GE): AH—Arts and Humanities; SC—Science and Engineering; SS—Social Sciences; ACHN—American Cultures, DD—Domestic Diversity; Wrt—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SC—Science and Engineering; SS—Social Sciences; ACHN—American Cultures, DD—Domestic Diversity; Wrt—Writing Experience
Courses in Ecology (ECL)

Graduate

200A. Principles and Applications of Ecology (5)
Lecture—4 hours; discussion—1 hour. Prerequisite: first course in Ecology [e.g., Environmental Science and Policy 100]. Statistical I02, Mathematics DA, 168 or consent of instructor; pass 1 open to graduate majors. Provides a broad background in the principles and applications of ecology, and serves as a foundation for advanced topics. Emphasis on biological diversity and ecosystem functioning, as well as the principles and applications of plant ecology, population genetics and evolution. Emphasis on population genetics and evolution. Emphasis on historical developments, current understanding, and real world applications. —I. (I.) Holway, Rice

Lecture—4 hours; discussion—1 hour. Prerequisite: course 200A; pass 1 open to graduate majors. Principles and applications of population genetics and evolution, focusing on concepts relevant to population biology. Emphasis on the evolution of ecological, evolutionary, and population genetics, population genetics and evolution, as well as the principles and applications of plant ecology, population genetics and evolution. Emphasis on historical developments, current understanding, and real world applications. —I. (I.) Holway, Rice

201. Ecosystems and Landscape Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 200A and 2008. Integration of concepts to understand and manage ecosystems in a complex and changing world. Emphasis on interactions among biotic, abiotic and human factors and changes over space/time. Local to global controls over water, carbon and nutrients across ecosystems, landscapes. GE credit: ScEng | SE—II. (II.) Cade

203. Physiological Ecology (3)
Lecture—3 hours. Prerequisite: Evolution and Ecology 101 or Environmental Studies 100; Neurobiology, Physiology, and Behavior 110 or Plant Biology 111 or Environmental Studies 129; elementary calculus. A comparative examination of several animal groups addressing fundamental physiological mechanisms that shape the ecology of each animal group. Offered in alternate years. —I. Wainwright

204. Population and Community Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Environmental Studies 100 or Evolution and Ecology 101, Mathematics 21A-21B or consent of instructor; Mathematics 228b recommended. Review of major concepts of population and community ecology, with emphasis on the rationale of theory and use of theory as applied in the ecology of natural and managed systems. Offered in alternate years. —I. Lomolino

205. Community Ecology (4)
Lecture—2 hours; discussion—2 hours. Prerequisite: Environmental Studies 100, Evolution and Ecology 101, or Plant Biology 117. Introduction to literature and contemporary research into processes structuring ecological communities. —B. Karban, Lawler

Lecture—3 hours, laboratory—4 hours. Prerequisite: introductory courses in statistics and plant ecology; consent of instructor. Principles and techniques of vegetation analysis, including structure, composition, and dynamics. Emphasis given to sampling procedures, association analysis, ordination, processes, and mechanisms of succession, and classification. Most techniques are demonstrated or conducted during field trips and laboratories. Offered in alternate years. —I. (I.) Loomis

207. Plant Population Biology (3)
Lecture—2 hours, laboratory/discussion—1 hour. Prerequisite: advanced undergraduate ecology course (e.g., Environmental Science and Policy 100, Evolution and Ecology 101, or Plant Biology 117), and advanced undergraduate course in genetics and/or evolution (e.g., Biological Sciences 101 or Evolution and Ecology 100). Introduction to theoretical and empirical research in plant
211. Advanced Topics in Cultural Ecology (4)  
Lecture/discussion—3 hours; term paper. Prerequisite: Environmental Science and Policy 133/Anthropology 135 or consent of instructor. Focus on themes and analytical tools in anthropology. Topics include issues of sustainability, conservation, and cultural diversity. Offered in alternate years. (I) Lubell, McElreath

212A. Environmental Policy Process (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: Introduction to political policy (e.g., Environmental Studies 160) or environmental law (e.g., Environmental Studies 161); course in bureaucratic theory (e.g., Political Science 187 or Environmental Studies 166); course in statistics (e.g., Sociology 106 or Agricultural and Resource Economics 106). Introduction to selected topics in the policy process, applications to the field of environmental policy. Develops critical reading skills, understanding of frameworks of the policy process and political behavior, and an ability to apply multiple frameworks to the same phenomenon. Offered in alternate years. (Same course as Environmental Science and Policy 212A.) (I) Arnold, Lubell

212B. Environmental Policy Evaluation (4)  
Lecture—1 hour; discussion—1 hour; seminar—2 hours. Prerequisite: introductory microeconomics (e.g., Economic 108); Statistics 108 or Agricultural and Resource Economics 106; policy analysis (e.g., Environmental Studies 168A or the equivalent); Agricultural and Resource Economics 176. Methods and practices of policy analysis; philosophical and intellectual bases of policy analysis and the political role of policy analysis. (Same course as Environmental Science and Policy 212B.) Offered in alternate years. (I) Springborn

213. Population, Environment, and Social Structure (4)  
Seminar—3 hours; term paper. Prerequisite: at least one course in population or human ecology, or in environmental science. Relationships among population dynamics, resource scarcity and environmental problems, and social structure; focus on demographic content of global ecological models and simulations, ecological content of modern demographic theories, and debates about scarcity, inequality, and social conflict and change. Offered in alternate years. (I/II)

214. Marine Ecology: Concepts and Practice (3)  
Lecture—1 hour; discussion—1.5 hours; fieldwork—1.5 hours. Prerequisite: graduate standing or one course in ecology, one course in evolution or genetics, or permission of instructor; survey course in marine ecology recommended. Critical review and analysis of concepts and practices in modern marine ecology at the interface of several fields of study including behavioral, evolutionary, and physiological. Emphasis on critical thinking, problem solving, and hands-on study. Three field trips required. (III) Morgan

216. Ecology and Agriculture (4)  
Lecture—1 hour; discussion—2 hours. Prerequisite: Evolution and Ecology 11 or consent of instructor. Ecological principles as relevant to agriculture. Integration of ecological approaches into agricultural research to increase ecosystem functions and services. Topics include crop autoecology, biotic interactions among crops and pests, ecosystem and landscape ecology. Not open for credit to students who have completed Vegetable Crops 216. Offered in alternate years. (I) Jackson

217. Conservation and Sustainable Development in Third World Nations (4)  
Lecture/discussion—2 hours. Prerequisite: at least one course from two of these three groups: (a) Environmental Studies 160, 161, 168A, 168B; (b) Environmental Studies 101, 133, International Agricultural Development 103, Geography 142; (c) Anthropology 126, 131, Geography 141, Sociology 144, 145A, 145B. Examination of the patterns of resource ownership, control and management in agricultural and pasture lands, and wildlands, with emphases on conservation and sustainability. Comparison of industrial democracies and poorer nations. (Same course as International Development 217.) Offered in alternate years. (III)

219. Ecosystem Biogeochemistry (4)  
Lecture—3 hours; laboratory/discussion—2 hours. Prerequisite: introductory courses in ecology/biology and soils are recommended; undergraduates accepted with consent of instructor. Multi-disciplinary analysis of energy and nutrient transfers within terrestrial ecosystems. Examination of processes and inter- and intra-system interactions between the atmosphere, biosphere, lithosphere, and hydrosphere. Laboratory section uses biogeochemical simulation models to examine case studies. (Same course as Soil Science 219.) Offered in alternate years. (I) Houlton

220. Spatio-Temporal Ecology (2)  
Lecture/discussion—2 hours. Prerequisite: Population Biology 200B or course 204 and Evolution and Ecology 104. An introduction to Evolution and Policy 212 or consent of instructor. Spatio-temporal ecological theory focusing on population persistence and stability, predator-prey and host-parasitoid interactions, species coexistence and competition, and maintaining ecosystems. Emphasis on policy-relevant topics, non-linear dynamics, and conservation. Topics vary. (Same course as Population Biology 220B.) May be repeated one time for credit. (S/U grading only.) (III)

225. Terrestrial Field Ecology (4)  
Seminar—1 hour; fieldwork—12 hours. Prerequisite: introductory ecology and introductory statistics or consent of instructor. A field course conducted over spring break and four weekends at Bodega Bay, emphasizing student projects. Ecological hypothesis testing, data gathering, analysis, writing, and oral presentation will be stressed. (Same course as Entomology 225/Population Biology 225.) (III) Karban

231. Mathematical Methods in Population Biology (3)  
Lecture—3 hours. Prerequisite: Mathematics 16C or 21C or the equivalent. Mathematical methods used in population biology. Linear and nonlinear difference equation and differential equation models are studied, using stability analysis and qualitative methods. Partial differential equation models are introduced. Applications to population biology models are stressed. (Same course as Population Biology 231.) (I) Hastings

232. Theoretical Ecology (3)  
Lecture—3 hours. Prerequisite: course 204 or the equivalent and Mathematics 16C or 21C, or one of courses 100 or 121 or Evolution and Ecology 101, and a strong mathematics background (Mathematics 22A-22B-22C or the equivalent). Examination of major conceptual and methodological issues in theoretical ecology. Models formulation and development will be emphasized. Topics will vary from year to year. May be repeated for credit. Offered in alternate years. (II) Hastings

233. Computational Methods in Population Biology (3)  
Lecture/laboratory—2 hours; discussion/laboratory—1 hour. Prerequisite: A course in theoretical ecology (e.g., course 231 or an equivalent to Environmental Science and Policy 121 from your under-graduate institution) or consent of instructor; no programming experience required. Numerical methods for simulating population dynamics using the computational software package R. Emphasis placed on model formulation and development, the theoretical concepts and philosophical principles to guide simulation efforts, model parameterization, and implementing simulations with R. (Same course as Population Biology 233.) Offered in alternate years. (S/U grading only.) (II) Sackett, Schreiber

Lecture—2 hours; discussion—0.5 hours; laboratory—0.5 hours. Prerequisite: undergraduate genetics and ecology/conservation biology courses recommended. Introduction to the field of applied ecological genetics to include applications in conservation ecology, population genetics, population biology, wildlife health and conservation biology. Limited enrollment. (Same course as Population Biology 242.) (II) Ernst

271. Research Conference in Ecology (1)  
Seminar—1 hour. Prerequisite: consent of instructor. Critical presentation and evaluation of current literature and ongoing research in ecology. Requirements include active participation in weekly discussions and the presentation of a paper or chapter once per quarter. May be repeated for credit. (Same course as Population Biology 271.) (S/U grading only.) (I, II, III) Schreiber

280. Current Anthropology Journal Editorial Workshop (4)  
Workshop—1 hour; independent study—2 hours. Students must enroll in all three quarters. Reading and offering workshop critiques of manuscripts submitted for publication, and reading and discussion of other relevant work in anthropology and human ecology. Track and edit publisher’s decisions and authors’ replies that accompany major features. Participation in the development of new sections for the electronic edition of the journal including a “news and views” section and a debate section. (Same course as Anthropology 280.) May be repeated for credit. May be repeated for 12 units of credit with consent of instructor. (S/U grading only.) (I, II, III)

290. Seminar in Ecology (1-4)  
Seminar—1-4 hours. Prerequisite: consent of instructor. Topics in ecology. Students are expected to present an oral seminar on a particular aspect of the general topic under consideration. (S/U grading only.) (I, II, III, II, III)

296. Topics in Ecology and Evolution (1)  
Seminar—1 hour. Prerequisite: graduate standing. Seminars presented by visiting lecturers, UC Davis faculty, and graduate students. May be repeated for credit. (Same course as Population Biology 296.) (S/U grading only.) (I, II, III, II, III)

297T. Tutoring in Ecology (1-4)  
Seminar—1-4 hours. Prerequisite: consent of instructor. Topics in ecology. Students are expected to present an oral seminar on a particular aspect of the general topic under consideration. (S/U grading only.) (I, II, III, II, III)

297T. Tutoring in Ecology (1)  
Lecture—1 hour; discussion—1 hour. Prerequisite: graduate standing in ecology; consent of instructor. Teaching ecology includes working with discussion groups for regular departmental courses under direct guidance of staff. May be repeated for credit. (S/U grading only.)
Economics

[College of Letters and Science]

Ann Stevens, Ph.D., Chairperson of the Department
Deborah Swenson, Ph.D., Vice Chairperson of the Department

Department Office: 2216 Social Sciences and Humanities Building
530-752-9241; http://www.econ.ucdavis.edu

Faculty

Paul Bergin, Ph.D., Professor
Giacomo Bonanno, Ph.D., Professor
James Bushnell, Ph.D., Associate Professor
Cullen Cameron, Ph.D., Professor
Scott E. Carrell, Ph.D., Associate Professor
Gregory Clark, Ph.D., Professor
Robert C. Feenstra, Ph.D., Professor
Athanasios Gefichos, Ph.D., Assistant Professor
Espen Henriksen, Ph.D., Assistant Professor
Oscar Jorda, Ph.D., Professor
Christopher M. Meissner, Ph.D. Professor
Douglas Miller, Ph.D., Associate Professor
Marianne E. Page, Ph.D., Professor
Giovanni Peri, Ph.D., Professor
Klaus Nehring, Ph.D., Professor Emeritus
T. Y. Shen, Professor Emeritus
Leon L. Wegge, Ph.D., Professor Emeritus

Emeriti Faculty

Andrzej Brzeski, Ph.D., Professor Emeritus
W. Eric Gustafson, Ph.D., Senior Lecturer Emeritus
Academic Senate Distinguished Teaching Award
L. Jay Halus, Ph.D., Professor Emeritus
Kevin D. Salyer, Ph.D., Professor Emeritus
Burkhard C. Schipper, Ph.D., Associate Professor Emeritus
Kathryn N. Russ, Ph.D., Associate Professor Emeritus
Kevin D. Salyer, Ph.D., Professor Emeritus
Joaquim Silvestre, Ph.D., Professor Emeritus
Ann Huff Stevens, Ph.D., Professor Emeritus
Deborah Swenson, Ph.D., Professor Emeritus
Alan M. Taylor, Ph.D., Professor Emeritus
Wing T. Woo, Ph.D., Professor Emeritus

Minor Program Requirements: UNITS

Economics 1A and 1B; Statistics 13, 32, or 102; Mathematics 16A-16B or 21A-21B; Mathematics 100 and 101 be taken as soon as possible after the introductory courses.

Major Advisers. Contact Department office.

Economics

nomic development, public finance, econometrics, or mathematical economics.

Internships and Career Alternatives. Internships for economics majors may have been arranged at banks, brokerage firms, government enterprises, and governmental units. The internships must complement the student’s course work. A degree in economics is excellent preparation for students who wish to go on to law school, business school, advanced work in economics, or graduate work in international relations. It is also a good background for careers in management and positions with the government.

A.B. Major Requirements: UNITS

Preparatory Subject Matter ............... 17-20

Economics 1A-1B .............................. 8
Statistics 13, 32, or 102 ...................... 3-4
Mathematics 16A-16B or 21A-21B ........... 6-8

Depth Subject Matter ....................... 44

Economics 100, 101 .......................... 8
Economics 102 ................................. 4
One course from: Economics 110A, 110B, 111A, 111B .................................. 4
Select 16 units from Economics 103, 106, 116, 121A, 121B, 122, 125, 130, 131, 132, 134, or 137 .............................. 20
Additional upper division Economics courses .................................................. 12

Total Units for the Major ................... 61-64

Recommended. Students considering graduate study in economics are strongly urged to take Mathematics 21A-21B and 22A.

The Economics Department suggests that Economics 100 and 101 be taken as soon as possible after the introductory courses.

Graduate Advisers. Contact Department office.

Minor Program Requirements: UNITS

Economics 100, 101 ........................... 8
Select 4 units from upper division Economics courses ...................................... 4

Preparation. Economics 1A and 1B; Statistics 13, 32, or 102; Mathematics 16A and 16B or 21A and 21B; Mathematics 16A and 16B or 21A and 21B should be completed before taking Economics 100 and 101. Students need to complete Economics 100 and 101 before taking the advanced courses.

Course Limits. Except under extraordinary circumstances, no more than two economics courses should be taken in any quarter. In special cases, the department will accept a limited number of related upper division courses from other departments in satisfaction of the economics upper division course requirements. Approval from a departmental adviser is required in all such cases.

Graduation with High or Highest Honors. To be eligible for departmental recommendation for High or Highest Honors in Economics at graduation, a student must take all upper division courses in Economics for a letter grade, earn at least a 3.500 grade point average in those courses, and complete at least eight units of course work that result in the submission of an honors project. Consult the Catalogue of Letters and Science section of this catalog and contact the Department for more information.

Study Abroad. The economics department wishes to accommodate students who would like to complement their economics degrees with a study abroad experience. Up to 20 units of upper division credit from foreign campuses (excluding Economics 100 and 101) may be used towards the completion of the degree. To ensure that foreign courses will apply towards the economics degree, students need to select courses from the pre-approved list at the UC Davis Study Abroad office or seek pre-approval in the economics department for the foreign courses they wish to complete.


Graduate Advisers. Contact Department office.

American History and Institutions. This University requirement can be satisfied by completion of Economics 111A, 111B; see also under University requirements.

Courses in Economics (ECN)

Lower Division

1A. Principles of Microeconomics (4) Lecture—3 hours; discussion—1 hour. Course 1A and 1B may be taken in either order. Analysis of the allocation of resources and distribution of income. The pricing mechanism and how it is affected by public policy.

1B. Principles of Macroeconomics (4) Lecture—3 hours; discussion—1 hour. Course 1A and 1B may be taken in either order. Analysis of the economy as a whole; determinants of the level of income, employment and prices; money and banking, economic fluctuations, international trade, economic development; the role of public policy.

90X. Lower Division Seminar (1-2) Seminar—1-2 hours. Prerequisite: lower division standing and consent of instructor. Examination of a special topic in Economics through shared readings, discussions, and written assignments. May not be repeated for credit. Limited enrollment.

92. Internship and Field Work (1-12) Internship—3-36 hours; term paper. Prerequisite: junior or senior standing; availability of internship placement; or approved field work project; stockbrokerage interns must have completed Management 11A-11B; consent of instructor. Intensive study of practical application of concepts in economics, stressing research methods and empirical analysis. (P/NP grading only.)

98. Group Study for Undergraduates (1-5) Prerequisite: consent of instructor. Primarily for lower division students. (P/NP grading only.)

99. Individual Study for Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only.)

Upper Division

100. Intermediate Micro Theory (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A, 1B; Mathematics 16A-16B or 21A-21B with grade of C- or better in each. Price and distribution theory under conditions of perfect and imperfect competition. General equilibrium and welfare eco-
Economics

101. Intermediate Macro Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A, 1B; Mathematics 16A-16B or 21A-21B with grade of C or better in each, or consent of instructor. Analysis of economic data to investigate key relationships emphasized in introductory microeconomics and macroeconomics. Obtaining, transforming, and displaying data; statistical analysis of economic data; and basic univariate and multivariate regression analysis. Only 2 units of credit allowed to students who have completed course 1A or Agricultural and Resource Economics 106. GE credit: VL—I, II, III. (I, II, III.)

102. Analysis of Economic Data (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A, 1B, Statistics 13 or 32, Mathematics 16A-16B or 21A-21B, with grade of C or better in each, or consent of instructor. Analysis of economic data to investigate key relationships emphasized in introductory microeconomics and macroeconomics. Obtaining, transforming, and displaying data; statistical analysis of economic data; and basic univariate and multivariate regression analysis. Only 2 units of credit allowed to students who have completed course 1A or Agricultural and Resource Economics 106. GE credit: VL—I, II, III. (I, II, III.)

103. Economics of Uncertainty and Information (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100; Mathematics 16A-16B or 21A-21B, Statistics 13 or 32, with grade of C or better in each course, or consent of the instructor. Descriptive and normative analysis of individual decision making, with applications to personal, professional, financial, and public policy decisions. Emphasis on decision making under uncertainty and over time. Heuristics and biases in the psychology of decisions; overcoming decision traps.—I. (I.)

106. Decision Making (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A, 1B and 110A. Development and application of analytical tools to explain the nature and functioning of economies before the Industrial Revolution. Examples will be drawn from a variety of societies, including England, China, Polynesia, and Pre-Columbian America. GE credit: SS—I, II, III. (I, II, III.)

110B. World Economic History Since the Industrial Revolution (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A, 1B and 110A. Development and application of analytical tools to explain the nature and functioning of economies after the Industrial Revolution. Examples will be drawn from a variety of societies, including England, China, Germany, and India. GE credit: SS—I, II, III. (I, II, III.)

111A. Economic History (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A-1B or consent of instructor. Survey of economic change in the United States from Colonial times to the present, with reference to other regions of the Western Hemisphere. GE credit: SS—I, II, III. (I, II, III.)

111B. Economic History (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A-1B, or consent of instructor. Survey of economic change in the United States from 1865 to the post World War II period. GE credit: SS—I, II, III. (I, II, III.)

115A. Economic Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A and 1B. Major issues encountered in economic development of the United States from 1865 to the present, including growth and structural change, human welfare, population growth and health, labor markets and internal migration. Important issues of policy concerning international trade and industrialization. (Same course as Agricultural and Resource Economies 115A.) GE credit: SocSci, Div I SS, WC—I, II, III. (I, II, III.)

115B. Economic Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A and 1B. Major macroeconomic issues of developing countries. Issues include problems in generating a market; the product of monetary and fiscal policies, foreign aid and investment. Important issues of policy concerning international borrowing and external debt of developing countries. (Same course as Agricultural and Resource Economies 115B.) GE credit: SocSci I SS, WC—I, II, III. (I, II, III.)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, Mathematics 16B and 21B. Economics analysis of the relative virtues of capitalism and socialism, including welfare economics. Marxist exploitation theory, the socialist calculation debate (Hayek and Lange), alternative capitalist systems (Japan, Germany, China), and contemporary models of market socialism. GE credit: WC.

121A. Industrial Organization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A/B; 100, or consent of instructor. An appraisal of the role of competition and monopoly in the American economy; market structure, conduct, and economic performance of a variety of industries. GE credit: SocSci—I, II, III. (I, II, III.)

121B. Industrial Organization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A, 1B, 100, or consent of instructor. The study of antitrust and economic regulation. Emphasis on applying theoretical models to U.S. industries and cases studied in the class. Introduction to game theory. Explanation of the behavior of rational individuals with interacting and often conflicting interests. Non-cooperative and cooperative theory. Applications to economics, political science and other fields.—I, II, III. (I, II, III.)

122. Theory of Games and Strategic Behavior (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, Mathematics 16A and 16B or 21A and 21B or consent of instructor. Introduction to game theory. Examination of the behavior of rational individuals interacting and often conflicting interests. Non-cooperative and cooperative theory. Applications to economics, political science and other fields.—I, II, III. (I, II, III.)

125. Efficiency in Energy Markets (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A and 1B, Mathematics 16A and 16B and course 102 or consent of instructor. Introduction to game theory. Explanation of the behavior of rational individuals with interacting and often conflicting interests. Non-cooperative and cooperative theory. Applications to energy efficiency and production, and environmental and energy policy, market structure and power, global climate change, optimal regulation, and real-world applications, e.g., California electricity crisis.—II. (II.)

130. Public Microeconomics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, Economics 16A and 16B or 21A and 21B or consent of instructor. Public economics: the basic theory of welfare economics. Application of the theory to public policy issues: cost analysis. Topics include consumer protection, pollution, education, poverty and crime.—I, II, III. (I, II, III.)

131. Public Finance (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, Mathematics 16A and 16B or 21A and 21B or consent of instructor. The analysis of government regulation and deregulation in the airplane and trucking industries. GE credit allowed to students who have completed Agricultural and Resource Economics 171A or 171B may not receive credit for this course.—I, II, III. (I, II, III.)

132. Health Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or consent of instructor. The health care market, emphasizing the role and use of economics. Individual demand, provision of services by doctors and hospitals, health insurance, managed care and competition, the role of government access to health care.—II. (II.)

134. Financial Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A, 1B, and 100; Mathematics 16A; Statistics 13. General background and rationale of corporate finance as resource allocation over time; decision making under uncertainty and the role of information; capital market and interest rate structure; financial decisions. Students who have completed Agricultural and Resource Economics 171A may not receive credit for this course.—I. (I, II, III)

135. Money, Banks and Financial Institutions (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, 101, Statistics 13. Banks and the banking system. Uncertainty and asymmetric information in the lending process; efficiency of competitive equilibrium in lending markets. Regulation and the conduct of monetary policy.—II. (II.)

136. Topics in Macroeconomic Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 101. Advanced Topics in macroeconomic theory. The course develops the theoretical and empirical analysis of a specific field of macroeconomics. Possible topics include, business cycle theories, growth theory, monetary economics, political economics and theories of unemployment and inflation.—II. (II.)

137. Macroeconomic Policy (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, 101, Statistics 13. Theory and practice of macroeconomic policy, both monetary and fiscal.—I. (I.)

140. Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 102, course 100 and course 101; Mathematics 16A and 16B or Mathematics 21A and 21B, Statistics 13, or any upper division Statistics course. Problems of observation, estimation and hypothesis testing in economics through the study of the theory and application of linear regression models. Critical evaluation of selected examples of empirical research. Exercises in applied economics. Not open for credit to students who have enrolled in or completed Agricultural and Resource Economics 106.—II. (II.)

145. Transportation Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, Mathematics 16A, 16B, Statistics 13 or consent of instructor. Intended for advanced economics undergraduates. Pass one open to Economics and Graduate School of Management majors. Application of theoretical and empirical microeconomic models to the economics of transportation, the behavior of travelers, and the impact of transportation on economic activity and welfare. GE credit: WC.

151A. Economics of the Labor Market (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, Mathematics 16A, 16B, Statistics 13 or consent of instructor. Intended for advanced economics undergraduates. Examination of fundamental problems of planning and financing transportation “infrastructure” (roads, ports, airports). The economics of the automobile industry, as well as the impact of government regulation and deregulation in the airlines and trucking industries.

151B. Economics of Human Resources (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 151A. Human resource analysis; introduction to human capital theory and economics of education; the basic theory of vocational choice including theories of labor market discrimination; income distribution; poverty. Policy issues; negative income tax; manpower training programs; incomes policy.—II. (II.)

Quarter Offered: I-Fall; II-Winter; III-Spring; IV-Summer; 2015-2016 offering in parentheses.
152. Economics of Education (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100; course 102; Mathematics 168 or 218; Statistics 131 or 132, with grade of C or better in each course, or consent of the instructor. Application of theoretical and empirical tools of economics to the education sector. Demand for Education; Education Production and Market Structures in Education. Policy applications: class size reduction, school finance equalization, accountability, and school choice.

160A. International Microeconomics (4)
Lecture—5 hours; discussion—1 hour. Prerequisite: course 1A or consent of instructor. International trade theory: impact of trade on the domestic and world economies; public policy toward external trade. Only two units of credit allowed to students who have completed course 162. I, II, III.

160B. International Macroeconomics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A, 1B, 100, 101, or consent of instructor. Macroeconomic theory of an open economy: Balance of payments, open macroeconomic mechanism, international monetary economics issues; international financial institutions and their policies. Only two units of credit allowed to students who have completed course 162. I, II, III.

162. International Economic Relations (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A or consent of instructor. International trade and monetary relations, trade policy, exchange rates, and investments between international capital migration and investment. Emphasis on current policy issues. Course intended especially for non-majors. Not open for credit to students who have completed course 160. GE credit: SocSci | SS, WC. I, II, III.

171. Economy of East Asia (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A or consent of instructor. Industrial dynamics and trade issues in selected countries of the East Asia. Consult department for course scheduling. I, II, III.

190. Topics in Economics (4)
Lecture/discussion—3 hours; discussion—1 hour. Prerequisite: consent of instructor. Selected topics in economic analysis and public policy. Variable content. May be repeated for credit.

190X. Upper Division Seminar (1-6)
Seminar—1-6 hours. Prerequisite: courses 100 and 101, and consent of the instructor. In-depth examination at an upper division level of a special topic in Economics. Emphasis on focused analytical work.

192. Internship
Internship—3-18 hours. Prerequisite: upper division standing; consent of instructor. Internship experience off and on campus in all subject areas offered in the Department of Economics. Supervised by a member of the staff. May be repeated for credit. (P/NP grading only.) GE credit: SE.

194HA-194HB. Special Study for Honors Students (4-4)
Independent study—3 hours; seminar—1 hour. Prerequisite: major in Economics with senior standing; consent of instructor and completion of 135 units with a minimum GPA of 3.500 in courses counted toward the major. A program of research culminating in the writing of a senior honors thesis under the direction of a faculty adviser. (Deferred grading only, pending completion of course.)

197T. Tutoring in Economics (1-5)
Tutorial—3-15 hours. Prerequisite: consent of instructor and chairpersons; assistance to the instructor by tutoring students in one of the department's regularly scheduled courses. May be repeated for up to 10 units of credit. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

Graduate

200A. Microeconomic Theory (5)
Lecture—4 hours; discussion—1 hour. Prerequisite: graduate standing. Linear and nonlinear optimization theory applied to develop the theory of profit-maximizing firm and the utility-maximizing consumer. [Same course as Agricultural and Resource Economics 200A—II. (II) Silvestre]

200B. Microeconomic Theory (5)
Lecture—4 hours; discussion—1 hour. Prerequisite: course 200A. Characteristics of market equilibrium under perfect competition, simple monopoly and monopsony. Emphasis on general equilibrium and welfare economics; the sources of market success and market failure. (Same course as Agricultural and Resource Economics 200B—II. (II) Silvestre)

200C. Microeconomic Theory (5)
Lecture—4 hours; discussion—1 hour. Prerequisite: course 200B. Uncertainty and information economics. Individual decision making under uncertainty. Introduction to game theory, with emphasis on applications to markets with firms that are imperfect competitors or consumers that are imperfectly informed. (Same course as Agricultural and Resource Economics 200C—II. (II) Silvestre)

200D. Macroeconomic Theory (5)
Lecture—4 hours; discussion—1 hour. Prerequisite: course 101, Mathematics 21A, 21B, and 21C. Macro static theory of income, employment, and prices. I, II, III.

200E. Macroeconomic Theory (5)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200B may be taken concurrently and 200D. Macrodynmic theory of income, employ- ment, and prices. I, II, III. Geromonichales

201A. History of Economic Thought I (4)
Lecture—3 hours; discussion—1 hour. Economic thought from the classical Greek era to modern times. Offered in alternate years.

201B. History of Economic Thought II (4)
Lecture—3 hours; discussion—1 hour. Origins and emergence of modern economic analysis. Offered in alternate years.

203A. Advanced Economic Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200A, 200B, or 200C. Advanced topics in general equilibrium theory and welfare economics: existence, determinateness and efficiency; intertemporal economics: uncertainty. I, II. Quinzii

203B. Advanced Economic Theory: Game Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200A, 200B, and 200C. Covers the most recent developments in game theory, with the focus changing from year to year. Selected topics are: refinements of Nash equilibrium, repeated games, evolution, social situations, bounded rationality, and bargaining theory. I, II, III. Schipper

203C. Topics in Economic Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200A, 200B, 200C. Selected topics in contemporary microeconomic theory. May be repeated for credit with the consent of the Graduate Studies Committee.

210A. Economic History (4)
Lecture/discussion—4 hours. Economic history of the eastern hemisphere in the modern period. Medieval Europe or other regions may be studied, depending on student interest. I, II. Cichon

210B. Economic History (4)
Lecture/discussion—4 hours. The United States from Colonial times to the present. Other areas of the western hemisphere may be studied, according to student interest.

210C. Economic History (4)
Seminar—4 hours. Prerequisite: a graduate course in economic history. Selected topics and issues, emphasis on current research and topics, offered as needed. [Quarter offered to be flexible.—II. (II) Meissner]

214. Development Economics (4)
Lecture—4 hours. Prerequisite: Agricultural and Resource Economics 100A, 100B, course 101, Agricultural and Resource Economics 204A and course 160A-160B recommended. Review of the principal theoretical and empirical issues whose analysis has formed development economics. Analysis of economic development theories and methodology and their application to specific policy issues in developing country contexts. (Same course as Agricultural and Resource Economics 214A—I, II, III.)

215A. Microdevelopment Theory and Methods I (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200A or 204; course 240A recommended. Agricultural development theory, with a focus on microeconomics. Agricultural household behavior with and without market imperfections and uncertainty. Analysis of rural land, labor, credit and insurance markets, institutions, and policies. (Same course as Agricultural and Resource Economics 215A—I.)

215B. Open Macroeconomics of Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Agricultural and Resource Economics/Economics 200A or 204, 200D or 205, and 214 or 215A. Models and policy approaches regarding trade, monetary and fiscal issues, capital flows and debts are discussed in the macroeconomic framework of an open developing country. The basic analytical focus is real exchange rate and its impact on optimal allocation of resources. (Same course as Agricultural and Resource Economics 215B—II.)

215C. Microdevelopment Theory and Methods II (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 215A. Extension of development theory and microeconomic methods. Agricultural growth and technological change; poverty and income inequality; sectoral, multilateral, including village and regional models. Computable general equilibrium models and applications. (Same course as Agricultural and Resource Economics 215C—I, II, III.)

215D. Environment and Economic Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 200A, 204 or Agricultural and Resource Economics 275. Interdisciplinary course drawing on theoretical and empirical research on interactions between environmental resource use and economic development processes. Analysis of issues emerging at the interface of environmental and development economics. (Same course as Agricultural and Resource Economics 215D—II.

221A. The Theory of Industrial Organization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200A, 200B, or 200C. Game theory is used to analyze strategic interaction, product differentiation, entry-deterring strategies, contractual arrangements, vertical control and antitrust issues.—I. (I) Rapson

221B. Empirical Analysis in Industrial Organization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 221A and 240B. Recent empirical work in industrial organization. Topics include empirical analysis of cartels, product differentiation, innovation and technological change, and imperfect competition in international markets.—II. (III) Rapson

221C. Industrial Organization and Regulation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 221A and 240B. Optimal regulation of natural monopoly. Topics include regulatory mechanisms
for single and multiple output firms under symmetric and asymmetric information, optimality without regulation: the economic theory of regulation, and empirical studies of regulation and deregulation.

230A. Public Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200C. Measures of deadweight loss and consumer surplus; optimal commodity and income taxation; tax incidence; policy issues in personal tax, corporate tax, corporate social insurance; the evaluation of effective tax rates.—II. (II.) Hynes

230B. Public Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 203A. Theory of the firm: microeconomic perspectives; income and employment determination; distribution of income; the evaluation of the welfare effects of government policies.—III. (III.) O’Rourke

230C. Public Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200C and 240B. Advanced topics in public economics of the public sector, with emphasis on current research. Topics may vary from year to year.—II. (II.) Carrell, Stieglitz

235A. Alternative Approaches to Monetary Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 230A or 234. Theory of money supply and changes in nominal income. Also discusses the effects of changes in money supply on interest rates.—II. (II.) Solly

235B. Monetary Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 235A. Emphasizes problem of finding an appropriate price for money in microeconomics/general equilibrium analysis. Consideration given to the meaning of money, its role in inflation and the real economy and its role in models of finance.—III. (III.) Geromichalos

235C. Monetary Policy (4)
Lecture—3 hours; discussion—1 hour. Organization of the Federal Reserve System, the definition of money, goals and tools of monetary policy, alternative targets for monetary policy, impact of monetary policy, the problem of lags, and alternative policies.—II. (II.) Flavin

239. Econometric Foundations (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in undergraduate-level econometrics. The course will prepare students for econometric theory and empirical work by examining the statistical foundation of econometrics. Special attention is paid to problems specific to non-experimental data common to social sciences. Topics from matrix algebra are also covered. (Same course as Agricultural & Resource Economics 239)—I. (I.) Green

240A. Econometric Methods (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Statistics 133 and a course in linear algebra or the equivalent. Least squares, instrumental variables, and maximum likelihood estimation and inference for single equation linear regression model; linear restrictions; heteroskedasticity; autocorrelation; lagged dependent variables. (Same course as Agricultural & Resource Economics 240A)—II. (II.) Cameron

240B. Econometric Methods (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 240A. Topics include asymptotic theory and instrumental variables, pooled time-series cross-section and panel data analysis, seemingly unrelated regression, classical hypothesis tests, identification and estimation of simultaneous equation models, cointegration, error correction models, and qualitative and limited dependent variable models. (Same course as Agricultural and Resource Economics 240B)—II. (II.) Cameron

240C. Time Series Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 240A. Applied econometric theory; estimation, inference and forecasting of time series models; trends and non-standard asymptotic theory; vector time series methods and cointegration; time series models for higher order moments and transition data; state space modeling and the Kalman filter. (Same course as Agricultural and Resource Economics 240C)—II. (II.) Cameron

240D. Cross Section Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 240B. Estimation and inference for nonlinear regression models for crosssection data; models for discrete data and for limited dependent variables; models for panel data; additional topics such as bootstrap and semiparametric regression. (Same course as Agricultural and Resource Economics 240D)—II. (II.) Cameron

240E. Topics in Time Series Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 240A, 240B and 240C. Modern econometric techniques for time series data. Expand on topics covered in Economics 240A, 240B, and 240C. Contents may vary from year to year. (Same course as Agricultural and Resource Economics 240E)—II. (II.) Cameron

240F. Topics in Cross Section Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 240A, 240B and 240D. Modern econometric techniques for cross-section data. Expand on topics covered in Economics 240A, 240B, and 240D. Contents may vary from year to year. (Same course as Agricultural and Resource Economics 240F)—II. (II.) Cameron

250A. Labor Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 150A and 150B or equivalent. Philosophy of theory and history of American and foreign labor movements; union structure, organization and collective bargaining under changing labor market conditions; current labor market analysis.—I. (I.) Page

250B. Labor Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 151A or consent of instructor; course 204 or 200A recommended. Microeconomic theory of labor supply and labor demand, estimation of labor supply and demand functions and human capital theory; labor market analysis.—II. (II.) Page

260A. International Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200A or 200B. Theories of trade determinants; gains from trade; tariffs and effective protection; economic unions.—I. (I.) Feenstra

260B. International Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 200D and 200E. Balance of payments adjustment policies, international exchange markets’ theories of balance of payments policy and international monetary mechanisms.—II. (II.) Bergin

260CN. International Investment and Trade (4)
Seminar—4 hours. Prerequisite: course 260A. Analysis of foreign investment and its links to trade; theories of the firm as they relate to firm’s export and investment decisions; and an introduction to the political economy of international trade.—II. (II.) Swenson

260D. Topics in International Macroeconomics (4)
Seminar—4 hours. Prerequisite: course 260B or consent of instructor. Survey of current literature in international macroeconomics. (Same course as Agricultural and Resource Economics 260D)—II. (II.) Simonovska

260E. Topics in International Trade (4)
Seminar—4 hours. Prerequisite: course 260A, 260B. Current literature in international trade theory.—II. (II.) Russ

260F. International Macroeconomic Policy (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 260B. Theory and practice of international macroeconomic policy. Topics include exchange rate regimes, international financial institutions, crises and current topics.

270A. Economics of Growth (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200D and 200E. Modern theories and empirical work by examining the neoclassical theories up to current endogenous growth models. Emphasis on the analysis of human capital and growth, technological innovation, its diffusion and empirical evidence of exogenous growth.

270B. Economics of Growth (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200D and 200E. Empirical analysis of growth patterns and growth models. Emphasis on the relationship between macroeconomic management and long-term growth; the use of foreign capital in accelerating growth and its occasional misalignments; the comparison of growth performance in East Asia and Latin America since 1980; experiences of centrally-planned economies and transitions to market-based growth; and the transformation from an industrial economy to a knowledge economy.

270C. Economics of Growth (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200D and 200E. Institutional bases; politics; contracts and commitment; money and finance; mal-thusian dynamics; modern economic growth; transitions and industrialization; dual economics, core and periphery; sources of convergence and divergence; openness and growth; resources, demography, and geography; institutions, imperialism, and class conflicts.

275A. Effective Instruction: Curriculum and Assessment-Theory, Research, and Practice (2)
Lecture/discussion—2 hours. Prerequisite: accept in Teacher Credential Program. Restricted to Teaching Credential majors. Examination of contemporary theories of curriculum development, research about the relationship among instructional planning, classroom assessment, and student learning to guide teaching practice.—I. (I, II)

275B. Effective Instruction: English Language Development and Instruction English Language Learners (2)
Lecture/discussion—2 hours. Prerequisite: acceptance in the Teaching Credential program; successful completion of course 275A. Restricted to Teaching Credential majors. Examination and application of English language acquisition and development research to teaching practice. Particular attention to research that enhances learning of English language learners and under-performing students.—I. (I, II)

280. Orientation to Economic Research (2)
Discussion—2 hours. Course tries to bridge the gap between students’ coursework and their subsequent research. It deals with topics such as the origination of a research project, some mechanics of empirical research and hints on the submission of research papers. (S/U grading only)

290. Topics in Economics (4)
Seminar—4 hours. Prerequisite: consent of instructor. Selected topics in economic analysis and public policy, focusing on current research. May be repeated for credit.

291. Contemporary Economics Seminar (2)
Seminar—2 hours. Prerequisite: graduate standing in Economics. Seminar series on topics of current interest. May be repeated for credit. (S/U grading only)—I, II, III

298. Group Study (1-5)
Discussion—1-5 hours. Prerequisite: graduate standing and consent of instructor. (S/U grading only)

299. Individual Study (1-12)
Prerequisite: consent of instructor and graduate standing. (S/U grading only)

299D. Dissertation Research (1-12)
(S/U grading only)

Professional

397. Teaching of Economics (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing in economics. Teaching of economics: methods of instruction, organization of courses, examination and evaluation procedures. (S/U grading only)—I (I)

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses:
Pre-Fall 2011 General Education (GE): ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; ACHG=American Cultures; DD=Dominant Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; Wrt=Writing Experience
Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; ACHG=American Cultures; DD=Dominant Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; Wrt=Writing Experience

Wrt=Writing Experience
Education, School of

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Steven Z. Athanases, Ph.D., Professor
Heidi L. Ballard, Ph.D., Associate Professor
Shannon Cannon, Ph.D., Lecturer, Supervisor of Teacher Education
Cynthia Carter Ching, Ph.D., Associate Professor
Laura Dubcovsky, Ph.D., Supervisor of Teacher Education
Kerry Enright, Ph.D., Associate Professor
Christian Fallis, Ph.D., Professor, Director of Teacher Education
Kevin A. Gee, Ed.D., Assistant Professor
Cristina Gonzalez, Ph.D., Professor
Cassandra M. D. Hart, Ph.D., Assistant Professor
Paul E. Heckman, Ph.D., Professor
Pauline V. Holmes, Ph.D., Lecturer, Supervisor of Teacher Education
Michal Kurlaender, Ed.D., Associate Professor
Michelle Fortes, Ph.D., Lecturer, Supervisor of Teacher Education
Harold G. Levine, Ph.D., Professor, Director
Lee M. Martin, Ph.D., Assistant Professor
M. Lynn Martininkle, Ed.D., Lecturer, Supervisor of Teacher Education
Danny C. Martinez, Ph.D., Assistant Professor
Alvin M. Mendle, M.A., Lecturer, Supervisor of Teacher Education
Barbara J. Merino, Ph.D., Professor
Peter C. Murray, Ph.D., Professor
Cynthia Passmore, Ph.D., Associate Professor
J. Richard Pomeroy, Ph.D., Lecturer, Supervisor of Teacher Education
Patricia Quijada, Ph.D., Associate Professor
Gloria M. Rodriguez, Ph.D., Associate Professor
Rebecca Rosa, M.A., Lecturer, Supervisor of Teacher Education
Heather M. Rose, Ph.D., Associate Professor
Emily J. Solari, Ph.D. Assistant Professor
Thomas B. Timar, Ph.D., Professor
Cary J. Trexler, Ph.D., Associate Professor
Yuko Ichikawa Tanovitch, Ed.D., Associate Professor
Matt Wallace, Ph.D., Lecturer, Supervisor of Teacher Education
Karen A. Watson-Geglio, Ph.D., Professor
Tobin F. White, Ph.D., Associate Professor

Emeriti Faculty
Donald G. Armstrong, Ph.D., Professor Emeritus
G. Phillip Cartwright, Ph.D., Professor Emeritus
Concha Delgado-Gaitan, Ph.D., Professor Emeritus
Sharon Dogdale, Ph.D., Professor Emeritus
Richard A. Figueroa, Ph.D., Professor Emeritus
Barbara G. Goldman, Ph.D., Professor Emeritus
Douglas L. Minnis, Ed.D., Lecturer Emeritus
Sandra M. Murphy, Ph.D., Professor Emeritus
Jonathan H. Sandoval, Ph.D., Professor Emeritus
Julius M. Sassenrath, Ph.D., Professor Emeritus
Carlton J. Spring, Jr., Ph.D., Professor Emeritus
Jon. C. Wagner, Ph.D., Professor Emeritus
David R. Wampler, Ph.D., Lecturer Emeritus
George D. Young, Ph.D., Professor Emeritus
I. Phillip Young, Ph.D., Professor Emeritus

Center for Applied Policy in Education (CAP-ED)
Thomas Timar, Director
Tina Murdoch, Assistant Director
530-752-1533

Cooperative Research and Extension Services for Schools (CRESS)
Susan O'Hara, Executive Director
530-752-7449

Area 3 Writing Project (A3WP)
Karen Smith, Director
530-752-8392

Sacramento Area Science Project (SASP)
Arthur Beauchamp, Co-Director
530-752-5876

UC Davis Math Project (UCDMP)
Pam Hutchison, Director
Julie Oroso, Co-Director
530-752-6632

Center for Community School Partnership (CCSP)
Renee Newton, Director
530-754-4319

California After School Network
Frank Pisi, Director
530-754-6635

Center for Education and Evaluation Services (CEES)
Theresa Westover, Director
530-754-9523

Sacramento Area Youth Speaks Program
Vojra Watson, Director
530-370-2889

Edward Teller Education Center (ETEC)
295-422-5059

Student Services Office
106 School of Education Building
530-752-5887; Fax 530-754-6672
eduadvising@ucdavis.edu

Minor in Education
Program Coordinator: 530-752-5887

Graduate Group in Education (Ph.D.)
Cynthia Passmore, Graduate Group Chair
Program Coordinator: 530-752-7259

Capital Area North Doctorate in Educational Leadership (CANDEL)
Janet Gong, UC Davis Co-Director
Viki Monteria, Sonoma State University Co-Director
Program Coordinator: 530-754-6664

Master of Arts in Education
Paul E. Heckman, Program Chair
Program Coordinator: 530-752-7259

Teacher Education-Credential
Paul E. Heckman, Program Chair
Barbara G. Goldman, Associate Director of Teacher Education
Program Coordinator: 530-752-0758

UC Educational Research Center (UCERC)
530-752-4663; Fax 530-752-8019

Minor Program Requirements:
The UC Davis School of Education is committed to developing informed citizens and advocates for productive educational environments in a democratic society. Education courses are designed for undergraduate students from all majors. A minor in Education will help students:

- Develop an understanding of the issues and concerns of public and private education
- Complete prerequisites for the teaching credential program
- Work towards a master's degree or doctoral degree in education or related field
- Seek employment in policy, advocacy, or other education related careers

Courses, Students must complete 20 units

Minor Program in Education. At least 12 units of the 20-unit minimum for the minor must be in Education. The remaining units for the minor may be in education or a related field as approved on the electives list.

Minor Program Requirements:
Upper Division Required Courses ........................... 12
Education 100, 110, 120 ..................................... 12

Elective Courses ................................................ 8
The remaining eight units may be taken from the following courses:
Education 115, 181 .......................................... 2
Education 114, 119, 122, 130, 142, 147, 150, 152, 173, 185 .......... 4
Education 192, 198 ........................................... variable

Approved Courses Outside of Education
Agricultural Education 100 ................................... 3
Mathematics 197CT ...................................... 1-3
Mathematics 197CT ...................................... 1-3
University Writing Program 197CT ......................... 4
African American & African Studies 130;
American Studies 152, Asian American Studies 101;
Biological Sciences 195A or B*;
Chicano Studies 132, Economics 152;
Human Development 100A, 100B, 101;
Linguistics 173, 180, Psychology 130, 132, 141;
Sociology 124, Spanish 116, 117;
University Writing Program 1040 ........................ 4
* Internship (192, 195A or B, 195TC, 197TC) and Independent Study (199), or a combination of both, may not exceed a total of four units. Elective courses may include only one internship.

Minor Advisers. A designated faculty member in the School of Education may advise students and give final approval on the minor. For additional information contact the Student Services office in School of Education Building.

Courses in Education (EDU)
Lower Division
81. Learning in Science and Mathematics
(2)
Lecture/discussion—2 hours, field work—2 hours.
Exploration of how students learn and develop understanding in science and mathematics classrooms.

82. Introduction to the study of science
(1)
Lecture—1 hour, lab work—1 hour.
Introduction to research methods and data analysis.

92. Internship (1-3)
Internship—3-9 hours. Prerequisite: consent of instructor. Enrollment dependent on availability of intern placements. Internship as a teacher’s aide or tutor in K-12 classrooms under the supervision of a faculty member. May be repeated for credit. (P/NP grading only.)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. Primarily for lower division students. (P/NP grading only.)

Upper Division
100. Introduction to Schools
(4)
Lecture—3 hours; field work—3 hours. Prerequisite: upper division standing. Study of occupational concerns of teachers; skills for observing classroom activities; school organization and finance; school...
110. Educational Psychology: General (4)
Lecture/discussion—4 hours. Prerequisite: Psychology 1; upper division standing. Learning processes, cognitive development, individual differences, testing and evaluation. GE credit: SocSci, Wrt | SS, WE—II, III, IV. (I., III.) Ballkrohnk

115. Educating Children with Disabilities (2)
Lecture—2 hours. Prerequisite: upper division standing. Educational issues and processes involved in teaching children with disabilities. The course will focus on the special education needs of children who are mainstreamed in regular classes. GE credit: SocSci | SS—II, III. (I., III.) Mundy, Solari

119. The Use and Misuse of Standardized Tests (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 110 or consent of instructor. Principles underlying educational and psychological testing. Purpose of testing; individual achievement and evaluation of school programs. Interpretation and misinterpretations of outcomes. Analysis of SAT, GRE and other common tests. Experience in test administration and test interpretation. GE credit: SocSci, Wrt | QL, SS, WE—II, III. (III.) Abedi

120. Philosophical and Social Foundations of Education (4)

122. Children, Learning and Material Culture (4)
Lecture/discussion—3 hours; extensive writing or discussion—1 hour; fieldwork. Prerequisite: upper division standing or consent of instructor. How material artifacts shape what and how children learn in school, at play, and in the material environment of the home. GE credit: SocSci, Wrt | QL, SS, WE—II, III. (III.) Goodwin

130. Issues in Higher Education (4)
Discussion—3 hours; field work—3 hours. Prerequisite: upper division standing or consent of instructor. Analysis of current issues in higher education and of some practical implications of varying philosophical approaches to the role of the university. GE credit: SocSci | SS, WE—II, III. (III.) Gonzales

147. Anglos, Latinos and the Spanish Black Legend: The Origins and Educational Implications of Hispanic Prejudice (4)
Lecture/discussion—3 hours; field work; term paper. Prerequisite: upper division standing or consent of instructor. Examination of anti-Hispanic prejudice in the United States focusing on the “Black Legend,” a 16th Century anti-Hispanic myth underpinning the doctrine of “Manifest Destiny.” Exploration of the Legend’s presence in contemporary American society through interviews and analysis of school textbooks. (Same course as Spanish 147.) GE credit: AnthHum, Div, Wrt | ACGH, AH, DD, WE—II. (I.) Gonzalez

150. Cultural Diversity and Education in a Sociopolitical Context (4)
Lecture/discussion—3 hours; extensive writing. Introduction to cultural diversity and education in a sociopolitical context. Interactive course. Small and large group discussions explore, extend, and apply readings; range of in class and out of class experiences to assignments and course themes, lectures, slide shows, speakers, brief fieldwork, and presentations. GE credit: SocSci | SS, DD, WE—II, III, II. (II, III.) Athenies, Enright, Martinez

151. Language Development in the Chicano Child (3)
Lecture/discussion—3 hours. Prerequisite: some knowledge of Spanish and linguistics recommended. Bilingualism, second language acquisition, bilingual education, language assessment, Chicano Spanish and the role of dialect varieties in the classroom. Not open for credit to students who have completed course 151T. Offered irregularly.

157. Language Development in the Chicano Child (3)
Lecture/discussion—3 hours. Prerequisite: some knowledge of Spanish and linguistics recommended. Bilingualism, first and second language acquisition, bilingual education, language assessment, Chicano Spanish and the role of dialect varieties in the classroom. Not open for credit to students who have completed course 151T. Offered irregularly.

152. Academic Spanish for Bilingual Teachers (3)
Lecture/discussion—3 hours; field work. Prerequisite: Spanish 23-24 or Spanish 31-32-33. Communicative class taught in Spanish focused on the development of Spanish communication skills for current and/or future bilingual teachers. Main topics are related to school content areas in bilingual settings, with an emphasis on standard and Southwest Spanish dialects. Restricted to Spanish speaking students. GE credit: AnthHum or SocSci | AH or SS, QL, WE—II. (II.)

153. Diversity in the K-12 Classroom (2)
Lecture/discussion—2 hours. Prerequisite: acceptance in Teaching Credential Program. Restricted to Teaching Credential Majors. Analysis of research on learning styles among culturally diverse students with review and evaluation of curricula and classroom teaching techniques. The ethnographic interview as a research tool. (Deferred grading only, pending completion of course 180A. Restricted to Teaching Credential Majors. Applications of computers in education as instructional, intellectual, and communication tools. (Deferred grading only, pending completion of sequence)—II, III, II. (II, III.) Martindale, Mendle, Pomeroy, White

180A. Computers in Education (3)
Lecture/discussion—1 hour; laboratory—2 hours; project—2 hours. Prerequisite: acceptance in Teacher Credential Program. Restricted to Teaching Credential Majors. Applications of computers in education as instructional, intellectual, and communication tools. (Deferred grading only, pending completion of course 180A. Restricted to Teaching Credential Majors. Applications of computers in education as instructional, intellectual, and communication tools. (Deferred grading only, pending completion of sequence)—I, II, III, II. (II, III.) Martindale, Mendle, Pomeroy, White

180B. Computers in Education (3)
Lecture/discussion—1 hour; laboratory—2 hours; project—2 hours. Prerequisite: acceptance in Teacher Credential Program; successful completion of course 180B. Restricted to Teaching Credential Majors. Applications of computers in education as instructional, intellectual, and communication tools. (Deferred grading only, pending completion of sequence)—I, II, III, II. (II, III.) Martindale, Mendle, Pomeroy, White

181. Teaching in Science and Mathematics (2)
Lecture/discussion—2 hours, field work—2 hours. Prerequisite: major in mathematics, science, or engineering; or completion of a one-year sequence of science or calculus and consent of the instructor. Class size limited to 40 students per section. Exploration of effective teaching practices based on examination of how middle school students learn math and science. Selected readings, discussion and field experience in middle school classrooms. (Same course as Geology 181.) GE credit: SS, WE, QL, WE—II, III, II. (II, III.) Ching

182. Semester Project for Curricular Integration (1)
Seminar—1 hour. Prerequisite: Agricultural Systems and Environment 21 or appropriate microcomputer course, experience with instructional computing and consent of instructor. Design and implementation of a curricular unit to integrate computer technology into a K-12 classroom setting. A project-based seminar intended for students with substantial prior experience in computer circuitry and related technologies. Not open for credit to students who have completed course 180 or 181.

183. Teaching High School Mathematics and Science (3)
Lecture/discussion—2 hours; field work. Prerequisite: course 81/Geology 81 or course 181/Geology 181 and major in mathematics science or engineering; or completion of a one-year sequence of science or calculus and consent of the instructor. Limited to 40 students per section. Exploration and creation of effective teaching practices based on examination of high school students learn mathematics and science. Field experience in high school classrooms. (Same course as Geology 183.) GE credit: SocSci | QL, SS, WE—II, III, II, III. (II, III.) Passmore, Stevenson

185. Learning in a Digital Age: Information, Schooling, and Society (4)
Lecture/discussion—2 hours; lecture/laboratory—2 hours. Focus on the changing nature of learning in a digital age: social media, ubiquitous connectivity, online education, electronic communications, writing, gaming, and youth culture. Readings will be drawn from major recent works detailing fundamental shifts in information, schooling, and society, as well as in alternate years. GE credit: SciEng, SS—II, IV. (II, IV.) Ching

192. Internship (1-3)
Internship—2.8 hours; discussion—1 hour. Prerequisite: upper division standing and consent of instructor. Internship as a tutor, teacher’s aide, or peer...
205A. Ethnographic Research in Schools I: Current Theory and Practice (4)

205B. Ethnographic Research in Schools II: Field-Based Approaches (4)
Discussion—4 hours. Prerequisite: graduate standing and course 205A. Student research projects in specific schools with cooperative critical analysis of the design, data collection, and inferencing by researchers. Students will continue to meet with instructor as a group throughout the quarter to discuss specific projects.—II. (II.) Watson-Gegeo

206A. Inquiry into Classroom Practice: Traditions of Teacher Research Approaches (4)
Lecture/discussion—2 hours; fieldwork. Prerequisite: consent of instructor; open to graduate teaching credential students. Introduction to traditions and approaches of teachers conducting research in their own classrooms: purposes, focal areas, methods of data collection and analysis, and written genre conventions.—I. (I.)

206B. Inquiry into Classroom Practice: Application for a Teacher Research (4)
Lecture/discussion—3 hours; fieldwork—1 hour. Prerequisite: satisfactory completion of course 206A or consent of instructor, open to graduate teaching credential students. Analysis and implementation of teacher research through the development, implementation and evaluation of a short-term classroom research-based intervention. Particular attention to research that enhances learning of English language learners and under-performing students.—III. (III.) Anthamaser, Ballard, Passmore, Falls, Booker, White

206C. Inquiry into Classroom Practice: Study Design (4)
Seminar—3 hour; fieldwork—1 hour. Prerequisite: satisfactory completion of course 206B or consent of instructor. Proposal development for classroom-based inquiry designed to address student learning needs. Mixes methods research design and preliminary data collection approaches. Design and application of baseline student assessment for proposal development. Literature review. Data collection in K-12 classrooms required. Open to Graduate MA Credential students only.—I. (I.) Ambrose, Falls, Merino, Wallace

206D. Inquiry into Classroom Practice: Data Analysis and Reporting (4)
Seminar—2 hours; fieldwork—1 hour; extensive writing or discussion. Prerequisite: satisfactory completion of course 206C or consent of instructor. Support of the inquiry begun in course 206C through continuous collaboration and feedback results in the writing and presentation of a research study. Open to Graduate MA Credential students.—III. (III.) Ambrose, Falls, Merino, Wallace

207. Conceptualization (4)
Lecture—2 hours; discussion—2 hours. Prerequisite: graduate standing or consent of instructor. Development of the skills of philosophical analysis and argument for the establishment of a point of view, in the consideration of education theory and practice. Classical and contemporary approaches to subject matter and activity emphasis, hidden curriculum, and modes of inquiry.

208. Presenting Educational Research in Written Reports (4)
Seminar—3 hours; extensive writing. Prerequisite: graduate standing or consent of instructor. Rhetorical and substantive challenges of presenting educational research through written reports, research theses, and genres; competing discourse conventions of educational research, policy, and practice; the social organization of publishing educational research. May be repeated one time for credit. Offered irregularly.

209. Image-based Field Research (4)
Lecture/discussion—3 hours; fieldwork—2 hours. Prerequisite: graduate standing or upper division standing with consent of instructor. Critical and practical understanding of video and still photography as resources for enhancing field research in schools and other social settings.

210. The Psychology of School Learning (4)
Lecture/discussion—4 hours. Study of human learning theory and research related to learning in school. Classical approaches of scholars such as Ausubel, Bruner, Gagne, Piaget, Vygotsky, Skinner. Review of contemporary issues of constructivism, metacognition, problem solving, learning strategies, science and mathematics teaching.—II. Martin, White

211. Sociocultural and Situative Perspectives on Learning and Cognition (4)
Lecture/discussion—3 hours; extensive writing—1 hour. Prerequisite: graduate standing or consent of instructor. Sociocultural and situative theories of cognition and learning. Major ideas of L.S. Vygotsky, followed by modern perspectives: situated cognition, cognitive apprenticeship, situated learning, communities of practice, cultural-historical activity theory, and distributed cognition. Implications of each theoretical perspective for educational practice. Offered in alternate years.—III. Ching, White

215. Research on Achievement Motivation in Education (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing in Education or consent of instructor. Analysis and critique of recent research on cognitive processes related to achievement motivation in school settings. Topics include self-determination theory, attribution theory, goal theory, intrinsic and extrinsic motivation, learned helplessness, psychological reactance, gender and culture, and research designs. Offered in alternate years.—Mundy

220. Concepts and Methods of Policy Analysis (4)
Seminar—3 hours; fieldwork; term paper. Prerequisite: graduate standing. Introduction to concepts and methods of policy analysis. The relationship between educational issues and problems; policy development; constructing persuasive policy analyses; issues related to policy process.—I. (I.) Timar

221. Culture and Social Organization of Schools (4)
Seminar—4 hours. Prerequisite: graduate standing or consent of instructor. Culture and social organization of schools. Examines perspectives of social researchers, educational policymakers, and school members and their implications for educational research, policy and practice.

222. School Change and Educational Reform (4)
Lecture/discussion—2 hours; seminar—2 hours. Prerequisite: graduate standing in Education with course 120 or the equivalent. Analysis of models, processes, and case studies of school change and educational reform with real-world characteristics of schools and schooling, planned and unplanned change, the moral evaluation of school change, and the role of educational research.

223. Education and Social Policy (4)
Seminar—4 hours. Prerequisite: graduate standing in Education or consent of instructor. Focuses on understanding the social and political context of edu-
225. Education Policy and Law (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing or consent of instructor. Examination of law as an instrument of social policy. Specific focus on the legalization of education decision making, its causes, dimensions, and effects on administrative and teacher authority. —Timar

226. Culture and Social Organization of Higher Education (4)
Seminar—3 hours; field work—1 hour. Prerequisite: graduate standing or consent of instructor. Critical study of culture and social organization of higher education. Institutions policies and functions in the U.S., with some attention to other countries. —Gonzalez

228. Politics and Governance of Education (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing. Examination of political power, representation, influence, decision-making and inter-governmental relations in the public schools. Offered in alternate years. —Timar

229. Education Finance Policy (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing. Examination of (1) United States financing public education, (2) the relationship between school finance and education policy, and (3) the relationship between education finance and education practice. —Rose

230. Special Topics in Education Policy (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Selected topics in education policy. Designed to facilitate preparation for the qualifying examination or dissertation. Students will critically analyze scholarly work including their own works in progress. May be repeated for credit when topic differs. —II, III. (II, III.) Athanases, Enright, Martinez, Tonkovich

234. Theory and Research in Early Literacy (4)
Seminar—3 hours; field work—1 hour. Prerequisite: graduate standing or consent of instructor. Analysis of children's initial processes in learning to read extending from the preschool years into second grade. Topics include emergent literacy, phonological awareness, word recognition, decoding, spelling, vocabulary, comprehension, and interaction in reading, assessment, instruction, and intervention. Offered in alternate years. —III. Tonkovich

236. Application of Hierarchical Linear Models in Education Research (4)
Lecture—2 hours; lecture/discussion—2 hours; term paper. Prerequisite: course 204A or similar course with permission of instructor. Applications of hierarchical linear models in educational research across multiple areas, such as policy, curriculum, and assessment. Develop working knowledge of hierarchical linear modeling and an understanding of its use in existing research as well as student’s work. —Gee

237. Survey Research Methods (4)
Lecture/discussion—3 hours; field work—1 hour; term paper. Prerequisite: course 114 or equivalent. Theories, principles, and application of survey research methodology. Students develop, validate, and administer survey instruments; select representative samples; conduct focus groups; and analyze survey data. Familiarity with introductory concepts in descriptive and inferential statistics is assumed. Offered in alternate years. —(II) Abedi

238. Participatory Action Research (PAR) (4)
Lecture/discussion—3 hours; field work—1 hour. Prerequisite: minimum of one quarter recommended of an introductory research methods course. Principles and strategies of PAR and related methodologies that emphasize collaborating with those affected by the issue being researched in order to educate, take action or effect social change. Conduct interviews with stakeholders, develop case analyses and research proposals. —II. Ballard

242. Research on Text Comprehension (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Analysis of recent research related to cognitive processing of written texts. Topics include word decoding, schema theory, background knowledge, assimilation, accommodation, working memory, processing depth, vocabulary acquisition, sentence-level processes, text-level processes, text structure, implications for curriculum and instruction. —Tompick

243. Research on the Teaching and Learning of Writing (4)
Seminar—4 hours. Prerequisite: graduate standing in Education or consent of instructor. Study of issues in research on composition; history of composition studies; data analysis techniques; product and process approaches; cognitive and social perspectives. Offered in alternate years.

244. Topical Seminar in Language, Literacy and Culture (4)
Seminar—3 hours; project—1 hour. Prerequisite: graduate standing. Critical study of selected issues of language, literacy, and culture as they relate to education. May be repeated two times for credit when topic differs. —I, II, III. (I, II, III.) Athanases, Enright, Martinez, Tonkovich

245. Theory and Research in Early Literacy (4)
Seminar—3 hours; field work—1 hour. Prerequisite: graduate standing or consent of instructor. Analysis of children's initial processes in learning to read extending from the preschool years into second grade. Topics include emergent literacy, phonological awareness, word recognition, decoding, spelling, vocabulary, comprehension, and interaction in reading, assessment, instruction, and intervention. Offered in alternate years. —III. Tonkovich

246. Reading as a Social and Cultural Process (4)
Lecture—3 hours; field work—1 hour. Prerequisite: course 211 recommended or consent of instructor. Recent theoretical and empirical work on reading in social contexts. Topics include reading as an individual interactive process, reading as a social and cultural process; critical perspectives on reading; implications of contrastive theoretical perspectives for curriculum and instruction in reading. Offered in alternate years.

247. Research on Response to Culturally Diverse Literature, K-12 (4)
Lecture—3 hours; field work—1 hour. Research on response to culturally diverse literature in classrooms and other K-12 settings. Topics include reader response theories, values in expanding the literary canon, problems of cultural authenticity, resistance to multicultural literature, and instruction for diverse texts and learners. Offered in alternate years. —(II) Athanases

248. Academic Language and Literacies (4)
Seminar—3 hours; fieldwork; project. Prerequisite: graduate standing or consent of instructor. Exploration of theories and research on academic language and literacies for the schooling of first and second language learners. Students use basic qualitative methods to collect and analyze classroom language and literacy data. Offered in alternate years. —(III) Enright

249. Discourse Analysis in Educational Settings (4)
Seminar—3 hours term paper. Prerequisite: graduate standing or consent of instructor. Seminar on classroom discourse (lessons, teaching/learning interactional sequences). Final term paper is an analysis of discourse data tape-recorded by student in a field setting. —II. (II) Watson-Gecow

251. Research in Bilingual and Second Language Education (3)
Seminar—3 hours. Prerequisite: course 151; knowledge of a foreign language. Discussion and analysis of recent research in bilingual and second language education. Topics include: language acquisition in second language learners and bilinguals, second language teaching methodologies, language models in bilingual education, interaction analysis in bilingual and cross-cultural classrooms, use of the vernacular in classrooms. Offered irregularly.

253. Language and Literacy in Linguistic Minorities (3)
Seminar—4 hours. Prerequisite: graduate standing in Education with upper division course work in mathematics or consent of instructor. Analysis of curricular issues and goals in mathematics education including long-term trends, current status and influences, proposed changes, and evaluation issues. Selected curriculum projects will be examined. —Ambrose, White

256. Research in Mathematics Education (4)
Seminar—4 hours. Prerequisite: graduate standing in Education with upper division course work in mathematics, or consent of instructor. Examination of research process in mathematics education; review of critical productive problems identified by researchers; evolution of trends, issues, theories and hypotheses in various areas of mathematics education. Research course emphasizes foundations. Offered in alternate years. —Ambrose, White

256. Research in Mathematics Education (4)
Seminar—4 hours. Prerequisite: graduate standing in Education with upper division course work in mathematics, or consent of instructor. Examination of research process in mathematics education; review of critical productive problems identified by researchers; evolution of trends, issues, theories and hypotheses in various areas of mathematics education. Research course emphasizes foundations. Offered in alternate years. —Ambrose, White

257. Computer Technology in Mathematics Education (4)
Seminar—4 hours. Prerequisite: graduate standing in Education with upper division course work in mathematics; or consent of instructor. Current research issues and activities in mathematics education; status, trends, theories and hypotheses. Formulation of research questions and design of studies. Projection of future directions for research. Offered in alternate years. —Ambrose, White

260. The Modern History of Science Education (4)
Seminar—4 hours. Prerequisite: graduate standing in Education with upper division coursework in science, or consent of instructor. History of curricular issues and goals in science education from the late 19th century forward, including long-term trends, current status and influences, proposed changes, and evaluation issues. National science standards and curriculum projects. Offered in alternate years. —Passmore

262A. Research Topics in Science Education I (4)
Seminar—4 hours. Prerequisite: graduate standing in Education with upper division coursework in science, or consent of instructor. History of curricular issues and goals in science education from the late 19th century forward, including long-term trends, current status and influences, proposed changes, and evaluation issues. National science standards and curriculum projects. Offered in alternate years. —Passmore
280. Inquiry and Practice: Research Design and Application for Educational Leaders (4)
Lecture/discussion—4 hours; fieldwork; project. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Students identify an issue from their educational setting, engage in data collection/analysis, write-up the process/results, and present to class. May become a dissertation proposal, if the problem or its extension is of sufficient interest and value. —II, III

281A. Problem-Based Learning Courses: Part 1 (4)
Lecture/discussion—4 hours; extensive writing or discussion; fieldwork. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Students identify an issue from their educational settings, engage in data collection/analysis, write-up the process/results, and present to class. May become a dissertation proposal, if the problem or its extension is of sufficient interest and value. —II, III

281B. Problem-Based Learning Courses: Part 2 (4)
Lecture/discussion—4 hours; extensive writing or discussion; fieldwork. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Continuation of part one. —II, III

281C. Problem-Based Learning Courses: Part 3 (4)
Lecture/discussion—4 hours; extensive writing or discussion; fieldwork. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Continuation of part two. —II, III

282A. Beginning Issues and Practices: Contemporary Educational Leadership (4)
Lecture/discussion—4 hours; fieldwork; project. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Students explore the history and dynamic relationships among leadership theory/practice and their application to current educational settings. Students will reflect on and refine their personal theory of leadership. —II, III

282B. Beginning Issues and Practices: Diversity Issues for Educational Leaders (4)
Lecture/discussion—4 hours; fieldwork; project. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Students will critically examine the theory/practice/process of leadership in community-building and collaboration in/across communities, while addressing the utilization of human and material resources and the creation of partnerships, community linkages, and collaborative efforts. —II, III

283A. Advanced Issues and Practices: Leadership Across Communities (4)
Lecture/discussion—4 hours; fieldwork; project. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Students will critically examine the theory/practice/process of leadership in community-building and collaboration in/across communities, while addressing the utilization of human and material resources and the creation of partnerships, community linkages, and collaborative efforts. —II, III

283B. Advanced Issues and Practices: Leadership and Student Services (4)
Lecture/discussion—4 hours; fieldwork; project. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Practical and theoretical perspectives for building a sense of vision to lead the profession of student affairs and to meet the needs of the whole student. —II, III

284A. Policy: History and Theory of Educational Policy (4)
Lecture/discussion—4 hours; fieldwork; project. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Students will critically examine the history/theory of educational policy. They will explore the role of policy and examine its impact on the education sector. Students will critically engage in leading diverse schools that will be explored. Emphasis will be placed on the interaction between underrepresented segments of society and educational institutions. Best Practices in leading diverse settings will be explored. —II, III

284C. Policy: Possibilities and Limitations of Educational Policy in a Democracy (4)
Lecture/discussion—4 hours; fieldwork; project. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Students will critically examine the history/theory of educational policy. They will explore the role of policy and examine its impact on the education sector. Students will critically engage in leading diverse schools that will be explored. Emphasis will be placed on the interaction between underrepresented segments of society and educational institutions. Best Practices in leading diverse settings will be explored. —II, III

Lecture/discussion—4 hours; fieldwork; project. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Human resource and legal concepts and activities governing decisions of school leaders in public education. Attention to the theory, application, and practice of personnel and risk management, curriculum, student services, teacher rights, student roles, school community, and legal rights for families. —II, III

286A. Organizational Structures and Change: Curriculum & Instruction Issues in Education (4)
Lecture/discussion—4 hours; fieldwork; project. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Students will critically examine the history and dynamic relationships among leadership theory/practice and their application to current educational settings. Students will reflect on and refine their personal theory of leadership. —II, III

286B. Organizational Structures and Change: Curriculum & Instruction Issues in Education (4)
Lecture/discussion—4 hours; fieldwork; project. Prerequisite: admission into the CANDEL EdD program or consent of instructor. Students will critically examine the history and dynamic relationships among leadership theory/practice and their application to current educational settings. Students will reflect on and refine their personal theory of leadership. —II, III

287. CANDEL Dissertation Seminars (6-12)
Prerequisite: admission into the CANDEL EdD program or consent of instructor. Third year seminars encourage students to complete dissertations within the year. Cohort members meet together in three-week meetings with faculty members and share their writing, data collection, analysis, discussion of results, development of conclusions/implications. May be repeated nine times for credit until completion of dissertation. (S/U grading only) —I, II, III, (I, II, III)

288. Proseminar in Education (4)
Seminar—3 hours; fieldwork—3 hours. Prerequisite: admission to the Ph.D. dissertation program in Education. Professional induction into educational research field and Graduate Group in Education at UC Davis. Introduction to landscape of educational research methodologies, purposes and theories. Analysis of debates within field. Investigation of K-12 educational outreach efforts at UC Davis. —I, II, III

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses
Sciences. Emphasis on effective teaching methods.

tions from the social, biological, and physical
mental school curriculum, emphasis on contribu-
in elementary schools. Current conceptions of ele-
program. Supervised teaching in regular classrooms
(2-18)
304C. Teaching in the Elementary Schools
Lecture/discussion—2 hours; fieldwork—9.48 hours.
Prerequisite: acceptance into a teacher education
program. Supervised teaching in regular classrooms
in elementary schools. Evaluation of teaching materi-
als including instructional technology. Current ele-
mentary school emphasis on contributions from fine arts and humanities. —II. III."

305A. Teaching in the Middle Grades (5-8)
Lecture—2 hours; seminar—2 hours; student teach-
ing—15-50 hours. Prerequisite: acceptance into a
teacher education program. Supervised teaching in
regular or special education classrooms in middle
grades. Current conceptions of the middle-grades
curriculum with emphasis on social, biological, and
physical sciences. Effective teaching methods.

Lecture/discussion—2 hours; fieldwork—9.48 hours.
Prerequisite: acceptance into a teacher education
program. Supervised teaching in regular secondary
classrooms. Techniques for classroom communica-
tions; constructing goals and objectives; assessment
of learning; special problems of adolescents; instruc-
tional technology.—I-II-III.

307. Methods in Elementary Science (2)
Lecture/discussion—2 hours. Prerequisite: accep-
tance into teacher education program. Principles,
procedures, and materials for teaching the biologi-
cal and physical sciences in elementary schools.—I.

308. Methods in Elementary Social Studies (2)
Lecture/discussion—2 hours. Prerequisite: accep-
tance into a teacher education program. Principles,
procedures, and materials for teaching history and
the social sciences in elementary schools.—III.

309. The Teaching of Mathematics, K-9 (3)
Lecture/discussion—3 hours. Prerequisite: accep-
tance into a teacher education program. Mathemat-
ics curriculum and teaching methods for K-9
reflecting the needs of California’s diverse student
populations.—I. II. III. Rosas

322A. Pedagogical Preparation for
Secondary Social Science I (3)
Lecture/discussion—1 hour; discussion—1 hour.
Prerequisite: course 322A. Intermediate teaching
methods and curriculum approaches for secondary
social science teaching. State and national curriculum
standards; application of learning theory to effective
instruction; interdisciplinary teaching and active
learning approaches; effective teaching strategies for
English Learners.—I. II. (II.) Rosas

322B. Pedagogical Preparation for
Secondary Social Science II (3)
Lecture/discussion—2 hours. Prerequisite: course 322A.
Teaching methods and curriculum approaches for
social science teaching. Interdisciplinary
approaches to teaching major themes across social
science content areas; teaching potentially contro-
versial social science topics; teaching democratic
civic values, student assessment and evaluation. —II.

323A. Physical Science in the Secondary School (3)
Laboratory/discussion—2 hours; discussion/labora-
tory—1 hour. Prerequisite: acceptance into a
teacher education program. Activity-based overview
of concepts and processes in secondary school phys-
ical sciences. Emphasis upon philosophy, appropri-
ate teaching methods, materials, assessment and eval-
uation of learning. — II. II. (II.) Rosas

323B. Life Sciences in the Secondary School (3)
Laboratory/discussion—2 hours; discussion/labora-
tory—1 hour. Prerequisite: acceptance into a
teacher education program. Effective teaching
based overview of concepts and processes in secondary school biol-
ogy and life sciences. Emphasis on philosophy, appropriate teaching
methods, materials, assessment and evaluation of learning, and issues.—II. (II.)

298. Group Study (1-5)
(S/U grading only.)

299. Individual Study (1-6)
Independent study—3-18 hours. Individual study
under the direction of a faculty member. (S/U grad-
ing only.)

299D. Research (1-12)
Independent study—3-36 hours. Research for indi-
vidual graduate students. (S/U grading only.)

Professional

300. Reading in the Elementary School (4)
Lecture—3 hours; fieldwork—3 hours. Prerequisite:
grade standing. Principles, procedures, and cur-
riculum materials for teaching of reading. Includes
decoding skills with a special emphasis on phonics,
comprehension skills, study skills, and reading in the
content areas.—II.

301. Reading in the Secondary School (4)
Discussion—4 hours. Prerequisite: grade stand-
ing, enrollment in the secondary credential program,
or consent of instructor. Principles, procedures, and
materials for teaching secondary school teachers to improve
the reading competence of students. Strategies for
enhancing learning through reading and writing in
disciplines, with special attention to linguistically
diverse populations.—I. II. III. Martinez

302. Language Arts in the Elementary School (2)
Lecture—2 hours. Prerequisite: grade standing.
Principles, procedures, and materials for the teach-
ing of oral and written expression, listening, language,
drama, and children’s literature in elementary
schools.

303. Art Education in the Elementary School (2)
Lecture/discussion—2 hours. Prerequisite: admissi-
on to multiple subject credential program. Understand-
ing the principles of education in the arts through
participation. Development of concepts, introduction
to media, and techniques suitable for the elementary
school. Curriculum, pedagogy, and materials for
teaching the visual and performing arts curriculum in
elementary schools.—III. (III.)

304A. Teaching in the Elementary Schools (2-18)
Lecture/discussion—2 hours; fieldwork—9.48 hours.
Prerequisite: acceptance into a teacher education
program. Supervised teaching in regular classrooms
in elementary schools. Selection and organization of
teaching materials. Introduction to techniques of
diagnosing school achievement of children.—I. (I.)

304B. Teaching in the Elementary Schools (2-18)
Lecture/discussion—2 hours; fieldwork—9.48 hours.
Prerequisite: acceptance into a teacher education
program. Supervised teaching in regular classrooms
in elementary schools. Current conceptions of ele-
mentary teaching, emphasis on contributions from
the social, biological, and physical sciences. Emphasis on effective teaching methods. —II. (II.)
Endocrinology and Metabolism

Christopher Thaisis, Ph.D. (Clark Kerr Presidential Chair and Director, University Writing Program) Ross Thompson, Ph.D., Professor (Psychology) Thomas Timar, Ph.D., Professor (Education) Cary Tredler, Ph.D., Associate Professor (Education) Yuuko Uchikoshi Tankovich, Ed.D., Associate Professor (Education) Stefano Varese, Ph.D., Professor

Graduate Study. The Graduate Group in Endocrinology and Metabolism offers programs of study and research leading to the Ph.D. degree. Students may concentrate in: language, literacy and culture; learning and mind sciences; mathematics education; school organization and educational policy; or science and agriculture education. Students may also combine these fields of study with designated emphasis areas such as Critical Theory; Second Language Acquisition, Women's Studies, and Writing, Rhetoric, and Composition Studies. Detailed information regarding graduate study may be obtained by writing to the Graduate Coordinator or at http://education.ucdavis.edu/programs/PhDoverview.html.

Preparation. Students should have earned a Bachelor's or M.A. degree or the equivalent in a discipline relevant to their proposed emphasis program. For example, students applying for the mathematics education emphasis should have earned the B.A. or M.A. or M.A.T. degree in mathematics or mathematics education.

Graduate Advisers. Michel Kurlaender, Lee Martin

Graduate Coordinator. Mary M. Reid

Courses. See Education, School of, on page 236.

The Major Programs

Eleven majors, leading to the B.S. degree, are open to students.

Aerospace Science & Engineering

Biological Engineering

Biological Systems Engineering

Chemical Engineering

Civil and Environmental Engineering

Computer Science

Electrical and Computer Engineering

Materials Science and Engineering

Mechanical and Aerospace Engineering

Transportation Technology and Policy

Minor Programs

The College of Engineering offers nine undergraduate minors: Biomedical Engineering (Department of Biomedical Engineering) Computational Biology (Department of Computer Science) Construction Engineering and Management (Department of Civil and Environmental Engineering) Electrical Engineering (Department of Electrical and Computer Engineering) Energy Science and Technology (Department of Biological and Agricultural Engineering) Energy Policy (Department of Biological and Agricultural Engineering) Energy Efficiency (Department of Biological and Agricultural Engineering) Materials Science (Department of Chemical Engineering and Materials Science) Sustainability in the Built Environment (Department of Civil and Environmental Engineering)

Courses in Engineering (ENG)

Students are encouraged to carefully adhere to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisites have not been completed.

Lower Division

1. Introduction to Engineering (1)

Lecture—1 hour. Open to first-year students only. Introduction to the role of engineers in the acquisition and development of engineering knowledge, the differences and similarities among engineering fields, and the work ethic and skills required for engineering. [P/NP grading only.] GE credit: SE—I, II, III. [I, II] VanderGheynst

4. Engineering Graphics in Design (3)

Lecture—2 hours; laboratory—3 hours. Engineering design, descriptive geometry, pictorial sketching, computer-aided graphics, and their application in the solution of engineering problems. GE credit: SciEng | SE; VL—I—II, III, IV. [I, II] Schaaf, Sasaki
6. Engineering Problem Solving (4)

7. Technology and Culture of the Internet (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: basic computer experience recommended. Technology and culture of networked computing and the Internet. Topics include the history and development of network computing, Internet architecture and services, basics of Web page design and hypertext markup language, political, social, cultural, economic and ethical issues related to the Internet. GE credit: SciEng | SE.

10. The Science Behind the Technology in Our Lives (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: high school algebra. Understanding of how the technology in our lives works using only basic concepts and rudimentary mathematics. GE credit: SciEng or SocSci, Wrt | SE or SS.—II, I. Orel, Parikh

11. Issues in Engineering (1)
Lecture—1 hour. Prerequisite: Participation in the NESA Engineering Program or consent of instructor. Designed to broaden student’s understanding of the engineering profession, its methods, principles, design and development process, career opportunities, and professional responsibilities.—I. (I.) Vander-Gheynst

17. Circuits I (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 22A (C- or better recommended); Mathematics 22B (C- or better recommended) may be taken concurrently. Physics 9C or 9DH (C- or better recommended). Basic electric circuit analysis techniques, including electrical quantities and elements, resistive circuits, transient and steady-state responses of RLC circuits, sinusoidal excitation and phasors, and complex frequency and network functions. GE credit: SciEng | SE, VL, —I, II, III, (I, II, III).

20. Introduction to Space Exploration: Understanding the Technological and Environmental Challenges to Our Exploration of the Solar System (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: high school level Algebra, Geometry, General Science, and/or Physics (highly recommended). Introductory overview of the space environment. Discussion of space exploration technology including propulsion, orbital mechanics, and spacecraft engineering. Offered in alternate years. GE credit: SciEng | QL, SE, SL.

35. Statics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Physics 9A; Mathematics 21D (may be concurrent). Force systems and equilibrium conditions with emphasis on engineering problems. GE credit: SciEng | SE, VL, —I, II, III, (I, II, III).

45. Properties of Materials (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in Mathematics 16C or 21C, Chemistry 2A, and Physics 1A. Introductory course on the properties of engineering materials and their relation to the internal structure of materials. GE credit: SciEng | QL, SE, SL, WE —I, II, III, IV, (I, II, III, IV).

45S. Honors Properties of Materials (1)
Discussion—1 hour. Prerequisite: enrollment in the Materials Science and Engineering Honors Program; concurrent enrollment in course 45 required. Examination of special materials science and engineering topics through readings, discussions, laboratory work, or special activities which may include projects, laboratory experience or computer simulations. Open only to students in the Materials Science and Engineering Honors program.—II, (II).

45Y. Properties of Materials (4)
Web virtual lecture; laboratory; Prerequisite: C- or better in Mathematics 16C or 21C, Chemistry 2A and Physics 9A. Introduction to the properties of engineering materials and their relation to the internal structure of materials. Not open for credit to students who have passed course 45. GE credit: SciEng | QL, SE, SL, VL —IV, (IV).

98. Directed Group Study (1-4)
Restricted to College of Engineering students only. (P/NP grading only.) May be repeated for credit up to 3 times.

Upper Division

100. Electronic Circuits and Systems (3)
Lecture—3 hours; lecture—2 hours. Prerequisite: course 17 (C- or better recommended). Introduction to analog and digital circuit and system design through hands on laboratory design projects. Students who have completed Electrical and Computer Engineering students only. Kinematics and kinetics of particles, systems of particles, and of rigid bodies; application of these topics are applied to engineering problems. Only two units of credit allowed to students who have previously taken course 36. GE credit: SciEng | QL, SE, VL, —I, II, III, (I, II, III). Cheng, Eke, Hess, Joss.

103. Fluid Mechanics (4)
Lecture—3 hours. Prerequisite: C- or better in each of the following: Engineering 35 and Mathematics 22B and Physics 98. Open to students in the College of Engineering and Hydrology majors. Fluid properties, fluid statistics, continuity and linear momentum equations for control volumes, flow of incompressible fluids in pipes, dimensional analysis and boundary-layer flows. Not open for credit to students who have completed Chemical Engineering 150A. GE credit: SciEng | SE, VL, —I, II, III, (I, II, III). Aldredge, Davis, Delplanque, Hwang, Kennedy, Robinson

104. Mechanics of Materials (4)
Lecture—4 hours. Prerequisite: grade of C- or better in Engineering 35 and Mathematics 22B and Physics 98. Open to students in the College of Engineering and Hydrology majors. Fluid properties, fluid statistics, continuity and linear momentum equations for control volumes, flow of incompressible fluids in pipes, dimensional analysis and boundary-layer flows. Not open for credit to students who have completed Chemical Engineering 150A. GE credit: SciEng | SE, VL, —I, II, III, (I, II, III). Aldredge, Davis, Delplanque, Hwang, Kennedy, Robinson

104L. Mechanics of Materials Laboratory (1)
Lecture—3 hours. Prerequisite: course 104. Experiments which illustrate the basic principles and verify the analysis procedures used in the mechanics of materials are performed using the basic tools and techniques of linear and nonlinear statics. GE credit: SciEng | SE, VL, —I, II, III, (I, II, III).

105. Thermodynamics (4)
Lecture—4 hours. Prerequisite: C- or better in Mathematics 22B and Physics 98. Open to College of Engineering students only. Fundamentals of thermodynamics: heat energy and work, properties of pure substances, First and Second Law for closed and open systems, reversibility, entropy, thermodynamic temperature scale, and the properties of thermodynamics to engineering systems. GE credit: SciEng | QL, SE, VL, —I, II, III, (I, II, III). Aldredge, D’Souza, Erickson

106. Engg Economics (3)
Lecture—3 hours. Prerequisite: upper division standing in Engineering. The analysis of problems in engineering economy; the selection of alternatives; replacement decisions. Compounding, tax, origins and cost of capital, economic life, and risk and uncertainty are applied to methods of selecting most economic alternatives. GE credit: SciEng or SocSci, QL, SE, SL, SS, VL, —II, III, (I, II, III). Hartough, Slaughter

111. Electric Power Equipment (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: grade of C- or better in course 17. Principles of AC and DC electrical motors and generators, their control systems and power sources. Selection of electric power equipment components based on their construction features and performance characteristics. Offered irregularly. GE credit: SciEng | QL, SE, VL, WE.—Delwiche Hartsough

121. Fluid Power Actuators and Systems (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: grade of C- or better in Engineering 100 and Engineering 102. Hydraulic and pneumatic systems with emphasis on analysis and control of actuators. Design of hydraulic and pneumatic systems, specification and sizing of components, and selection of electrohydraulics/electro-pneumatics, servo valves, and closed loop systems to solve basic control problems. Offered in alternate years. GE credit: SciEng | QL, SE, SL, WE.—III. (III) Rosa

122. Introduction to Mechanical Vibrations (4)
Lecture—4 hours. Prerequisite: C- or better in Engineering 102; C- or better in Engineering 6 or course 5 or Computer Science Engineering 30, ability to program in MATLAB. Free and forced vibrations in lumped-parameter systems with and without damping; vibrations in coupled systems; electromechanical analogs; use of energy conservation principles. GE credit: SciEng | QL, SE.

160. Environmental Physics and Society (3)
Lecture—3 hours. Prerequisite: Physics 9D, SC, or 10 and 18 or Mathematics 16B or the equivalent. Impact of humankind on the environment will be discussed from the perspective of the physical sciences. Calculations based on physical principles will be made, and the resulting policy implications will be considered. (In the College of Engineering, students may receive only one unit of credit towards the Technical Electives requirement.) (Same course as Physics 160.) GE credit: SciEng or SocSci | SE or SL, VL—II, III. (II, III.) Jungerman, Craig

180. Engineering Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Mathematics 21D and 22B; C- or better in Engineering 6 or Mechanical Engineering 5 or Computer Science Engineering 30. Solutions of systems of linear and nonlinear algebraic equations; approximation methods; solutions of ordinary differential equations; initial and boundary value problems; solutions of partial differential equations of elliptic, parabolic, and hyperbolic types; Eigen value problems. GE credit: SciEng | SE, VL—I. (I.) Halef

188. Science and Technology of Sustainable Power Generation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper-division standing. Physics 7C or 9C. Focus on scientific understanding and development of power generation that is the basis of modern society. Concerns with the current and future demands for energy and the development of power generation technologies that are sustainable, in particular, discussion of the most recent innovations. GE credit: SocSci | SS, SC, SS, (I, II, III.) Hufnagel

190. Professional Responsibilities of Engineers (3)
Lecture—3 hours. Restricted to upper division students in the College of Engineering. Organization of the engineering profession; introduction to contracts, specifications, business ethics, patients, and liability; discussion of professional, ethical, societal, and political issues related to engineering. GE credit: SocSci | SS, SC, SS, (I, II, III.) Hufnagel

198. Directed Group Study (1-5)
May be repeated for credit up to 3 times. (P/NP grading only.) GE credit: SE.

Graduate

250. Technology Management (3)
Lecture—3 hours. Prerequisite: consent of instructor. Management of the engineering and technology activity. Functions of design, planning, production, marketing, sales, and maintenance. Technological
211C. Numerical Solution of Partial Differential Equations III (3)

Lecture—3 hours. Prerequisite: course 211B. Conservation laws, fluid dynamics, convection, fluid equations, elasticity equations, electromagnetic equations, transport equations. III. (III.) Rodrigue, Miller, Orel, Jensen.

213A. Computer Graphics (3)

Lecture—3 hours. Prerequisite: consent of instructor. Development of algorithms for perspective line drawing of three-dimensional objects, as defined by polygons or bicubic patches. —II. Max

217A. Applied Computational Science (3)

Lecture—3 hours. Prerequisite: course 210A, Mathematics 229A or the equivalent (may be taken concurrently). Applied modular programming in low level language (C or Fortran). Direct implementations and integrated applications of algorithms applied to computational science problems, which are exemplified through projects. Emphasis on the practical use and implementation of theory taught in course 210A. —I. Rodrigue, Miller, Orel, Jensen

217B. Applied Computational Science (3)

Lecture—3 hours. Prerequisite: course 210B or the equivalent (may be taken concurrently). Applied modular programming in low level language (C or Fortran). Direct implementations of the theory taught in course 210B and applications of algorithms for computational science problems, exemplified through projects including partial differential equations, initial/boundary value problems. —II. Rodrigue, Miller, Orel, Jensen.

218. Signal Processing (3)

Lecture—3 hours. Prerequisite: Mathematics 121A, 121B or the equivalent. Discrete-time and continuous-time signal processing. Fourier transforms, Laplace transform and reconstruction. Sampling theorem and analog-to-digital conversion, multirate signal processing, wavelets and filter banks; fast algorithms: FFT, DWT, and pyramid; data compression with wavelets; spectral factorization; designing application-specific wavelets. Offered in alternate years. —II. Dowla

219. Wavelets and Their Applications (3)

Lecture—3 hours. Prerequisite: Electrical and Computer Engineering 150A, Mathematics 167. Fourier transforms and digital filters; sampling theorem and analog-to-digital conversion, multirate signal processing, wavelets and filter banks; fast algorithms: FFT, DWT, and pyramid; data compression with wavelets; spectral factorization, designing application-specific wavelets. Offered in alternate years. —I. Dowla

220A. Artificial Neural Nets I (3)


220B. Artificial Neural Nets II (3)


221. Genetic Algorithms and Optimization (3)

Lecture—3 hours. Prerequisite: Mathematics 145 or the equivalent; graduate standing; ability to program in one of the modern programming languages. Introduction to genetic algorithms. Fundamental theorem; schema processing; genetic operators; applications to function optimization, VLSI circuit layout. Implementation on parallel computers; genetic programming; evolutionary algorithms. —III. Vemuri

225. Computational Structures for Signal and Image Processing and Graphics (3)

Lecture—3 hours. Prerequisite: Computer Science Engineering 152. Tools for research in digital media. Communication protocols, algorithms and architectures suitable in modern networked environment. Transmission of digital data over voice-grade channels, telecommunications networks for data transport, Broadband multimedia communications, ATM, and Broadband ISDN. Offered in alternate years. —II. Vemuri

230. Topics in Computational Fluid Dynamics (3)

Lecture—3 hours. Prerequisite: Mathematics 228 and Physics 112B. Microscopic and macroscopic descriptions of matter; thermodynamics and kinetics; constitutive, electrical, mechanical and thermal properties. —I, II, III. (I, II, III) Luhmann, Yeh, Baldus, Mcurdy

231A. Applied Quantum Mechanics (3)

Lecture—3 hours. Prerequisite: courses 205ABC (may be taken concurrently). Classical properties of matter; introduction to quantum mechanics by the correspondence principle. Solvable bound state/continuum problems, in 1-D: well, barrier, and harmonic oscillator. Solvable problems in 3-D: HO, well, and hydrogen atom. Matrix theory: Schroedinger, Heisenberg, and interaction picture. —II. (III) Orel, Kral, Yeh

231B. Applied Quantum Mechanics (4)

Lecture—3 hours. Prerequisite: course 231A. Approximate methods in quantum mechanics, perturbation methods, variational methods, time dependent perturbation theory, scattering, and radiation. —III. (I) Orel, Kral, Yeh

233A-233B-233C. Theory and Applications of Solid-State Physics (3-3-3)

Lecture—3 hours. Prerequisite: course 230C or the equivalent. Structure and properties of crystals; theory of dielectrics, metals and alloys; magnetism, superconductivity, and semiconductors. Applications to various solid-state devices. —II—III—III. (III—III—III) Orel

234A. Applied Electromagnetics I (3)

Lecture—3 hours. Prerequisite: Electrical and Computer Engineering 130B or the equivalent. Electromagnetics: Gauss’s law, potentials, fields, boundary value problems, multiple pole expansions, dielectrics, polarization, capacitance, inductance, torque, forces, eigenfunction expansions, Magnostatics, Bio-Savart law, Ampere’s law, vector potential, gauge transformations, magnetization, induction, constitutive relations. —II. (III) Kolter, Hwang

234B. Applied Electromagnetics II (3)

Lecture—3 hours. Prerequisite: course 234A. Maxwell’s equations, wave equations for fields and potentials. Poising’s Theorem and power flow. Momentum and angular momentum in the electromagnetic field. Stress tensor. Polarization. Reflect-
234C. Applied Electromagnetics III (3) Lecture—3 hours. Prerequisite: course 234B. Dynamics of relativistic particles; collisions between charged particles, energy loss, and scattering; radiation by moving particles; bremsstrahlung, method of virtual quanta, radiative beta processes; multipole fields; radiation damping, self fields of a particle, scattering and absorption of radiation.—I. (I.) Kolner, Hwang

225. Biophotonics in Medicine and the Life Sciences (3) Lecture/discussion—3 hours. Prerequisite: Physics 108 and Biology 101-105; course 202 highly recommended; graduate standing. Introduction to the science and technology of biomedical optics and photonics, with an overview of applications in medicine and the life sciences. Emphasis on research supported by the NSF Center for Biophotonics at UC Davis Medical Center. (Same course as Biomedical Engineering 255 and Biophysics 255S.)—II. (III.) Chang, Matthews

262A. Atomic and Molecular Interactions (3) Lecture—3 hours. Prerequisite: Physics 215A-215B-215C or the equivalent. Atomic structure and spectra. Offered in alternate years.—(I.) Orel

262B. Atomic and Molecular Interactions (3) Lecture—3 hours. Prerequisite: Physics 215A-215B-215C. Molecular structure and spectra. Offered in alternate years.—(II.) Orel

262C. Atomic and Molecular Interactions (3) Lecture—3 hours. Prerequisite: course 262B. Classical and quantum mechanical collision theory of electron and heavy particle scattering. Offered in alternate years.—(III.) Orel

263A. Quantum Statistics of Light (3) Lecture—3 hours. Prerequisite: Physics 208B-208C and Physics 215A-215B-215C or the equivalent. Classical susceptibilities, single quantization of light/matter interaction, resonance phenomena, second quantization of electromagnetic fields, number representation and operators.—II. (I.) Orel, McCurdy


264A. Classical Optics I (3) Lecture—3 hours. Prerequisite: course 108B and Electrical and Computer Engineering 130B or Physics 110. (I, II, III.) (A) Crystal optics; anisotropic wave propagation; dispersion relations, phase and group velocity surfaces. Polarization, Stokes parameters, Poincare sphere. Optical crystallography; interference figures; optical centers, optical groups. Piezoelectricity, electro-optic, magneto-optic effects. Geometrical optics; eikonal equation, Lagrange's integral invariant, Fermat's principle.—I. (II.) Kolner


285A. Physics and Technology of Microwave Vacuum Electron Beam Devices I (4) Lecture—4 hours. Prerequisite: B.S. degree in physics or electrical engineering or the equivalent for background. Physics and technology of electron beam emissions, flow and transport, electron gun design, space charge waves and klystrons. Offered in alternate years.—II. (III.) Luhmann

285B. Physics and Technology of Microwave Vacuum Electron Beam Devices II (4) Lecture—4 hours. Prerequisite: 285B. Physics and technology of gyrotrons, gyro-amplifiers, free electron lasers, magnetrons, crossfield amplifiers and relativistic devices. Offered in alternate years.—II. (III.) Luhmann

Electrical and Computer Engineering 255 and Biophysics 255S.)—II. (III.) Orel

290C. Graduate Research Group Conference (1) Seminar—1-2 hours. (S/U grading only.)—I, II, III. (I, II, III.)

290. Biophotonics Seminar (1) Seminar—1 hour. Prerequisite: consent of instructor. May be repeated for credit up to five units per segment when topic differs.—I, II, III, IV

290A-N. Special Topics in Applied Science (1-5) Lecture, laboratory, or combination. Prerequisite: graduate standing or permission of instructor. Special topics in the following areas: (A) Atomic, Molecular, and Optical Physics; (B) Chemical Physics; (C) Computational Physics; (D) Biophotonics/Biotechnology; (E) Materials Science; (F) Information Science and Photonics; (G) Nonlinear Optics; (H) Plasma/Fusion Energy Physics; (I) Quantum Electronics; (J) Condensed Matter/Statistical Physics; (K) Classical Optics; (L) Microwave and Millimeter-Wave Technology; (M) Synchrotron Radiation Science; (N) Space Physics. May be repeated for credit up to five units per segment when topic differs.—I, II, III, IV

280. Biophotonics Internship (7-12) Courses in Biophotonics (BPT) Graduate

280. Biophotonics Internship (7-12) Internship—36 hours. Prerequisite: graduate standing; consent of instructor. Open only to students in the designated emphasis in Biophotonics. Research experience diverse to that from the student’s dissertation topic at an industrial company, national laboratory, or a cross-college laboratory for one quarter. (S/U grading only.)—I, II, III, IV

280A. Biophotonics Seminar (1) Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Presentation of current research in the area of biophotonics by experts in the field, followed by group discussions. May be repeated up to three times for credit. (S/U grading only.)—I, II, III, IV

280B. Biophotonics Seminar (1) Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Presentation of current research in the area of biophotonics by experts in the field, followed by group discussions. May be repeated up to three times for credit. (S/U grading only.)—I, II, III, IV

280C. Biophotonics Seminar (1) Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Presentation of current research in the area of biophotonics by experts in the field, followed by group discussions. May be repeated up to three times for credit. (S/U grading only.)—I, II, III, IV

280D. Biophotonics Seminar (1) Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Presentation of current research in the area of biophotonics by experts in the field, followed by group discussions. May be repeated up to three times for credit. (S/U grading only.)—I, II, III, IV

280E. Biophotonics Seminar (1) Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Presentation of current research in the area of biophotonics by experts in the field, followed by group discussions. May be repeated up to three times for credit. (S/U grading only.)—I, II, III, IV

280F. Biophotonics Seminar (1) Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Presentation of current research in the area of biophotonics by experts in the field, followed by group discussions. May be repeated up to three times for credit. (S/U grading only.)—I, II, III, IV

280G. Biophotonics Seminar (1) Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Presentation of current research in the area of biophotonics by experts in the field, followed by group discussions. May be repeated up to three times for credit. (S/U grading only.)—I, II, III, IV

280H. Biophotonics Seminar (1) Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Presentation of current research in the area of biophotonics by experts in the field, followed by group discussions. May be repeated up to three times for credit. (S/U grading only.)—I, II, III, IV

280I. Biophotonics Seminar (1) Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Presentation of current research in the area of biophotonics by experts in the field, followed by group discussions. May be repeated up to three times for credit. (S/U grading only.)—I, II, III, IV
biological materials, and to educate students for this work. Our goals are to advance the science, teach the principles of engineering, and disseminate the knowledge of engineering needed to produce, distribute, and process biological products such as food and fiber, while conserving natural resources, preserving environmental quality, and ensuring the health and safety of people.

Objectives. We educate students in the fundamentals of mathematics, physical and biological sciences, and engineering, balanced with the application of principles to practical problems. We teach students to develop skills for solving engineering problems in biological systems through use of appropriate analysis, synthesis, and engineering design techniques. We prepare students for entry into engineering practice and graduate education, as well as for engagement in lifelong learning. We foster the ability of our students to collaborate and communicate effectively, and provide an awareness of the importance of economics, professional responsibility, and the environment.

Students graduating with a B.S. degree in Biological Systems Engineering from UC Davis are prepared to:

• Apply life sciences in engineering at the biochemical, cellular, organismal, and macro, levels.
• Solve biological systems engineering problems while employed in the private or public sector.
• Consider the environmental consequences of their engineering activities.
• Communicate effectively with professional colleagues and public constituencies,
• Act in an ethical manner, and
• Continue their education in a changing professional world.

The Biological Systems Engineering Undergraduate Program

Biological Systems Engineering is an engineering major that uses biology as its main scientific base. With rapid advances in biology and biotechnology, engineers are needed to work side by side with life scientists to bring laboratory developments into commercial production and field application. Industries in bioenergy, bioprocessing, biotechnology, food processing, aquaculture, agriculture, plant production, animal production, and forest production all need engineers with strong training in biology. The heightened concern for environmental resources and their preservation generates many engineering opportunities as society strives to maintain balance within the biosphere.

In the freshman and sophomore years, the Biological Systems Engineering major requires sequences of courses in mathematics, physics, chemistry, engineering science, and humanities, similar to all accredited engineering programs. In addition to these course sequences, the Biological Systems Engineering major also requires courses in the biological sciences. Exclusive of General Education units, the Biological Systems Engineering major requires a minimum of 161 units (90 units in the lower division; 71 units in the upper division).

Biological Systems Engineering graduates take jobs in the biotechnology, food, and medical industries; work for state agencies; or pursue graduate study. Students can also use the program as a pathway to professional schools in medicine, veterinary medicine, dentistry, or business.

The Biological Systems Engineering program is accredited by the Engineering Accreditation Commission of ABET; see http://www.abet.org. Students are encouraged to adhere carefully to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisites have not been completed.

Lower Division Required Courses

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>UNITS</th>
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</thead>
<tbody>
<tr>
<td>Mathematics 21A 21B 21C 21D</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 22A 22B</td>
<td>6</td>
</tr>
</tbody>
</table>

Physics 9A-9B-9C | 15 |
Chemistry 2A-2B | 10 |
Biological Systems Engineering 6, 35, 17 | 12 |
Biological Systems Engineering 1 | 4 |
Biological Systems Engineering 75 | 4 |
University Writing 1 or 1V | 4 |
Communication 1 or 3 | 4 |

Upper Division Requirements:

If your career objective is a professional degree in the health sciences (e.g., medicine, veterinary medicine, or dentistry), you should consult with advisers from the appropriate school to plan for successful admission and to ensure that you take specific courses that may be required and that you have the necessary experience. The upper division requirements are listed following the areas of specialization:

• Biotechnology Engineering
• Agricultural and Natural Resources Engineering
• Food Engineering

Areas of Specialization

Biotechnology Engineering: Biotechnology involves the handling and manipulation of living organisms or their components to produce useful products. Students specializing in biotechnical engineering integrate analysis and design with applied biology to solve problems in renewable energy production, large-scale biotechnical production, control of biological systems, and bio-based materials production.

Students may focus on the mechanisms and processes for the sustainable production and use of energy from renewable biological sources. Students may also focus on the challenges in scaling up laboratory developments to industrial production, including production, packaging, and application of biocatalysts for plant pests and diseases; genetically altered plants; plant materials and food products; and microbial production of biological products, tissue culture, and bioremediation. Students may also focus on the development of biosensors to detect microorganisms and specific substances, useful in the development of products based on biotechnological processes and materials.

Biotechnical engineers work in the biotech industries on process design and operation, scale-up, and instrumentation and control.

Recommended biological science electives:

Biological Sciences 101, 102, 103
Microbiology 102
Molecular and Cellular Biology 120L
Plant Biology 113

Recommended engineering electives:

Biological Systems Engineering 161 Chemical Engineering 161B, 161C, 161L
Civil and Environmental Engineering 143, 148A, 149, 150, 153
Engineering 180
Mechanical Engineering 161, 162, 163


Food Engineering

Producing the food we eat every day constitutes the largest industrial sector of the U.S. economy, and this production involves the work of engineers in a wide variety of food industries, both at home and around the world. Students specializing in food engineering design food processes and operate equipment to produce food of high quality, safe, and nutritious food with minimal impact of these operations on the environment.

Students learn to apply engineering principles and concepts to harvesting, storage, process, package, and distribute food and related products. In addition to engineering principles, the food engineering specialization provides an understanding of the chemical, biochemical, microbiological, and physical aspects of food. Students study concepts of food refrigeration, freezing, thermal processing, drying, and other food operations.

Food engineers work as practicing engineers, scientists, and managers in the food industry.

Recommended biological science electives:
requirement for students in the Biological Systems by the College of Letters and Sciences cannot be

Master Undergraduate Adviser.

Upper Division Required Courses

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<tr>
<th>Units</th>
<th>Courses</th>
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<tbody>
<tr>
<td>3</td>
<td>Agriculture 125, 130, 165, 170A, 170B, 170BL, 170C, 170CL</td>
</tr>
</tbody>
</table>

Biological Systems Engineering electives—Select a minimum of 4 units from all upper division Biological Systems Engineering courses not otherwise required, with the exception of Biological Systems Engineering courses 189-199.

Statistics 100C, 100D, 101C, 101D, 102, 104, 105 Engineering electives—Select a minimum of three units. All upper division courses offered by the College of Engineering may be taken as engineering electives with the exception of the following:

Civil and Environmental Engineering 123, Computer Science Engineering 188, Engineering 190, 191B, 199C, all courses numbered 190-197 and 199 (except Engineering 190, which may be taken for 2 units of engineering elective credit) …… 3

Biological science electives—All upper division courses in the College of Biological Sciences (with the exception of Biological Sciences 132, Evolution and Ecology 175, Exercise Science 102, 112, 115, 118 through 149L, Microbiology 100 and all courses numbered 190-199) may be used as biological science electives. The following courses may also be taken as biological science electives: Applied Biological Systems Technology 161; Animal Science 118, 143, 144, 146; Agricultural Management 102; Environmental Horticulture 101; Environmental Science and Policy and Management 120, 182, 185 (offered at UC Berkeley); Environmental Science and Policy 100, 110, 152; Environmental Toxicology 101, 112A, 131; Food Science and Technology 102A, 104L, 119, 120, 121, 128, 159; Infectious Diseases 141; Soil Science 100; Wildlife, Fish, and Conservation Biology 121. Students may choose other upper division courses with substantial biological content offered by the College of Agricultural and Environmental Sciences; consultation with a faculty adviser and approval by petition is required …… 3

Upper Division Composition Requirement* one course from the following: University Writing Program 101, 102B, 102E, 102F, 102G, 102A, 104A, 104E, 104F, 104T …… 4

Energy Minor Programs

There is an urgent need to develop and commercialize new technologies that are novel in the use of energy that have the potential to provide a sustainable and use of energy. The goal of these minors is to prepare students for careers that require training in energy science and technology and energy policy. Clean tech and green tech markets including energy are some of the most rapidly growing fields in new investment. Well-trained individuals in all related fields are needed to provide the level of expertise required to advance technology and policy and to satisfy state, national, and international objectives for greater energy sustainability. The minors are expected to accommodate persons of diverse background with educational interests in areas that may include engineering, science, policy, economics, planning, and management.

Upper Division Required Courses

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<tr>
<th>Units</th>
<th>Courses</th>
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<tbody>
<tr>
<td>3</td>
<td>Agriculture 125, 130, 165, 170A, 170B, 170BL, 170C, 170CL</td>
</tr>
</tbody>
</table>

Upper Division Composition Requirement* one course from the following: University Writing Program 101, 102B, 102E, 102F, 102G, 102A, 104A, 104E, 104F, 104T …… 4

Energy Minor Programs

There is an urgent need to develop and commercialize new technologies that are novel in the use of energy that have the potential to provide a sustainable and use of energy. The goal of these minors is to prepare students for careers that require training in energy science and technology and energy policy. Clean tech and green tech markets including energy are some of the most rapidly growing fields in new investment. Well-trained individuals in all related fields are needed to provide the level of expertise required to advance technology and policy and to satisfy state, national, and international objectives for greater energy sustainability. The minors are expected to accommodate persons of diverse background with educational interests in areas that may include engineering, science, policy, economics, planning, and management.

Energy Science and Technology Minor

All courses must be taken for a letter grade. Grade of C- or better required for all courses used to satisfy minor requirements with overall GPA in minor requirement courses of 2.00 or better.

Minor Requirements:

<table>
<thead>
<tr>
<th>Units</th>
<th>Courses</th>
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<tbody>
<tr>
<td>18</td>
<td>Engineering 105 or Chemical Engineering 1528</td>
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<tr>
<td></td>
<td>Applied Science 188 .................................... 4</td>
</tr>
<tr>
<td></td>
<td>Select 12 units from: Biological Systems Engineering 162, Chemical Engineering 146, 1528, 161A, 161B, 161L, 166; Civil Engineering 125, 143, 162, 163; Mechanical Engineering 161; Agricultural and Resource Economics 175; Food Science and Technology 125; Applied Biological Systems Technology 182; Atmospheric Science 116; Plant Science 101; Environmental Science and Policy 167 ... 12</td>
</tr>
</tbody>
</table>

Minor Advisors. Bryan Jenkins (Department of Biological and Agricultural Engineering), Karen McDonald (Department of Chemical Engineering and Materials Science), Case van Dam (Department of Mechanical and Aerospace Engineering)

Energy Policy Minor

All courses must be taken for a letter grade. Grade of C- or better required for all courses used to satisfy minor requirements with overall GPA in minor requirement courses of 2.0 or better.

Minor Requirements:

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<tr>
<th>Units</th>
<th>Courses</th>
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<tbody>
<tr>
<td>18</td>
<td>Applied Science 188 and Environmental Science and Policy 167 .................................... 8</td>
</tr>
<tr>
<td></td>
<td>Select 10 units from: Civil Engineering 125; Environmental Science and Policy 171, 163, 168A, 168B; Political Science 105, 109, 122, 164 143, 162, 164 ... 10</td>
</tr>
</tbody>
</table>

Minor Advisors. Deb Nienmeier (Department of Civil and Environmental Engineering), Joan Ogden (Environmental Science and Policy)

Energy Efficiency Minor

All courses must be taken for a letter grade. Grade of C- or better required for all courses used to satisfy minor requirements with overall GPA in minor requirement courses of 2.0 or better.

Minor Requirements:

<table>
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<tr>
<th>Units</th>
<th>Courses</th>
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<tbody>
<tr>
<td>20</td>
<td>Engineering 188 and Civil Engineering 1725 .................................... 8</td>
</tr>
<tr>
<td></td>
<td>Select 12 units from: Civil Engineering 126, 127, 128, 143; Environmental Science and Policy 167; Design 136A, 136B, 137A ... 12</td>
</tr>
</tbody>
</table>

Minor Advisors. Frank Loge (Civil and Environmental Engineering), Dan Spierling (Institute of Transportation Studies), Mark Modera (Western Cooling Efficiency Center)

The Graduate Program in Biological Systems Engineering

Integral to the Graduate Program in Biological Systems Engineering is the focus on finding economical and environmentally sustainable solutions to many of the most important global issues of our time: the safety, security, and abundance of our food, detection of pathogens, development of bio-energy alternatives, control of insect-borne disease and damage, as well as the preservation of our land, air and water resources. We enjoy the strategic advantage of being located in California, the national leader in agricultural production and crop diversity, and a major center for biotechnology. With the unique status of belonging to both the College of Engineering and the College of Agricultural and Environmental Sciences, collaboration is the rule. We interact with colleagues in both engineering and the life sciences to create multidisciplinary approaches to teaching and research. Students benefit from this dynamic environment that combines the strengths of nationally ranked engineering, agricultural and environmental programs.

Financial support is available in the form of research assistantships, teaching assistantships, fellowships and financial aid.

Research Highlights:

- Bioenvironmental engineering
- Renewable energy
- Industrial biotechnology
- Food safety
- Biosensors
- Bioprocess engineering
- Bioinstrumentation
- Ergonomics, health and safety
- Aquacultural engineering
- Ecological systems engineering
- Food engineering
- Forest and fiber engineering
- Postharvest engineering
- Soil and water engineering
- Machine systems and precision agriculture

Research Facilities and Partnerships:

- Agricultural Ergonomics Research Center
- GIS Visualization Lab
- Energy Institute
- Bodega Marine Lab
- Western Center for Agricultural Equipment
- California Biomass Collaborative

Complete information is available on the departmental website.

Courses in Engineering: Biological Systems (EBS)

Lower Division

1. Foundations of Biological Systems Engineering (4)

Lecture—2 hours; laboratory—3 hours; project—3 hours. Restricted to students in Biological Systems Engineering. Introduction to engineering and the engineering design process. The program is offered for students who have completed the required prerequisite courses.

2. Introduction to Biological Systems Engineering (4)

Lecture—2 hours; laboratory—3 hours; project—3 hours. Required courses for students in the Biological Systems Engineering program. A grade of C- or better is required in this class.

Master Undergraduate Adviser. M. Delwiche

Quarter Offered: Fall, Winter, Spring, Summer

Pre-Fall 2011 General Education (GE): AH—Art and Humanities; SS—Social Sciences; WE—World Cultures

Fall 2011 and on Revised General Education (GE): AH—Art and Humanities; SS—Social Sciences; WE—World Cultures
75. Properties of Materials in Biological Systems (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Biological Sciences 1A; grade of C- or better in Physics 9B, Physics 9C, or PHYS 90C (may be taken concurrently). Properties of typical biological materials; composition and structure with emphasis on the effects of physical and biochemical properties on design of engineered systems of biological materials with typical engineering materials. GE credit: ScienEng | QL, SE, SL, VL, WE.—II. (I.) Jenkins, Piedra-
hile.

224 Engineering: Biological and Agricultural

90C. Research Group Conference in Biological Systems Engineering (1)
Discussion—1 hour. Prerequisite: lower division standing in Biological Systems Engineering or Food Engineering; consent of instructor. Research group conference. May be repeated for credit. (P/NP grading only.) GE credit: SE.—I. (I.) Rosa

92. Internship in Biological Systems Engineering (1-5)
Internship. Prerequisite: lower division standing; project approval prior to period of internship. Supervised work experience in biological systems engineering. May be repeated for credit. (P/NP grading only.) GE credit: SE.

98. Directed Group Study (1-5)
Preparation of well-defined project. Group study of selected topics; restricted to lower division students. (P/NP grading only.) GE credit: SE.

99. Special Study for Lower Division Students (1-5)
(P/NP grading only.) GE credit: SE.

Upper Division

103. Fluid Mechanics Fundamentals (4)
Lecture—4 hours. Prerequisite: Physics 9B. Fluid mechanics axioms, fluid statics, kinematics, velocity fields for one-dimensional incompressible flow and boundary layers, turbulent flow time averaging, potential flow, dimensional analysis, and macroscopic and microscopic laws. Use of range of practical problems. (Same course as Hydrologic Science 103N.) GE credit: ScienEng | QL, SE, SL, VL.—II. (II.) Wallender

114. Principles of Field Machinery Design (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Engineering 102, 104. Traction and stability of vehicles with wheels or tracks. Operating principles of field machines and basic mechanisms used in their design. GE credit: ScienEng | QL, SE, SL, VL.—III. Rosa

115. Forest Engineering (3)
Lecture—3 hours. Prerequisite: Engineering 104, Biological Sciences 1C. Applications of engineering principles to problems in forestry including those in forest regeneration, harvesting, residue utilization, and transportation. GE credit: ScienEng | QL, SE, SL, VL.—III. Harstoung

120. Power Systems Design (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 17, 102, 103, 105. Design and performance of power devices and systems including combustion engines, electric generators and motors, fluid power systems, fuels, and emerging Technologies. Selection of units for power matching and optimum performance. GE credit: ScienEng | QL, SE, SL, VL, WE.—I. (I.) Rosa

125. Fluid Flow in Biological Systems (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 103; Engineering 105; Biological Sciences 2A, 2B and 2C. Fundamentals of heat transfer with application to biological systems. Theory and transient heat transfer analysis and simulation of heat conduction, convection and radiation. Heat transfer operations. GE credit: ScienEng | QL, SE, SL, VL, WE.—III. (III.) Fan, Nitiin

127. Mass Transfer and Kinetics in Biological Systems (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 125. Fundamentals of mass transfer and kinetics in biological systems. Molecular diffusion and convection. Thermodynamics and biochemical reactions. Applications to biological systems. GE credit: ScienEng | QL, SE, SL, VL, WE.—I. (I.) VanderGheynst, Zicari

128. Biomechanics and Ergonomics (4)
Lecture—3 hours; laboratory—4 hours. Prerequisites: Statistics 100B, Engineering 102; Anatomical, physiological, and biomechanical bases of physical ergonomics. Human motor capabilities, body mechanics, kinesiology, and anthropometry. Applications and use of biomechanics. GE credit: ScienEng | QL, SE, SL, VL, WE.—II. (II.) Jeoh, Slaughter

130. Modeling of Dynamic Processes in Biological Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 75; Engineering 6 or Computer Science & Engineering 30; grade of C- or better in Mathematics 228 required for enrollment eligibility. Techniques for modeling processes through mass and energy balance, rate equations, and state equations. Computer problem solution of models. Example models include package design, evaporation, respiration, root water uptake, and plant growth. GE credit: ScienEng | QL, SE, SL, VL, WE.—I. (I.) K. McCarthy, Upadhyaya

135. Bioenvironmental Engineering (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 125, 130B. Biological responses to environmental conditions. Principles and engineering design of environmental control systems. Overview of environmental pollution problems and legal restrictions for biological systems; introduction of environmental quality assessment techniques, environmental monitoring and control. GE credit: ScienEng | QL, SE, SL, VL, WE.—I. (I.) Jenkins, Zhang

144. Groundwater Hydrology (4)

145. Irrigation and Drainage Systems (4)
Lecture—4 hours. Prerequisite: course 103 or Hydrologic Science 103N. Engineering and scientific principles applied to design and operation of sprinkler and micro irrigation systems and drainage systems within economic, biological, and environmental constraints. Interaction between irrigation and drainage. GE credit: ScienEng | QL, SE, SL, VL, WE.—II. (II.) Grismer, Wallender

147. Runoff, Erosion and Water Quality Management in the Tahoe Basin (3)
Lecture/labatory—30 hours; fieldwork—15 hours; discussion—10 hours. Prerequisite: Physics 78 or 98, Mathematics 16C or 21C, Civil and Environmental Engineering 142 or Hydrologic Science 141 or Environmental and Resource Sciences 100. Four days in the Tahoe City. Practical hydrology and runoff water quality management from Tahoe Basin slopes. Development of hillside design and selection models and selecting designs and applications from physical science perspectives including precipitation-runoff relationships, sediment transport, and detention ponds. (Same course as Hydrologic Science 147C.) GE credit: ScienEng | QL, SE, SL—Grismer

151. Kinetics and Bioreactor Design (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 127. Provides the basic principles of reactor design for biosprocesses and applications. Special emphasizes the following topics: 1) kinetics and reactor engineering principles; 2) bio-reaction kinetics and 3) bioreactor design. GE credit: ScienEng | QL, SE, SL, VL, WE.—II. (II.) Fan, Zicari

165. Bioinstrumentation and Control (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 100. Instrumentation and control for biological production systems. Measurement system concepts, instrumentation and data acquisition and control. GE credit: ScienEng | QL, SE, SL, VL, WE.—II. (II.) Fan, Delves, Slaughter

170A. Engineering Design and Professional Responsibilities (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 1, Engineering 102, 104. Engineering design including professional responsibilities. Emphasis on project selection, steering processes, specifications, human factors, biological materials, safety systems, and professionalism. Detailed design project will be assigned for courses 170B and 170BL. GE credit: ScienEng | QL, SE, SL, VL, WE.—I. (I.) Giles, Zhang

170B. Engineering Projects: Design (2)
Discussion—2 hours. Prerequisite: course 170A; course 170B required concurrently. Individual or group projects involving the design of devices, structures, or systems to solve specific engineering problems in biological systems. GE credit: ScienEng | QL, SE, SL, VL, WE.—II. (II.) Giles, Zhang

170BL. Engineering Projects: Design Laboratory (1)
Laboratory—3 hours. Prerequisite: course 170B required concurrently. Individual or group projects involving the design of devices, structures, or systems to solve specific engineering problems in biological systems. GE credit: ScienEng | QL, SE, SL, VL, WE.—II. (II.) Giles, Zhang

170C. Engineering Projects: Design Evaluation (1)
Discussion—1 hour. Prerequisite: course 170B; required to enroll in course 170C concurrently. Individual or group projects involving the fabrication, assembly and testing of components, devices, structures, or systems designed to solve specific engineering problems in biological systems. Project for study previously selected by student and instructor. GE credit: ScienEng | QL, SE, SL, VL, WE.—II. (II.)

175. Rhythm of Biological Materials (3)
Lecture—3 hours. Prerequisite: course 103 or Engineering 103N. Fluid and solid rheology, viscoelastic behavior of foods and other biological materials, and application of rheological properties to food and biological systems (i.e., pipeline design, extrusion, mixing, coating). GE credit: ScienEng | QL, SE, SL, VL, WE.—II. (II.) McCarthy

189A. Special Topics in Biological Systems Engineering (1-5)
190C. Research Group Conference in Biological Systems Engineering (I)
Discussion—2 hours. Prerequisite: upper division standing in Biological Systems Engineering or Food Engineering; consent of instructor. Research group conference. May be repeated for credit. (P/NP grading only.) GE credit: SE.—I, II, III. (I, II, III.)

192. Internship in Biological Systems Engineering (1-5)
Internship. Prerequisite: upper division standing; approval of project prior to period of internship. Supervised work experience in biological systems engineering; credit for (P/NP grading only.) GE credit: SE.

197T. Tutoring in Biological Systems Engineering (1-5)
Tutitorial—3-15 hours. Prerequisite: upper division standing. Tutoring individual students, leading small voluntary discussion groups, or assisting the instructing in laboratories affiliated with one of the department’s regular courses. May be repeated for credit if topic differs. (P/NP grading only.) GE credit: SE.

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only) GE credit: SE.

Graduate

200. Research Methods in Biological Systems Engineering (2)
Lecture—2 hours. Prerequisite: graduate standing. Planning, execution and reporting of research projects. Literature review techniques and proposal preparation. Reading and reporting papers. Uncertainty analysis in experiments and computations. Graphic analysis. Oral and written presentation of research results, manuscript preparation, submission and review.—I. Zhang, Giles

205. Continuum Mechanics of Natural Systems (4)
Lecture/discussion—4 hours. Prerequisite: Mathematics 21D and 228, Physics 9B. Continuum mechanics of static and dynamic air, water, earth and biological systems using hydraulic, heat and electrical conductivity; diffusivity; dispersion; strain; stress; deformation gradient; velocity gradient; stretch and spin tensors. (Same course as Hydrologic Science 205.)—III. Wallender

215. Soil-Machine Relations in Tillage and Traction (3)
Lecture—3 hours. Prerequisite: course 114. Mechanics of interactions between agricultural soils and tillage and traction devices; determination of relevant physical properties of soil; analyses of stress and strains in soil due to machine-applied loads; experimental methods for synthesizing characteristics of overall systems. Offered in alternate years.—(II.) Zhang, Giles

216. Energy Systems (4)
Lecture/discussion—4 hours. Prerequisite: course 105. Theory and application of energy systems. System analysis including input/output analysis, energy balances, thermodynamic availability, economics, environmental considerations. Energy conversion systems and devices including cogeneration, heat pump, fuel cell, hydroelectric, wind, photovoltaic, and biomass conversion processes. Offered in alternate years.—(II.) Upadhyaya

218. Solar Thermal Engineering (4)

220. Pilot Plant Operations in Aquacultural Engineering (3)
Lecture—1 hour, laboratory—6 hours. Prerequisite: Civil Engineering 243A, 243B or Applied Biological Systems Technology 161, 163. Topics in water treatment as they apply to aquaculture operations. Laboratory study of unit operations in aquaculture. Offered in alternate years.—(I.) Padghare

228. Occupational Musculoskeletal Disorders (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: graduate standing and consent of instructor. Epidemiology and etiology of occupational musculoskeletal disorders (MSDs) with focus on low back and upper extremities disorders; anatomical and biomechanical functions of lower back and upper extremities, MSDs risk factors assessment and control; research opportunities related to MSDs.—III. Fathallah

231. Mass Transfer in Food and Biological Systems (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing. Application of mass transfer principles to food and biological systems. Study of mass transfer affecting food quality and shelf life. Analysis of mass transfer in polymer films used for coating and packaging foods and controlling release of biologically active compounds. Offered in alternate years.—(II.) Krochta, J.

233. Analysis of Processing Operations: Drying and Evaporation (3)
Lecture—3 hours. Prerequisite: course in food or process engineering, familiarity with FORTRAN. Diffusion theory in drying of solids. Analysis of fixed-bed and continuous countercurrent evaporator models. Computer applications in food and fermentation systems. Offered in alternate years.—(II.)

235. Advanced Analysis of Unit Operations in Food and Biological Engineering (3)
Lecture—3 hours. Prerequisite: course 132. Analysis and design of food processing operations. Steady-state and dynamic heat and mass transfer models for operations involving phase change such as freezing and drying. Separation processes including membrane applications in food and fermentation systems.—(III.) Singh

237. Thermal Process Design (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: course in heat transfer. Heat transfer and biological basis for design of heat sterilization of foods and other biological systems; design of sterilizers in or bulk. Offered in alternate years.—III.

239. Magnetic Resonance Imaging in Biological Systems (3)
Lecture—3 hours. Prerequisite: graduate standing. Theory and applications of magnetic resonance imaging to biological systems. Classical Bloch model of magnetic resonance. Applications to be studied are drying of fruits, flow of food suspensions, diffusion of moisture, and structure of foods. Offered in alternate years.—I. M. McCarthy

240. Infiltration and Drainage (3)
Lecture—3 hours. Prerequisite: Soil Science 107, Engineering 103. Aspects of multiphase flow in soils and their effect on and immiscible displacement problems. Gas phase transport and entrainment during infiltration, and oil-water-gas displacement will be considered. Offered in alternate years.—II. G. Wallender

241. Sprinkle and Trickle Irrigation Systems (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 145/Hydrologic Science 115. Computerized design of irrigation systems. Consideration of emitter mechanics, distribution functions and water yield functions. Offered in alternate years.—III.

242. Hydraulics of Surface Irrigation (3)
Lecture—3 hours. Prerequisite: course 145, Hydrologic Science 115. Mathematical models of surface irrigation systems for predicting the distribution of water flowing onto a field. Quantity of runoff and distribution of infiltrated water over field length as a function of slope, roughness, infiltration and inflow rates. Offered in alternate years.—(III.) Wallender

243. Water Resource Planning and Management (3)
Lecture—3 hours. Prerequisite: Hydrologic Science 141 or the equivalent. Applications of deterministic and stochastic mathematical programming techniques to water resource planning, analysis, design, and management. Water allocation, capture, expansion, and reservoir operation. Concentric use of surface water and groundwater. Water quality management. Irrigation planning and operation models. (Same course as Agricultural Science 243.) Offered in alternate years.—(I.)

245. Waste Management for Biological Production Systems (3)
Lecture—3 hours. Prerequisite: graduate standing or consent of instructor. Characterization of solid and liquid wastes from agricultural and food production systems. Study of methods and system design for handling, treatment, and disposal/utilization of these materials.—II. Delwiche

260. Analog Instrumentation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 100. Instrument characteristics: generalized instrument models, calibration, and frequency response. Signal conditioning: operational amplifier circuits, filtering, and noise. Transducers: motion, force, pressure, flow, temperature, and photodetector. Offered in alternate years.—II. Delwiche

262. Computer Interfacing and Control (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 100, course 163, Procedural and object-oriented programming in C++, analog and digital signal conversion, data acquisition and computer control. Offered in alternate years.—(III.) Delwiche

265. Design and Analysis of Engineering Experiments (5)
Lecture—3 hours; lecture/discussion—2 hours. Prerequisite: Statistics 100, Agricultural Systems and Environment 120, or an introductory course in statistics. Simple linear, multiple, and polynomial regression, correlation, residuals, model selection, one-way ANOVA, fixed and random effect models, sample size, multiple comparison and block repeated measures, and Latin square designs, factorial experiments, nested design and subampling, split-plot design, statistical software packages.—(III.) Upadhyaya, Plant

267. Renewable Bioprocessing (3)
Lecture—3 hours. Prerequisite: course 160, Biological Sciences 101 or Microbiology 102. Applications of biotechnology and bioprocess engineering toward the use of agricultural and renewable feedstocks for the production of biochemicals. Design and modeling of microbial- and plant-based production systems including associated fermentation, extraction, and purification operations. Offered in alternate years.—I. VanderGheynst

268. Polysaccharides Surface Interactions (3)
Lecture—3 hours. Prerequisite: graduate students in science or engineering. Study of fundamental surface science theories as applied to physical and chemical interactions of carbohydrates and polysaccharides. Offered in alternate years.—I. Zidan

270. Modelling and Analysis of Biological and Physical Systems (3)
Lecture—3 hours. Prerequisite: familiarity with a programming language. Mathematical modeling of biological systems: model development; analytical and numerical solutions. Case studies from various specializations within biological and agricultural engineering. Offered in alternate years.—III. Upadhyaya
Engineering: Biomedical

[College of Engineering]

Chairperson of the Department

Department Office, 2303 Genome and Biomedical Sciences Facility 530-752-1033; http://www.bme.ucdavis.edu

[Faculty]

Kryiacos Anthanasiou, Ph.D., Distinguished Professor (Biomedical Engineering; Medicine: Orthopaedic Surgery)
Sharon Aviran, Ph.D., Assistant Professor (Biomedical Engineering; and Medicine: Radiology)
Craig Benham, Ph.D., Professor (Biomedical Engineering; Mathematics; and Genome Center: Bioinformatics)
John Boone, Ph.D., Professor (Biomedical Engineering; and Medicine: Radiology)
Ye Chen-Izu, Ph.D., Associate Professor (Biomedical Engineering; Medicine: Pharmacology; and Internal Medicine)
Simon Cherry, Ph.D., Distinguished Professor (Biomedical Engineering; and Medicine: Radiology)
FitzRoy Curry, Ph.D., Professor (Biomedical Engineering; and Medicine: Physiology and Membrane Biology)
Yang Duan, Ph.D., Professor (Biomedical Engineering; and Medicine: Orthopaedic Surgery)
Mark Facciotti, Ph.D., Assistant Professor (Biomedical Engineering; and Genome Center)
Katherine Ferrara, Ph.D., Distinguished Professor (Biomedical Engineering; and Medicine: Orthopaedic Surgery)
David Fyhrie, Ph.D., Professor (Biomedical Engineering; and Medicine: Orthopaedic Surgery)
Volkan Heinrich, Ph.D., Associate Professor (Biomedical Engineering; and Medicine: Orthopaedic Surgery)
Tanya Kuhl, Ph.D., Professor (Biomedical Engineering; and Medicine: Orthopaedic Surgery)
J. Kent Leach, Ph.D., Associate Professor (Biomedical Engineering; and Medicine: Orthopaedic Surgery)
Laura Marcu, Ph.D., Professor (Biomedical Engineering; and Medicine: Neurological Surgery)
Tingrui Pan, Ph.D., Associate Professor (Biomedical Engineering; and Medicine: Orthopaedic Surgery)
Atul Parikh, Ph.D., Professor (Biomedical Engineering; and Medicine: Orthopaedic Surgery)
Jinyi Qi, Ph.D., Professor (Biomedical Engineering; and Medicine: Orthopaedic Surgery)
Vivek Raman, Ph.D., Assistant Professor (Biomedical Engineering; and Medicine: Radiation Oncology)
Cheemeng Tan, Ph.D., Assistant Professor (Biomedical Engineering; and Medicine: Orthopaedic Surgery)
Sasichiro Yamada, Ph.D., Associate Professor (Biomedical Engineering; and Medicine: Radiation Oncology)
Yahiya Yakoboyashi, Ph.D., Associate Professor (Biomedical Engineering; and Medicine: Radiation Oncology)

Emeriti Faculty

Maury Hull, Ph.D., Emeritus Professor (Biomedical Engineering; and Engineering and Aerospace Engineering)

The Biomedical Engineering Undergraduate Major

The Biomedical Engineering program is accredited by the Engineering Accreditation Commission of ABET; see http://www.abet.org.

Biomedical engineering is an interdisciplinary area of study that integrates knowledge from engineering with the biomedical sciences. It is a very diverse field, with biomedical engineers working in systems ranging from medical imaging to the design of artificial organs. Some major research advances in biomedical engineering include the left ventricular assist device (LVAD), artificial joints, kidney dialysis, bioengineered skin, angioplasty, computed tomography (CT), and flexible endoscopes. Students who choose biomedical engineering are interested in being of service to human health but do not routinely interact directly with patients.

The mission of the B.S. degree program of the Department of Biomedical Engineering is to combine exceptional teaching with state-of-the-art research for the advancement of technologies and computational techniques that meet medical and societal challenges. As a biomedical engineer, you can choose employment opportunities in industry, hospitals, academic research institutes, teaching, national laboratories, or government regulatory agencies.

The educational objectives of our program are to equip our graduates with skills necessary for success in careers related to biomedical engineering or another area of the student’s choosing, through employment in industry or government, or through pursuit of graduate or professional degrees and contribute effectively to society through engineering practice, research and development, education, or in governmental, regulatory or legal aspects.

The biomedical engineering curriculum has been designed to provide a solid foundation in mathematics, life and physical sciences, and engineering, and to provide sufficient flexibility in the upper division requirements to encourage students to explore specializations within the field. Our instructional program is designed to impart knowledge of contemporary issues at the forefront of biomedical engineering research. Exclusive of General Education units, the minimum number of units required for the Biomedical Engineering degree is 152.

For information about graduate degree options, see Biomedical Engineering (A Graduate Group), on page 183.

Lower Division Required Courses

Students are encouraged to adhere carefully to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisites have not been completed.

UNITS

Mathematics 21A-21B-21C-21D

16

Mathematics 22A-22B

6

Physics 9A-9B-9C

15

Chemistry 2A-2B-2C

15

Chemistry 8A or 118A; Chemistry 8B or 118B

6

Engineering 6-17-17

6

University Writing Program 1Y, or 1V, or English 3, or Comparative Literature 1, 2, 3, or 4, or Native American Studies

4

Biological Sciences 2A

5

Biomedical Engineering 1

6

Upper Division Required Courses

Engineering 100 or Electrical and Computer Engineering 100

3

Biomedical Engineering 116 or Neurobiology Physiology Behavior 101

5

Biomedical Engineering 105, 108, 109, 110A, 110B, 110C, 110D

30

Science electives

7

To be chosen according to specialization.

Biomedical Engineering 102, 116, 116I, 116F, 116T

4

Any graded upper division Biomedical Engineering course (except Biomedical Engineering 116, 116I, 116F, 116T)

4

units of Biomedical Engineering 192 or 199 with the approval of the Biomedical Engineering Undergraduate Committee

Engineering electives

24

Any graded upper division Biomedical Engineering course (except Biomedical Engineering 102, 116, 116I, 116F, 116T)

units of Biomedical Engineering 192 or 199 with the approval of the Biomedical Engineering Undergraduate Committee

No more than four units allowed from lower division coursework.


Upper Division Composition Requirement

0.4

One course from the following (a grade of C or better is required): University Writing Program 101, 102B, 102E, 104A, 104E, 104F, 104I, 104T, or passing the Upper Division Composition Exam offered by the College of Letters & Science.

Quarter Offered: F-Fall; W-Winter, S-Spring, Y-Summer, 2011-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): AAH=Arts and Humanities; AC=Arts and Communication; ACGH=American Cultures; DD=Domestic Diversity; OR=Oral Skills; OL=Oral Literacy; OL@=Oral Literacy and Composition; P=Preparation; QQ=Quantitative; SL=Scientific Literacy; VL=Visual Literacy; WC=World Cultures; WR=Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences;

ACGH=American Cultures; DD=Domestic Diversity; OL=Oral Skills; OL@=Oral Literacy; SL=Scientific Literacy; VL=Visual Literacy; WC=World Cultures; WR=Writing Experience
Biomedical Engineering Minor

The minor in Biomedical Engineering allows students from any engineering discipline to build upon their existing core strengths and add expertise in biomedical applications. This deeper technical training makes students more attractive to employers in the medical device industry and would also position students for graduate training in health related applications of engineering. The minor requires two life sciences courses not typically required for engineering students, one at the cellular level (Biomedical Engineering 102) and the other at the physiological level (Neurobiology, Physiology, and Behavior 101 or Biomedical Engineering 116). The remaining 12 units are to be selected in consultation with an advisor from the list of upper division Biomedical Engineering courses. Students will be advised to select additional courses to complement their existing curricula. Examples of relevant coursework for different majors are provided as a reference. These listings classify the upper division Biomedical Engineering courses into categories and provide a suggested subset of coursework for the majors most likely to have students interested in health-related applications.

Biomedical Engineering Minor Requirements:

All courses must be taken for a letter grade. No grade lower than a C- for coursework completed in the minor.

Biomedical Engineering Electives:

- 2 units from Electrical and Computer Engineering 100 or 161L, 162, 163, 167, 173, 189A, 189C
- 2 units from Chemistry 118AB
- 2 units from Biomedical Engineering 117, 118, 126, 140, 141, 142, 143, 151, 152, 161A, 161L, 162, 163, 167, 173, 189A, 189C

Upper Division

20. Fundamentals of Bioengineering (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Chemistry 2B and Mathematics 21D; Physics 9B. Basic principles of control theory applied to biomedical engineering: Biomedical systems and momentum conservation equations applied to solve problems in the biological and medical sciences. Only two units of credit may be repeated for credit when topic differs. GE credit: SciEng | SE.

89A. Topics in Biomedical Engineering (1-5)
Prerequisite: consent of instructor. Restricted to lower division students. Topics in Biomedical Engineering. (A) Cellular and Molecular Engineering. May be repeated for credit when topic differs. GE credit: SciEng | SE.

89B. Topics in Biomedical Engineering (1-5)
Prerequisite: consent of instructor. Restricted to lower division students. Topics in Biomedical Engineering. (B) Biomedical Imaging. May be repeated for credit when topic differs. GE credit: SciEng | SE.

89C. Topics in Biomedical Engineering (1-5)
Prerequisite: consent of instructor. Restricted to lower division students. Topics in Biomedical Engineering. (C) Biomedical Engineering. May be repeated for credit when topic differs. GE credit: SciEng | SE.

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. Restricted to lower division students. Topics in Biomedical Engineering. (D) Special Study for Undergraduates. May be repeated for credit when topic differs. GE credit: SciEng | SE.

Upper Division

102. Quantitative Cell Biology (4)
Lecture/discussion—4 hours. Prerequisite: Biological Sciences 2A; Chemistry 118A or 118AB. Cell biology for bioengineers. Emphasis on physical concepts underlying cellular processes including protein trafficking, cell motility, cell division and cell adhesion. Current topics include cell biology, cancer, cancer and stem cells will be discussed. Only two units of credit for students who have completed Biological Sciences 104 or Molecular and Cellular Biology 143. GE credit: SciEng | QL, SE, VL—II. (II) Yamada

105. Probability and Statistics for Biomedical Engineers (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Mathematics 21D; Engineering 6 (may be concurrent). Concepts of probability, random variables and processes, and statistical analysis with applications to engineering problems in biomedical sciences. Includes discrete and continuous random variables, probability distributions and models, hypothesis testing, statistical inference and MATLAB applications. Emphasis on BME applications. GE credit: SciEng | QL, SE, VL—II. (II) Saiah

106. Biotransport Phenomena (4)
Lecture—4 hours. Prerequisite: C- or better in course 20; course 116 or Neurobiology, Physiology, and Behavior 101; Physics 9B, Mathematics 228. Open to Biomedical Engineering majors only. Topics of momentum and mass transfer with applications to biomedical systems; emphasis on basic fluid transport related to blood flow, mass transfer across cell membranes, and the design and analysis of artificial human organs. GE credit: SciEng | QL, SE, SI, VL—II. (II) Leach

107. Mathematical Methods for Biological Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 6; course 20; Mathematics 228. Restricted to Biomedical Engineering majors only. Mathematical and computational modeling to solve biomedical problems. Includes stochastic processes and Monte Carlo simulations, and partial differential equations. Introduced to numerical techniques in MATLAB. GE credit: SciEng | QL, SE, VL—IV. (IV) VanWart

108. Biomedical Signals and Control (4)
Lecture—4 hours. Prerequisite: Engineering 6, 17; grade of C- or better in Mathematics 228. Restricted to Biomedical Engineering majors only. Systems and control theory applied to biomedical engineering problems. Time-domain and frequency-domain analysis of signals and systems, convolution, Laplace and Fourier transforms, transfer function, dynamic systems, control system design, control theory, stability, and noise filtering. GE credit: SciEng | QL, SE, VL—IV. (IV) Mlinar

Quarter Offered:

Fall: Fall, Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): AHS—Arts and Humanities; SciEng—Science and Engineering; SECSci—Social Sciences; Div—Dominant Diversity; Wrt—Writing Experience

Fall 2011 and on Revised General Education (GE): AA—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences.

ACGH—American Cultures; DD—Dominant Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
117. Analysis of Molecular and Cellular Networks (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: grade of C- or better in Biological Sciences 2A and Mathematics 22A. Restricted to upper division students. Introduction to standard mathematical notation. Mathematical and computational methods for analysis of such networks. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | QL, SE, SL, VL, WE.—III. (III.) Silva

118. Microelectromechanical Systems (4)
Lecture—2 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: Exercise Science 103 and/or Engineering 45 and/or consent of instructor. Structural and mechanical properties of biomedical tissues, including bone, cartilage, ligaments, tendons, nerves, and skeletal muscle. (Same course as Exercise Science 147.) GE credit: SciEng | QL, SE.—II. (II.) Savageau

119. Protein Engineering (4)

120. Principles and Practices of Biomedical Imaging (4)
Lecture—4 hour. Prerequisite: Physics 9B; Engineering 6; Engineering 35. Structural and mechanical properties of tissue, cells, and organs. Imaging techniques for biological tissue, as well as for biomedical imaging. GE credit: SciEng | QL, SE.—III. (III.) Facciotti

121. Cell and Tissue Mechanics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Physics 9B; Mathematics 21C or Mathematics 21OC. Basic concepts and techniques of biomechanical analysis. Geometric properties of discrete and continuous systems. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | QL, SE, VL.—II. (II.) Parikh, Simon

122. Bioelectricity, Biomechanics, and Signaling Systems (4)
Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: C- or better in Mathematics 22B; course 116; or Neuroscience, Biology, and Behavior 123. Fundamentals of bioelectricity in single cells, the extracellular matrix, and individual molecules, as well as of their assemblies, in particular membranes. GE credit: SciEng | QL, SL, VL.—II. (II.) Heinrich

123. Bioelectricity, Biomechanics, and Signaling Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Basic concepts and techniques in biomechanical analysis. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | QL, SL, VL.—II. (II.) Chen-Lzu

124. Biomedical Fluid Mechanics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemical Engineering 45 and/or consent of instructor. Basic concepts and techniques in biomechanical analysis. GE credit: SciEng | QL, SE

125. Molecular Control of Biosystems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 2A, Physics 9B and Mathematics 22B. Building block models of molecular interaction networks: how such networks can be analyzed to understand gene regulation and signal transduction networks at different levels of organization in health and disease. Topics include classic genetic systems, signal transduction, biological feedback systems, and drug discovery. GE credit: SciEng | QL, SE.—III. (III.) Saiz

161A. Biomedical Engineering (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 2A; Chemistry 8B. Restricted to upper division standing. Introduction to basic concepts and techniques of biomolecular engineering such as recombinant DNA technology, protein engineering, and molecular diagnostics. Three units of credit taken only as course 161S. Offered in alternate years. GE credit: SciEng | QL, SE.—I. Yokobayashi

161B. Biomedical Engineering: Brief Course (1)
Lecture—1 hour. Prerequisite: Biological Sciences 2A; Chemistry 8B; course 161L (may be taken concurrently). Basic concepts and techniques in biomolecular analysis. GE credit: SciEng | QL, SE.— IV. Yokobayashi

162. Introduction to the Biophysics of Molecules and Cells (4)
Lecture—4 hours. Prerequisite: C- or better in Mathematics 22B and Physics 9C. Introduction to fundamental physical mechanisms governing structure and function of bio-macromolecules. Emphasis on a quantitative understanding of the nano- to microscale biophysical interactions of individual molecules, as well as of their assemblies, in particular membranes. GE credit: SciEng | QL, SE, SL.—II. (II.) Heinrich

163. Bioelectricity, Biomechanics, and Signaling Systems (4)
Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: C- or better in Mathematics 22B; course 116 or Neurobiology, Physiology, and Behavior 123. Fundamentals of bioelectricity in single cells, the extracellular matrix, and individual molecules, as well as of their assemblies, in particular membranes. GE credit: SciEng | QL, SE, SL.—II. (II.) Heinrich

164. Biomedical Fluid Mechanics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Basic concepts and techniques in biomechanical analysis. GE credit: SciEng | QL, SE
bioreactor design, tissue design criteria and outcomes assessment. GE credit: SciEng | OL, SE, SL, WE.—II. (II.) Yamada
189A. Topics in Biomedical Engineering (1-5)
Prerequisite: consent of instructor. Topics in Biomedical Engineering. (A) Cellular and Molecular Engineering; (B) Biomedical Imaging; (C) Biomedical Engineering. May be repeated if topic differs. Offered irregularly. GE credit: SciEng | SE.
190A. Upper Division Seminar in Biomedical Engineering (1)
Seminar—1 hour. Prerequisite: upper division standing. In-depth examination of research topics in a small group setting. Question and answer session with faculty members. May be repeated for credit. (P/Th/NP grading only.) GE credit: SE.
192. Internship in Biomedical Engineering (1-12)
Internship—3.66 hours. Prerequisite: consent of instructor. Restricted to upper division majors. Supervised work experience in the field of biomedical engineering. May be repeated for credit. (P/Th/NP grading only.) GE credit: SE.—I, II, III, IV. (II, III, IV.)
198. Directed Group Study (1-5)
Prerequisite: consent of instructor. May be repeated up to a total of 18 units. (P/Th/NP grading only.) GE credit: SE.—I, II, III, IV. (II, III, IV.)
199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. Special study for advanced undergraduates. (P/Th/NP grading only.) GE credit: SE.

The Graduate Program in Biomedical Engineering
Doctoral and master’s degrees in Biomedical Engineering are offered through the interdisciplinary Graduate Group in Biomedical Engineering. Please see http://www.bme.ucsd.edu and Biomedical Engineering (AGC) and Biomedical Engineering (AGB) on page 193 of the catalog for a description of graduate education offerings, requirements, group faculty and research faci.

Graduate
202. Cell and Molecular Biology for Engineers (4)
Lecture/discussion—4 hours. Prerequisite: Biological Sciences 104 or Molecular and Cellular Biology 121. Preparation for research and critical review in the field of cell and molecular biology for biomedical engineering. Emphasis on understanding and engineering concepts intrinsic to specific topics including receptor ligand dynamics in cell signaling and function, cell motility, DNA replication, and RNA processing, cellular energetics and protein sorting. Modern topics in bioinformatics and proteomics.—II. (II.) Yamada
204. Physiology for Bioengineers (5)
Lecture—4 hours. Prerequisite: Biological Sciences 1A or equivalent; graduate standing or consent of instructor. Basic human physiology of the nervous, muscular, cardiovascular, respiratory, and renal systems and their interactions; emphasis on the physical and computational principles governing these systems, including control and transport processes, fluid dynamics, and electrochemistry.—I. (I.) Benham
209. Scientific Integrity for Biomedical Engineers (2)
Lecture—1 hour; discussion—1 hour. Scientific integrity and ethics for biomedical engineers, with emphasis on discussion on mentoring, authorship and peer review, use of humans and animals in biomedical research, conflict of interest, intellectual property, genetic technology and scientific record keeping. Biomedical Engineering majors only. (S/U grading only.)—III. (III.) Simon
210. Introduction to Biomaterials (4)
Lecture—4 hours. Prerequisite: Engineering 45 or consent of instructor. Mechanical and atomic properties of metallic, ceramic, and polymeric implant materials of metallic, ceramic, and polymeric implant materials; corrosion, degradation, and failure of implants; inflammation, wound and fracture healing, blood coagulation; properties of bones, joints, and blood vessels; biocompatibility of orthopaedic and cardiovascular materials.
211. Design of Polymeric Biomaterials and Biomedical Engineering (4)
Lecture—4 hours. Prerequisite: Engineering 45 or consent of instructor; upper division undergraduates or graduate students. Design, selection and application of polymeric biomaterials. Integration of the principles of polymer science, surface science, materials science and biology.—II. (II.) Revzin
212. Biomedical Heat and Mass Transport Processes (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mechanical Engineering 165, Biological Systems Engineering 125, Chemical Engineering 153 or the equivalent. Application of principles of heat and mass transfer to biomedical problems with emphasis on heat exchange between the biomedical system and its environment, mass transfer across cell membranes and the design and analysis of artificial human organs. (Same course as Mechanical and Aeronautical Engineering 212.) Offered in alternate years.—III. (III.) Aldridge
213. Principles and Applications of Biological Sensors (4)
Lecture—4 hours. Prerequisite: Chemistry 2C. Biological sensors based on principles of electrochemical, optical and affinity detection. Methods for integration of sensing elements (e.g. enzymes) into biosensors and miniaturization of biosensors.—I. (I.) Revzin
214. Blood Cell Biomechanics (4)
Lecture—4 hours. Prerequisite: Engineering 102. Mechanical properties that govern blood flow in the microcirculation and vascular wall, and as well as in blood vessels. (Same course as Mechanical and Aeronautical Engineering 215.)—II. (II.) Barakat
215. Biomedical Fluid Mechanics and Transport Phenomena (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103 or Chemical Engineering 150B or Civil and Environmental Engineering 141. Application of fluid mechanics and transport to biomedical systems. Flow in normal physiological function and pathological conditions, including hemodynamics and pharmacokinetics, flow effects on cell transport processes in the arterial wall and in tumors, and tissue engineering. (Same course as Mechanical and Aeronautical Engineering 215.)—III. (III.) Barakat
216. Advanced Topics in Cellular Engineering (4)
Lecture—4 hours. Prerequisite: course 214 or consent of instructor. Research strategies and technologies used in the study of immune function and inflammation. Static and dynamic measure-ments of stress, strain, and molecular scale forces in blood and vascular tissue, as well as genetic approaches to the study of disease.—I. (I.) Simon
217. Mechanobiology in Health and Disease (4)
Lecture/discussion—4 hours. Prerequisite: course 100B or equivalent (Engineering 103); Biological Sciences 101 or equivalent; Neurology, Physiology, and Behavior 101 or equivalent. Principles by which biomechanical forces affect cell and tissue function to impact the development of disease. Emphasis on cardiovascular system: structure and function, biofluid mechanics and mechanotransduction, disease mechanisms and research methods. Cartilage, bone and other systems; current topics discussed.—III. (III.) Passeri
218. Microsystems (4)
Lecture/discussion—4 hours. Introduction to the theory of physical and chemical principles at the microscale. Scale effects, surface tension, microfluidic mechanics, micromechanical properties, inter-molecular interactions and micro tribology. (Same course as Electrical and Computer Engineering 244B.)—I. (I.) Islam, Kiehl, Pan
222. Cytoskeletal Mechanics (4)
Lecture/discussion—4 hours. Prerequisite: course 202. Current topics in cytoskeletal mechanics including the physical properties of actin filaments and motor proteins, molecular force sensor and generator, cyto-skeletal regulation of cell motility and adhesion. Offered in alternate years.—I. (I.) Yamada
223. Multibody Dynamics (4)
Lecture—4 hours. Prerequisite: Engineering 102. Coupled rigid body kinematics/dynamics; reference frames, vector differentiation; configuration and motion constraints; holonomicity; generalized speeds; partial velocities; mass, inertia tensor/theorems; angular momentum; generalized forces; comparing Newton/Euler, Lagrange’s, Kane’s methods; computer-aided equation derivation; orientation; Euler and spherical parameters. (Same course as Mechanical and Aeronautical Engineering 225.)—II. (II.) Eke, Hubbard
225. Spatial Kinematics and Robotics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C Language and course 222. Spatial kinematics, screw theory, spatial mechanisms analysis and synthesis, robot kinematics and dynamics, robot workspace, path planning, robot programming, realtime architecture and software interface. (Same course as Mechanical and Aeronautical Engineering 225.) Offered in alternate years.—II. Cheng
227. Research Techniques in Biomechanics (4)
Lecture—2 hours; laboratory—4 hours; term paper/discussion—1 hour. Prerequisite: consent of instructor, Mathematics 228; Exercise Science 115 recommended. Experimental techniques for biomechanical analysis of human movement are examined. Techniques evaluated include data acquisition and analysis by computer, force platform analysis, strength assessment, planar and three-dimensional videography, data reduction and smoothing, body segment parameter determination, electromyography, and biomechanical modeling. (Same course as Mechanical and Aeronautical Engineering 227/Exercise Science 227.)—II. (II.) Williams, Hawkins
228. Skeletal Muscle Mechanics: Form, Function, Adaptability (4)
Lecture—4 hours. Prerequisite: basic background in biology, physiology, and engineering; Engineering 35 and 45, Mathematical Optimization; Physiological, Physiology, and Behavior 101 recommended. Basic structure and function of skeletal muscle examined at the microscopic and macroscopic level. Muscle adaptation in response to aging, disease, injury, exercise, and disuse. Analytic models of muscle function are discussed. (Same course as Exercise Science 228.)—I. (I.) Hawkins
231. Musculo-Skeletal System Biomaterials, Mechanics, and Engineering (4)
Lecture—4 hours. Prerequisite: Engineering 102. Mechanics of skeletal muscle and mechanical models of muscle, solution of the inverse dynamics problem; theoretical and experimental methods of biomechanics, kinetic and kinematic analysis, computation of intersegmental load and muscle forces, applications to gait analysis and sports biomechanics. (Same course as Mechanical and Aeronautical Engineering 231.)—III. (III.) Hull
232. Skeletal Tissue Mechanics (3)
Lecture—3 hours; laboratory—1 hour. Prerequisite: Engineering 104B. Overview of the mechanical properties of skeletal muscle and the musculo-skeletal system, the relationship of these properties to anatomic and histologic structure, and the changes in these properties caused by aging and disuse. The tissues covered include bone, cartilage, bone and synovial fluid, ligament and tendon. (Same course as Mechanical and Aeronautical Engineering 232.)—III. (III.) Fyhrie
233. Soft Tissue Mechanics (4)
Lecture—4 hours. Presentation of structure and function of musculoskeletal soft tissues: cartilage, tendon, ligament, fascia, skin, and related care. Application of biomechanics and its interaction with engineering principles governing the mechanical behavior of these tissues: viscoelasticity, quasi-linear viscoelasticity, and bifurcation theory. Offered in alternate years. I. (II.) Carlson
239. Advanced Finite Elements and Optimization (4)
Lecture—4 hours. Prerequisite: Engineering 180 or Applied Science 115 or Mathematics 128B. Introduction to advanced finite elements and design optimization methods, with application to modeling of complex mechanical, aerospace and biomedical systems. Review of the art in finite elements in optimum design of components under realistic loading conditions and constraints. Offered in alternate years. (Same course as Mechanical Engineering 193). I. (II.) Sarigil-Kilic
240. Computational Methods in Nonlinear Mechanics (4)
Lecture—4 hours. Prerequisite: Applied Science Engineering 115 or Mathematics 128B or Engineering 180. Deformation of solids and the motion of fluids treated with state-of-the-art computational models. Numerical treatment of nonlinear dynamics; classification of coupled problems; applications of advanced mathematical, aerodynamic, and biological systems. Offered in alternate years. (Same course as Mechanical and Aeronautical Engineering 240). I. (II.) Sarigil-Kilic
241. Introduction to Magnetic Resonance Imaging (3)
Lecture—3 hours. Prerequisite: Physics 9D, Mathematics 228. Equipment, methods, medical applications of MRI. Lectures review basic, advanced pulse sequences, image reconstruction, display and technological handling of how these are applied clinically. Lecture complements a more technical course. (Course 246 can be taken concurrently). I. (II.) Buonocore
242. Introduction to Biomedical Imaging (4)
Lecture—4 hours. Prerequisite: Physics 9D and Electrical and Computer Engineering 106 or consent of instructor. Basic physics and engineering principles of image science. Emphasis on ionizing and nonionizing radiation production and interactions with the body and detectors. Major imaging systems: radiography, computed tomography, magnetic resonance, ultrasonography, and optical microscopy.
243. Radiation Detectors for Biomedical Applications (4)
Lecture/discussion—4 hours. Prerequisite: Physics 9D, Mathematics 210, 228. Radiation detectors and sensors used for biomedical applications. Emphasis on radiation interactions, detection, measurement, and use of radiation for imaging. Operating principles of gas, semiconductor, and scintillation detectors. I. (II.) Cherry
246. Magnetic Resonance Technology (3)
Lecture—3 hours. Prerequisite: Physics 9D, Mathematics 228. Course covers MRI technology at an advanced level with emphasis on mathematical descriptions and problem solving. Topics include spin dynamics, signal generation, image reconstruction, pulse sequences, RF, gradient coil design, signal to noise, image artifacts. I. (II.) Buonocore
247. Current Concepts in Magnetic Resonance Imaging I (3)
Lecture—3 hours. Prerequisite: course 241 or 246 or consent of instructor. Modern pulse sequences, pulse sequence options, and biomedical/industrial applications; velocity encoded phase imaging and angiography, proton spectroscopy, linear imaging, spiral imaging, computer simulation of MRI, fast spin echo, other topics. I. (II.) Buonocore
248. Current Concepts in Magnetic Resonance Imaging II (3)
Lecture—3 hours. Prerequisite: course 247 or consent of instructor. Continuation of lecture coverage of modern pulse sequences, pulse sequence options, and biomedical/industrial applications: Control of tissue contrast by magnetization refocusing and spoiling, RF pulse design, diffusion and perfusion imaging, image artifact reduction methods, other. I. (II.) Buonocore
250. Mathematical Methods of Biomedical Imaging (4)
Lecture—4 hours. Prerequisite: graduate standing or consent of instructor. Complex mathematical techniques with emphasis on imaging systems. Matrices and vector spaces, Fourier analysis, integral transforms, signal representations, probability and random processes.
251. Medical Image Analysis (4)
252. Mathematical Methods of Biomedical Imaging (4)
Lecture—4 hours. Prerequisite: course 105 or Statistics 120; course 105 or Electrical and Computer Engineering 150A. Analytic tomographic reconstruction from projections in 2D and 3D; model-based image reconstruction methods; maximum likelihood and Bayesian image reconstruction methods. I. (II.) Qi
255. Biophotonics in Medicine and the Life Sciences (3)
Lecture/discussion—3 hours. Prerequisite: Physics 108 and Biology 101-105; course 202 highly recommended; graduate standing; Introduction to the science and technology of biomedical optics and photonics, with an overview of applications in medicine and the life sciences. Emphasis on research supported by the NSF Center for Biophotonics at UC Davis Medical Center. (Same course as Applied Science 255 and Biophysics 255). I. (II.) Chuang, Mathews
262. Cell and Molecular Biophysics for Bioengineers (4)
Lecture—4 hours. Prerequisite: course 284 or equivalent; graduate standing; undergraduate students by consent of instructor. Introduction to fundamental mechanisms of biology of the cell, gene, and assembly of bio-macromolecules. Emphasis is on a quantitative understanding of the nano-to-microscale interactions between and within individual molecules, as well as between molecules and particular membranes. Not open for credit to students who have completed course 162. I. (II.) Mercuro, Wachtman-Hogiu
271. Gene Circuit Theory (4)
Lecture—4 hours. Prerequisite: course 270 or 202 concurrently or consent of instructor. Analysis, design, and construction of gene circuits. Modeling strategies, elements of design, and methods of the artions in design. Case studies involving prokaryotic gene circuits to illustrate natural selection, discovery of design principles, and construction of circuits for engineering objectives. I. (II.) Savageau
272. Tissue Engineering (3)
Lecture/discussion—3 hours. Prerequisite: Biological Sciences 104 or Molecular and Cellular Biology 125. A survey of methodology and techniques in tissue engineering. Introduction to stem cells and extracellular matrix scaffolding. Design and development of tissues for functional restoration of various organs damaged or lost due to cancer, disease and trauma. Introduction to molecular genetic signals, responding stem cells and extracellular matrix scaffolding. I. (II.) Reddi
273. Integrative Tissue Engineering and Technologies (4)
Lecture/discussion—4 hours. Prerequisite: courses 202 and 204 or similar; graduate standing; course 272 strongly encouraged, although not a prerequisite. Engineering principles to direct cell and tissue behavior and formation. Contents include controlled delivery of macromolecules, transport within and around biomaterials, examination of mechanical forces of engineered constructs, and current experimental techniques that introduce them. Theoretical applications of linear systems, ordinary and partial differential equations, and probability theory and random processes that describe biological systems and instruments that measure them. Students will be introduced to numerical solution techniques in MATLAB. I. (II.) Leach
281. Acquisition and Analysis of Biomedical Signals (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 100, Statistics 130A. Basic concepts of digital signal recording and analysis; sampling; empirical modeling; Fourier analysis, random processes, spectral analysis, and correlation applied to biomedical signals. I. (II.) Heinrich
282. Biomedical Signals Processing (4)
Lecture—4 hours. Prerequisite: Electrical and Computer Engineering 150A, 150B. Characterization and analysis of continuous and discrete-time signals from linear systems. Examples drawn from physiological-illustrate the use of these mathematical transformations to model biological and bioengineered systems and instruments. Filter design and stochastic signal modeling. Genomic signal processing.
284. Mathematical Methods for Biomedical Engineers (4)
Lecture/discussion—4 hours. Prerequisite: Mathematics 228, Statistics 130A, or consent of instructor; upper division biomedical engineering majors, and graduate students in sciences and engineering; priority given to Biomedical Engineering graduate students. Theoretical applications of linear systems, ordinary and partial differential equations, and probability theory and random processes that describe biological systems and instruments that measure them. Students will be introduced to numerical solution techniques in MATLAB. I. (II.) Raychaudhuri
285. Computational Modeling in Biology and Immunology (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing or consent of instructor. Essential computational modeling techniques in immunology. Emphasis on applications of Monte Carlo methods in studying immune recognition and response. Introduction to Brownian dynamics and Molecular Motors; examples of motion at the molecular level diffusion and interactions. I. (II.) Raychaudhuri
286. Nuclear Imaging in Medicine and Biology (4)
Lecture/discussion—4 hours. Prerequisite: course 243 or consent of instructor. Radioactive decay, interaction of radiation with matter, radionuclide production, radiation detection, digital autoradiography, gamma camera imaging, single photon emission computed tomography, positron emission tomography and applications of these techniques in biology and medicine. I. (II.) Chen
293. Concepts in Molecular Imaging (4)
Lecture—2 hours; lecture/discussion—2 hours; term paper. Prerequisite: Chemistry 2C, Mathematics 21C, Physics 9D, consent of instructor. Current techniques and tools for molecular imaging. Emphasis on learning to apply principles from the physical sciences to imaging problems in medicine and biology. I. (II.) Sclufkie
Engineering: Chemical Engineering and Materials Science

<table>
<thead>
<tr>
<th>(College of Engineering)</th>
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<tbody>
<tr>
<td>Ahmet Palazoglu, Ph.D., Chairperson of the Department 530-752-6496; Fax 530-752-1031</td>
</tr>
<tr>
<td>Department Office, 3001 G ausp Hall 530-752-0400; Fax 530-752-1031; <a href="http://chems.engineering.ucdavis.edu">http://chems.engineering.ucdavis.edu</a></td>
</tr>
</tbody>
</table>

Faculty

Klaus van Bentheim, Ph.D., Associate Professor David E. Block, Ph.D., Professor and Endowed Chair (Chemical Engineering, Viticulture and Enology) Academic Senate Distinguished Teaching Award Roger B. Boulton, Ph.D., Professor and Endowed Chair (Chemical Engineering, Viticulture and Enology) Ricardo Castro, Ph.D., Associate Professor Stephanie R. Dungan, Ph.D., Professor (Chemical Engineering, Food Science and Technology) Noel El Farra, Ph.D., Professor Roland Faller, Ph.D., Professor Bruce C. Gates, Ph.D., Distinguished Professor Jeffery C. Gibling, Ph.D., Professor Niel Jensen, Ph.D., Professor (Chemical Engineering & Materials Science, Mechanical and Aerospace Engineering) Sangtae Kim, Ph.D., Professor Denise Kral, Ph.D., Ph.D. Professor Tonya L. Kuhl, Ph.D., Professor Enrique J. Lavernia, Ph.D., Distinguished Professor Marjorie L. Longo, Ph.D., Professor Subhash Mohan, Ph.D., Distinguished Professor Karen A. McDonald, Ph.D., Professor Greg Miller, Ph.D., Professor Adam Moule, Ph.D., Assistant Professor Alexandra Novotny, Ph.D., Distinguished Professor and Endowed Chair (Materials Science and Engineering, Chemistry, Land, Air and Water Resources) Annriel, Ph.D., Professor Ahmet Palazoglu, Ph.D., Professor Atil Parik, Ph.D., Professor (Chemical Engineering & Materials Science, Biomedical Engineering) Ronald J. Phillips, Ph.D., Professor

Robert L. Powell, Ph.D., Professor Subhash H. Risbud, Ph.D., Distinguished Professor Distinguished Teaching Award-Graduate/Professional William Ristenpart, Ph.D., Professor Julie M. Schoenung, Ph.D., Professor Sabayyachi Seshadri, Ph.D., Professor Pieter Strenee, Sc.D., Distinguished Professor Academic Senate Distinguished Teaching Award Yayoí Takamura, Ph.D., Associate Professor Syprasa Teeragunus, Ph.D., Lecturer SCE Emeriti Faculty Joanna R. Groza, Ph.D., Professor Emeritus Brian G. Higgins, Ph.D., Professor Emeritus David G. Howitt, Ph.D., Professor Emeritus Alan P. Jackman, Ph.D., Professor Emeritus Benjamin J. McCoy, Ph.D., Professor Emeritus Amiya K. Mukherjee, Ph.D., Professor Emeritus Academic Senate Distinguished Teaching Award, UC Davis Prize for Teaching and Scholarly Achievement, Distinguished Graduate Mentoring Award Zuhair A. Munir, Ph.D., Professor Emeritus Dewey D.Y. Ryu, Ph.D., Professor Emeritus James F. Shackelford, Ph.D., Professor Academic Senate Distinguished Teaching Award Stephen Whitaker, Ph.D., Professor Emeritus Academic Senate Distinguished Teaching Award Affiliated Faculty Diran Apelian, Ph.D., Visiting Professor Ilke Arslan, Ph.D., Assistant Adjunct Professor Mark Asta, Ph.D., Adjunct Professor Nigel Brownin, Ph.D., Adjunct Professor Andrew Canning, Ph.D. Adjunct Professor Jarek Majewski, Ph.D., Adjunct Professor Koichi Takamura, Ph.D., Adjunct Professor Dan Thoma, Ph.D. Adjunct Professor Ruxandra Vidu, Ph.D. Associate Adjunct Professor Frank Yaghmaie, Ph.D., Associate Adjunct Professor

The Department of Chemical Engineering and Materials Science offers five undergraduate programs: Chemical Engineering, Biochemical Engineering, Chemical Engineering/Materials Science and Engineering, Electronic Materials Engineering, and Materials Science and Engineering. Mission Statement. To advance, through teaching and research programs, the frontiers of chemical engineering, bioengineering, and materials science and engineering; to educate students with a sense of professionalism and community; and to serve the public of California through outreach efforts. Honors Program. An Honors Program is available to qualified students in the Chemical Engineering, Biochemical Engineering, and Materials Science and Engineering majors. It is a four-year program designed to challenge the most talented students in these majors. Students invited to participate will take a one-unit honors seminar in their freshman year and will spend their Sophomore year in honors courses. In the upper division, students will complete either an honors thesis or a project that might involve local industry (Chemical engineering 194 HA, HB, HC). Students must maintain a grade point average of 3.500 to continue in the program. Successful completion of the Honors Program will be acknowledged on the student's transcript. Chemical Engineering Undergraduate Program The Chemical Engineering program is accredited by the Engineering Accreditation Commission of ABET; see http://www.abet.org. Chemical engineers apply the principles of chemistry and engineering to produce useful commodities, ranging from fuels to polymers. Chemical engineers are increasingly concerned with chemical and engineering processes, the environment and food production. They work in diverse areas ranging from integrated circuits to integrated waste management. Preparation for a career in chemical engineering requires an understanding of both engineering and chemical principles to develop proficiency in conceiving, designing, and operating new processes. The chemical engineering curriculum has been planned to provide a sound knowledge of engineering and chemical sciences so that you may achieve competence in addressing current and future technical problems. Objectives. The objectives of the program in Chemical Engineering are to educate students in the fundamentals of chemical engineering, balanced with the application of these principles to practical problems; to train them as independent, critical thinkers who can also function effectively in teams; to foster a sense of community, ethical responsibility, and professionalism; to prepare them for careers in industry, government, and academia; to illustrate the necessity for continuing education and self-learning; and to help students to learn to communicate proficiently in written and oral form. Students are encouraged to adhere carefully to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisites have not been completed.

Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>Mathematics 21A:21B:21C:21D:22A:22B</td>
<td>University</td>
<td>14</td>
</tr>
<tr>
<td>Physics 9A:9B:9C</td>
<td>University</td>
<td>15</td>
</tr>
<tr>
<td>Chemistry 2A, 2B, 2C or Chemistry 2AH, 2B1, 2CH</td>
<td>University</td>
<td>15</td>
</tr>
<tr>
<td>Chemical Engineering and Materials Science 5, 6</td>
<td>University</td>
<td>6</td>
</tr>
<tr>
<td>Chemistry Engineering 51</td>
<td>University</td>
<td>4</td>
</tr>
<tr>
<td>Biological Science 2A or Biotechnology 1</td>
<td>University</td>
<td>4 or 5</td>
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English 3 or University Writing Program 1, 1V, 1Y, or Comparative Literature 1, 2, 3, 4, or Native American Studies 5 | University | 4 |

Upper Division Required Courses

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 110A, 110B, 128A, 128B, 129A</td>
<td>University</td>
<td>16</td>
</tr>
<tr>
<td>Chemistry Engineering and Materials Science Electives</td>
<td>University</td>
<td>8</td>
</tr>
<tr>
<td>Choose any upper division courses in the areas of Chemistry (CHE), Chemical Engineering (CEN) or Materials Science and Engineering (EMS). You may receive elective credit up to a maximum of four units for any combination of engineering courses numbered 190C, 192, 198, and 199. Courses may also include the following: BIS 102, Food Science and Technology 100A, 102A, 102B, Fiber and Polymer Science 150.</td>
<td>University</td>
<td></td>
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</tbody>
</table>

Upper Division Composition Requirement | University | 0 or 4 |
| Choose one from the following (grade of C- or better is required): University Writing Program 102E, 102F, 104A, 104F, 104T or passing the Upper Division Composition Exam offered by the College of Letters & Science. | University | |

Options for Junior and Senior Years

The focus in your junior year is on fundamentals, such as thermodynamics, fluid mechanics, energy transfer, and mass transfer phenomena. In the senior year, you draw together these fundamentals and apply them in a study of kinetics, process design, and process dynamics and control. The program includes eight units of chemical, biochemical, and materials science electives that allow you to strengthen specific areas in chemical engineering, explore new areas, or pursue new areas of specialization.
Research does not replace the required lab elective.

Laboratory elective list: Biomedical Engineering 1611, Biotechnology 161A, 161B; Food Science and Technology 1028, 104L, 123; Molecular and Cellular Biology 1201, 120L, 1201, 1202; Microbiology, Physiology, and Behavior 101L, 104L; Viticulture and Enology 123L, 124L. Lecture elective list: Biological Sciences 2B, 2C, 101, 103, 104; Biological Systems Engineering 165; Biomedical Engineering 102, 107, 109, 117, 140, 161A, 162A; Biotechnology 160, 188; Chemical Engineering 144, 166, 170; Chemistry 120A, 130B; Food Science and Technology 102A, 104, 123; Microbiology 140, 150; Molecular and Cellular Biology 123; Neurobiology, Physiology, and Behavior 101, 107; Plant Biology 112; Plant Sciences 100A, 152; Statistics 120, 120A, 130A; Viticulture and Enology 123, 124

Upper Division Composition Requirement ................................. 0 or 4

One course from the following (grade of C- or better is required): Writing Program 102E, 102F, 104A, 104E, 104T or passing the Upper Division Composition Exam offered by the College of Letters & Science.

Materials Science and Engineering Undergraduate Program

The Materials Science and Engineering program is accredited by the Engineering Accreditation Commission of ABET, see http://www.abet.org.

Materials science and engineering is directed toward an understanding of the structure, properties, and processing of materials. Society demands new and improved materials for many applications for such materials as common metals, polymers, and ceramics. New materials are needed for high-speed transportation systems, surgical and dental implants, new generations of power plants, renewable energy sources, and solid-state electronic and photonics devices in computer and communication technology. Both the development of new materials and the understanding of present-day materials demand a thorough knowledge of basic engineering and scientific principles, including crystal structure, elastic and plastic behavior, thermodynamics, phase equilibria and reaction rates, and the physical and chemical behavior of engineering materials.

Materials engineers study phenomena found in many different engineering operations, from fracture behavior in automobiles to fatigue behavior in aircraft frames, from corrosion in petro-chemical refineries to radiation-induced damage in nuclear power plants, and from the fabrication of steel to the design of semiconductors. Materials engineers are involved in the development of new materials and the understanding of present-day materials. A thorough knowledge of the structure, properties, and processing of materials is essential for materials engineers.

A minimum of 14 units from one of the following focus areas:


Chemical Engineering: Chemical Engineering 31, 140, 141, 142

Civil Engineering: Civil Engineering 35, 104,

Civil Engineering 130, 132


A minimum of 4 units chosen from Chemical Engineering 15IA, Materials Science Engineering 170, 160, 188; Civil Engineering 123, 125, 143, 144 depending on area of focus, plus 4 upper division electives......................... 6-9

Students may receive up to a maximum of 4 units of credit for engineering 199 courses, when these courses are approved by the departmental undergraduate studies committee. To receive credit, students must submit a summary of their research to the committee. A letter of support from the faculty mentor is also required to verify that you have conducted substantial research activity.

* Students would need to take Neurobiology, Physiology, and Behavior 101 to be considered for enrollment in Biomedical Engineering 106 Upper Division Composition Requirement ................................. 0 or 4

One course from the following (grade of C- or better is required): University Writing Program 102E, 102F, 104A, 104E, 104T or passing the Upper Division Composition Exam offered by the College of Letters & Science.

Materials Science Minor

There is a constant need for professionals with more knowledge and experience in understanding the behavior of materials from which products such as electronics, sensors, biological implants, transportation vehicles, medical devices and infrastructure are made. The goal of this minor is to prepare students
The Graduate Program in Chemical Engineering
M.S. and Ph.D.
Ph.D. designated emphases are available as specializations in biotechnology, biophysics, and nuclear science.

The Graduate Program in Materials Science and Engineering
M.S. and Ph.D.
Ph.D. designated emphases are available as specializations in biotechnology, biophysics, and nuclear science.

Minor Requirements
UNITs
Materials Science ............................ 20
Chemicals and Science 160, 162, 164 ........................................ 12
Choose one of the following: Materials Science 172 or 174 ........................................ 4
Choose an additional four units from the following, if not used above, Materials Science 147, 147L, 172, 172L, 174, 174L, 180, 181 or 182 ....... 16
Minor Advisor: Julie Schoenung (Department of Chemical Engineering and Materials Science)

Graduate Programs in the Department of Chemical Engineering and Materials Science
The Department of Chemical Engineering and Materials Science is home to two top-20 ranked graduate programs in Chemical Engineering and Materials Science & Engineering. We offer a unique environment for graduate studies, we are large enough to boast world-renowned faculty and state-of-the-art research facilities, yet small enough to give every graduate student personal attention.

Lower Division
1. Design of Coffee—An Introduction to Chemical Engineering (3)
Lecture—1 hour; laboratory—2 hours; project—1 hour. Non-technical introduction to how chemical engineers think, illustrated by elucidation of the process of roasting and brewing coffee. Qualitative overview of the basic principles of engineering analysis and design. Corresponding experiments testing design choices on the sensory qualities of coffee. Not open for credit to Chemical Engineering and Biochemical Engineering majors or students who have completed Chemical and Materials Science 5.
GE credit: SciEng | SE, SL, VL — III. (III.) Kuhl, Ristenpart
5. Analysis in Biochemical, Chemical, and Materials Engineering (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Mathematics 21A and 21B (concurrently). Analysis of systems of interest to chemical engineers and materials scientists. Applications of differential and integral calculus. Dimensional analysis. GE credit: SciEng | QL, SE — II. (III.)
6. Computational Methods for Bio/Chemical/Materials Engineers (4)
Lecture—discussions—4 hours. Prerequisite: Mathematics 21C and course 5. Programming methods for solving problems in chemical, biochemical and materials engineering using Mathematica. Programming styles, data structures, working with lists, functions and rules, and visualizations drawn from material balances, statistics, numerical methods, and bioinformatics. Introduction to object oriented programming using Java. GE credit: SciEng | QL, SE — II. (III.)
90XI. Honors Discussion Section (1)
Discussion—1 hour. Prerequisite: open only to students enrolled in the Chemical Engineering or Biochemical Engineering Honors programs. Examination of special topics covered in selected upper division courses through additional readings, discussions, collaborative work, or special activities which may include projects, laboratory experience or computer simulations. May be repeated for credit when topics differ.—I, II, III.
94XI. Honors Seminar (1)
Seminar—1 hour. Prerequisite: open only to students enrolled in the Chemical Engineering or Biochemical Engineering Honors programs. Examination of selected current topics in chemical or biochemical engineering through readings, discussions, collaborative work or special activities which may include projects, laboratory experiences or computer simulations.—I. (I.)
Upper Division
188XI. Honors Materials Design (1)
Discussion—1 hour. Prerequisite: enrollment in the Materials Science and Engineering Honors Program. Examination of special topics covered in the materials design course through additional readings, discussions, collaborative work, or special activities which may include projects, laboratory experience or computer simulations. Open only to students in the Materials Science and Engineering Honors Program.—II. (II.)
188XII. Honors Materials Design (1)
Discussion—1 hour. Prerequisite: enrollment in the Materials Science and Engineering Honors Program. Examination of special topics covered in the materials design course through additional readings, discussions, collaborative work, or special activities which may include projects, laboratory experience or computer simulations. Open only to students in the Materials Science and Engineering Honors Program.—III. (III.)
189XR. Special Topics in ECM (1-5)
190XI. Honors Discussion Section (1)
Discussion—1 hour. Prerequisite: open only to students enrolled in the Chemical Engineering or Biochemical Engineering Honors programs. Examination of special topics covered in selected upper division courses through additional readings, discussions, collaborative work, or special activities which may include projects, laboratory experience or computer simulations. May be repeated for credit when topics differ.—I, II, III. (I, II, III.)
194HA. Special Study for Honors Students (2)
Independent study—6 hours. Open to only students enrolled in the Chemical Engineering or Biochemical Engineering Honors Programs. Guided independent study of a selected topic in Chemical Engineering or Biochemical Engineering. Preparation for course 194HB. GE credit: SciEng | SE — I, II, III. (I, II, III.)
194HB. Special Study for Honors Students (1-5)
Independent study—3 hours. Prerequisite: course 194HA. Open to only students enrolled in the Chemical Engineering or Biochemical Engineering Honors programs. Guided independent study of a selected topic in Chemical Engineering or Biochemical Engineering. Preparation for course 194HC. May be repeated for credit. GE credit: SciEng | SE — I, II, III. (I, II, III.)
194HC. Special Study for Honors Students (1-5)
Prerequisite: course 194HB. Open to only students enrolled in the Chemical Engineering or Biochemical Engineering Honors programs. Guided independent study of a selected topic in Chemical Engineering or Biochemical Engineering leading to the presentation of
158A. Process Economics and Green Design (4)

158B. Separations and Unit Operations (4)
Lecture—4 hours. Prerequisite: course 158A. Senior design experience with multiple realistic constraints. Heuristic and rigorous design of chemical process equipment. Separations by filtration, distillation and extraction. Synthesis of reactor and separation networks, heat and power integration. GE credit: SciEng | QL, GE, SE.—II. (II)

158C. Plant Design Project (4)
Laboratory/discussion—2 hours; project—2 hours. Prerequisite: course 158B or 161C. Senior design experience for chemical and biochemical processes. Impact of multiple realistic constraints. Design, cost and profitability analysis of complete plants. Use of computer-aided design techniques. GE credit: SciEng | QL, QL, SE, SL, VL, WE.—III. (III)

160. Fundamentals of Biomanufacturing (3)
Lecture—3 hours. Prerequisite: Microbiology 102, Biological Sciences 101, or Animal Biology 259B. Principles of large scale bioreactor production of metabolites, enzymes, and recombinant proteins including the development of strains/cell lines, fermentation/fermentor design, monitoring and operation, product recovery and purification, and biomanufacturing economics. Open not for credit for students who have completed either course 161C or 161B and 161A, only two units of credit to students who have completed either course 161A or 161B. GE credit: SciEng | QL, SE, VL.—I. (II), McDonald

161A. Biochemical Engineering Fundamentals (4)
Lecture/discussion—4 hours. Prerequisite: course 148A. Bio-kinetics; bioreactor design and operation; transport phenomena in bioreactors; microbial, plant and animal cell culture. GE credit: SciEng | QL, QL, SE, VL.—II. (II)

161B. Bio-separations (4)
Lecture/discussion—4 hours. Prerequisite: course 143. Product recovery and purification of biochemicals. Cell disruption, centrifugation, filtration, membrane separation, extraction, and chromatographic separation. GE credit: SciEng | QL, SE.—II. (II)

161C. Biotechnology Facility Design and Regulatory Compliance (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 161A and 161B (corequisite), or Molecular & Cellular Biology 263 (corequisite). Design of biotechnology manufacturing facilities. Fermentation and purification equipment, and utility systems. Introduction to current good manufacturing practices, regulatory compliance, and documentation. GE credit: SciEng or SocSci | QL, SE or SS, SE, VL.—II. (II) Block

161L. Bioprocess Engineering Laboratory (4)
Laboratory—9 hours; discussion—1 hour; term paper. Prerequisite: course 161A and 161B, or Vitiiculture and Enology 186, or Biological Sciences 102 and Molecular and Cellular Biology 120L. Restricted to chemical/biomedical engineering majors during pass. 1 laboratory experiments in the operation and analysis of bioreactors; determination of enzyme kinetic and catalytic coefficients in bioreactors; and ion exchange chromatography. GE credit: SciEng, Wrt | QL, QL, SE, VL, WE.—III

166. Catalysis (3)
Lecture—3 hours. Prerequisite: course 148A; consent of instructor. Principal types of catalysis based on an integration of principles of physical, organic, and inorganic chemistry and chemical kinetics and chemical reaction engineering. Catalysis in solution; catalysis by enzymes; catalysis in swellable polymers; catalysis in microscopic cages (zeolites); catalysis on surfaces. GE credit: SciEng | SE.—II. (II) Gates

170. Introduction to Colloid and Surface Phenomena (3)
Lecture—3 hours. Prerequisite: Chemistry 110A. Introduction to the behavior of surfaces and disperse systems. The fundamentals will be applied to the solution of practical problems in colloid science. The course should be advanced chemists, biologists, soil scientists, and related disciplines. GE credit: SciEng | SE.—II. (II) Stroeve

190C. Research Group Conferences (1)
Discussion—1 hour. Prerequisite: upper division standing in Chemical Engineering; consent of instructor. Research group conferences. May be repeated for credit. (P/NP grading only) GE credit: SE.—I, II, III, IV. (I, II, III, IV)

190X. Upper Division Seminar (1)
Seminar—1 hour. Prerequisite: upper division standing. In-depth examination of a special topic in a small group setting.

192. Internship in Chemical or Biochemical Engineering (1-5)
Internship—3-15 hours. Prerequisite: completion of a minimum of 84 units; project approval before period of internship, consent of instructor. Supervised work experience in Chemical or Biochemical. May be repeated for credit. (P/NP grading only) GE credit: SE.—I, II, III, IV. (I, II, III, IV)

198. Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only) GE credit: SE.—I, II, III, IV. (I, II, III, IV)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only) GE credit: SE.—I, II, III, IV. (I, II, III, IV)

Graduate

206. Biochemical Engineering (3)
Lecture—3 hours. Prerequisite: Microbiology 102 and 102L, Biological Sciences 101, 102, 103, Molecular and Cellular Biology 122, 120L, Food Science and Technology 205 recommended; or consent of instructor. Applications of basic biochemical and engineering principles of practical enzymatic processes. Lectures cover large scale production and separation of enzymes, immobilized enzyme systems, enzyme reaction design and optimization, and new application of enzymes in genetic engineering related biotechnology. Offered in alternate years.—II. Ryu

226. Enzyme Engineering (3)
Lecture—3 hours. Prerequisite: Microbiology 102 and 102L, Biological Sciences 102, 103, Molecular and Cellular Biology 122, 120L, 200A; or consent of instructor. Application of basic biochemical and engineering principles of practical enzymatic processes. Lectures cover large scale production and separation of enzymes, immobilized enzyme systems, enzyme reaction design and optimization, and new application of enzymes in genetic engineering related biotechnology. Offered in alternate years.—II. Ryu

246. Advanced Biochemical Engineering (2)
Lecture—2 hours. Prerequisite: course 206 or consent of instructor. Advances in the field of biotechnol- ogy including genetic engineering, enzyme engineering, fermentation science, and renewable resources development. The impact results of original research will be evaluated for understanding of the fundamental principles and for potential practical application.—II. (II) Ryu

252. Statistical Thermodynamics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 152B, Engineering 105B, or the equivalent. A treatment of the statistical basis of thermodynamics; introduction to statistical mechanics; discussion of the laws of thermodynamics; application of the statistical thermodynamic relationships to phase and chemical reaction equilibrium; introduction to molecular simulations and the evaluation of thermodynamic properties from molecular simulations.—II. (II) Dungan

253A. Advanced Fluid Mechanics (4)
Lecture—4 hours. Prerequisite: courses 141 and 259. Kinematics and basic principles of fluid flow. Principals of constitutive equations. Navier-Stokes equations for Newtonian fluids. Survey of rectilinear creeping flow, lubrication flow and boundary layer theory.—I. (I)

253B. Advanced Heat Transport (4)
Lecture—4 hours. Prerequisite: courses 142 and 259 or the equivalent. Fundamental energy postu- lates and derivation of macroscopic energy equations. Mechanisms of conduction, isotropic, thermoelastic and anisotropic materials, solution problems using Greens functions and perturbation theory.—II. (II)

253C. Advanced Mass Transfer (4)
Lecture—4 hours. Prerequisite: courses 143 and 259 (may be taken concurrently) or the equivalents. Kinematics and basic conservation principles for multicomponent systems. Constitutive equations for momentum, heat and mass transfer, applications to binary and ternary systems. Details of diffusion with reaction, and the effects of concentration.—I. (II)

254. Colloid and Surface Phenomena (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: graduate standing in science or engineering or consent of instructor. Thermodynamics and rate processes at interfaces. These fundamental processes will be applied to determine the collective properties of thin films and membranes, self-assembled systems, liquid crystals and colloidal systems. Experimental techniques in surface analysis.—III. (III) Stroeve, Longo

256. Chemical Kinetics and Reaction Engineering (4)
Lecture—4 hours. Prerequisite: courses 146 or the equivalent. Analysis of the performance of chemical reactors and design of chemical equipment. Focus on the principles of chemical kinetics and transport phe- nomena. Consideration of noncatalytic/catalytic reactions in single fluid phases and emphasis on reactions in multiple fluid mixtures, especially gas-solid reactors.—II. (II)

259. Advanced Engineering Mathematics (4)
Lecture—4 hours. Prerequisite: Mathematics 21D, 22A, 22B. Applications of methods of applied math- ematics to the analytical and numerical solution of linear and nonlinear ordinary and partial differential equations arising in the study of transport phenomena.—I. (I)

262. Transport Phenomena in Multiphase Systems (3)
Lecture/discussion—3 hours. Prerequisite: course 253C. Heat, mass and momentum transfer in multi- phase, multicomponent systems with special empha- sis on transport processes in porous media. Derivation of the averaging theorem and application of the method of volume averaging to multicomponent, reacting systems.—III. (III)

263. Rheology and Mechanics of Non-Newtonian Fluids (3)
Lecture—3 hours. Prerequisite: courses 253A and 259 or consent of instructor. Mechanics of polymer solutions and suspensions and the develop- ment of properly invariant constitutive equations. Topics include: viscometry, linear and nonlinear vis- coelasticity, and the mechanics of viscoelastic systems. Offered in alternate years.—II. Powell

265. Emulsions, Microemulsions and Bilayers (3)
Lecture—3 hours. Prerequisite: an undergraduate course in physical chemistry. Thermodynamics and mechanical properties of surfactant-laden interfaces. Forces between and within interfaces. Physics of micelle and microemulsion formation. Structure and stability of emulsions. Properties of phospholipid bilayers, with emphasis on vesicles.—II. (II) Dungan

Quarter Offered: I-Fall; II-Winter; III-Spring; IV-Summer; 2015-2016 offering in parentheses.
267. Advanced Process Control (3)  Lecture—3 hours. Prerequisite: course 157 or the equivalent. Advanced course in analysis and synthesis of linear multivariable systems. Emphasis on frequency-domain techniques and applications to chemical processes. Topics include singular value analysis, internal model control, robust controller design methods as well as self-tuning control techniques. Offered in alternate years. III.

289A-L. Special Topics in Chemical Engineering (1-5) Lecture and/or laboratory. Prerequisite: consent of instructor. Special topics in (A) Fluid Mechanics; (B) Nonlinear Analysis and Numerical Methods; (C) Process Control; (D) Chemistry of Catalytic Processes; (E) Biotechnology; (F) Interfacial Engineering; (G) Molecular Thermodynamics; (H) Membrane Separations; (I) Advanced Materials Processing; (J) Novel Experimental Methods; (K) Advanced Transport Phenomena; (L) Biomolecular Engineering. May be repeated for credit when topic differs. —II, III, I, II, III.

290. Seminar (1) Seminar—1 hour. (S/U grading only.)

290C. Graduate Research Group Conference (1) Discussion—1 hour. Prerequisite: consent of instructor. Research problems, progress and techniques in chemical engineering. May be repeated for credit. (S/U grading only.) —II, III, I, II, III.

294. Current Progress in Biotechnology (1) Seminar—1 hour. Prerequisite: graduate standing. Seminar presented by guest lecturers on subjects of their own research activity. May be repeated for credit. (Same course as Molecular and Cellular Biology 294.) (S/U grading only.) —II, III, I, II, III.

Ryu, Dae

298. Group Study (1-5) Prerequisite: consent of instructor. (S/U grading only.)

299. Research (1-12) (S/U grading only.)

Professional

390. Teaching of Chemical Engineering (1) Discussion—1 hour. Prerequisite: qualifications and acceptance as teaching assistant and/or associate in chemical engineering. Participation as a teaching assistant or associate-in in a designated engineering course. Methods of leading discussion groups or laboratory sections, writing and grading quizzes, use of laboratory equipment, and grading laboratory reports. May be repeated two times for credit. (S/U grading only.)—II, III, I, II, III.

Courses in Materials Science and Engineering (EMS)

Lower Division

2. Stuff: Diversity of Materials in Our Lives (2) Lecture/discussion—2 hours. Role of materials in technological societies and their impact on our way of living. Exploration of how materials are extracted from the earth, processed, and shaped into products, including discussion of disposal and reuse of materials. GE credit: SciEng | SE. —II. (II.)

Risbud

6H. Honors Materials Science Computer Applications (1) Discussion—1 hour. Prerequisite: enrollment in the Materials Science and Engineering Honors Program; concurrent enrollment in Engineering 6 required. Restricted to students in the Materials Science and Engineering Honors Program. Examination of materials science computer applications through traditional readings, discussions, collaborative work, or special activities which may include projects or computer simulations.

9H. Honors Solid-State Materials Science (1) Discussion—1 hour. Prerequisite: enrollment in the Materials Science and Engineering Honors Program; concurrent enrollment in Physics 9D required. Restricted to students in the Materials Science and Engineering Honors Program. Examination of solid-state materials science and modern physics topics through additional readings, discussions, collaborative work, or special activities which may include projects, laboratory experience or computer simulations.

Upper Division

147. Principles of Polymer Materials Science (3) Lecture—3 hours. Prerequisite: Chemistry 2A-2B; Chemistry 8A-8B or Engineering 45; introductory physics. Basic principles of polymer science presented including polymer structure and synthesis; polymerization mechanisms, polymer classes, properties, and reactions; polymer morphology, rheology, and characterization; polymer processing. (Same course as Fiber and Polymer Science 120.) GE credit: SciEng | QL, SE. —II. (II.)

160. Thermodynamics of Materials Processes and Phase Stability (4) Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in each of the following: Engineering 45, Mathematics 228B; Chemistry 2C (recommended). Review of thermodynamic principles of interest to materials scientists and engineers. Application of thermodynamics to material processing, phase stability, corrosion. GE credit: SciEng | QL, SE. —II. (II.)

162. Structure and Characterization of Engineering Materials (4) Lecture—4 hours. Prerequisite: C- or better in each of the following: Engineering 45, Mathematics 228, Physics 9B. Description of the structure of engineering materials on the atomic scale by exploring the fundamentals of materials science. The importance of this structure to materials’ properties. Description of experimental determination using x-ray diffraction techniques. GE credit: SciEng | QL, SE. —II. (II.)

162L. Structure and Characterization of Materials Laboratory (2) Laboratory—3 hours; discussion—1 hour. Prerequisite: course 162 [concurrent enrollment recommended]. Experimental investigations of structure of solid materials are combined with techniques for characterization of materials. Laboratory exercises emphasize methods used to study structure of solids at the atomic and microstructural levels. Methods focus on optical, x-ray and electron techniques. Only 2 units of credit allowed to students who have completed course 134L. Not open for credit to students who have completed course 132L. GE credit: SciEng, Wrt | QL, SE. —II. (II.)

164. Rate Processes in Materials Science (4) Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 45, and course 160. Basic kinetic laws and the principles governing phase transformations. Applications in diffusion, oxidation, nucleation, growth and spinodal transformations. GE credit: SciEng | QL, SE, SL, VL. —II. (II.)

170. Sustainable Energy Technologies: Batteries, Fuel Cells, and Photovoltaic Cells (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 45. Open to students in Engineering or related fields. Basic principles of future energy devices such as lithium batteries, fuel cells, and photovoltaic cells. Examines the current status of these energy technologies and analyze challenges that still must be overcome. Offered in alternate years. GE credit: SciEng | QL, SE. —II. (II.)

Kim

172. Electronic, Optical and Magnetic Properties of Materials (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 110A or Physics 9D, Engineering 6 or Chemical and Materials Science 6 or equivalent [recommended]. Electronic, optical, and magnetic properties of materials as related to structure and processing of solid state materials. Physical principles for understanding the properties of metals, semiconductors, ceramics, and amorphous solids and the applications of these materials in engineering. GE credit: SciEng | QL, SE, SL, VL. —I. (II.)

172L. Electronic, Optical and Magnetic Properties Laboratory (1) Laboratory—3 hours; lecture/laboratory—1 hour. Prerequisite: course 172 [concurrent enrollment recommended]. Experimental investigation of electronic, optical and magnetic properties of engineering materials, emphasizing the fundamental relationship between microstructure and properties as well as the influence of rate processes on the evolution of the microstructure of materials. GE credit: SciEng, Wrt | QL, SE, SL, VL. —I. (II.)

174. Mechanical Behavior of Materials (4) Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 45; course 162 (recommended). Microscopic and macroscopic aspects of the mechanical behavior of engineering materials, with emphasis on recent development in materials characterization by nondestructive testing. Fundamental aspects of plasticity in engineering materials, strengthening mechanisms and mechanical failure modes of materials systems. GE credit: SciEng, Wrt | QL, SE, SL, VL. —III. (III.)

174L. Mechanical Behavior Laboratory (2) Laboratory—3 hours; lecture/laboratory—1 hour. Prerequisite: course 174 [concurrent enrollment recommended]. Experimental investigation of mechanical behavior of engineering materials. Laboratory exercises emphasize the fundamental relationship between microstructure and mechanical properties, and the evolution of the microstructure as a consequence of rate process. Not open for credit to students who have completed course 138L. GE credit: SciEng, Wrt | QL, SE, SL, VL. —II. (III.)

180. Materials in Engineering Design (4) Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: C- or better in Engineering 45. Restricted to students with upper division standing. Quantitative treatment of materials selection for engineering applications. Discussion of design and material selection strategy; process and process selection strategy; process economics; lifecycle thinking and eco-design. Use of materials selection software. GE credit: SciEng, Wrt | OL, SE, SL, VL. WE. —III. (III.)

181. Materials Processing (4) Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: C- or better in Engineering 45; and Engineering 105 or Chemical Engineering 152B or Electrical & Computer Engineering 140A or course 164. Principles of phase equilibria, thermodynamics and reaction kinetics applied to material processing. Effects of processing variables on the structure-property relationship. Fundamentals of the manufacturing processes for electronic, optical, functional and structural materials. GE credit: SciEng, Wrt | OL, SE, SL, VL. —III. (III.)

182. Failure Analysis (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in Engineering 45; course 174 (recommended). Analysis of the way materials fail. Effects of temperature, mechanical deformation and corrosion on the properties of materials, forensics and methodologies for investigating failures of materials including optical microscopy, scanning electron microscopy, and scanning electron microscopy. Investigation of practical problems. GE credit: SciEng, Wrt | QL, SL, VL. WE. —II. (II.)

188A. Materials Design Project (4) Laboratory—4 hours; discussion—1 hour. Prerequisite: courses 160, 162, 164, 172, and 174. Major materials design experience involving analysis of real materials synthesis/processing/fabrication and technological applications including critical assessments of economic, manufacturing, and ethical constraints. Various principles of materials science have been integrated into a culminating team design project.

Quarter Offered: F—Fall; W—Winter; S—Spring; V—Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): AH—Arts and Humanities; SciEng—Science and Engineering, SocSci—Social Sciences; Div—Domestic Diversity; Wrt—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering, SS—Social Sciences; ACOM—American Cultures, DD—Domestic Diversity, OL—Oral Skills, QL—Quantitative, SL—Scientific, VL—Visual, WC—World Cultures, WRT—Writing Experience
1888. Materials Design Project (4)
Laboratory—4 hours; discussion—1 hour. Prerequisite: course 188A. Major materials design experience involving analysis of real materials synthesis/processing/fabrication/technology applications including critical assessments of economic, manufacturing, and ethical constraints. Various principles of materials science are integrated into a culminating project. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | OL, SE, SL, VI, WE. —II, III. Sen

190C. Research Group Conferences (1)
Discussion—1 hour. Prerequisite: consent of instructor. Selected topics of current interest in materials science and engineering research. May be repeated for credit. (P/NP grading only.)—I, II, III, (I, II, III)

198. Directed Group Study (1-5)
Lecture—1-5 hours. Prerequisite: consent of instructor. Group study of selected topics. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Graduate

230. Fundamentals of Electron Microscopy (3)
Lecture—2 hours; lecture/discussion—1 hour. Prerequisite: course 162. Principles and techniques of scanning and transmission of electron microscopy used in the study of material phases will be described. Emphasis upon practical applications. Offered in alternate years.—II, III

230L. Laboratory for Electron Microscopy (2)
Laboratory—6 hours. Prerequisite: course 230 concurrently. Practical application of techniques of electron scanning and transmission microscopy including x-ray microanalysis. Offered in alternate years.—II

232. Advanced Topics in Transmission Electron Microscopy (3)
Lecture—1 hour; discussion—2 hours. Prerequisite: course 230. Advanced course in the techniques of electron microscopy including analytical techniques, probe operation, microanalysis, and high resolution imaging. Offered in alternate years.—II

232L. Laboratory for Advanced Transmission Electron Microscopy (2)
Discussion—1 hour; laboratory—3 hours. Prerequisite: course 230L. Laboratory in advanced transmission electron microscopy techniques relevant to specific graduate research projects in materials science. Offered in alternate years.—II

241. Principles and Applications of Dislocation Mechanics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: graduate standing in Engineering; consent of instructor. Concepts in dislocation theory are applied to explain plasticity of crystalline solids. Glide and climb of dislocations, strain hardening, recrystallization, theories of creep processes and interaction of dislocation with solute atoms, precipitates and impurity clouds are discussed. Offered in alternate years.—II

Lecture—3 hours. Prerequisite: graduate standing in Engineering and consent of instructor; course 160 recommended. Theory of alloying, kinetics of phase changes, homogeneous and heterogeneous transformation, transformation by shear, order-disorder reactions. Offered in alternate years.—II, III

244. Interaction of Materials and their Environment (3)
Lecture—3 hours. Prerequisite: Engineering 45 and 105A, or consent of instructor. Thermodynamic and kinetic foundations of the corrosion and oxidation processes. Practical aspects of corrosion control and prevention. Stress-corrosion and gas-embrittlement phenomena. Corrosion; microbially- and atmospheric corrosion. Offered in alternate years.—I

248. Fracture of Engineering Materials (3)
Lecture—3 hours. Prerequisite: course 174. Description of the failure of materials by crack propagation. Topics include the stress fields about elastic cracks, the Griffith- Irwin analysis, descriptions of plastic zones, fracture toughness testing, microstructural aspects of fracture and failure at elevated temperatures. Offered in alternate years.—II, III

249. Mechanisms of Fatigue (3)
Lecture—3 hours. Prerequisite: course 174 or consent of instructor; course 248 recommended. Microstructural description of the mechanisms of fatigue in metals. Topics include a phenomenological treatment of cyclic deformation, dislocation processes in cyclic deformation, fatigue crack nucleation, Stage I crack growth, threshold effects and high-temperature cyclic deformation. Offered in alternate years.—II

250A-F. Special Topics in Polymer and Fiber Science (3)
Lecture—3 hours. Prerequisite: course 147 or consent of instructor. Selected topics of current interest in polymer and fiber sciences. Topics will vary each term the course is offered. (Same course as Textiles and Clothing 250A-F.)

251. Applications of Solid State Nuclear Magnetic Resonance Spectroscopy (3)
Lecture—3 hours. Prerequisite: graduate standing in chemistry, physics or engineering, or consent of instructor. Fundamentals of solid state NMR spectroscopy and principles of advanced NMR techniques for analyzing structure of solid materials.—III

260. Advanced Thermodynamics of Solids (4)
Lecture/discussion—4 hours. Prerequisite: course 160. Thermodynamic principles, formalism and their application to solid materials. Specific examples from ceramic and solid state systems. Use of thermodynamic approach in developing understanding of and constraints for processes in real systems. Offered in alternate years.—I

262. Advanced Topics in Structure of Materials (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 162; course 174 recommended; graduate standing in Engineering or consent of instructor. Nature of microstructure in engineering materials. Crystalline and noncrystalline structures, with special emphasis on grain boundary segregation in the development of polycrystalline microstructure and the radial distribution function of amorphous materials. Not open for credit to students who previously completed [canceled] course 245. Offered in alternate years.—II

264. Transport Phenomena in Materials Processes (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing in Engineering. Thermodynamic driving forces and atomic-scale mechanisms underlying diffusive mass transport in materials. Nucleation, growth and coarsening dynamics of phase transformations. Not open for credit to students who previously completed course 240.—II, (II)

272. Advanced Functional Properties of Materials (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing in Physics, Chemistry and Engineering. Fundamental physical properties of solid materials important to solid state devices, specifically electronic, magnetic, and optical properties. Topics include band structures, metals, superconductors, semiconductors, dielectrics, optical properties, and magnetic and mechanical properties of these properties into devices.—I

274. Advanced Mechanical Properties of Materials (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 174. Comprehensive study of mechanical properties of materials, with special attention to dislocations and deformation and fracture control mechanisms. Mechanical properties of conventional engineering materials as well as advanced materials such as nanocrystalline solids and thin films are considered. Offered in alternate years.—I

282. Glass: Science and Technology (3)
Lecture—2 hours, extensive writing and reading. Prerequisite: graduate standing in Chemistry, Physics or Engineering, or consent of instructor. Modern paradigms in glass science and their applications to technologies. Relation of macroscopic properties of glasses and glass-forming materials to atomic-level structures, including principles of formation, relaxation, transport phenomena, nucleation, crystallization and phase separation in glasses. Offered in alternate years.—II, III

289A-G. Special Topics in Materials Science (1-5)
Lecture and/or laboratory. Prerequisite: consent of instructor. Special topics in: (A) Electronic Materials; (B) Ceramics and Minerals; (C) Physics and Chemistry of Materials; (D) Materials Processing; (E) Materials Science and Forensics; (F) Biomaterials; (G) Surface Chemistry of Metal Oxides. May be repeated for credit when topics differ.—I, II, III, (I, II, III)

290C. Graduate Research Conference (1-5)
Discussion—1 hour. Prerequisite: consent of instructor. Individual and/or group conference on problems, progress, and techniques in materials science and engineering research. May be repeated for credit. (S/U grading only)—I, II, III, (I, II, III)

294. Materials Science Seminar (1)
Seminar—1 hour. Current literature and developments in materials science with presentations by individual students. May be repeated for credit. (S/U grading only)—I, II, III, (I, II, III)

298. Group Study (1-5)

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only)

Professional

390. The Teaching of Materials Science (1)
Discussion—1 hour. Prerequisite: meet qualifications for teaching assistant and/or associate-in in materials science and engineering. Participation as a teaching assistant or associate-in in a designated engineering course. Methods of leading discussion groups or laboratory sections, writing and grading quizzes, use of laboratory equipment, and grading laboratory reports. May be repeated two times for credit. (S/U grading only)—I, II, III, (II, III)

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Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): AAH=Arts and Humanities; SCI=Science and Engineering; SoCi=Social Sciences; DivD=Diverse; DomD=Dominant Diversity; Wmt=Writing Experience
Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SCI=Science and Engineering; SS=Social Sciences; ACGH=African American Studies; DD=Dominant Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific, VL=Visual; WC=World Cultures, WE=Writing Experience

Engineering: Civil and Environmental
gram at the University of California, Davis are to...

...and the environment. We provide the programs of the Civil Engineering undergraduate program at an international institution, such as the University of Edinburgh, by participating in an Education Abroad Program. The department encourages interested students to participate in both Summer Abroad and Education Abroad Programs. Please consult with the undergraduate staff adviser in the department for more information. Often students are in their junior year of study when they participate in this option.

Civil Engineering Undergraduate Program
The Civil Engineering program is accredited by the Engineering Accreditation Commission of ABET; see http://www.abet.org.

Students are encouraged to adhere carefully to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisite requirements have not been completed. Exclusive of General Education units, the minimum number of units required for the Civil Engineering major is 153 (77 units in lower division and 76 units in upper division).

Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
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<tbody>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
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<tr>
<td>Mathematics 22A-22B</td>
<td>6</td>
</tr>
<tr>
<td>Physics 1A-1B-1C and choice of Physics 9D, 10A or 11A</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry 2C, Biological Science 2A or 3A</td>
<td>4</td>
</tr>
<tr>
<td>Geology 50-50L</td>
<td>12</td>
</tr>
<tr>
<td>Chemistry 2A-2B or 2AH-2BH</td>
<td>10</td>
</tr>
<tr>
<td>Civil and Environmental Engineering 3</td>
<td>8</td>
</tr>
<tr>
<td>Civil and Environmental Engineering 3 is designed for lower division students and is not open to upper-division students. Students taking this course will substitute four units of additional upper-division Civil and Environmental Engineering coursework.</td>
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</tbody>
</table>

Upper Division Requirements: Areas of Specialization

Undergraduates may emphasize one or more of the following areas of specialization, or generalize across all areas. You are urged to consult a departmental adviser when developing your individual program. Additional information on areas of specialization and potential faculty advisers can be obtained from the College of Engineering Bulletin and the departmental website.

Environmental Engineering. The focus of this area is on the management and improvement of air, land, and water quality in the face of increasing population, expanding industrialization, and global warming. Examples of environmental engineering problems include innovative analysis and design of air, water, wastewater, and solid waste treatment systems; mathematical modeling of natural and engineered systems; sampling, and transport and transformation of natural and anthropogenic pollutants; and modeling of air pollutant emissions.


Geotechnical Engineering. This area deals with civil infrastructure and environmental problems that require quantifying the behavior of geologic materials, as well as soils and rocks. Examples of geotechnical engineering problems include foundations for buildings and bridges, earthwork (such as dams, tunnels, highways), earthquake hazards (such as foundations, liquefaction, soil-structure interaction), and geo-environmental problems (ground water flow, subsurface contaminant transport and remediation).

Suggested Advisers. R. W. Boulanger, Y. F. Dihesoo, J. T. Delong, J. T. Harvey, B. Jeremic, B. L. Kutter

Structural Engineering and Structural Mechanics. The focus of this area is the conception, design, analysis, construction, and life-cycle modeling of all types of civil infrastructure, including buildings, bridges, dams, ports, highways, and industrial facilities. Structural materials include metals, reinforced concrete, timber, and advanced composites. Loads range from earthquakes to adverse environmental conditions. Structural mechanics emphasizes theoretical and computational tools that may be used in structural engineering.


Transportation Planning and Engineering. This area deals with the movement of people and goods in a manner consistent with society’s environmental (such as air and water quality) and socio-economic (such as equity and mobility) goals. Transportation engineering applies engineering, economic, and behavioral science principles to the planning, analysis, design, and operation of transportation systems, such as highways, transit, and air travel. Transportation planning involves the formulation and analysis of transportation policy, program, and project alternatives in consideration of societal goals, budgetary constraints, economic objectives, and technological feasibilities.


Water Resources Engineering. This area includes hydrology, hydraulics, fluid mechanics, and water resources systems planning and design. Hydrology deals with quantifying and understanding all aspects of the hydrologic cycle, including the relationships between precipitation, runoff, ground-water, and surface water. Water quality and contaminant transport issues are linked to all aspects of water resources management. Hydraulics and fluid mechanics deal with flows in pipes, conduits, open-channel systems, and natural systems, such as lakes and estuaries. Water resources systems planning and design deals with the comprehensive development and analysis of water resources to meet the multiple needs of industry, agriculture, municipalities, recreation, and other activities.


Civil Engineering

Upper Division Required Courses

<table>
<thead>
<tr>
<th>Engineering</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>102</td>
<td>104</td>
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<td>104</td>
<td>104</td>
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<td>106</td>
<td>105</td>
</tr>
</tbody>
</table>

Quarter Offered: Fall, Winter, Spring, Summer.
Civil and Environmental Engineering 114, 190.............. 6 One course from Civil and Environmental Engineering 115, 153; Mathematics 118A; or Statistics 108........................................ 4 A minimum of four of the following group options (a minimum of two courses in each of the four areas Courses listed in more than one group may be counted only once...... 30* Environmental: Civil and Environmental Engineering 148A or 149 and at least one course from Civil and Environmental Engineering 140, 143, 148B, 150 Geotechnical: Civil and Environmental Engineering 171 and 171 Lab and at least one course from Civil and Environmental Engineering 173, 175, 179 Structures: Civil and Environmental Engineering 130 and at least one course from Civil and Environmental Engineering 131, 132, 135 136, 137, 138, 139 Transportation: Civil and Environmental Engineering 161, 162 or 179 and at least one course from Civil and Environmental Engineering 161, 162, 163, 165, 179 Water Resources: Civil and Environmental Engineering 141 and 141 Lab and at least one course from Civil and Environmental Engineering 142, 144, 145, 146, 155 Senior Design Requirement: You must complete one of the following courses as part of the Group Option or Civil & Environmental Engineering elective requirement: Civil & Environmental Engineering 127, 128, 143, 148A, 149, 153, 162, 165, Engineering Applied Science 188, Anthropology 104N, 191, Agricultural and Resource Economics 175, 176, Atmospheric Science 116, Community and Regional Development 142, 154, 172, Environmental Science and Policy 161, 162, 172, 191, Environmental Toxicology 101, 102A, Geology 130, 134, Landscape Architecture 180**, Nature and Culture 120, Plant Sciences 101, 141, 150, 162, may include Landscape Architecture 3........... 12 *Student enrollment requests will be reviewed by the instructor to ensure that a balanced group of students with different experience, majors or expertise are able to enroll. ** Due to variability in series course offering, consent of minor advisor is required.

Minor advisors: J. Darby, J.T. Harvey, J. Lund

Sustainability in the Built Environment Minor

All courses must be taken for a letter grade. A grade of C- or better is required for all courses used to satisfy minor requirements with an overall GPA in minor requirement courses of 2.00 or better.


To pre-apply to this minor program offered by Civil and Environmental Engineering, find full details regarding admission and completion in the Application Form available from the department website or the undergraduate staff adviser in 2045 Haussi Hall. All courses must be taken for a letter grade. A grade of C- or better is required for all courses used to satisfy minor requirements with an overall GPA in minor requirement courses of 2.00 or better.

Minor Requirements:

Construction Engineering and Management

Twelve units from: Civil and Environmental Engineering 179, Agricultural and Resource Economics 112, 155, 157, 171A, 171B, Economics 134, 162, may include one course from Agricultural and Resource Economics 18, Management 111, 118. 12

Minor advisors: J. Darby, J.T. Harvey, J. Lund

Sustainability in the Built Environment Minor

All courses must be taken for a letter grade. A grade of C- or better is required for all courses used to satisfy minor requirements with an overall GPA in minor requirement courses of 2.00 or better.


*Student enrollment requests will be reviewed by the instructor to ensure that a balanced group of students with different experience, majors or expertise are able to enroll. ** Due to variability in series course offering, consent of minor advisor is required.

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The Graduate Program in Civil and Environmental Engineering

M.S. and Ph.D.; Designated Ph.D. emphasis available in Biotechnology

http://cee.engr.ucdavis.edu 530-752-1441 With over thirty faculty members, over 200 million in annual research expenditures and over 240 graduate students, the Department of Civil and Environmental Engineering integrates research, education and professional service in areas related to civil infrastructure and the environment. Graduate students benefit from close working relationships with professors who are the leading international experts in their field. They are supported in their study and research by robust funding, and they have access to state-of-the-art research centers. For example, one of the experimental laboratories that constitutes NEEES, the Network for Earthquake Engineering Simulation, http://nees.ucdavis.edu, has the largest centrifuge of its kind in the nation and gives researchers access to their peers at other unique centers via high-speed networks. Since 1960, researchers at the J. Amorocho Hydraulics Laboratory (JAHIL) have served the state of California by solving ecological, biological, environmental and hydraulic engineering problems. Students may also have the opportunity to work in one of the many state of the art environmental engineering labs or the structural testing facilities in the department. Our graduates go on to serve the profession and academia by advancing the leading edge of fundamental knowledge, as well as engineering practice. Generous financial support is available in the form of research assistantships, teaching assistantships, fellowships and financial aid. About 75% of the graduate students in our program are either fully or partially supported.

Research Highlights:

- Alternative fuel transportation infrastructure
- Earthquake engineering
- Environmental engineering
- Environmental planning and management
- Geotechnical engineering
- Hydraulics and fluid mechanics
- Hydrology
- Structural engineering
- Structural health monitoring
- Structural mechanics
- Systems planning and design
- Transportation engineering
- Transportation planning and design
- Water resources engineering

Research Facilities and Partnerships:

- Center for Watershed Sciences
- Center for Water-Energy Efficiency
- Institute of Transportation Studies
- J. Amorocho Hydraulics Laboratory (JAHIL)
- Nano-Engineering and Smart Structures Technologies
- NSF NEES Geotechnical Centrifuge
- Pavement Research Center
- Tahoe Environmental Research Center
- Western Cooling Efficiency Center

Complete Information on our website.

Courses in Engineering: Civil and Environmental (ECI)

Lower Division

3. Introduction to Civil and Environmental Engineering Systems

Lecture—3 hours, laboratory—3 hours. Prerequisite: Mathematics 21A [may be taken concurrently]. Restricted to lower division students; Civil Engineering majors during Pass 1. Introduction to civil engineering systems. General view of the engineering process as obtained by participation in laboratory experiments. Course available basis. Credit: GE credit: SciEng | QL, SE—II. (I.) Darby

16. Spatial Data Analysis (2)

Lecture—1 hour, laboratory—3 hours. Restricted to Civil Engineering and Biological Systems Engineering majors; non-majors accommodated on a space-available basis. Course available basis. Credit: GE credit: SciEng | QL, SE—II. (I.) Fan

17. Surveying (2)

Lecture—2 hours. Prerequisite: Physics 9A [may be taken concurrently]. Restricted to Civil Engineering and Biological Systems Engineering majors. Non-majors accommodated on a space-available basis. Credit: GE credit: SciEng | QL, SE—II. (I.) Fan

19. C Programming for Civil and Environmental Engineers (4)

Lecture—3 hours, laboratory—3 hours. Prerequisite: Mathematics 21A [may be taken concurrently]. Pass 1 open to Civil Engineering majors and Optical Science and Engineering majors. Credit: GE credit: SciEng | SE—III. (III.) Fan

90X. Lower Division Seminar (1-4)

Seminar—1-4 hours. Prerequisite: consent of instructor. Examination of a special topic in a small group setting. May be repeated for credit. Credit: GE credit: SciEng | SE

92. Internship in Engineering (1-5)

Internship. Prerequisite: lower division standing; approval of project prior to period of internship. Supervised work experience in civil engineering. Credit: GE credit: SciEng | SE
114. Probabilistic Systems Analysis for Civil Engineers (4) Lecture—4 hours. Prerequisite: C or better in Mathematics 21C. Probabilistic concepts and models in engineering, including analysis of engineering experimental and field data. Introduction to stochastic processes and models of engineering systems. Not open for credit to students who have completed course 107. GE credit: SciEng | QL, SE.—I, II, III, IV. [I, II, III]
115. Computer Methods in Civil & Environmental Engineering (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: C programming or consent of instructor. Fundamentals of numerical algorithms and computer models for solving practical problems in Civil and Environmental Engineering. GE credit: SciEng | SE.—II, III, IV. [III, IV] Yonnis
119. Parallel Processing for Engineering Applications (4) Lecture—4 hours; laboratory—3 hours. Prerequisite: C programming or consent of instructor. Fundamentals of parallel computing for engineering applications; emphasis on structured parallel programming and memory parallel clusters. Not open for credit to students who have completed course 119B. Offered in alternate years. GE credit: SciEng | SE—Kleeman, Jeremic
123. Urban Systems and Sustainability (4) Lecture—4 hours; prerequisite: upper division standing. Systems-level approach of how to evaluate and then modify sustainability of urban systems based on interaction with natural environments. Topics include: definition/metrics of urban sustainability; system analyses of urban systems; enabling technology, policies, legislation, measures and modification of ecological footprints. GE credit: SciEng or SocSci, Div, Wrt | AGCH, DD, SE, SS, WE — Kendall
125. Building Energy Performance (4) Lecture—4 hours. Prerequisite: upper division standing in Engineering. Open to students in the College of Engineering. Mechanisms of energy consumption in buildings including: thermal loads, ventilation, air infiltration, thermal energy distribution, and HVAC systems; energy performance simulation; methods and strategies of energy efficiency. GE credit: SciEng | SE—Modena
126. Integrated Planning for Green Civil Systems (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: Physics 9C or Landscape Architecture 60 or Design 145 or Environmental Science and Policy 100 or Nature and Culture 120 or Anthropology 100 or Statistics 32 or Plant Sciences 101; consent of instructor. Working within multidisciplinary teams, a heuristic approach and multiple realistic constraints, an integrated design process will be applied to the planning of a project-based green and sustainable civil system. GE credit: SciEng | SE—II, III, IV. [II, III, IV] Kendall, Lorge
127. Integrated Design for Green Civil Systems: Senior Design Experience (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 126; consent of instructor. Restricted to senior level standing. Working within multidisciplinary teams and a heuristic, project-based learning environment, a green and sustainable civil system will be designed. Evaluate various design options under architectural, environmental, and economic constraints, and present designs through oral and written presentations. GE credit: SciEng | SE—II, III, IV. [III, IV] Kendall, Lorge
128. Integrated Construction for Green Civil Systems (4) Lecture—2 hours; laboratory—6 hours. Prerequisite: course 127. Working within multidisciplinary teams, a heuristic learning environment, and multiple realistic constraints, an integrated design process will be applied to the construction of a project-based green and sustainable civil system. Offered irregularly. GE credit: SciEng | SE—Kendall, Lorge
130. Structural Analysis (4) Lecture—4 hours. Prerequisite: C or better in Engineering 104, Mathematics 22A. Open to Civil Engineering majors only. Analysis of indeterminate and determinate trusses, beams and frames. Plastic bending and limit analysis. GE credit: SciEng | QL, SE.—I, III, IV. [I, II, III]
131. 0-1000 Structural Analysis (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: C or better in Engineering 104; Engineering 6. Open to Engineering majors only. Matrix formulation and computer analysis of statically indeterminate structures. Stiffness, force and displacement solutions. Elastic structures. Finite element methods for elasticity and bending problems. Offered irregularly. GE credit: SciEng | SE
132. Design Structural: Metallic Elements (4) Lecture—4 hours. Prerequisite: course 130. Design of metallic beams, columns, and other members for various types of loading and boundary conditions; design of columns; member performance within structural systems. GE credit: SciEng | SE, VL—II, III. [II, III] Bolander, Kanvinde
135. Structural Design: Concrete Elements (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 130. Restricted to Civil Engineering, Civil Engineering/Materials Science and Engineering, and Materials Science and Engineering majors only. Strength design procedures for columns, rebar, beams, Beams and beams of general cross-section. Building code requirements for bending, shear, axial load, combined stresses and bond. Introduction to prestressed concrete. GE credit: SciEng | QL, SE—II, III. [II, III] Chai
136. Building Design: Senior Design Experience (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 130 or 131; course 135 or 132. Restricted to senior level standing. Design of a building structure for a specific need under the multiple constraints of safety, serviceability, cost and aesthetics. Offered irregularly. GE credit: SciEng | QL, SE—II, III. [II, III] Kavvas
138. Earthquake Loads on Structures (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 130 or 131. Determination of loads on structures due to earthquake forces. Methods of estimating equivalent static lateral forces; response spectrum and time history analysis. Concepts of mass, damping and stiffness for typical structures. Design for inelastic behavior: Interaction of plastic zones and Code requirements. GE credit: SciEng | SE—Kunnath
139. Advanced Structural Mechanics (4) Lecture—4 hours. Prerequisite: C or better in Engineering 104. Review of stress, strain, equilibrium, compatibility, and elastic material behavior. Plane stress and plane strain problems in elasticity; energy methods. Theories for unsymmetric bending, straight and curved beams. Beams on elastic foundations; stresses in plates and shells; elastic stability. GE credit: SciEng | SE—II. [II] Rashid, Sukumar
140L. Environmental Analysis of Aquatic Systems Laboratory (1) Lecture—3 hours. Prerequisite: Chemistry 2B or third quarter; course 140 may be taken concurrently. Restricted to Civil Engineering undergraduate and graduate students. Introduction to “wet chemical” and instrumental techniques commonly used in the examination of water and wastewater and associated data analysis. GE credit: SciEng | SE
141L. Engineering Hydraulics Laboratory (1) Lecture—3 hours. Prerequisite: course 141 (may be taken concurrently). Open to Engineering students only. Laboratory experiments and demonstration on flow measurements and modeling. Flood flow through channels and reservoirs. Frequency analysis of hydrologicprecipitations. Precipitation analysis for hydrologic design. Hydrologic design. GE credit: SciEng | QL, SE—II. [II] Kavvas
143. Green Engineering Design and Sustainability (4) Lecture—4 hours. Prerequisites: course 141. Groundwater occurrence, distribution, and movement; groundwater flow systems; radial flow to wells and aquifer test characterization; groundwater contamination; solute transport by groundwater; fate and transport of subsurface contaminants. Groundwater supply and transport modeling. GE credit: SciEng | QL, SE, SS, WE—II, III. [I, II, III]
144L. Groundwater Systems Design Laboratory (1) Laboratory—3 hours. Prerequisite: course 144, taken concurrently. Computer modeling of groundwater systems using sampling programs, well injection/withdrawal, and natural and engineered secondary conditions. Use of Groundwater Vistas computer program. —Ginn
145. Hydraulic Structure Design: Senior Design Experience (4) Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: C or better in course 141. Restricted to senior level standing. Project-based course covering the design of an integrated urban drainage system, including design of alternatives, multiple realistic constraints (public...
strategies to satisfy multiple constraints including cost, effectiveness and environmental sustainability. Oral, poster or final report required. GE credit: SciEng | SE, SL.—III. (III.) Niemier

163. Energy and Environmental Aspects of Transportation (4)
Lecture—3 hours; extensive writing. Prerequisite: Economics 1A, Introduction to physical, biological and chemical processes in natural waters. Fundamentals of mass balances in water and waste water treatment. GE credit: SciEng | SE. —II. (II.) Wurtz, Young

148A. Water Quality Management (4)
Lecture—4 hours. Prerequisite: C- or better in Chemistry 2B. Basic concepts of water quality measurement and regulation. Design drawings and specifications and cost analysis. Offered irregularly. GE credit: SciEng | SE.—III. (III.) Younis

164. Water Resources Simulation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103. Computer simulation techniques in the analysis, design and operation of surface water systems; modeling concepts and practices with application to surface runoff, water quality in rivers and streams and dispersion of contaminants in water bodies. GE credit: SciEng, Wrt | SE.—II.—II. (II.) Younis

148B. Water and Wastewater Treatment System Design: Senior Design Experience (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in Engineering 103 and course 148A. Restricted to senior level standing. Design and evaluation of water and wastewater treatment systems. GE credit: SciEng | QL, SE, VL.—II, VI. —III. (III.) Darby

149. Air Pollution (4)
Lecture—4 hours; discussion—1 hour. Prerequisite: Mathematics 21D, 228, Chemistry 2B, Atmospheric Science 121A or Engineering 103. Physical and technical aspects of air pollution. Emphasis on geo- physical control of air pollution meteorology as well as physical and chemical properties of pollutants. [Same course as Atmospheric Science 149.] GE credit: SciEng | QL, SE, SL.—I. (I.) Cappa

150. Air Pollution Control System Design: Senior Design Experience (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103, 105, 106; course 149. Restricted to senior level standing. Design and evaluation of air pollution control devices and systems. GE credit: SciEng | SE.—II. (II.) Cappa

153. Deterministic Optimization and Design (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Mathematics 21C and 22A; computer programming course. Optimization for engineering decision making; optimization techniques such as linear programming, dynamic programming, and non-linear programming. Applications in engineering disciplines, including multiple realistic problems, through computer-based course projects. GE credit: SciEng | QL, SE, SL.—I. (I.) Fan

155. Water Resources Engineering Planning (4)
Lecture—4 hours. Prerequisite: Engineering 106 or Economics 1A; course 114. Basic engineering planning concepts; role of engineering, economic, environmental social and information analysis; institutional, political and legal aspects. Case studies and computer models illustrate the planning of water resource systems. GE credit: SciEng or SocSci, Wrt | SE, SL.—I, II, III. —I. (I.) Lund

161. Transportation System Operations (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 6 (or the equivalent) and 102. Principles of transportation system operations; traffic control and density of measurement of transport models of transportation operations and congestion applied to urban streets and freeways. GE credit: SciEng | QL, SE.—II. (II.) Zhang

162. Transportation Land Use Sustainable Design: Senior Experience (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in course 161 or 163. Restricted to senior level standing. Interactions between land use and transportation systems design. Generalized design guidelines and computer-based solutions for transportation land use. Students will select from various strategies to satisfy multiple constraints including cost, effectiveness and environmental sustainability. Oral, poster or final report required. GE credit: SciEng | SE, SL.—III.—III. (III.) Niemier

Hydrologic Engineering; (C) Geotechnical Engineering; (D) Geotechnical Engineering; (E) Structural Engineering; (F) Transportation Engineering; (G) Traffic and Transportation Engineering; (H) Transportation Planning; (I) Water Resources Engineering; (J) Water Resources Planning. May be repeated for credit when the topic is different. GE credit SciEng | SE.—I, II, III, I, II, III

190. The Civil Engineer in Society (2)
Lecture—1 hour; laboratory—3 hours. Open to upper division Civil Engineering majors. The Civil Engineering profession; introduction to concepts in business, management, economics, and career; introduction to professional organizations; introduction to the history of the Civil Engineering profession including the importance of professional licensure and a discussion of professional ethical and societal issues related to civil engineering. GE credit: SciEng | SS.—II. (II.) Kunneth

190C. Research Group Conferences in Civil and Environmental Engineering (1)
Discussion—1 hour. Prerequisite: upper division standing in Civil and Environmental Engineering; consent of instructor. Research group conferences. May be repeated for credit. (P/NP grading only.) GE credit: SE.—I, II, III, I, II, III

192. Internship in Engineering (1-5)
Internship. Prerequisite: upper division standing; approval of project plan and written consent of the internship. Supervised work experience in civil engineer- ing. May be repeated for credit. (P/NP grading only.) GE credit: SE.

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: senior standing in engineering and at least a B average. (P/NP grading only.) GE credit: SE.

Graduate

201. Introduction to Theory of Elasticity (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 104. Fundamental equations of elasticity in three dimensions; plane stress and plane strain; flexure and torsion of bars of various shapes. Intro- duction to variational and approximate methods.—I. (I.) Rashid

203. Inelastic Behavior of Solids (3)
Lecture—3 hours. Prerequisite: course 201. Funda- mentals of theories of plasticity, viscoelasticity and viscoplasticity for solids. Stress analysis; constitutive modelling for engineering materials, e.g., metals, polymers, soils, etc., and microscopic motivation. Offered in alternate years.—Dafalias

205. Continuum Mechanics (5)
Lecture—2 hours. Prerequisite: course 201. Tensor formulation of the field equations for continuum mechanics, including large deformation effects. Invariance and symmetry requirements. Introduction to nonlinear thermoelasticity and thermodynamics. Solution of three-dimensional problems. Selected top- ics. Offered in alternate years.—Dafalias

206. Fracture Mechanics (4)
Lecture—4 hours. Prerequisite: course 201; Engi- neering 104. Linear and nonlinear fracture mechan- ics, stress analysis, energy concepts, brittle fracture criteria, path independent integrals, Dugdale- Barenblatt model, general cohesive zone models, ductile fracture criteria, crack tip fields, fracture mechanics, energy and propagating cracks, fatigue. Application of numeri- cal methods for fracture mechanics. Offered in alter- nate years.—Rashid

211. Advanced Matrix Structural Analysis (4)
Lecture—4 hours. Prerequisite: course 131. Analysis of complex frameworks by the displacement method; treatment of tapered beams, curved beams, and beams on elastic foundations; partial rigidity connec- tions; geometric and material nonlinearities; buck- ling; flexibility-based formulations; FEM-software for nonlinear analysis of structures.—I. (I.) Kunnath

212B. Finite Elements: Application to Linear and Nonlinear Structural Mechanics Problems (4) Lecture—4 hours. Prerequisite: course 212A. Application to linear and nonlinear structural mechanics problems. Linear elasticity, weak form, and finite element approximation. Incompressible material problems. Non-linear problems with material non-linearity.—III. (III.) Sukumar

213. Analysis of Structures Subjected to Dynamic Loads (4) Lecture—4 hours. Prerequisite: course 211 [may be taken concurrently]. Analysis of structures subjected to earthquake, wind and blast loading; distributed, consistent and lumped mass methods; computer implementation; nonlinear response spectrum; frequency and time domain analysis; seismic protection of structures; numerical methods in linear and nonlinear structural dynamics.—I. (I.) Kunath

221. Theory of Plates and Introduction to Shells (3) Lecture—3 hours. Prerequisite: course 201 [may be taken concurrently]. Development of classical and refined plate theories. Application to isotropic, orthotropic and composite plates. Solution of rectangular and circular plates. Membrane theory for axisymmetric shells and bending of circular shells.

223. Advanced Dynamics, Signal Processing, and Smart Structures Technology (4) Lecture—4 hours. Prerequisite: course 213 or equivalent. Signal processing and system identification of structures under dynamic excitations; Fourier and Laplace transforms; data acquisition and sensor design fundamentals; sensor technologies/techniques for nondestructive evaluation; structural control; actuators and dampers for smart structures; piezoelectric and acousto-optic emissions; micro- and nano-fabrication.—II. (II.) Loh

232. Advanced Topics in Concrete Structures (4) Lecture—4 hours. Prerequisite: course 130, 135, 138 and 139, and graduate standing. Ductility of reinforced concrete; strength of two-way slabs; modified compression field theory.—I. (I.) Chai

233. Advanced Design of Steel Structures (4) Lecture—4 hours. Prerequisite: courses 130 or 131, 132. Review of Load and Resistance Factor Design (LRFD); steel plate girder design; plastic design of indeterminate systems; moment frames and bracing systems; connection design; seismic design of steel structures; vibration of floating systems; steel-concrete composite design.—III. (III.) Kanvinde

234. Prestressed Concrete (4) Lecture—4 hours. Prerequisite: courses 130 or 131, 132. Survey of methods and applications: prestressing materials and systems; prestress losses; flexural design; design for shear and torsion; deflection control and control; continuous beams and indeterminate structures; partial prestressing; design of compression members; strut-and-tie models. Offered in alternate years.—Bolander

235. Cement Composites (4) Lecture—3 hours, laboratory—3 hours. Prerequisite: Engineering 21A or 115. Compositions of cement composites; materials selection and proportioning; component and composite properties; hydration reactions and microstructure development; mechanisms of failure; frost-resistance; fiber reinforcement; concrete durability; novel reinforcing materials; fly ash and recycled materials; non-metallic reinforcing; repair and retrofit technologies; applications to structural design. Offered in alternate years.—II. (II.) Young


237. Bridge Design (4) Lecture—4 hours. Prerequisites: courses 130, 135; course 234 recommended. Open to graduate students only. Bridge and construction characteristics; design philosophy, details according to Caltrans and American Association of State Highway and Transportation Officials codes, principles; steel, prestressed concrete, and modular bridges; modern bridges using advanced fiber reinforced polymer composites; fieldtrip required.—III. (III.) Cheng


240. Water Quality (4) Lecture—4 hours. Prerequisites: courses 141 and 142. Quality requirements for beneficial uses of water. Hydrologic cycle of quality. Hydromechanics in relation to quality of surface and groundwaters; transport and fate of waterborne pollutants. Heat budget for surface waters; predictive methods; introduction to water quality modeling.—II. (II.) Schladow

241. Environmental Reactive Chemical Transport Modeling (4) Lecture—4 hours. Prerequisite: Chemistry 2A, or Chemistry 2B, or course 149, or equivalent. Modeling of reactive chemical transport in air and water including kinetic reactions, equilibrium reactions, and phase partitioning. Emphasis on numerical solution schemes and programming techniques to provide deeper insight into model performance and limitations. Offered in alternate years.—III. Kleeman

242. Air Quality (4) Lecture—4 hours. Prerequisite: Engineering 105, course 149, or equivalent. Factors determining air quality. Effects of air pollutants. Physical and chemical fundamentals of atmospheric transport and reaction. Introduction to air quality modeling. Offered in alternate years.—III. (III.) Kleeman

243A. Water and Waste Treatment (4) Lecture—4 hours. Prerequisite: course 148A or the equivalent. Characteristics of water and airborne wastes; treatment processes and process kinetics; treatment system design.—I. (I.) Young

243B. Water and Waste Treatment (4) Lecture—4 hours. Prerequisite: course 243A. Continuation of course 243A. Aeration, thickening, biological processes, design of biological treatment systems.—II. (II.) Young

244. Life Cycle Assessment for Sustainable Engineering (4) Lecture—4 hours. Prerequisite: graduate standing. Life cycle assessment methodology is taught emphasizing applications to infrastructure and energy systems. Life cycle design, life cycle cost methods, other tools from industrial ecology, and links to policy are covered as well.—I. (I.) Kendall

245A. Applied Environmental Chemistry: Inorganic (4) Lecture—3 hours, discussion—1 hour. Prerequisite: Engineering 105, Chemistry 2B or the equivalent, course 140, Chemistry 2C or 107A recommended. Chemistry of natural and polluted waters. Topics include chemical, kinetic and equilibrium principles, redox reactions, gas solubility and solid-solution equilibria, thermodynamics, carbonate systems, condensation chemistry, interface, and biological phenomena. Offered in alternate years.—(II.) Young

245B. Applied Environmental Chemistry: Organic (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 128A, 128B, 128C, or the equivalent; Chemistry 2C or 107A recommended. Transport and transformation of organic chemicals in the environment. Topics include application of thermody- namics to predict solubility and activity coefficients; distribution of organic chemicals between the aqueous phase and air, soil, or solid phases; chemi- cal, photothermal and biological transformation reactions. Offered in alternate years.—(III.) Young

246. Pilot Plant Laboratory (4) Lecture—1 hour; discussion—1 hour; laboratory—6 hours. Prerequisite: course 243A, 243B (may be taken concurrently) or consent of instructor, graduate standing. Laboratory investigation of physical, chemical, and biological processes for water and waste water treatment.—II. (II.) Darby

247. Aerosols (4) Lecture—4 hours. Prerequisite: Engineering 103, 105, course 141, 149. Behavior of airborne particles including particle formation, modification, and removal processes. Offered in alternate years.—III. Kleeman

247L. Aerosols Laboratory (4) Lecture—2 hours; laboratory—6 hours. Prerequisite: course 247. Methods of generation and characterization of aerosols. Detailed topics may include flow rate measurement, aerosol scattering, and collection, ions measurement, metals measurement, and carbon measurement. May be repeated one time for credit.—Kleeman

248. Biofilm Processes (4) Lecture—4 hours. Prerequisite: Soil Science 111 or 211 or course 243B or consent of instructor; calculus and basic cell molecular biology recommended. Natural and engineered biofilms, including biofilm occurrence and development, spatial structural microbial processes, fundamental and applied research tools, biofilm reactors, beneficial uses, and detrimental effects.—Wuerz

249. Probabilistic Design and Optimization (4) Lecture—4 hours. Prerequisite: Mathematics 21C, 22A, programming course; Applied Science Engineering 115 and mathematical modeling course recommended. Applied mathematics with a focus on modeling, identifying, and controlling dynamic, stochastic, and underdetermined systems. Applications in civil engineering design, project evaluation, and risk management. Offered in alternate years.—II. Lund

250. Civil Infrastructure System Optimization and Identification (4) Lecture—4 hours. Prerequisite: Mathematics 21C, 22A, programming course; Applied Science Engineering 115 and mathematical modeling course recommended. Applied mathematics with a focus on modeling, identifying, and controlling dynamic, stochastic, and underdetermined systems. Applications in civil engineering design, project evaluation, and risk management. Offered in alternate years.—III. Fan

251. Transportation Demand Analysis (4) Lecture—4 hours. Prerequisite: course 114 or the equivalent. Procedures used in urban travel demand forecasting. Principles and assumptions of model components (trip generation, trip distribution, model split). New methods of estimating travel demand. Computer exercises using empirical data to calibrate models and forecast travel demand.—II. (II.) Nieennie

252. Sustainable Transportation Technology and Policy (3) Lecture—2 hours; discussion—1 hour. Prerequisite: course 165. Role of technical fixes and demand management in creating a sustainable transportation system. Emphasis on technology options, including
253. Dynamic Programming and Multistage Decision Processes (4)

254. Discrete Choice Analysis of Travel Demand (4)
Lecture—4 hours. Prerequisite: course 114. Behavioral and statistical principles underlying the formulation and estimation of discrete choice models. Practical application of discrete choice models to characterization of choice behavior, hypothesis testing, and forecasting. Emphasis on computer exercises using real-world data sets. (Same course as Geography 279.) —III. (III) Mokhtarian

256. Urban Traffic Management and Control (4)
Lecture—4 hours. Prerequisite: course 114. Basic concepts and models related to the branch of traffic science that deals with the movement of vehicles on a road network, including travel speed, travel time, congestion concepts, car-following, and freeway models. —II. (II) Chang

257. Flow in Transportation Networks (4)
Lecture—4 hours. Prerequisite: course 153; 161 or 256 recommended. Elements of graph theory, a survey of pertinent optimization techniques, extremal principles in network flow problems, deterministic equilibrium assignment, stochastic equilibrium assignment, extensions of equilibrium assignments and dynamic transportation network assignment. —II. (II) Lund

258. Transportation Planning in Developing Countries (3)
Lecture—3 hours. Prerequisite: course 160 or consent of instructor. Investigation of the role that transportation investments and policies play in the development of regions and countries. Emphasis is on identifying appropriate technologies, policies, and planning methods for designing transportation systems in nations of differing socioeconomic, geo-graphic, and institutional settings. Offered in alternate years. —III. (III) Sperring

259. Asphalt and Asphalt Mixes (4)
Lecture—4 hours. Prerequisite: course 179 or consent of instructor. Analysis of asphalt mixes and their use in civil engineering structures, with primary emphasis on pavements. Asphalt, aggregate properties and effects on mix properties. Design, construction, recycling, recent design and performance research. Offered in alternate years. —II. (II) Harvey

260. Sediment Transport (4)
Lecture—4 hours. Prerequisite: course 141 or equivalent. Sediment transport in hydrologic systems. Processes of sediment movement, which will emphasize how sediment moves and the physical processes that affect sediment transport. Field trip. Offered in alternate years.

264A. Transport, Mixing and Water Quality in Rivers and Lakes (4)
Lecture—4 hours. Prerequisite: course 141 and 240. Principal causes of mixing and transport in rivers, lakes and reservoirs, and their impacts on water quality. Freshwater/saltwater interface in coastal aquifers. Sediment moves and the physical processes that affect sediment transport. Field trip. Offered in alternate years. —Schladow

264B. Transport, Mixing and Water Quality in Estuaries and Wetlands (4)
Lecture—4 hours. Prerequisite: courses 141 and 240. Principal causes of mixing and transport in estuaries and wetlands, and their impacts on water quality. Topics include advection/diffusion; tides; transverse mixing; longitudinal dispersion; sediment transport; nutrient cycling; computer modeling of estuaries. Coastal and riverine systems. Offered in alternate years. —Schladow

265. Stochastic Contaminant Transport (4)

266. Applied Stochastic Methods in Engineering (4)
Lecture—4 hours. Prerequisite: courses 114 or Mathemat ics 131 or Statistics 130A or 131A. Mathematics 118A (may be taken concurrently). Stochastic processes classification; Gaussian random fields; stochastic calculus in mean square; Ito and Stratonovich representations; Fokker-Planck equation; stochastic differential equations with random coefficients. Offered in alternate years. —Kavvas

267. Water Resource Management (3)
Lecture—3 hours. Prerequisite: courses 114, 141, and 142; course 153 recommended. Engineering in the context of development and management. Uses of computer modeling to improve water management. —Same course as Geography 272.)—I. (I) Lund

268. Infrastructure Economics (3)
Lecture—3 hours. Prerequisite: Economics 1A, En gineering 106 or the equivalent. Economics applied to infrastructure engineering planning, operations, maintenance, and management problems; microeconomic and macroeconomic theories; benefit-cost analysis; effect of uncertainty; optimization economics; non-classical economics; public finance. Offered in alternate years. —Lund

269. Transportation-Air Quality: Theory and Practice (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 149 or the equivalent. Health and regulatory aspects of airborne pollutants. Principles of modeling vehicle emissions. Conformity issues and the regula-tory framework. Regional and micro-scale modeling. Offered in alternate years. —Niemeier

270. Advanced Water Resources Management (3)
Lecture—3 hours. Prerequisite: courses 153 and 267 or the equivalent. Discussion of technical papers related to planning theory, system maintenance, regionalization, multi-objective methods, risk analysis, invariant optimization formulation, economic development, forecasting, operations, and other topics. Offered in alternate years. —Lund

271. Inverse Problems (4)
Lecture—4 hours. Prerequisite: courses 114 and 144 or equivalents. Inverse calibration of distributed parameter models, using data representing model outputs. Forward and inverse mappings, stability, uniqueness and sensitivity. Optimization formulation of inverse problems, maximum likelihood and other objective functions, indirect and direct approaches, solution by UCODE in hands-on project format. —I. (I) Ginn

272A. Advanced Hydrogeology (4)

272B. Advanced Hydrogeology (4)

272C. Multiphase Reactive Transport (4)
Lecture—4 hours. Prerequisite: courses 142, 144, 148A. Multicomponent, multistate fluid flow and transport in geological systems. Reactions, mass transport, and diffusion mass transfer. Eulerian and Lagran-gean averaging methods. Applications to contami-nation remediation problems in river and subsurface hydrology. Offered in alternate years. —Ginn

273. Water Resource Systems Engineering (3)
Lecture—3 hours. Prerequisite: courses 114 and 153 or the equivalent. Planning, design, and management of water resource systems. Application of deterministic and stochastic optimization techniques. Water allocation, capacity expansion, and design and operation of reservoir systems. Surface water and groundwater management. Offered in alternate years. —I. (I) Lund

275. Hydrologic Time-Series Analysis (4)
Lecture—4 hours. Prerequisite: course 114 and 142. Application of statistical methods for analysis and modeling of hydrologic time series, including spectral analysis and prediction of hydrologic sequences using time series methodology. Offered in alternate years. —III. (III) Kavvas

276. Watershed Hydrology (4)
Lecture—4 hours. Prerequisite: course 142 or the equivalent. Analysis and mathematical modeling of hydrologic processes taking place in a watershed. Precipitation analysis and modeling. Theory of overland flow and its kinematic wave approximation. Analysis and modeling of saturated and unsaturated subsurface flow processes taking place on a hill slope. —II. (II) Kavvas

277A. Computational River Mechanics I (4)
Lecture—4 hours. Prerequisite: Applied Science Engineering 115, course 141 (both may be taken concurrently). Unsteady open channel flows, com-putation of water surface profiles, shallow water equa-tions. St. Venant equations, method of characteristics, finite difference methods, stability and accuracy of explicit and implicit schemes, flood routing in simple and compound channels, advec-tion of plumes. Not open to students who have completed course 277. —I. (I) Younis

277B. Computational River Mechanics II (4)
Lecture—4 hours. Prerequisite: course 277A. Open channel flows, physical aspects of river mechanics, formulation of depth-averaged transport equations, boundary conditions, coordinates transformation and grid gen-eration, finite-difference solution techniques, applica-tions to two-dimensional momentum and pollutant transport in rivers. Offered in alternate years. —III. (III) Younis

277C. Turbulence and Mixing Processes (4)
Lecture—4 hours. Prerequisite: graduate standing. Nature of turbulent flows, conservation equations, momentum, heat, scalar transport, pressure and wall-bounded flows, body forces and mixing, roughness effects, turbulence modeling and simulation. Offered in alternate years. —III. (III) Younis

278. Hydrodynamics (3)

279. Advanced Mechanics of Fluids (4)
Lecture—4 hours. Prerequisite: course 141. Rota-tional flows. Navier-Stokes equations and solutions for laminar flow, boundary layer equations and solu-tions for laminar flow.

280A. Nonlinear Dynamic Finite Elements for Elastic-Plastic Problems (4)
Lecture—4 hours. Prerequisite: consent of instructor. State of the art computational methods and tools for analyzing linear and nonlinear dynamics problems. Offered in alternate years. —III. Jeremic

280B. Nonlinear Dynamic Finite Elements (4)
Lecture—4 hours. Prerequisite: consent of instructor. State of the art computational methods and tools for analyzing linear and nonlinear dynamics problems. Offered in alternate years. —III. Jeremic

281A. Advanced Soil Mechanics (4)

281B. Advanced Soil Mechanics (5)
Lecture—4 hours; laboratory—3 hours. Prerequisite: course 171A. Site investigation and soil characterization within the context of slope stability analysis. —II. (II.) Delong

282. Pavement Design and Rehabilitation (4)
Lecture—4 hours. Prerequisite: course 179 or consent of instructor. Advanced pavement design and structural/functional condition evaluation for concrete and asphalt pavements. Highways, airfields, port facilities; new facilities, rehabilitation, reconstruction. Mechanistic-empirical procedures, materials, climate and traffic characterization. Use of current design methods; recent developments and research. Offered in alternate years. —III. Harvey

283. Physico-Chemical Aspects of Soil Behavior (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 171. Study of the geotechnical behavior of soils considering formation, transport, mineralogy, soil-fluid-electrolyte systems, surface tension, particle mechanics, shape, fabric, and structure. Laboratory exercises demonstrate effects of fundamental interparticle forces (contact, Van Der Waals, capillarity and chemical). Offered in alternate years. —I. Kutter

284. Theoretical Geomechanics (4)

286. Advanced Foundation Design (4)
Lecture—4 hours. Prerequisite: course 173. Design and analysis of pile and pier foundations, including seismic effects; deep excavation systems; tie-back, nailing, and anchor systems; coffer dams; loads on buried conduits; ground modification techniques; and other related topics. —III. (III.) Delong

287. Geotechnical Earthquake Engineering (4)
Lecture—4 hours. Prerequisite: courses 138 and 281A. Characteristic and estimation of earthquake ground motions; effects of fault excavation and local site response; liquefaction potential and remediation; residual strength and stability considerations; ground deformations; dynamic soil-structure interaction. —III.

288. Earth and Rockfill Dams (4)
Lecture—4 hours. Prerequisite: courses 281A and 281B (may be taken concurrently). Site selection; design considerations; layout; seismic effects including consequences of fault movements; construction; environmental considerations, instrumentation; maintenance remediation and retrofit of existing dams. Offered in alternate years. —II. (I-III.) Jeremic

289A-I. Selected Topics in Civil Engineering (1-5)
Lecture, laboratory, or combination. Prerequisite: consent of instructor. Directed group study of special topics with separate sections in (A) Environmental Engineering; (B) Hydraulic and Hydrologic Engineering; (C) Engineering Planning; (D) Geotechnical Engineering; (E) Structural Engineering; (F) Structural Mechanics; (G) Transportation Engineering; (H) Transportation Planning; (I) Water Resources Engineering; (J) Water Resource Planning. May be repeated for credit. —I, II, III, (I, II, III.)

290 Seminar (1)
Seminar—1 hour. Discussion of current graduate research, and guest lectures on recent advances. Oral presentation of individual study. Course required of graduate degree candidates. (S/U grading only.) —I, II, III, (I, II, III.)

290C Graduate Research Group Conference (1)
Discussion—1 hour. Research problems, progress, and techniques in civil engineering. May be repeated for credit. (S/U grading only.) —I, II, III, (I, II, III.)

290T Topics in Water and Environmental Engineering (1)
Seminar—2 hours. Seminars presented by visiting lecturers, UC Davis faculty and, graduate students. May be repeated for credit. (S/U grading only.) —I, II, III, (I, II, III.)

290G Group Study (1-5)
Group Study—1 (S/U grading only.)

299. Research (1-12)
(S/U grading only.)

Professional

390. The Teaching of Civil Engineering (1)
Discussion—1 hour. Prerequisite: meet qualifications for teaching assistant and/or associate in Civil Engineering. Participation as teaching assistant or associate in a designated engineering course. Methods of leading discussion groups or laboratory sections, writing and grading quizzes, use of laboratory equipment and laboratory report. May be repeated for total of 9 units. (S/U grading only.) —I, II, III, (I, II, III.)

390B. Group Study (1-5)
Prerequisite: consent of instructor. (S/U grading only.)

Engineering: Computer Science

(College of Engineering)
Nina Amente, Ph.D., Chairperson of the Department
Department Office. 2063 Kemper Hall
530/752-7004; http://www.cs.ucdavis.edu

Faculty
Nina Amente, Ph.D., Professor
Zhaojun Bai, Ph.D., Professor
Matthew Bishop, Ph.D., Professor
Hao Chen, Ph.D., Associate Professor
Jan Davidson, Ph.D., Associate Professor
Premkumar T. Devanbu, Ph.D., Professor
Matthew Franklin, Ph.D., Professor
Xin Liu, Ph.D., Associate Professor
Karl Levitt, Ph.D., Professor
Lawrence T. Kou, Ph.D., Professor Emeritus
Matthew Bishop, Ph.D., Professor Emeritus
Kwan-Liu Ma, Ph.D., Professor
Pramod Mohapatra, Ph.D., Professor
Zhendong Su, Ph.D., Associate Professor
Charles U. Martel, Ph.D., Professor
Norman S. Matloff, Ph.D., Professor
Ronald A. Olsson, Ph.D., Professor
Prasant Mohapatra, Ph.D., Professor
S. Felix Wu, Ph.D., Professor
Emeriti Faculty

Academic Senate Distinguished Teaching Award
Premkumar T. Devanbu, Ph.D., Professor
Hao Chen, Ph.D., Associate Professor
Matthew Franklin, Ph.D., Professor
Pramod Mohapatra, Ph.D., Professor
Zhendong Su, Ph.D., Associate Professor
S. Felix Wu, Ph.D., Professor

Academic Senate Distinguished Teaching Award
Lawrence T. Kou, Ph.D., Professor Emeritus
Peter Linz, Ph.D., Professor Emeritus
Raul F. Walters, Ph.D., Professor Emeritus
Gunther Weber, Ph.D., Assistant Adjunct Professor

The Computer Science and Engineering Program
The Department of Computer Science administers two curricula: Computer Science and Engineering in the College of Engineering, and Computer Science in the College of Letters and Science. It also administers two minors: Computer Science in the College of Letters and Science, and Computational Biology in the College of Engineering. For information on the Computer Science curriculum and minor: see Computer Science, on page 216.

The Computer Science Engineering major (below) prepares students to do further work in hardware, software, theory, or electronics, either in industry or in postgraduate study.

The primary differences between the Computer Science Engineering and the Computer Science majors are the extent of course work covering hardware and the flexibility of the curriculum. The Computer Science Engineering major develops a solid understanding of the entire machine, including hands-on experience with its hardware components. The Computer Science major has some course work on hardware, at the digital-design level, on simulators. The Computer Science Engineering major has fewer free electives. The CS major’s more generous electives make it easier to complete a minor or double major.

A key theme of the Computer Science Engineering curriculum is the hardware/software interaction, a theme reflected in the courses required and the orientation of the courses themselves.

The Computer Science and Engineering major provides students with a solid background in mathematics, physics, chemistry, and electronic circuits and systems, all supporting the computer hardware and computer software courses that constitute the focus of the curriculum.

Mission. The University of California, Davis, is, first and foremost, an institution of learning and teaching, committed to serving the needs of society. The Department of Computer Science contributes to the mission in three ways. First, its undergraduate and graduate education programs seek to educate students in the fundamental principles of computer science and the skills needed to solve the complex technological problems of modern society. The breadth of coursework provides a framework for life-long learning and an appreciation for multidisciplinary activities. Second, through its research programs, the department contributes to the development and progress of computer science, and software and information technology, to provide innovative, creative solutions for societal needs. Finally, the department disseminates its research to enhance collaborations with the public sector, further interdisciplinary interests that benefit society, and...
12. Introduction to Media Computation (4)
Lecture—3 hours; discussion/lab—1 hour. Prerequisite: Introduction to key computational ideas necessary to understand and produce media. Fundamentals of programming are covered as well as analysis of how media are represented and transmitted in digital form. Aimed primarily for non-computer science students. Some course as Cinema and Techno-cultural Studies 012. GE credit: ArtHum or SciEng | AH or SE, VL — II, III, I, III, III
13. Introduction to Computers (4)
Lecture—3 hours; laboratory—3 hours. Not open for credit to students who have completed course 30. Computer uses in modern society. Focus on uses in nontechnical disciplines. Includes word processing, spreadsheets, web-page creation, elementary programming, basic computer organization, use of the Internet, the uses of computers and their influence on society. Course not intended for CS or CSE majors. Only two units of credit allowed to students who have completed Plant Science 21. GE credit: Sci-Eng, Wrt | QL, SE, WE — I, II, III, I, II, III, II
20. Discrete Mathematics for Computer Science (4)
30. Programming and Problem Solving (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 16A or 21A [may be taken concurrently]; prior experience with basic programming concepts [variable, loops, conditional statements] recommended. Introduction to computers and computer programming, algorithm design, and debugging. Elements of good program style and Programming in the C language. Use of basic UNIX tools. GE credit: SciEng | QL, SE — I, II, III, III, I, II, III, I, II, III, I, II, III
40. Software Development and Object-Oriented Programming (4)
50. Computer Organization and Machine-Dependent Programming (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 40. Comparative study of different hardware architectures via programming in the assembly languages of various machines. Role of system software in producing an abstract machine. Introduction to I/O devices and programming. Only one unit of credit allowed for students who have taken Electrical and Computer Engineering 70. GE credit: SciEng | SE — I, II, III, II, II, III, II, III, II, III, III
60. Data Structures and Programming (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 20, 40 [C++ and UNIX]; grade of C- or better in each course. Design and analysis of data structures for a variety of applications. Trees, heaps, searching, sorting, hashing, graphs. Extensive programming. GE credit: SciEng | QL, SE — I, II, III, II, III, II, III, II, I, II, III, I, II, III, I, II, III
89A-L. Special Topics in Computer Science (1-5)
Lecture, laboratory, or combination. Prerequisite: consent of instructor. Special topics in Computer Science Theory; Architecture; Programming Languages and Compilers; Operating Systems; Software Engineering; Databases; Artificial Intelligence; Computer Graphics; Net- works; Computer-Aided Design; Scientific Computing; Social Science; Humanities; Arts and Humanities; Social Sciences; Engineering; Science and Engineering; Science; Social Science; American Culture; American Culture; Oral Skills; Quantitative; Scientific; Visual; World Culture; Writing Experience
tradesoffs, and evaluation of interactive information systems. GE credit: SciEng | SE, VL.—III. (III.) Amenta, Ma

165A. Database Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 60. Database modeling and design (E/R model, relational model), relational algebra, query languages (SQL), file and index structures, query processing, transaction management. GE credit: SciEng | SE.—II. (II.) Ludaescher

165B. Database Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 165A. Data modeling (object-oriented, graph-based, spatiotemporal models), Querying semistructured data (XML). Database theory (normalization, integration, provenance). Database programming (stored procedures, embedded SQL, web programming). Advanced topics (data warehousing, parallel data processing). GE credit: SciEng | SE.—III. (III.) Ludaescher

170. Introduction to Artificial Intelligence (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 140A. Design and implementation of intelligent computer systems. Knowledge representation and reasoning, machine perception and inference. Problem solving. Natural language processing. GE credit: SciEng | SE.—II. (II.) Davidson, Levitt

171. Machine Learning (4)
Lecture—3 hours; discussion—1 hour. Introduction to machine learning and unsupervised learning, including classification, dimensionality reduction, regression and clustering using modern machine learning methods. Applications of machine learning. GE credit: SciEng | SE.—III. (III.) Davidson, Matloff, Tagkopoulos

173. Image Processing and Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 60; Mathematics 67 or C or better in Mathematics 22A. Techniques for automated extraction of high-level information from images generated by cameras, three-dimensional surface sensors, and medical devices. Typical applications include detection of objects in various types of images and describing populations of biological specimens appearing in medical imagery. GE credit: SciEng | SE.—II. (II.) Amenta

175. Computer Graphics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 60; Mathematics 22A or Mathematics 67. Principles of computer graphics, with a focus on interactive systems. Current graphics hardware, elements of algorithms in two- and three-dimensional space, geometric transformations, camera models and interaction, graphics system design, standard graphics APIs, individual projects. GE credit: SciEng | SE.—II. (II.) Amenta, Hamann, Joy

177. Scientific Visualization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 175. Computer graphics techniques for generating images of various types of measured or computer-simulated data. Typical applications for these graphics techniques include study of air flows around car bodies, medical data, and molecular structures. GE credit: SciEng | SE, VL.—II. (II.) Hamann, Joy, Max

187. Geometric Modeling (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 175. Interactive graphics techniques for defining and manipulating geometrical shapes used in computer-aided design and drafting, aircraft design, and architectural design. GE credit: SciEng | SE, VL.—I. (I.) Hamann, Joy, Max

188. Ethics in an Age of Technology (4)

189A-N. Special Topics in Computer Science (1-5)

190C. Research Group Conferences in Computer Science (1)
Discussion—1 hour. Prerequisite: upper division standing in Computer Science and Engineering; consent of instructor. Research group conferences. May be repeated for credit. (P/NP grading only)—I, II, III, (I, II, III.)

190X. Senior Seminar (2)
Seminar—2 hours. Prerequisite: senior standing. Examination of a special topic in a small group setting.—I, II, (I, II, III.)

192. Internship in Computer Science (1-5)
Internship. Prerequisite: completion of a minimum of 84 units; project approval prior to period of internship. Supervised work experience in computer science. May be repeated for credit. (P/NP grading only)

193A. Senior Design Project (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 140B recommended (may be concurrent) or consent of instructor. Open to Computer Science or Computer Science and Engineering seniors. Team design project involving analysis, design, implementation and evaluation of a large-scale problem involving computer and computational systems. The project is supervised by a faculty member. Students must take course 193A and 193B to receive credit. (Deferral grading only; pending completion of sequence.) GE credit: SciEng | SE.—II, III, (II, III) Davidson, Joy, Mahapatra

193B. Senior Design Project (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: IP grade in course 193A. Team design project involving implementation and evaluation of a large-scale problem involving computer and computational systems. The project is supervised by a faculty member. Students must take course 193A and 193B to receive credit. (Deferral grading only; pending completion of sequence.) GE credit: SciEng | SE.—II, III, (II, III) Davidson, Joy, Mahapatra

197T. Tutoring in Computer Science (1-3)
Discussion—1 hour; laboratory/discussion—3-6 hours. Prerequisite: consent of instructor. Restricted to upper-division standing. Tutoring in computer science courses, especially introductory courses. (P/NP grading only)—I, II, III, (I, II, III)

198. Directed Group Study (1-5)
Independent study. Consent of instructor. May be repeated for credit. (P/NP grading only.)—I, II, III, (I, II, III)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only)

The Graduate Program in Computer Science
Doctoral and Masters degrees in Computer Science are offered through the interdisciplinary Graduate Group in Computer Science. Please see http://www.cs.ucdavis.edu and Computer Science (A Graduate Group), on page 216, for a description of graduate education offerings, requirements, group faculty and research foci.

Graduate

201A. Advanced Computer Architecture (4)
Lecture—3 hours; term paper. Prerequisite: course 154B or Electrical and Computer Engineering 170; course 150. Modern research topics and methods in computer architecture. Design implications of memory latency and bandwidth limitations. Performance enhancement via within-processor and between-processor parallelism. Term project involving student-proposed extensions/modifications of work in the research literature. Not open for credit to students who have completed course 250A.—I. Farrens

201B. High-Performance Uniprocessing (4)
Lecture—3 hours; term paper. Prerequisite: course 201A. Maximizing uniprocessor performance. Barriers to high performance; problems to the solutions; historical and current processor designs. Not open for credit to students who have completed course 250B.—II. Farrens

210C. Parallel Architectures (4)
Lecture—3 hours; project—1 hour. Prerequisite: course 201A. Evolution of parallel architectures from special-purpose machines to commodity clusters. Emphasis on recent machines and applications that drive them. Not open for credit to students who have completed course 250C.—III.

203. Novel Computing Technologies (4)
Lecture—3 hours; project—1 hour. Prerequisite: course 201A. Novel computing technologies that could revolutionize computer architecture. Quantum computing technologies, including algorithms, device, and fault tolerance. A survey of unconventional technologies involving nanoscale electronics, MEMS devices, biological devices, and nanotechnology. Offered in alternate years.—II.

220. Theory of Computation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 120, 122A. Time and space complexity classes. Reductions, completeness, and the role of randomness. Logic and undecidability.—III. Roga

221. Computational Methods in Systems and Synthetic Biology (4)
Lecture—3 hours; discussion—1 hour. Computational methods related to systems and synthetic biology. An overview of modern learning techniques related to the analysis of biological data, biological networks. Predictive modeling and simulation of biological systems. Topics on biological circuit construction.—I. (I) Tagkopoulos

222A. Design and Analysis of Algorithms (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 122A; Statistics 131A recommended. Techniques for designing efficient algorithms, analyzing their complexity and applicability to a broad range of applications. Methods for recognizing and dealing with difficult problems.—I, II, (I, II) Amenta, Franklin, Gusfield, Martel, RagHAVan

222B. Advanced Design and Analysis of Algorithms (4)
Lecture—3 hours; project—1 hour. Prerequisite: course 222A. Advanced topics in complexity theory. Problem classification. The classes P, NP, P-space, coNP, Matching and network flow algorithms. Matrix multiplication. Approximation algorithms.—III. (III) Gusfield, Franklin, Martel, RagHAVan

223. Parallel Algorithms (4)
Laboratory/discussion—3 hours; project—1 hour. Prerequisite: course 222A. Theory of parallel computer systems including PRAMs, loosely coupled systems and interconnection networks. Parallel algorithms for classical problems and general techniques for their design and analysis. Proving lower bounds on parallel computation in several settings.—II. (II) Martel

224. String Algorithms and Applications in Computational Biology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 222A. Algorithms that operate on strings. Pattern matching, set of patterns, regular expression pattern matching, suffix trees and applications, inexact

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): Arts and Humanities: SciEng; Science and Engineering: SocSci; Social Sciences; Div-Dominant Diversity; Writ-Writing Experience
Fall 2011 and on Revised General Education (GE): AH-Arts and Humanities; SE-Science and Engineering; SS-Social Sciences; AGCH-American Cultures, DD-Dominant Diversity, OL-Oral Skills, QL-Quantitative, SL-Scientific, VL-Visual, WC-World Cultures, Writ-Writing Experience
225. Graph Theory (3)
Lecture—3 hours. Prerequisite: graduate standing in electrical engineering or computer science or consent of instructor. Graphs and fundamental concepts. Vectors, spaces and graphs. Planar graphs: Whitney’s and Kuratowski’s theorems. Topological parameters: packings and coverings. Connectivity: Menger’s theorem. Hamilton’s and Chordal theorems. Graph factorization: Tutte’s theorem. Graph coloring: Brooks and Vizing’s theorem. —II. Franklin

226. Computational Geometry (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 175, 222A. Mathematics of unstructured data. Algorithms for data structures such as Voronoi diagrams, oct-trees, and arrangements. Applications in computer graphics, concentration on problems in three-dimensions. Offered in alternate years. —III. Amenta, Max

227. Modern Cryptography (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 220 or 222A. Modern cryptography as a discipline emphasizing formal definitions and proofs of security. One-way functions, pseudo-randomness, encryption, digital signatures, zero-knowledge, secure two-party computation. —II. Franklin

228. Cryptography for E-Commerce (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 222A. Cryptographic primitives and protocols of importance to e-commerce, present and future. Distribution mechanisms, payment mechanisms, pricing mechanisms, anonymity and privacy mechanisms, fair exchange mechanisms. Offered in alternate years. —II. Levitin

229. Advanced Computational Structural Bioinformatics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: graduate standing. Algorithmic problems in structural biology; protein structure classification; protein structure prediction (including comparative modeling and ab initio protein structure prediction); molecular simulations (molecular dynamics and Monte Carlo simulations). —II. (I.) Koehl

230. Applied Numerical Linear Algebra (4)
Laboratory/discussion—3 hours; discussion—1 hour. Prerequisite: course 130 or Engineering Applied Science 209 or Mathematics 167. Numerical linear algebra [NLA] with emphasis on applications in engineering systems; matrix factorizations; perturbation and rounding errors of fundamental NLA algorithms. Offered in alternate years. —I. Bai

231. Large-Scale Scientific Computation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 130. Algorithms and techniques for large-scale scientific computation, including basics for high performance computing, iterative methods, discrete and continuous Fourier transform, Poisson solvers, particle methods, spectral graph partitioning and its applications. Offered in alternate years. —II. Bai

234. Computational Functional Genomics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 124; graduate standing in Computer Science or Life Sciences. Bioinformatics methods for analysis and inference of functional relationships among genes using large-scale genomic data, including methods for integration of gene expression, promoter sequence, EST-DNA binding and other data, and applications to modeling of biological networks. —II. (II.) Filkov

235A. Computer and Information Security (4)
Lecture—3 hours; project. Prerequisite: course 150; course 152A recommended. Modern topics in computer security, including: encryption, access control, operating systems security, network security, applied cryptography, cryptographic protocols, secure programming practices, safe languages, mobile code, malware, and security and privacy, and case studies from real-world systems. Not open for credit to students who have taken course 235. —I. (I.) Chen

235B. Foundations of Computer and Information Security (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 235A; courses 120, 150 recommended. Theoretical foundations of methods used to protect data in computer and communication systems. Access control matrices and unification of security; policies; Bell LaPadula, Biba, Chinese Wall models, non-interference and non-deducibility; information flow and the confinement problem. Not open for credit to students who have taken course 235. —II. (I.) Bishop

236. Computer Security: Intrusion Detection Based Approach (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 150; course 153 recommended. Concepts of intrusion detection systems and their implementation based on machine learning, signature-based detection using pattern matching, automated response to attacks using artificial intelligence planning, tracking intruders based on principal component analysis, security policy languages. Offered in alternate years. —I. Levitin

240. Programming Languages (4)
Lecture—3 hours; discussion—1 hour. Prerequisites: courses 140, 150. Advanced topics in programming languages, including formal syntax and semantics, the relation between formal semantics and verification, an introduction to the lambda calculus. Additional topics may include design principles, alternative programming languages, in-depth semantic theory and models of language implementation. —II. (II.) Pandey

242. Translation of Programming Languages (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 240. Lexical analysis, parsing, storage management, symbol table design, semantic analysis and code generation. LL, LALR grammars. Compiler-compilers. —II. (II.) Pandey

243. Code Generation and Optimization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 201A or Engineering Electrical and Computer 270. Compiler optimizations for performance, code size and power reduction. Topics include control- and data-flow analysis, redundancy elimination, loop and cache optimizations, register allocation, local and global scheduling, and modulo scheduling. —II. (II.) Wilken

244. Principles of Concurrent Programming (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 20, 150. Fundamental concepts and applications of concurrent programs; concurrent program verification and derivation; synchronization mechanisms in programming languages; distributed programming techniques; case studies of languages. —I. (I.) Olsson, Pandey, Su

247. Concurrent Programming Languages (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 140A, 150. Fundamental concepts and models of parallel machines. Load balancing. Scalability. Portability. Efficiency measures. Design and implementation techniques for several classes of concurrent programming languages (such as object-oriented, functional, logic, and constraint-oriented programming languages). —I. (I.) Pandey, Olsson, Su

251. Operating Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 150, 152A recommended. Operating system concepts and implementation, performance evaluation in operating systems. Algorithms, internal architectures for single processor OS and distributed systems. Concurrency control, recovery, security, OS kernels, operating systems. Special topics embedded systems, real-time systems, device driver, NPU (Network Processor Unit). —III. (III.) Pandey, Wu

252. Computer Networks (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 152B. Internet protocol based computer networks, applications, transport and network protocols. High speed LAN technologies: Ethernet, Asynchronous Transfer Mode (ATM). Delay models in data networks: analysis of multiservice techniques in polycycles, ring, random, and token access protocols. Multimedia applications and requirements and design. —II. Mukherjee, Mahapatra, Ghosal

255. Resource Management in Wireless Communication Networks (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 252A. Advanced research issues in wireless communication networks, including multi-user diversity and cross-layer optimization, basic network information theory, MAC, and the impact on networks, and dynamics spectrum management. Offered in alternate years. —III. Liu

256. Performance Evaluation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 20, 152A, 154A-154B or Electrical and Computer Engineering 170, Statistics 131A; course 150 recommended. Use of simulation and queueing theory in computer and communication system design. Applications to computer networks, computer systems, telecommunication networks, and computer and communication system design. —III. (II.) Maltzoff, Ghosal, Mahapatra, Mukherjee

257. Mobile and Wireless Networks (4)
Lecture—3 hours, independent study. Prerequisite: course 252. Fundamental techniques in design of second generation wireless networks: cellular network and protocols, medium access techniques, handoff control, signaling and mobility management, wireless data works, Internet mobility and Personal Communication Services (PCS). Third generation wideband systems, novel technologies, adhoc networks. Offered in alternate years. —II. Ghosal, Mahapatra, Mukherjee

258. Networking Architecture and Resource Management (4)
Lecture—3 hours; project—1 hour. Prerequisite: course 152A or Electrical & Computer Engineering 173A; course 252 recommended. Design and implementation principles of networking architecture and protocols. Internet, ATM, and telephony case studies. Topics: Internet technology; application and services; resource management; Quality of Service (QoS) provisioning, performance evaluation and future research issues. (Same course as Electrical & Computer Engineering 273.) —II. (II.) Chuah, Mohapatra

259. Optical Networks (4)

260. Software Engineering (4)
Lecture—3 hours; project. Prerequisite: course 142; course 160 recommended. Principles and techniques for domain-specific software reuse. —I. (I.) Devanbu

261. Program Verification (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 125 or Philosophy 112 or familiarity with first-order logic; knowledge of an imperative and functional programming language. Methods of proving correctness of programs with respect to formal specifications, with attention to those suited for employing automated deductive logics: background, symbolic execution, techniques suited to iterative programming, methods from denotational semantics, termination, dynamic logic and proofs of concurrent programs. —I. (I.) Levitin

262. Formal Specification (3)
Lecture—3 hours. Prerequisite: course 261. Formal specification of modules, and its relationship to top-down programming development and verification.
Abstract data types, together with methods for specifying them. Implementations and proofs of implementation correctness to reason about the programs. Parameterized types. Constructing good formal specifications. Offered in alternate years. — II. Levitt

262. Distributed Database Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 165A. Concepts of distributed database systems and architectures, distributed database design, distributed query processing and optimization, transaction management, currency control, heterogeneous and multidatabase systems. — I, III. (III.) Gertz, Ludaescher

266. Spatial Databases (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 150. Concepts, models, and architectures for spatial databases, spatial access methods, query processing, spatio-temporal data management, moving objects, spatial data mining. Offered in alternate years. — II. Gertz, Ludaescher

267. Wide-Area Distributed Information Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 152B or 165A. Wide-area distributed information systems, data broadcast, multicast, publish/subscribe, service differentiation, information retrieval, Web caching. Offered in alternate years. — III. Askoy

268. Scientific Data And Workflow Management (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 165A. Scientific data integration, metadata, knowledge representation, ontologies, scientific work design and management. Offered in alternate years. — III. Gertz, Ludaescher

270. Artificial Intelligence (3)

271. Machine Learning and Discovery (4)
Lecture—3 hours; project—1 hour. Prerequisite: course 170. Artificial intelligence techniques for knowledge acquisition by computers. Fundamental problems in machine learning and discovery. Systems that learn from examples, analogies, and solved problems. Systems that discover numerical laws and qualitative relationships. Projects centering on implementation and evaluation. — II. Levitt, Vemuri

272. Information Visualization (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 163 or 175 recommended. Advanced topics in information visualization: perceptually effective display methods, color design and selection, interaction models and techniques, focus-context techniques, distortion methods, large graph visualization techniques, visual data mining methods, and evaluation methods. — II. Ma

273. Applied Visual Computing (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: graduate standing. Visual computing paradigms, specific applications to computer graphics and virtual reality. Undergraduate and introductory courses. Offered in alternate years. — I. Hamann, Joy, Ma, Max

274. Automated Deduction (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 125 or Philosophy 112 or familiarity with first-order logic. Techniques of mechanical theorem proving. Methods based on resolution and term-rewriting. Decision procedures. Induction. Applications to program verification, question-answering and plan generation. Study existing mechanical theorem provers. Offered in alternate years. — III. Levitt

275A. Advanced Computer Graphics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 274 or 178. Advanced topics in computer graphics. Hidden surface models, rendering of various surface types, subdivision methods, shading techniques, anti-aliasing, modeling techniques. — I. (II.) Joy, Hamann

275B. Advanced Computer Graphics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 175 or 177 or 178. Advanced topics in computer graphics and geometric modeling. Topics taken from advanced research papers in computer graphics, imagination, visualization and geometrization. Discussion of current research in the field. Offered in alternate years. — I. (II.) Joy, Hamann, Ma

276. Advanced Volume Visualization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 177. Applications, available tools and techniques, the challenges confronting the field of volume visualization, and some of the advanced topics in the field. Primary emphasis on current and advanced software and hardware techniques to achieve interactive visualization. — III. Hamann, Joy, Ma, Max

277. Advanced Visualization (4)
Lecture—2 hours; discussion—2 hours. Prerequisite: course 177. Visualization 3D including scalar fields, vector fields, and medical data. — III. Hamann, Joy

278. Computer-Aided Geometric Design (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 175. Mathematical techniques for the definition and manipulation of curves and surfaces. Beziers and curves and surfaces, B-spline curves and surfaces, subdivision surfaces, wavelets. Integration into various computer graphics rendering models, visualization systems and computer-aided design systems. Offered in alternate years. — III. Joy, Hamann

279. Computer Animation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 175 or 177 or 178. Course surveys current research and fundamental techniques that lie behind character animation tools. Emphasis on improving expressive aspects of movement and how physics, motion capture data, the arts and psychology literature, and interactive techniques can be used towards this goal. Offered in alternate years. — II. Neff

280. Virtual Reality Technology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 175. Fundamentals and principles of Virtual Reality (VR) technology. Potential and limits for its useful application. Developing a complete virtual reality application. Offered in alternate years. — III. Joy

289A-N. Special Topics in Computer Science (1-5)

290. Seminar in Computer Science (1)
Seminar—1 hour. Participation seminar; discussion and presentation of current research and development in computer science. (S/U grading only.) — I, II, III, IV, V, VI

290C. Graduate Research Group Conference (1)
Discussion—1 hour. Research problems, progress and techniques in computer science. May be repeated for credit. (S/U grading only.) — I, II, III, IV, V, VI

293A. Research in Computer Science (1)
Lecture—1 hour. Prerequisite: graduate standing in computer science. Study of research topics in computer science. Ph.D. level research methodologies (experimental, applied and theoretical). Study skills necessary to successfully find/solve significant research problems. Finds and successful interacting with a research advisor. Ethical issues in research/collaborative work. (S/U grading only.) — I. (I.) Martel

293B. Research in Computer Science (1)
Lecture—1 hour. Prerequisite: graduate standing in computer science; course 293A recommended. Study of Ph.D. level research methodologies (experimental, applied and theoretical), presenting research results for the computer science community. Study skills necessary to successfully find/solve significant research problems. (S/U grading only.) — II. (II.) Martel

298. Group Study (1-5)
Lecture, laboratory, or combination. Prerequisite: consent of instructor. (S/U grading only.)

299. Research (1-12)
(S/U grading only.)

Professional

390. The Teaching of Computer Science (1)
Discussion—1 hour. Prerequisite: meet qualifications for teaching assistant and/or associate-in in Computer Science. Participation as a teaching assistant or associate-in in a designated undergraduate course. Methods of leading discussion groups or laboratory sections, writing and grading quizzes, use of laboratory equipment, and grading laboratory reports. May be repeated for credit. (S/U grading only.) — I, II, III, IV, V, VI, VII

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)
leaders in industry or to do meaningful research in industry, government or academia. Research—To develop and support research programs that produce useful technological advances while simultaneously training the next generation of researchers and leaders; to update and/or shift the focus of these programs frequently in response to the needs of our constituencies and the nation; to provide a stimulating environment that encourages our graduate students to develop their abilities as far as possible.

**Electrical Engineering Undergraduate Program**

The Electrical Engineering program is accredited by the Engineering Accreditation Commission of ABET, see http://www.abet.org.

Electrical engineering involves the design, analysis, and effective use of electrical systems including electronic computers. Electrical systems and computers play a central role in nearly all aspects of modern life, including communication, education, environmental protection, space exploration, defense, and home entertainment.

Students who complete the Electrical Engineering curriculum will obtain a Bachelor of Science in Electrical Engineering. One of the engineering deans recognized in all fifty states as eligible for registration as a Professional Engineer.

**Objectives.** The Electrical Engineering program has adopted the following objectives to serve the long-term interests of our students and the industries of Northern California and the nation. Foundation—To provide our graduates with a solid foundation in engineering science, including mathematics, physical science, and the fundamentals of electrical engineering. This foundation is necessary to succeed in more advanced engineering courses and to be able to continue learning throughout a career. Breadth—To provide our graduates the sufficient breadth in electrical engineering in order to understand engineering tradeoffs that cross disciplines, to contribute effectively to multidisciplinary projects, and to make an informed decision about their area of specialization. Depth—To provide our graduates with sufficient depth in a specific area of electrical engineering necessary to solve complex real-world engineering problems and to contribute to a specific discipline within electrical engineering. Ethics—To provide our graduates with a basic understanding of, and ability to handle correctly, ethical problems that may arise during their careers. To provide them with an understanding of their obligations to society at large. Exclusive of General Education units, the minimum number of units for the Electrical Engineering major is 145 (70 units in the lower division and 75 in the upper division). Students are encouraged to adhere carefully to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisites have not been completed.

**Lower Division Required Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
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<tr>
<td>Mathematics 22A-22B</td>
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<tr>
<td>Physics 9A-9B-9C-9D</td>
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<tr>
<td>Chemistry 2A</td>
<td>5</td>
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<tr>
<td>Computer Science 36</td>
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<tr>
<td>Computer Science 104</td>
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<tr>
<td>Computer Science 165</td>
<td>4</td>
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<tr>
<td>Electrical and Computer Engineering 110</td>
<td>10</td>
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<tr>
<td>Electrical and Computer Engineering 170</td>
<td>4</td>
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<tr>
<td>Electrical and Computer Engineering 183</td>
<td>4</td>
</tr>
<tr>
<td>English 2 or Writing Program 1Y</td>
<td>3</td>
</tr>
<tr>
<td>English 2 or Writing Program 1Y or Comparative Literature 1, 2, 3, or 4</td>
<td>4</td>
</tr>
<tr>
<td>Native American Studies 5</td>
<td>4</td>
</tr>
</tbody>
</table>

**Upper Division Requirements: Electrical Engineering Curriculum**

**Areas of Specialization**

For updated recommended courses, see the department website at http://www.ece.ucdavis.edu/undergrad/undergradhandbook.html.

**Physical Electronics:** solid-state devices, circuits and fabrication and the theory courses supporting those subjects.

**Recommended elective courses:**

- Core electives: Electrical and Computer Engineering 130B, 140B
- Design Electives with Lab: Electrical and Computer Engineering 118, or 132A, 132B or 135. Select remaining upper-division design electives from Electrical and Computer Engineering 110B, 112C, 135
- Technical electives: Electrical and Computer Engineering 112, 180B

**Suggested Advisers.** S. Eker, J. Hihath, C.E. Hunt, S. Islam, R.A. Kiehl, J.M. Woodall

**Electromagnetics:** microwave circuits and systems, and for all systems engineering.

**Recommended elective courses:**

- Core electives: Electrical and Computer Engineering 130B, 140B
- Design Electives with Lab: Electrical and Computer Engineering 132A, 132B. Select remaining upper division design electives from Electrical and Computer Engineering 110B, 112C, 135
- Technical electives: Select from Electrical and Computer Engineering 112 and 133

**Suggested Advisers.** G.R. Branner, A. Knoess, X. Liu, N. Luhmann, O. Momeni, A. Pham, B. Yoo

**Analog Electronics:** transistor- and system-level analog circuit design.

**Recommended elective courses:**

- Core electives: Electrical and Computer Engineering 110B, 140B, 150B
- Design Electives with Lab: at least two from Electrical and Computer Engineering 112, 157A, 165, 195A-195B
- Select remaining upper division design electives from Electrical and Computer Engineering 118, 132A, 132B, 132C, 151, 1576, 160, 210
- Technical electives: Select from Electrical and Computer Engineering 130B, 146A

**Suggested Advisers.** R. Amirifarajah, G.J. Gu, P.J. Hurst, S.H. Lewis, O. Momeni, S.D. O’Driscoll

**Digital Electronics:** transistor- and system-level digital circuit design.

**Recommended elective courses:**

- Core electives: Electrical and Computer Engineering 110B, 140B, 150B
- Design Electives with Lab: Electrical and Computer Engineering 118 and 180B or 151 or 172 or 183 or 195A-195B
- Select remaining upper division design electives from Electrical and Computer Engineering 116, 170, 172, 180B
- Technical electives: Select from Electrical and Computer Engineering 130B and 112 or 146A or 157A or 160 or 210

**Suggested Advisers.** R. Amirifarajah, P.J. Hurst, S.H. Lewis, S.D. O’Driscoll

**Communication Controls and Signal Processing:** digital communication, robotics, classical controls and communication, wireless and cellular digital communication systems, signal and image processing, and computer vision.

**Recommended elective courses:**

- Core electives: Electrical and Computer Engineering, 150B, 180B

**Quarter Offered:** I—Fall; II—Winter; III—Spring; IV—Summer; 2015-2016 offering in parentheses

**Pre-Fall 2011 General Education (GE):**

AAG—American Cultures; DD—Domestic Diversity; DIV—Domestic Diversity; WRW—Writing Experience

**Fall 2011 and on Revised General Education (GE):**

AH—Arts and Humanities; SC—Science and Engineering; SS—Social Sciences; Div—Domestic Diversity; WRW—Writing Experience
Computer Engineering Undergraduate Program

The Computer Engineering program is accredited by the Engineering Accreditation Commission of ABET; see http://www.abet.org.

Exclusions of General Education units, the minimum number of units required for the Computer Engineering undergraduate major is 148 (79 units in the lower division and 69 units in the upper division).

Students are encouraged to adhere carefully to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisites have not been completed.

Lower Division Required Courses

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<tr>
<th>UNITS</th>
<th>Mathematics 21A-21B-21C-21D</th>
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</tr>
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<td></td>
<td>Physics 22A-22A-22B-22B</td>
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</tr>
<tr>
<td></td>
<td>Chemistry 2A</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Computer Science Engineering 19</td>
<td>3</td>
</tr>
</tbody>
</table>

Upper Division Required Courses

| UNITS | Electrical and Computer Engineering 110B, 130B, 140B, 170*D, 180B* | 32 |

Technical Electives

| UNITS | Electrical and Computer Engineering 119AB, 134AB, 136AB, 181AB, 193AB, 195AB | 9 |

Electrical and Computer Engineering 100, 119AB, 134AB, 136AB, 181AB, 193AB, 195AB

Computer Engineering 119AB, 134AB, 136AB, 181AB, 193AB, 195AB

At least one design project course:**

Computer and Engineering Computer Engineering 190, 192, 196, 197, 198, 199

A maximum of 6 units for any combination of engineering courses numbered 190C, 192, 198, and 199 may be used.

Chemistry 2C, 2D, and any upper-division course except Chemistry 195 & 197

Engineering 35, 45, EE10 (if not used to satisfy major requirement), and any upper-division course not used in satisfaction of core degree requirements, excluding Engineering 160, 190 (restricted to one unit of technical elective), 198, Computer Science Engineering 132, 153, 157, 158, 154A, & 154B (154 courses may be used by EEE majors who did not take EEC 170)

Any upper-division Mathematics course except Mathematics 135A & 197TC

Any upper-division Physics course except 116, 137, 160 (restricted to one unit of technical elective), 195, 197T

Any upper-division Statistics course except Statistics 100, 102, 103, 104, 106, 108, 120, & 130A

Biological Sciences 101, 101D, 102, 103, 104, 120, 120P, 122P, 129P

Economics 101, 102, 103, 122, 140

Management 11A, 118, 120, 120, 140, 150, 160, 170, 180

Upper Division Composition Requirement:

One course from the following (a grade of C- or better is required): University Writing Program 101, 102A-L, 104A-T or passing the University Division Composition Exam

Computer Science Engineering 154B may be substituted for Electrical and Computer Engineering 170.

*** After completion of the upper division elective requirement (at least 8 courses, 2 core, 2 with labs, 1 project) any units in excess of 32 will count toward the technical elective requirement.

Computer Engineering Undergraduate Program

The Computer Engineering program is accredited by the Engineering Accreditation Commission of ABET; see http://www.abet.org.

Exclusions of General Education units, the minimum number of units required for the Computer Engineering undergraduate major is 148 (79 units in the lower division and 69 units in the upper division).

Students are encouraged to adhere carefully to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisites have not been completed.

Lower Division Required Courses

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<td></td>
<td>Computer Science Engineering 19</td>
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</tbody>
</table>

Upper Division Required Courses

| UNITS | Electrical and Computer Engineering 110B, 130B, 140B, 170*D, 180B* | 32 |

Technical Electives

| UNITS | Electrical and Computer Engineering 119AB, 134AB, 136AB, 181AB, 193AB, 195AB | 9 |

Electrical and Computer Engineering 100, 119AB, 134AB, 136AB, 181AB, 193AB, 195AB

Computer Engineering 119AB, 134AB, 136AB, 181AB, 193AB, 195AB

At least one design project course:**

Computer and Engineering Computer Engineering 190, 192, 196, 197, 198, 199

A maximum of 6 units for any combination of engineering courses numbered 190C, 192, 198, and 199 may be used.

Chemistry 2C, 2D, and any upper-division course except Chemistry 195 & 197

Engineering 35, 45, EE10 (if not used to satisfy major requirement), and any upper-division course not used in satisfaction of core degree requirements, excluding Engineering 160, 190 (restricted to one unit of technical elective), 198, Computer Science Engineering 132, 153, 157, 158, 154A, & 154B (154 courses may be used by EEE majors who did not take EEC 170)

Any upper-division Mathematics course except Mathematics 135A & 197TC

Any upper-division Physics course except 116, 137, 160 (restricted to one unit of technical elective), 195, 197T

Any upper-division Statistics course except Statistics 100, 102, 103, 104, 106, 108, 120, & 130A

Biological Sciences 101, 101D, 102, 103, 104, 120, 120P, 122P, 129P

Economics 101, 102, 103, 122, 140

Management 11A, 118, 120, 120, 140, 150, 160, 170, 180

Upper Division Composition Requirement:

One course from the following (a grade of C- or better is required): University Writing Program 101, 102A-L, 104A-T or passing the University Division Composition Exam

Computer Science Engineering 154B may be substituted for Electrical and Computer Engineering 170.

Electrical Engineering Minor

There has been an increasing need for professionals in most engineering disciplines who understand the fundamentals of electronic circuits, electronic signals, semiconductor devices, applied electromagnetics, control systems, computer systems, and communication systems. The objective of this minor program is to prepare students with the necessary theoretical and practical training in one or many of the above mentioned fields. The minor program curriculum is designed to allow flexibility while ensuring a solid foundation of fundamental electrical engineering concepts. The program is expected to accommodate students of diverse backgrounds.

The minor must be outside the department or program of your major and no more than one course may be counted toward both your minor and your major. The courses you take to satisfy the requirements of a minor, including those completed elsewhere, must be approved by an advisor in the Department of Electrical and Computer Engineering. You must have a minimum overall GPA of 2.000 and satisfy the minor course requirements, listed below.

To receive notation of this minor on your diploma, you must obtain a minor petition and file it no later than the deadline for filing for graduation.

Minor Requirements

| UNITS | Electrical Engineering .......... | 21 |

Computer Engineering

At least one of the following combinations:

Analog circuits: Electrical and Computer Engineering 110A and 110B

Electromagnetics: Electrical and Computer Engineering 130A and 130B

Physical Electronics: Electrical and Computer Engineering 140A and 140B

Signals and Systems: Electrical and Computer Engineering 150A and 150B

Control Systems: Electrical and Computer Engineering 150A and 150B

Digital Systems: Electrical and Computer Engineering 180A and 180B

M.S. and Ph.D.

http://www.ece.ucdavis.edu

The Department of Electrical and Computer Engineering prepares graduate students to do meaningful research and acquire skills and insights vital to solving some of the world’s most complex technological problems. Our graduate program offers a challenging and stimulating environment in areas such as device physics and optoelectronics, control and signal processing, computer engineering, circuit design, electronic circuits and systems, computer engineering, communication networks, computer engineering, circuit design, electronic circuits and systems, computer engineering, communication networks, and computer systems. The depth of resources in the study of circuit design alone, with one of the largest faculty groups in the field in the UC system, distinguishes us from other
programs, while our program in microwave communications and devices is unique. The Electrical and Computer Engineering Graduate Program benefits from the highly interdisciplinary culture at UC Davis and attracts faculty from biomedical, chemical, electrical, computer, civil, and mechanical engineering, as well as computer science and mathematics. Many of our graduates go on to leadership and technology management roles in industry, returning each year for our industrial affiliates meeting to network with other industry representatives, current students and faculty. Generous financial support is available from the Rochester Institute of Technology; teaching assistantships, fellowships and financial aid.

**Research Highlights:**
- Communications, control, networking, and signal processing
- Computer engineering
- Electronic circuits
- Optoelectronics
- RF, micro- and millimeter waves
- Physical electronics

**Research Facilities and Partnerships:**
- Center for Information Technology in the Interest of Society
- Northern California Center for Nanotechnology
- Center on Polymer Interfaces and Macromolecular Assemblies
- Lawrence Livermore National Laboratory
- Lawrence Berkeley National Laboratory
- Los Alamos National Laboratory
- California Lighting Technology Center
- PlanetLab Consortium
- Sandra National Laboratory

Complete Information on our website.

**Courses in Engineering: Electrical and Computer Engineering (EEC)**

**Lower Division**

**1. Introduction to Electrical and Computer Engineering (1)**
Lecture—1 hour. Electrical and Computer Engineering as a professional activity. What Electrical and Computer Engineering is, what can you do with it, and what does it mean to have your knowledge. (P/NP grading only.) GE credit: SciEng | SE.—I. (I)

**10. Introduction to Digital and Analog Systems (3)**
Lecture—1 hour; laboratory—3 hours. Prerequisite: Engineering 6 or Mathematics 22AL, Computer Science Engineering 30, Physics 9C and Engineering 17 (concurrent enrollment in Engineering 17 is allowed). Open to Electrical and Computer Engineering sophomores. Interactive and practical introduction to fundamental concepts of electrical and computer engineering by implementing electronic systems, which can be digitally controlled and interrogated, with a programmable microcontroller with the ability to program the electrical connections between analog and digital components. GE credit: SciEng | SE.—II. (II)

**70. Computer Structure and Assembly Language (4)**
Lecture—3 hours; workshop—1 hour. Prerequisite: Computer Science Engineering 30. Computer architecture, machine language, assembly language, macros and conditional macros; subroutine/parameter passing, input/output programming, interrupt and trap, direct-memory-access; absolute and relocatable code; restart code; program development in an operating system. Only one unit of credit to students who have completed Computer Science Engineering 50. GE credit: SciEng | SE.—II. (II)

**89A-F. Special Topics in Electromagnetics (1-5)**
Prerequisite: consent of instructor. Special topics in (A) Electromagnetics, (B) Physical Electronics, (C) Active and Passive Circuits, (D) Computer Systems and Software, (F) Digital System Design for freshmen and sophomore level students. May be repeated for credit if topic differs. Offered irregularly. GE credit: SciEng | SE

**90C. Research Group Conference in Electrical and Computer Engineering (1)**
Discussion—1 hour. Prerequisite: consent of instructor; course registration. Research group conferences. May be repeated for credit. (P/NP grading only)—I, II, III, (I, III)

**90X. Lower Division Seminar (1-4)**
Seminar—1-4 hours. Prerequisite: consent of instructor. Examination of a special topic in a small group setting. May be repeated for credit.

**92. Internship in Electrical and Computer Engineering (1-5)**
Internship—3-15 hours. Prerequisite: lower division standing, project approval prior to period of intern- shhip. Supervised work experience in Electrical and Computer Engineering. May be repeated for credit. (P/NP grading only)

**98. Directed Group Study (1-5)**
Prerequisite: consent of instructor. (P/NP grading only)

**99. Special Study for Lower Division Students (1-5)**
(P/NP grading only.

**Upper Division**

**100. Circuits II (5)**
Laboratory—3 hours; lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 17, C or better. Restricted to the following majors: Electrical Engineering, Computer Engineering, Computer Science & Engineering, Electrical and Computer Engineering, Electrical Engineering/Materials Science, Optical Science & Engineering, Biomedical Engineering, Applied Physics, Electrical & Computer Engineering graduate students. Theory, application, and design of analog circuits. Methods of analysis including frequency response, SPICE simulation, and Laplace transform. Operational amplifiers and design of active filters. Students who have completed Engineering 100 may receive 3.5 units of credit. GE credit: SciEng | QL, SE, VL—II, III, (I, III)

**110A. Electronic Circuits I (4)**
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100; course 140A recommended. Use and modeling of nonlinear solid-state electronic devices in basic analog and digital circuits. Introduction to the design of transistor amplifiers and logic gates. GE credit: SciEng | SE, VL—II, III, (II, III)

**110B. Electronic Circuits II (4)**
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 110A. Analysis and design of integrated circuits. Single-stage amplifiers, cascaded amplifier stages, differential amplifiers, current sources, frequency response, and return-ratio analysis of feedback amplifiers. GE credit: SciEng | SE, VL—II, III, (III)

**112. Communication Electronics (4)**
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 110A and 150A; course 110B recommended. Electronic circuits for analog and digital communication, including oscillators, mixers, tunable amplifiers, modulators, demodulators, and phase-locked loops. Circuits for amplitude modulation (AM) and frequency modulation (FM) are emphasized. GE credit: SciEng | SE—II, (II)

**116. VLSI Design (4)**
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 110A; course 180A recommended. CMOS devices, layout, circuits, and functional units; VLSI fabrication and design methodologies. GE credit: SciEng | SE—II, (I)

**118. Digital Integrated Circuits (4)**
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 110A, 180A. Analysis and design of digital integrated circuits. Emphasis on Boolean logic circuit families. Logic gate construction, voltage transfer characteristics, propagation delay, and power consumption. Sequential/clocked circuits, sequential elements, interconnect, RAMs, ROMs, and PLAs. GE credit: SciEng | SE—II, (III)

**119A. Integrated Circuit Design Project (3)**
Workshop—1 hour; laboratory—6 hours. Prerequisite: course 116 or 118. Design course involving architecture, circuit design, physical design, and validation through extensive simulation of a digital or mixed-signal integrated circuit of substantial complexity under given design constraints. Team project that includes a final report. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE—II, (II)

**119B. Integrated Circuit Design Project (3)**
Workshop—1 hour; laboratory—6 hours. Prerequisite: course 119A. Design of digital and mixed-signal architec- ture, circuit design, physical design, and validation through extensive simulation of a digital or mixed- signal integrated circuit of substantial complexity under given design constraints. Team project that includes a final report. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE—II, (II)

**130A. Electromagnetics I (4)**

**130B. Introductory Electromagnetics II (4)**
Lecture—3 hours; discussion—1 hour. Prerequisite: course 130A. Plane wave propagation in lossy media, reflections, guided waves, single modulated waves and dispersion, and basic antennas. GE credit: SciEng | SE—II, (III)

**132A. RF and Microwave in Wireless Communication (5)**
Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 110B, 130B, 140B. The study of Radio Frequency and Microwave theory and practice for design of wireless electronic systems. Transmission lines, microwave integrated circuits, circuit analysis of electromagnetic energy transfer systems, the scattering parameters. GE credit: SciEng | SE—II, (I)

**132B. RF and Microwave in Wireless Communication (5)**
Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 132A. Passive RF and microwave device design, fabrication, and testing for wireless applications. RF and microwave filter and coupler design. Introductory analysis and design of RF and microwave transistor amplifiers. GE credit: SciEng | SE—II, (III)

**132C. RF and Microwave in Wireless Communication (5)**
Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 132B. RF and microwave amplifier theory and design, including transistor circuit models, stability considerations, noise models and low noise design. Theory and design of microwave transistor oscillators and mixers. Wireless system design and analysis. GE credit: SciEng | SE—III, (III)

**133. Electromagnetic Radiation and Antenna Analysis (4)**
Lecture—3 hours; discussion—1 hour. Prerequisite: course 130B. Properties of electromagnetic radiation; analysis and design of antennas: ideal cylindri- cal, small loop, aperture, and arrays; antenna field measurements. GE credit: SciEng | SE—II, (I)

**Quarter Offered:** I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses

**Pre-Fall 2011 General Education (GE):**
- Arts and Humanities: ACH|Arts and Humanities
- Sciences and Engineering: SciEng
- Social Sciences: SocSci
- General Diversity
- Writing Experience

**Fall 2011 and on Revised General Education (GE):**
- Arts and Humanities: SciEng
- Sciences and Engineering: SciEng
- Social Sciences: SocSci
- General Diversity
- Writing Experience
134A. RF/Microwave Systems Design (3) Lecture—3 hours; laboratory—6 hours. Prerequisite: course 308B or 110A or 150A. Class size limited to 24 students. Board-level RF design, fabrication, and characterization of an RF/microwave system, including the antenna, RF frontend, baseband circuits, and digital signal processing models. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—I. (I) Liu, Momeni

134B. RF/Microwave Systems Design (3) Lecture—3 hours; laboratory—6 hours. Prerequisite: course 134A. Class size limited to 24 students. Board-level RF design, fabrication, and characterization of an RF/microwave system, including the antenna, RF frontend, baseband circuits, and digital signal processing models. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—II. (II) Liu, Momeni


136A. Electronic Design Project (3) Workshop—1 hour; laboratory—6 hours. Prerequisite: Computer Science Engineering 30; courses 110A, 110B, 110C, 110D, 110E, 110F, 110G, 110H. Pass One required to major in Electronic and Computer Engineering. Group design project that will involve the entire class. GE credit: SciEng | SE.—II. (II)

136B. Electronic Design Project (3) Workshop—1 hour; laboratory—6 hours. Prerequisite: course 136A. Optical, electronic and communication-engineering design of an optoelectronic system operating under performance and economic constraints. Measurement and testing methods will be designed and implemented, and the system will be characterized. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—II. (II)

140A. Principles of Device Physics I (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 17, Physics 96D. Semiconductor device fundamentals, equilibrium and non-equilibrium statistical mechanics, minority carrier, diffusion, recombination, electrons and holes, p-n and Schottky junctions, first-order metal-oxide-semiconductor (MOS) field effect transistors, bipolar junction transistor fundamentals. GE credit: SciEng | SE.—I. (I)

140B. Principles of Device Physics II (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 140A. Electrical properties, designs, models and advanced concepts for MOS, Bipolar, and Junction FET (JFET) devices and including minority-carrier distributions, non-ideal effects, and device fabrication methods. MESFET and heterojunction bipolar transistor (HBT) fundamentals. Fundamentals of solar cells, photodiodes, and semiconductor lasers. GE credit: SciEng | SE.—III. (III)

145. Electronic Materials (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 140B, Engineering 43. Electronic and physical properties of materials used in electronics, including semiconductors, polymeric and MEMS, ceramics, dielectrics, metals, optical materials, organic semiconductors, optical and nonlinear properties, as well as their synthesis and deposition methods. GE credit: SciEng | SE.—I. (I)

146A. Integrated Circuits Fabrication (3) Lecture—2 hours; laboratory—3 hours. Prerequisite: course 140A. Basic fabrication processes for Metal-Oxide-Semiconductor (MOS) integrated circuits. Laboratory assignments covering oxidation, photolithography, impurity diffusion, metallization, wet chemical etching, and characterization work together in producing metal-gate PMOS test chips which will undergo parametric and functional testing. GE credit: SciEng | SE.—I. (I)

146B. Advanced Integrated Circuits Fabrication (3) Lecture—2 hours; laboratory—3 hours. Prerequisite: course 146A. Restricted to Electrical, Computer, and Electrical/Materials Engineering graduate students. Non-majors accommodated when space available. Fabrication processes for CMOS VLSI. Laboratory projects examine deposition of isolation, oxidation, photolithography, processes, metallization, and CV analysis. Topics include implantation, projection alignment, epitaxial growth, thin gate oxidation, and rapid thermal annealing. GE credit: SciEng | SE.—II. (II)

147. Microelectromechanical Systems (4) Lecture—2 hours; laboratory—3 hours. Prerequisite: Chemistry 2A, Engineering 100 or course 100. Restricted to seniors majoring in College of Engineering. Introduction to the theory and practice of micro-electromechanical systems (MEMS), including fundamentals of micro-nanofabrication, microscale sensing and actuation, self assembly, microfluidics and lab-on-a-chip. Weekly hands-on laboratory sections are emphasized on implementation and utilization of MEMS technologies. [Same course as Biomedical Engineering 118] GE credit: SciEng | QL, SE.—II. (II)

150A. Introduction to Signals and Systems I (4) Lecture—4 hours. Prerequisite: Engineering 6 or Mathematics 22A (may be taken concurrently). Course 150B. Characterization and analysis of continuous-time linear systems. Fourier series and transforms with applications. Introduction to communications and digital filter design. GE credit: SciEng | QL, SE.—II. (II)


152. Digital Signal Processing (4) Lecture—2 hours; laboratory—6 hours. Prerequisite: course 150B, course 70 or Computer Science Engineering 154B. Digital signal processing and implementation of real-time digital signal processing. Fundamentals of real-time systems. Programmable architectures including V/O, memory, peripherals, interrupts, DMA. Interfacing issues with A/D and D/A interfaces to a programmable DSP. Specification driven design and implementation of simple DSP applications. GE credit: SciEng | QL, SE.—II. (II)

157A. Control Systems (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 150A. Analysis and design of feedback control systems. Examples are drawn from electrical and mechanical systems as well as other engineering fields. Mathematical model of physical systems, stable system criteria, root-locus and frequency domain design methods. GE credit: SciEng | SE.—I. (I)

157B. Control Systems (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 157A. Closed system design, transfer-function and state-space methods; sampled-data implementation, digital control. Laboratory includes feedback system experiments and simulation studies. GE credit: SciEng | SE.—II. (II)

160. Signal Analysis and Communications (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 150A. Signal analysis based on Fourier methods. Fourier transforms, time-sampling, convolution, and filtering; spectral density; modulation: carrier-amplitude, carrier-frequency, and pulse-amplitude. GE credit: SciEng | SE.—I. (I)
180A. Digital Systems I (5) Lecture—3 hours; laboratory—6 hours. Prerequisite: Physics 9C or 9HD. Introduction to digital system design including combinational logic design, sequential and asynchronous circuits, computer arithmetic, memory systems and algorithmic state machine design; computer aided design (CAD) methodologies and tools. GE credit: SciEng | SE.—I, II, I, II.

180B. Digital Systems II (5) Lecture—3 hours; laboratory—6 hours. Prerequisite: course 150A. Computer-aided design of digital systems with emphasis on hardware description languages (VHDL), logic synthesis, and field-programmable gate arrays (FPGA). May cover advanced tools and systems design such as static timing analysis, pipelining, memory system design, testing digital circuits. GE credit: SciEng | SE.—I, II, III.

181A. Digital Systems Design Project (3) Workshop—1 hour; laboratory—6 hours. Prerequisite: courses 170 or Computer Science 122A. Digital-system and computer-engineering design course involving architecture, design, implementation and testing of a prototype application-specific processor under given design constraints. This is a team project that includes a final presentation and report. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—II, III.

181B. Digital Systems Design Project (3) Workshop—1 hour; laboratory—6 hours. Prerequisite: course 181A. Digital-system and computer-engineering design course involving architecture, design, implementation and testing of a prototype application-specific processor under given design constraints. This is a team project that includes a final presentation and report. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—II, III.

183. Testing and Verification of Digital Systems (5) Lecture—4 hours; laboratory—4 hours. Prerequisite: courses 170 and 180B. Computer-aided testing and design verification techniques for digital systems; physical fault testing; simulation-based design verification and test generation. GE credit: SciEng | SE.—II, III.

189A-V. Special Topics in Electrical Engineering and Computer Science (1-5) Prerequisite: consent of instructor. Special topics in (A) Computer Science, (B) Programming Systems; (C) Digital Signal Processing; (D) Signal Transmission; (F) Digital Communication; (G) Control Systems; (H) Robotics; (I) Signal Processing; (J) Image Processing; (K) High-Frequency Phenomena and Devices; (L) Solid-State Devices and Physical Electronics; (M) Systems Theory; (N) Active and Passive Circuits; (O) Integrated Circuits; (P) Computer Software; (Q) Computer Engineering; (R) Microprocessing; (S) Electronics; (T) Electromagnetics; (U) Opt-Electronics; (V) Computer Networks. May be repeated for credit when topic differs. GE credit: SciEng | SE.—I, II, III, I, II, III.

190C. Research Group Conferences in Electrical and Computer Engineering (1) Discussion—1 hour. Prerequisite: upper division standing in Electrical and Computer Engineering, consent of instructor. Research group conferences. May be repeated for credit (P/NP grading only). GE credit: SciEng | SE.—II, I, III, I, II, III.

190H. Internship in Electrical and Computer Engineering (1-5) Internship—4 hours. Prerequisite: completion of a minimum of 84 units with approval prior to period of internship; consent of instructor. Supervised work experience in electrical and computer engineering. May be repeated for credit if project is different. (P/NP grading only). GE credit: SciEng | SE.—I, II, III, I, II, III.

193A. Senior Design Project (3) Workshop—1 hour; laboratory—6 hours. Prerequisite: course 196 (may be taken concurrently); consent of instructor. Restricted to senior standing in Electrical or Computer Engineering. Team design project for seniors in Electrical or Computer Engineering. Project involves analysis, design, implementation and evaluation of an Electrical Engineering or Computer Engineering System. Project is supervised by faculty member. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—I, II, I, II.

193B. Senior Design Project (3) Workshop—1 hour; laboratory—6 hours. Prerequisite: course 193A. Team design project for seniors in Electrical Engineering or Computer Engineering. Project involves analysis, design and implementation of an Electrical Engineering or Computer Engineering System. Project supervised by a faculty member. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE.—II, I, III, I, II, III.

195A. Autonomous Vehicle Design Project (3) Workshop—1 hour; laboratory—6 hours. Prerequisite: course 180A, Computer Science and Engineering 30, and one of 115A, 158A, 180B, or Computer Science and Engineering 150. Pass One restricted to major. Design and construct an autonomous race car. Work in groups to design, build and test speed control circuits, a steering control loop. (Deferred grading only pending completion of sequence.) GE credit: SciEng | SE.—I, II, III.

195B. Autonomous Vehicle Design Project (3) Workshop—1 hour; laboratory—6 hours. Prerequisite: course 195A. Design and construct an autonomous race car. Students work in groups to design, build and test speed control circuits, track sensors, circuits, and a steering control loop. (Deferred grading only pending completion of sequence.) GE credit: SciEng | SE.—II, III.

196. Issues in Engineering Design (1) Seminar—1 hour discussion/laboratory—2-8 hours. Prerequisite: upper division standing; consent of instructor. Tutoring in Electrical and Computer Engineering courses, especially introductory courses. For upper-division students who need to work. (P/NP grading only).—I, II, III, I, II, III.

198. Directed Group Study (1-5) Prerequisite: consent of instructor. May be repeated three times for credit. (P/NP grading only) GE credit: SE.

199. Special Study for Advanced Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only).

Graduate


202. Advanced Digital Signal Processing (4) Lecture—4 hours. Prerequisites: courses 201, 260, and 265, and Mathematics 167 are recommended. Multirate DSP theory and wavelets, optimal transform and subband coders in data compression, advanced sampling theory and oversampled A/D converters, transmultiplexers and precoders in digital communication systems, genomic signal processing. Offered in alternate years.—II.

205. Computational Methods in Biomedical Imaging (4) Lecture—4 hours. Prerequisite: Biomedical Engineering 105 or Statistics 120; Biomedical Engineering 108 or course 150A. Analytical tomographic reconstruction from projections in 2D and 3D; model-based image reconstruction methods; maximum like-lihood and Bayesian methods; applications to CT, PET, and SPECT. (Same course as Biomedical Engineering 252) —II.

206. Digital Image Processing (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 130B. Two-dimensional systems theory, image perception, sampling and quantization, transform theory and applications, enhancement, filtering and restoration, image analysis, and image process systems.—II.

210. MOS Analog Circuit Design (3) Lecture—3 hours. Prerequisite: courses 110B, 111B and 140B. Analysis and design of MOS amplifiers, bias circuits, voltage references and other analog circuits. Stability and compensation of feedback amplifiers. Introduction to noise analysis in MOS circuits.—I.

211. Advanced Analog Circuit Design (3) Lecture—3 hours. Prerequisite: course 210; Statistics 131A and course 112 recommended. Noise and distortion in electronic circuits. Design and simulation of circuit applications to communication circuits. Specific applications include mixers, low-noise amplifiers, power amplifiers, phase-locked loops, oscillators and receiver architectures.—II.

212. Analog MOS IC Design for Signal Processing (3) Lecture—3 hours. Prerequisite: course 210. Analysis and design of analog MOS integrated circuits. Passive components, single-ended and fully differential op amps, sampled-data and continuous-time filters.—II.

213. Data-Conversion Techniques and Circuits (3) Lecture—3 hours. Prerequisite: course 210. Digital-to-analog and analog-to-digital conversion; component characteristics and matching, sample-and-hold, comparator, amplifier, and reference circuits.—III.


215. Circuits for Digital Communications (3) Lecture—3 hours. Prerequisite: courses 150B and 210 (may be taken concurrently); course 165, 166 or 265 recommended. Analog, digital, and mixed-signal CMOS implementations of communication circuit blocks; gain control, adaptive equalizers, sampling detectors, clock recovery. Offered in alternate years.—II.

216. Low Power Digital Integrated Circuit Design (3) Lecture—3 hours. Prerequisite: course 118B. IC design for low power and energy consumption. Low power architectures, logic styles and circuit design. Variable supply and threshold voltage management. Power estimation. Energy sources, power electronics, and energy recovery. Applications in portable electronics and sensors. Thermodynamics limits.—II.

217. Biomedical Electronics (4) Lecture—3 hours; project. Prerequisite: course 210 or consent of instructor. Special consideration and accommodation will be made for biomedical or signal processing majors who have not taken 210. Circ.
cuit design for medical applications including weak
inversion amplifiers, integrated UFL filters, chopper
stabilization, etc.; electromagnetic interfaces; neurom-
ulation pulse generation; wireless powering of and
communication with implantable devices. Electri-
physiological signaling and aspects of signal pro-
cessing for biomedical systems. —III. (III.)
219. Advanced Digital Circuit Design (3)
Lecture—3 hours. Prerequisite: course 118 or 218A.
Analysis and design of digital circuits. Both bipolar
and MOS circuits are covered. Dynamic and static
RAM cells and semiconductor amplifiers. Advanced MOS
families. Multi-valued logic. —III. (III.)
211. Analog Filter Design (3)
Lecture—3 hours. Prerequisite: courses 100 and
150A. Design of active and passive filters including
filter classification and design techniques; use of
non-linear RF circuit design techniques; dynamic
analysis of cascaded reactive circuits. stability issues
of active filters. —II. (II.)
222. RF IC Design (3)
Lecture—3 hours. Prerequisite: course 132C and
210. Radio frequency (RF) solid-state devices, RF
device modeling and design rules; non-linear RF cir-
cuit design techniques; use of non-linear computer-
aided (CAD) tools, RF power amplifier design.
Offered in alternate years. —II. (II.)
228. Advanced Microwave Circuit and
Device Design Techniques (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite:
theory, design, fabrication, analysis of
advanced microwave circuits and devices. Wide-
band, low noise, high frequency, high gain amplifiers.
Microwave oscillators. Applications of microwave
circuit theory. —II. (II.)
233. High Speed Signal Integrity (3)
Lecture—3 hours. Prerequisite: course 130B, Max-
well’s equations, field theory, transmission line,
complex waves, waveguides, resonant cavities, and
electromagnetics. —II. (II.)
232A. Advanced Applied Electromagnetics I
(3)
Lecture—3 hours; laboratory—3 hours. Prerequisite:
course 132B. The exact formulation of applied electromagnetics
problems using Green’s functions. Applications of these
techniques to transmission circuits. Offered in alter-
ate years. —I. (I.)
232B. Advanced Applied Electromagnetics II
(4)
Lecture—3 hours; laboratory—3 hours. Prerequisite:
course 132B. Advanced treatment of electromagnetics
in applications to passive microwave devices and antennas. Offered in alternate years. —III. (III.)
234. Photonics (4)
Lecture—3 hours; project—1 hour. Prerequisite:
course 230A or 230B. Optical propagation of electromagnetic waves and beams in photonics components and the design of such devices using numerical techniques. Offered in alternate years. —II. (II.)
236. Nonlinear Optical Applications (3)
Lecture—3 hours. Prerequisite: course 130B, course
230A (may be taken concurrently). Nonlinear optical
interactions in optical communication, optical infor-
mation processing and integrated optics. Basic con-
cepts underlying optical nonlinear interactions in
materials and guided media. Not open to credit to
students who have completed course 233. Offered in alternate years. —I. (I.)
237A. Lasers (3)
Lecture—3 hours. Prerequisite: course 130B or the
equivalent and course 235. Theoretical and practi-
cal description of laser physics, interaction of light
with matter, laser resonators, laser diodes, conventional and
solid state lasers. —II. (II.)
237B. Laser Physics II (4)
Lecture—3 hours; extensive problem solving. Prerequi-
tive: course 237A or Applied Science Engineering
265A. Oscillators, relaxation oscillators, instabil-
ity, coherence, gain saturation, intracavity elements, lasers,
pumping, transversely excited. —II. (II.)
238. Semiconductor Diode Lasers (3)
Lecture—3 hours. Prerequisite: course 245A. Under-
standing of fundamental optical transitions in semi-
conductor and quantum-confined systems. Lasers are
applied to diode lasers and selected photonic devices.
The importance of radiative and non-radi-
ative recombinations is discussed. —III. (III.)
239A. Optical Fiber Communications
Technologies (4)
Lecture—4 hours. Prerequisite: course 130B. Physi-
cal layer issues for component and system technolo-
gies in optical fiber networks. Sources of physical
limits and limitations in network scal-
ability. Enabling technologies for wavelength-
division-multiplexing, frequency-division-multiplexing,
and time-division-multiplexing networks. Optical amplifiers and their impact on optical
networks (signal-to-noise ratio, gain equalization,
and crosstalk). —III. (III.)
239B. Optical Fiber Communications
Systems and Networking (4)
Lecture—4 hours. Prerequisite: course 239A. Phys-
cal layer optical communications systems in network
architectures and protocols. Optical systems design
and integration using optical component techno-
lologies. Comparison of wavelength routed WDM,
TDM, and SONET systems and networks. Case studies
of next generation technologies. Offered in alternate
years. —III. (III.)
240. Semiconductor Device Physics (3)
Lecture—3 hours. Prerequisite: course 140B. Physi-
cal properties, characteristics, and models of funda-
mental semiconductor devices, including pn-
and Schottky diodes, MOSFETs and MESFETs Bipar-
lar Junction Transistors, and light emitters/detec-
tors. —II. (II.)
242. Advanced Nanostructured Devices (3)
Lecture—3 hours. Prerequisite: courses 130A and
140B. Physics of nano-scale materials and device
operation. Overview of new devices enabled by
nano-technology; fabrication and characteriza-
tion methods, applications of nano-structures and
devices. Offered in alternate years. —II. (II.)
244A. Design of Microelectromechanical
Systems (MEMS) (3)
Lecture—3 hours. Prerequisite: course 140A, 140B
or consent of instructor. Theory and practice of
MEMS design fundamentals, CAD tools, and case studies. A MEMS design proj-
ected will be fabricated in a
commercial foundry and tested in course 244B.
Offered in alternate years. —I. (I.)
244B. Microsystems (4)
Lecture/discussion—4 hours. Introduction to the
to-
261. Signal Processing for Communications (4)
Lecture—4 hours. Prerequisite: course 165, 260 or consent of instructor. Signal processing in wireless and wireline communication systems. Characterization and distortion of wireless and wireline channels. Channel equalization and maximum likelihood sequence estimation. Channel precoding and pre-equalization. Offsets to transmit diversity. Array processing. Offered in alternate years. —III.

262. Multi-Access Communications Theory (4)
Lecture—3 hours; project. Prerequisite: Statistics 120 or equivalent; course 173A or Engineering Computer Science 152A. Maximum stable throughput of Poisson collision channels. Classic collision resolution algorithms. Carrier sensing multiple access and its performance analysis. System stability analysis. Joint design of the physical/medium access control layers. Capacity region of multi-access channels. Multi-access with correlated sources. Offered in alternate years. —III.

263. Optimal and Adaptive Filtering (4)

264. Estimation and Detection of Signals in Noise (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 260. Introduction to parameter estimation and detections of signals in noise. Bayes and Neyman-Pearson likelihood-ratio tests for signal detection. Maximum-likelihood parameter estimation. Detection of known and Gaussian signals in white or colored noise. Applications to communications, radar, signal processing. —II. (II.)

265. Principles of Digital Communications (4)
Lecture—4 hours; course 165 and 260, or consent of instructor. Introduction to digital communications. Coding for analog sources. Characterization of signals and systems. Modulation and demodulation for the additive Gaussian channel. Digital signal transmission constrained linear filter channels and over fading multipath channels. Spread spectrum signals. —II. (II.)

266. Information Theory and Coding (3)
Lecture—3 hours. Prerequisite: Statistics 120. Information theory—Measure of information. Redundancy reduction encoding of an information source. Capacity of a communication channel, error-free communications. Offered in alternate years. —II.

267. Mobile Communications (4)
Lecture/laboratory—3 hours. Prerequisite: courses 260 and 265 can be taken concurrently. Time-varying multi-path fading channel models and receivers performing channel equalization; multiple access techniques and multiple access receivers design and performance; optimum design and the capacity of wireless channels. Offered in alternate years. —II.

269A. Error Correcting Codes I (3)
Lecture—3 hours. Prerequisite: Mathematics 22A and course 160. Introduction to the theory and practice of block codes, linear block codes, cyclic codes, decoding algorithms,—theory of error correction. —I. (I.)

269B. Error Correcting Codes II (3)
Lecture—3 hours. Prerequisite: course 165 and 269A. Introduction to convolutional codes, turbo codes, trellis and block coded modulation codes, soft-decision decoding algorithms, the Viterbi algo-
rithm, reliability-based decoding, trellis-based decoding, multistage decoding. Offered in alternate years. —II.

270. Computer Architecture (3)
Lecture—3 hours. Prerequisite: course 170 or Computer Science Engineering 154B. Introduction to modern techniques for high-performance single and multiple processor systems. Topics include advanced pipeline design, advanced memory hierarchy design, optimizing pipeline and memory use, and memory sharing among multiprocessors. Case studies of recent single and multiple processor systems. —II. (II.)

272. High-Performance Computer Architecture and Implementation (3)
Lecture—3 hours. Prerequisite: course 170 or Computer Science Engineering 154B and course 270 or Computer Science Engineering 250A. Architectural issues in achieving high-performance via concurrent execution of instructions and associated problems and solutions. Specialized architectures. Offered in alternate years. —I. (I.)

273. Networking Architecture and Resource Management (4)
Lecture—3 hours; project. Prerequisite: Computer Science Engineering 152A or course 173A; Computer Science Engineering 252 recommended. Design and implementation principles of networking architecture and protocols. Internet, ATM and telephony case studies. Topics: Internet technology; application and services; resource management; Quality of Service (QoS) provisioning; traffic engineering; performance evaluation and future research issues. —Same course as Computer Science Engineering 258. —II. (II.)

274. Internet Measurements, Modeling and Analysis (4)
Lecture—3 hours; project. Prerequisite: Computer Science Engineering 252 or course 273. Advanced topics in the theoretical foundations of network measurements, modeling, and statistical inference. Applications to Internet engineering, routing optimization, load balancing, traffic engineering, fault tolerance, anomaly detection, and network security. Individual project requirement. Offered in alternate years. —II. (II.)

276. Fault-Tolerant Computer Systems: Design and Analysis (3)
Lecture—3 hours. Prerequisite: courses 170, 180A. Introduces fault-tolerant digital system theory and practice. Offers an overview of hardware redundancy techniques based on hardware redundancy, time redundancy, information redundancy, and software redundancy. Examines hardware and software reliability analysis, design, and management. Not open for credit to students who have completed course 276A. Offered in alternate years. —II.

277. Graphics Architecture (3)
Lecture—3 hours. Prerequisite: Computer Science Engineering 154B or course 170; Computer Science Engineering 175. Design and analysis of the architecture of computer graphics systems. Topics include the graphics pipeline with a concentration on hardware and software techniques. Covering both parallelism in graphics, and case studies of noteworthy and modern graphics architectures. Offered in alternate years. —II.

278. Computer Arithmetic for Digital Implementations (3)
Lecture—3 hours. Prerequisite: courses 170, 180A. The design and implementation of computer arithmetic logic units are studied with particular emphasis on high-speed digital systems requirements. Additional (subtraction), multiplication and division operations are covered, and fixed and floating-point representations are examined. Offered in alternate years. —II.

281. VLSI Digital Signal Processing (4)
Lecture—3 hours; project. Prerequisite: courses 150B, 170, 180A or consent of instructor. Digital signal processors, building blocks, and algorithms. Design and implementation of processor algorithms, architectures, control, functional units, and circuit topologies for increased performance and reduced circuit size and power dissipation. —II.

282. Hardware Software Co-design (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 170, 180B. Specification and design of embedded systems; modeling and performance estimation; hardware/software partitioning; co-simulation; design reuse; platform-based design; reconfigurable computing. —III.

283. Advanced Design Verification of Digital Systems (4)
Lecture—3 hours; project. Prerequisite: courses 170 and 180A. Design verification techniques for digital systems; simulation-based design verification techniques; formal verification techniques, including equivalence checking, model checking, and theorem proving; timing analysis and verification; application of design certification techniques to microprocessors. Offered in alternate years. —II.

Lecture—4 hours. Prerequisite: courses 170 and 180B, or consent of instructor. Computer Science Engineering 122A recommended. Introduction to design and optimization of digital computing systems for embedded applications. Topics include combinational optimization techniques, performance and energy optimization in embedded systems, compilation and architecture-specific technologies, programmable and reconfigurable platforms; design automation and algorithmic improvements to design process. —II. (II.)

286. Introduction to Digital System Testing (3)
Lecture—3 hours. Prerequisite: course 180A; Statistics 120 or 131A. Review of several current techniques used to diagnose faults in both combinational and sequential circuits. Topics include path sensitization procedures, Boolean difference, Dallogram random test generation, TC testing and an analysis of the effects of intermittent faults. Not open for credit to students who have completed course 276A. Offered in alternate years. —II.

289A-V. Special Topics in Electrical and Computer Engineering (1-5)

290. Seminar in Electrical and Computer Engineering (1)
Seminar—1 hour. Discussion and presentation of current research and development in Electrical and Computer Engineering. May be repeated for credit. (S/U grading only.)—I, II, III.

290C. Graduate Research Group Conference in Electrical and Computer Engineering (1)
Discussion—1 hour. Prerequisite: consent of instructor. Research problems, progress, and techniques in electrical and computer engineering. May be repeated for credit. (S/U grading only.)—I, II, III.

291. Solid-State Circuit Research Laboratory Seminar (1)
Seminar—1 hour. Prerequisite: graduate standing. Lectures on solid-state circuit and system design by various visiting experts in the field. May be repeated for credit. (S/U grading only.)—I, II, III.
292. Seminar in Solid-State Technology (1)
Seminar—1 hour. Prerequisite: graduate standing. Lectures and discussions on solid-state technology by various visiting experts. May be repeated for credit. (S/U grading only)—I, III.

293. Computer Engineering Research Seminar (1)
Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Lectures, tutorials, and seminars on topics in computer engineering. May be repeated for credit up to four times. (S/U grading only)—II, III.

294. Communications, Signal and Image Processing Seminar (1)
Seminar—1 hour. Prerequisite: graduate standing. Communications, signal and image processing, video engineering and computer vision. May be repeated for credit. (S/U grading only)—I, II, III.

295. Systems, Control and Robotics Seminar (1)
Seminar—1 hour. Prerequisite: graduate standing. Lectures on robotics and related areas by faculty and visiting experts. May be repeated for credit. (S/U grading only)—II, III.

296. Group Study (1-5)
Prerequisite: consent of instructor. (S/U grading only)

299. Research (1-12)
(S/U grading only)

Professional

390. The Teaching of Electrical Engineering (1)
Discussion—1 hour. Prerequisite: meet qualifications for having assistant and/or associate-in-electrical-engineering, to be determined by the Electrical Engineering Department. Participation as a teaching assistant or associate-in-engineering is considered on a designated engineering course. Methods of leading discussion groups or laboratory sections, writing and grading quizzes, use of laboratory equipment, and grading laboratory reports. May be repeated for credit. (S/U grading only)—I, II.

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only)—I, II, III, IV, V, VI.

Engineering: Mechanical and Aerospace Engineering

(Dean of Engineering)

C. P. (Case) van Dam, D. Engr., Chairperson of the Department
Benjamin D. Shaw, Ph.D., Vice Chairperson of the Department

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- Harry H. Cheng, Ph.D., Professor
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- Roger Davis, Ph.D., Professor
- Jean-Pierre Delplanque, Ph.D., Professor
- Raissa D’Souza, Ph.D., Professor
- Fidelis O. Eke, Ph.D., Professor
- Paul A. Erickson, Ph.D., Associate Professor
- Rida T. Farouki, Ph.D., Professor
- Mohammed M. Islam, Ph.D., Associate Professor
- Academic Senate Distinguished Teaching Award
  Ronald A. Hess, Ph.D., Professor
- Michael R. Hill, Ph.D., Professor
- David A. Horsey, Ph.D., Professor
- David Hwang, Ph.D., Professor
- Niels G. Jensen, Ph.D., Professor
- (Civil and Environmental Engineering; Mechanical and Aerospace Engineering)
- Sanjay S. Joshi, Ph.D., Associate Professor
- Ian M. Kennedy, Ph.D., Professor
- Valeria La Saponara, Ph.D., Associate Professor
- Barbara S. Linke, Ph.D., Assistant Professor
- Mark Modera, Ph.D., Professor
- (Civil and Environmental Engineering; Mechanical and Aerospace Engineering; Land, Air and Water Resources)
- Kazuo Yamazaki, Ph.D., Professor

Emeriti Faculty
- Hector A. Baldes, Ph.D., Professor Emeritus
- James W. Bausch, Ph.D., Professor Emeritus
- Academic Senate Distinguished Teaching Award
  Charles W. Beadle, Ph.D., Professor Emeritus
- Jean-Jacques Chatott, Ph.D., Professor Emeritus
- Harry A. Dewer, Ph.D., Professor Emeritus
- Andrew A. Frank, Ph.D., Professor Emeritus
- Jerald M. Henderson, D. Engr., Professor Emeritus
- Pyron A. Hoffman, Sc.D., Professor Emeritus
- Munt Hubbard, Ph.D., Professor Emeritus
- Maury L. Hull, Ph.D., Professor Emeritus
- Dean C. Kargop, Ph.D., Professor Emeritus
- John D. Kemper, Ph.D., Professor Emeritus
- Wolfgang Kollasch, Ph.D., Professor Emeritus
- Donald L. Margolis, Ph.D., Professor Emeritus
- Allan A. McKillop, Ph.D., Professor Emeritus
- Bruce R. White, Ph.D., Professor Emeritus

Affiliated Faculty
- James Schoaf, Ph.D., Lecturer

The Mechanical and Aerospace Engineering Undergraduate Programs

The Department of Mechanical and Aerospace Engineering administers three undergraduate programs in the College of Engineering: (1) Mechanical Engineering, (2) Mechanical Engineering/Materials Science, and (3) Aerospace Science and Engineering. For more information about our programs, please see http://mae.ucdavis.edu/ug.php.

The Mechanical Engineering/Materials Science program is not accepting new students.

Mission. The Department of Mechanical and Aerospace Engineering is committed to educating future engineers so that they may contribute to the economic growth and well-being of the state, the nation, and the world, and to the advancement of knowledge in the fields of mechanical and aerospace sciences.

Objectives. The objectives of the programs offered in Mechanical and Aerospace Engineering include the following: to prepare its graduates to practice mechanical and/or aerospace engineering in a broad range of industries, to enable interested graduates to pursue graduate education, to prepare its graduates to participate in research and development, and to foster creative and innovative efforts in science, engineering, and technology and to allow interested graduates to pursue entrepreneurial endeavors.

Preparatory Requirements. In order to change to any major offered by the Department of Mechanical and Aerospace Engineering, student must: have completed at least one quarter (minimum of 12 units) at UC Davis; have completed not more than 135 cumulative units (excluding AP units); be in good academic standing and meet minimum progress requirements; receive a letter grade for all courses that satisfy Engineering degree requirements; have completed at least the following five courses: Mathematics 21A, B, C, Physics 9A and Chemistry 2A and b) have a GPA of 2.800 or better in all completed Mathematics, Physics, Biology and Chemistry courses required for your intended major(s) taken at UC Davis; have two 800 U GPA in completed engineering courses.

Mechanical Engineering Undergraduate Program


The mechanical engineer uses basic science in the design and manufacture of complex engineering systems, requiring the application of physical and mechanical principles to the development of machines, energy conversion systems, materials, and equipment for guidance and control. Work in this broad field of engineering requires a thorough knowledge of mathematics, physics, chemistry, material science, applied mechanics, thermodynamics, heat transfer, mass transfer, electricity, manufacturing processes, and economics. The Mechanical Engineering program is designed to provide knowledge in mechanical engineering and associated applied sciences so that graduates may practice in a broad range of industries, pursue graduate studies, participate in research and development, and/or pursue entrepreneurial endeavors.

Areas of Interest
Students spend their third year in further study of fundamental courses, and in the fourth year, they tailor their studies to their interests by selecting courses in controls and systems analysis, fluid mechanics, heat transfer, mechanical design or thermodynamics. Students can either prepare for graduate study in mechanical engineering or obtain a broad background for entering engineering practice. Students may select elective courses from among the areas of interest listed below.

Mechanical Design. The creation and improvement of products, processes, or systems that are mechanical in nature are the primary activities of a professional mechanical engineer. The development of a product from concept, to design, manufacturing process selection and planning, quality control and assurance, and life cycle considerations are areas of study and specialization in the area of mechanical design. Solutions to such major social problems as environmental pollution, the lack of mass transportation, the lack of raw materials, and energy shortages, will depend heavily on the engineer’s ability to create new types of machinery and their mechanical design. The engineer-designer must have a solid and relatively broad background in the basic physical and engineering sciences and have the ability to synthesize the size and cost of such a background in a creative problem-solving. In addition to having technical competence, the designer must be able to...
consider the socioeconomic consequences of a design and its possible impact on the environment. Product safety, reliability, and economics are other considerations.

Suggested technical electives:
- Aerospace Science and Engineering 133, 139
- Biological Systems Engineering 114, 120, 165
- Biomedical Engineering 118/Electrical and Computer Engineering 147
- Engineering 122, 160 (only one unit of credit towards Technical Electives requirement)
- Materials Science and Engineering 180, 181, 182
- Mechanical Engineering 121, 134, 150B, 151, 152, 154, 155


Biomedical and Engineering Fluid Mechan¬
ics. This field of study is based on the fundamentals of fluid mechanics and their broad range of applications in the biomedical and engineering areas. Areas of current research include blood circulation and its potential role in the regulation of normal physiological function and in the development of disease; groundwater and atmospheric flows and their implications for pollutant transport and environmental concerns; aerodynamic flow around transportation vehicles and its impact on vehicle performance; and flow in combustion engines and other energy systems with considerations of efficiency and environmental impact. These areas are investigated both experimentally and computationally.

Suggested technical electives:
- Aerospace Science and Engineering 138
- Engineering 160 (only one unit of credit towards technical requirements)
- Chemical Engineering 161A, 161B
- Civil and Environmental Engineering 144, 149
- Mechanical Engineering 161, 163


Combustion and the Environment. Combustion is widely used for energy generation, propulsion, heating, and waste disposal, as well as for many other applications. Mechanical engineers are often heavily involved with the design of combustion systems—internal (turbo engines, gas turbines, furnaces, etc.) and deal with aspects of combustion ranging from increasing efficiencies to reducing pollutant emissions. This specialization is for those who would like to work in fields that use combustion, or that deal with pollution related to combustion. With the current increased emphasis on reducing pollutants while maintaining or increasing efficiency, the efforts of mechanical engineers in designing and improving combustion systems are becoming more important.

Suggested technical electives:
- Mechanical Engineering 161, 163
- Civil and Environmental Engineering 149, 150

Suggested Advisers. R.C. Aldredge, R. Davis, P.A. Erickson, I.M. Kennedy, B.D. Shaw

Heat Transfer, Thermodynamics, and Energy Systems. This specialization emphasizes the fundamentals of heat transfer and thermodynamics, and their application to the design of advanced engineering systems. The objective of the program is to introduce students to the fundamental processes of heat transfer and thermodynamics in complex engineering systems. Students will be able to design systems that are more efficient, effective, and reliable systems with less environmental pollution and impact. An understanding of heat transfer and thermodynamics is required for the design of cost-effective systems for power generation, propulsion, heat exchangers, industrial processes, refining, and chemical processing. This area of specialization is important to many industries—and automotive—well as to the thermal design of electronic and computer packages.

Suggested technical electives:
- Aerospace Science and Engineering 138
- Mechanical Engineering 161, 163

Suggested Advisers. R.C. Aldredge, R. Davis, P.A. Erickson, I.M. Kennedy, J.W. Park, B.D. Shaw

Manufacturing. Manufacturing is concerned with the conversion of raw materials into finished prod¬
ucts by a variety of processes, such as machining, forming, casting, and molding. Modern manufactur¬ing technology is increasingly dependent upon inte¬gration with computer-aided design systems and precision computer controls. State-of-the-art laborato¬ries offer the opportunity for hands-on experience with a wide spectrum of manufacturing equipment.

Suggested technical electives:
- Biomedical Engineering 118/Electrical and Computer Engineering 147
- Electrical and Computer Engineering 160
- Materials Science and Engineering 180, 181
- Mechanical Engineering 150B, 151, 154


System Dynamics and Control. Engineers are increasingly concerned with the performance of inte¬grated dynamic systems in which it is not possible to optimize component parts without considering the overall system. System dynamics and control specialists are concerned with the modeling, analysis, and simulation of all types of dynamic systems and with the use of automatic control techniques to change the dynamic characteristics of systems in useful ways. The empha¬sis in this program is on the physical systems that are closely related to mechanical engineering, but the techniques for studying these systems apply to social, economic, and other dynamic systems.

Ongoing research includes projects on continuously variable transmissions, active and semi-active sus¬pension systems, modeling and control of vehicle dynamics, electromechanical actuator design, elec¬trically controlled fluid systems, analysis of flight control systems, and the design of flight-control systems with humans in the loop.

Suggested technical electives:
- Aerospace Science and Engineering 129, 139, 141
- Electrical and Computer Engineering 160
- Engineering 122
- Mechanical Engineering 121, 134, 154

Suggested Advisers. F.O. Eke, R.A. Hess, S. Joshi

Ground Vehicle Systems. An important aspect of mechanical engineering is the design of more environmentally benign surface vehicles that provide efficient individual and public transportation. Innovations in the field require competence in vehicle dynamics, control of vehicle dynamics, power sources and power transmission, lightweight structures and systems, and, alternatively, powered systems, including electrical drives and fuel cells, and mechatronic systems.

Suggested technical electives:
- Aerospace Science and Engineering 127, 129, 139
- Civil and Environmental Engineering 130, 149, 160
- Engineering 122, 160 (only one unit of credit towards technical electives requirement)
- Mechanical Engineering 121, 134, 152

Suggested Advisers. P.A. Erickson, M.J. Hill, S. Velinsky

Transportation Systems. As society recognizes the increasing importance of optimizing transpor¬tation systems to minimize environmental degradation and energy expenditure, engineers will need to con¬side major innovations in the way people and goods are moved. Such innovations will require competence in vehicle dynamics, propulsion and control, and an understanding of the problems caused by present-day modes of transportation. Vehicle control requires an understanding of sensors and actuators, and the integration of yet-to-be-pro¬posed concepts into overall vehicular dynamics. Competence in these areas allows for the develop¬ment of alternative propulsion concepts, such as electric, hybrid, and fuel cell.

Suggested technical electives:
- Aerospace Science and Engineering 127, 129
- Biological Systems Engineering 114, 120
- Civil and Environmental Engineering 131, 149
- Engineering 122, 160 (only one unit of credit towards Technical Electives requirement)
- Mechanical Engineering 134, 150B, 161, 163

Suggested Advisers. P.A. Erickson, J.W. Park, S. Velinsky

Mechanical Engineering Program Requirements

Students are encouraged to adhere carefully to all prerequisite requirements. The instructor is autho¬rized to drop students from a course for which stated prerequisites have not been completed.

Exclusive of General Education units, the minimum number of units required for the Mechanical Engi¬neering major is 157.

Lower Division Required Courses

| UNITS | Mathematics 21A-21B-21C-21D ............. 16 |
| Course Code | Mathematics 22A-22B-22C-22D-22E ............. 20 |
| Course Code | Physics 9A9B9C9D ............. 19 |
| Course Code | Chemistry 2A2B or 2AH2BH ............. 10 |
| Course Code | Engineering 4 ...................... 3 |
| Course Code | Engineering 6 or Mechanical Engineering 5 ............. 4 |
| Course Code | Engineering 17, 35, 45 (or 45Y) ............. 12 |
| Course Code | Mechanical Engineering 50 .......... 4 |
| Course Code | English 3 or University Writing Program 1, 1Y, 2, 3, 4, Native American Studies 5 .......... 5 |
| Course Code | Communication 1 or 2, 3, 4 ............. 4 |

Upper Division Required Courses

| Engineering 100, 102, 103, 104, 105, 106, 107A & 8, 150A, 165, 172 ............. 22 |
| Mechanical Engineering 183A & 185B (taken in consecutive quarters), or Aerospace Science and Engineering 130A & 130B ............. 8 |
| Engineering 190 ............. 3 |
| Select one course from the following Applied Mathematics Electives: Engineering 180, Mathematics 128C, Mechanical Engineering 115; Statistics 131A ............. 4 |
| Select one course from the following System Dynamics/Mechanical Design Electives: Engineering 122, Mechanical Engineering 121, 150B, 154 or 171 ............. 4 |
| Select two courses from the following Restricted Electives: Aerospace Science and Engineering 129, 139, 140, 141, 142; Materials Science and Engineering 180, 182; Mechanical Engineering 134, 151, 152, 161, 163; Students may also choose from Aerospace Science and Engineering 130A, 130B, Mechanical Engineering 150B, 154, 171 if these courses are not used in satisfaction of other degree requirements . 8 |
| Technical Elective Requirement ............. 7 |
At least four units must be taken from any Upper Division Engineering course, which may include any from the above System Dynamics/Mechanical Design or Restricted Elective lists if these courses are not used in satisfaction of other degree requirements. Up to 4 units may be selected from Biomedical Engineering 185A/B or any engineering 192, 199 not used in satisfaction of other degree requirements. Courses that cannot be used are Biomedical Engineering 110L, Engineering 160, 191, 198 (Gearing up for Graduate School/undergraduate research), Computer Science Engineering 188 or any 197T course.

Up to three units may be used from the following technical electives list:
- Agricultural and Resource Economics 100A, 100B, 112
- Applied Biological Systems Technology 101, 142, 165
- Atmospheric Science 149, 160
- Biological Sciences 2A, 2B, 2C
- Chemistry 2C, 2CH, 8A, 8B and any upper division course except Chemistry 195 and 197
- Economics 100, 101, 102, 103, 122
- Engineering: Any upper division course offered in the college of engineering except Biomedical Engineering 110E, Engineering 160, 191, 198 (gearing up for graduate school/undergraduate research), Computer Science Engineering 188 or any 197T course.
- Environmental and Resource Sciences 100, 100L, 121, 131, 136, 185, 186, 186L
- Exercise Biology 102
- Fiber and Polymer Science 100 (same as Materials Science Engineering 147)
- Food Science and Technology 159, 160
- Geology 17, 32, 35, 36, 50, 50L, 60, 100, 100L, 101L, 130, 131, 160, 162, 163
- Hydrologic Science 110, 124, 134, 141, 142, 143, 144, 146, 151, 182
- Management 11A, 11B, 100, 120, 140, 145, 150, 160, 170, 180
- Mathematics: any upper division course except Mathematics 197TC
- Physics 9HE and any upper division course except Physics 160 (restricted to one unit of technical elective), 195, 197T
- Statistics: any upper division course except Statistics 110, 123, 103, 104, 106, 108
- Upper Division Composition Requirement 0 or 4
  One course from following (grade of C- or better is required): University Writing Program 101, 102E, 104A, 104E, 104T or passing the Upper-Division Composition Exam.

The Mechanical Engineering/Materials Science Undergraduate Program

The Mechanical Engineering/Materials Science program is not accredited by the Engineering Accreditation Commission of ABET; http://www.abet.org.

The Mechanical Engineering/Materials Science program is not accepting new students through Undergraduate Admissions or the change of major process.

The Mechanical Engineering/Materials Science program is a combined major that offers students a unique interdisciplinary experience requiring work with mechanical engineering and materials science and engineering students. In addition to performing work in portions of the mechanical engineering program described above, this program provides the background to understand the structure, properties, and behavior of materials and to pursue these fields in industry and/or graduate scholarship.

Students are encouraged to adhere carefully to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisites have not been completed.

Exclusive of General Education units, the minimum number of units required for the Mechanical Engineering/Materials Science major is 170.

Lower Division Required Courses

| Mathematics 21A-21B, 21C, 21D | 16 |
| Mathematics 22A-22B | 6 |
| Physics 9A-9B, 9C, 9D | 19 |
| Chemistry 2A-2B, 2A-2BH | 10 |
| Engineering 3 | 3 |
| Engineering 6 or Mechanical Engineering 5 | 5 |
| Engineering 17, 35 or 45 (or 45I) | 12 |
| Mechanical Engineering 50 | 4 |
| English 3 or University Writing Program 1, 1Y, or 1Y, or Comparative Literature 1, 2, 3, or 4, or Native American Studies 5 | 4 |
| Communication 1 or 3 | 4 |

Upper Division Required Courses

| Engineering 100, 102, 103, 104, 105 | 19 |
| Mechanical Engineering 185A & 185B, Materials Science and Engineering 188A & B (taken in consecutive quarters) | 4 |
| Materials Science and Engineering 160, 162, 164, 174 | 16 |
| One course chosen from Materials Science and Engineering 172, 180, 181, 182, 188A-8B (if not used to satisfy above core requirement) | 4 |
| One laboratory course chosen from Materials Science and Engineering 162L or 174L | 2 |
| Select one course from: Engineering 180, 188A, 188B | 4 |
| Mathematics 128C, Mechanical Engineering 115, Statistics 131A | 4 |
| Engineering 190 | 3 |
| Technical Electives | 10 |
| One course must be chosen from the following System Dynamics/Mechanical Design electives: Engineering 122, Mechanical Engineering 121, 150B, 154 | 4 |
| Two courses must be chosen from: Aerospace Science and Engineering 129, 130A, 130B, 138, 139, 189A, 189B, Materials Science and Engineering 147, Mechanical Engineering 134, 151, 152, 161, 163 | 15 |
| Students may also choose from Mechanical Engineering 150B, 154 if not used for the System Dynamics/Mechanical Design elective requirement above. | 4 |
| Students may also choose from Material Science and Engineering 180, 181, 182, if these courses are not used for a Materials Science and Engineering requirement above. | 4 |
| A combined maximum of 4 units of Mechanical Engineering 185A & B, Materials Science and Engineering 188A & B or any course numbered 192 or 199 not used in satisfaction of core requirements may be applied to the technical elective degree requirement. | 0 or 4 |
| Upper Division Composition Requirement | 0 or 4 |
| One course from the following (grade of C- or better is required): University Writing Program 101, 102A, 102B, 102G, 102E, 104A, 104C, 104D, 104E, 104T or passing the Upper-Division Composition Exam. | 4 |

Division of Aerospace Science and Engineering

The Division of Aerospace Science and Engineering administers the Aerospace Science and Engineering Program within the Department of Mechanical and Aerospace Engineering.

Faculty

Roger Davis, Ph.D., Professor
Jean-Pierre Delplanque, Ph.D., Professor
Fidelis O. Eke, Ph.D., Professor
Mohamed M. Helouz, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Ronald A. Hess, Ph.D., Professor
Sanjay S. Joshi, Ph.D., Associate Professor
Valeria La Saponara, Ph.D., Associate Professor
Stephen K. Robinson, Ph.D., Professor
Nesrin Sarigul-Klijn, Ph.D., Professor
C. P. (Case) van Dam, D. Engr., Professor

The Aerospace Science & Engineering Undergraduate Program

The Aerospace Science and Engineering program is accredited by the Engineering Accreditation Commission of ABET; http://www.abet.org.

Aerospace Science and Engineering majors learn to apply the principles of the physical sciences and engineering to the design of aerospace vehicles. Specific objectives include the design, development and manufacture of aerospace vehicles and other transportation systems through the integration of disciplines associated with aerodynamics, propulsion, structures, and guidance/control.

Our Bachelor of Science degree in Aerospace Science and Engineering provides a broad background in the physical sciences, and the engineering sciences. These fundamentals, when complemented by the required technical courses, prepare students for employment in government or industry, while simultaneously establishing an excellent foundation for graduate studies.

Students are encouraged to adhere carefully to all prerequisite requirements. The instructor is authorized to drop students from a course for which stated prerequisites have not been completed.

Exclusive of General Education units, the minimum number of units required for the Aerospace Science and Engineering major is 140.

Lower Division Required Courses

| Mathematics 21A-21B, 21C, 21D | 16 |
| Mathematics 22A-22B | 6 |
| Physics 9A-9B, 9C, 9D | 19 |
| Chemistry 2A-2B, 2A-2BH | 10 |
| Engineering 4 | 4 |
| Engineering 6 or Mechanical Engineering 5 | 4 |
| Engineering 17, 35 or 45 (or 45I) | 12 |
| English 3 or University Writing Program 1, 1Y, or 1Y, or Comparative Literature 1, 2, 3, or 4, or Native American Studies 5 | 4 |
| Communication 1 or 3 | 4 |

Upper Division Required Courses

| Engineering 100, 102, 103, 104, 105 | 19 |
| Select one course from: Engineering 180, Mechanical Engineering 115, Mathematics 128C | 4 |
| Engineering 190 | 3 |
| Technical Electives | 7 |
| One course must be chosen from the following astronautics electives: Aerospace Science and Engineering 140, 141 or 142 | 4 |
| The remaining units must be taken from any upper-division engineering course except Biomedical Engineering 110L, Engineering 160, 191, 198 (Gearing up for Grad School/undergraduate research), Computer Science Engineering 188 or any 197T course. | 4 |
| Upper Division Composition Requirement | 0 or 4 |
Courses in Engineering: Mechanical (EME)

Courses in Mechanical Engineering (EME) are listed below: courses in Aerospace Science and Engineering (AEAE) are listed immediately following; graduate courses in Mechanical and Aeronautical Engineering (MAE) follow.

Lower Division

1. Mechanical Engineering (1)
   Lecture—1 hour. Description of the field of mechanical engineering with examples taken from industrial applications, discussion of the practice of engineering, principles, ethics, and responsibilities.
   P/NP grading only.

2. Computer Programming for Engineering Applications (4)
   Lecture—3 hours; laboratory—3 hours. Prerequisite: Mathematics 16A or 21A (may be taken concurrently). Structured programming in C for solving problems in engineering. Introduction to MATLAB and comparison study of C/C++ with MATLAB. Not open for credit to students who have completed course 124. GE credit: QL, SE, SL, VL—II. (J. Cheng)

3. Manufacturing Processes (4)
   Lecture/discussion—3 hours; laboratory—3 hours. Prerequisite: C- or better in Engineering 4 and Physics 9A. Restricted to Mechanical Engineering and Mechanical Engineering/ Materials Science Engineering majors. Modern manufacturing methods, safety, manufacturing inspections, computerized manufacturing and their role in the engineering design and development process. GE credit: SciEng | QL, SE, VL—II, III, IV. (S. Linke, S. Sashi)

3. Internship in Mechanical Engineering (1-5)
   Internship. Prerequisite: lower division standing; approval of project prior to period of internship. Supervised work-study experience in engineering. May be repeated for credit. (P/NP grading only.)

97TC. Mentoring and Tutoring Engineering in the Community (1-4)
   Prerequisite: consent of instructor. Mentoring, coaching, tutoring and/or supervision of students in K-12 schools in Engineering-related topics. May be repeated for credit. (P/NP grading only.)

99. Special Study for Undergraduates (1-5)
   Prerequisite: consent of instructor; lower division standing. (P/NP grading only.)

Upper Division

105. Thermo-Fluid Dynamics (4)
   Lecture—4 hours. Prerequisite: C- or better in Engineering 103 and 105. Restricted to Mechanical Engineering, Aerospace Science and Engineering, and Mechanical Engineering/Materials Science Engineering majors. Inviscid incompressible flow, compressible flow, psychrometrics, reacting mixtures and combustion. GE credit: SciEng | SE—II, III, IV. (J. Delplanque, K. Kendall, S. Shaw)

107A. Experimental Methods (3)
   Lecture—2 hours; laboratory—3 hours. Prerequisite: C- or better in Mechanical Engineering 106. Restricted to Mechanical Engineering, Aerospace Science & Engineering and Mechanical/ Materials Science & Engineering majors. Emphasis on physical experiments to illustrate principles of thermal-fluid systems. Statistical and uncertainty analysis of data; statistical design of experiments; measurement devices; experiments involving thermal cycles, combustion, compressible and incompressible flows. Two units of credit for students who have previously taken Chemical Engineering 155A; one unit of credit for students who have previously taken Chemical Engineering 155B; two units of credit for students who have previously taken Civil and Environmental Engineering 141L. GE credit: SciEng | QL, SE, VL—II, III, IV. (J. Erickson, K. Kendall, P. Shaw)

107B. Experimental Methods (3)
   Lecture—2 hours; laboratory—3 hours. Prerequisite: C- or better in Engineering 100 and Engineering 102, Engineering 104 recommended. Restricted to Mechanical Engineering, Aerospace Science & Engineering and Mechanical/ Materials Science & Engineering majors. Emphasis on the design and selection of mechanical systems. Theory of measurements; Signal analysis; Demonstration of basic sensors for mechanical systems; Experimental project design; Experiments involving voltage measurement; strain gauges, dynamic systems of 9, 1st and 2nd order. Only two units of credit for students who have previously taken Biomedical Engineering 111. Only one unit of credit for students who have previously taken Biological Systems Engineering 165. GE credit: SciEng | QL, SE, VL, WE—II, III, IV. (F. Horsley, L. Saponara)

115. Introduction to Numerical Analysis and Methods (4)
   Lecture—3 hours, lecture/discussion—1 hour. Prerequisite: C- or better in Engineering 6 or course 5 or Computer Science Engineering 30 or Chemical and Materials Science Engineering 6; C- or better in Mathematics 21A, 21B, 21C, 21D, 22A, 22B; C- or better in Physics 9A, 9B, 9C. Number representations, error and stability analysis, roots of nonlinear equations, linear equations, numerical integration, ordinary differential equations. Not open for credit to students who have taken Applied Science Engineering 115. GE credit: SciEng | SE—II, III. (J. Jensen)

121. Engineering Applications of Dynamics (4)
   Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in Engineering 102; C- or better in Engineering 6 or course 5 or Computer Science Engineering 30. Restricted to Mechanical Engineering, Aerospace Science and Engineering, and Mechanical Engineering/Materials Science Engineering majors. Technical elective that revisits dynamic principles with emphasis on engineering applications; stressing importance of deriving equations of motion and setting these into form for computer solution with computer simulation lab. Students gain experience with solving complex, real engineering applications. GE credit: SciEng | QL, SE, SL, VL—III. (J. Karron, Margolis)

134. Vehicle Stability (4)
   Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in Engineering 102. Restricted to Mechanical Engineering, Aerospace Science and Engineering, and Mechanical Engineering/Materials Science Engineering majors. Introduction to the static and dynamic stability characteristics of transportation vehicles with examples drawn from aircraft, high-performance automobiles, rail cars and boats. Laboratory experiments illustrate dynamic behavior of automobiles, race cars, bicycles, etc. GE credit: SciEng | QL, SE, SL, VL—III. (J. Karron, Margolis)

150A. Mechanical Design (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 45 or Engineering 45Y; C- or better in both Engineering 104 and course 50 (may be taken concurrently). Restricted to Mechanical Engineering, Aerospace Science and Engineering, and Mechanical Engineering/Materials Science and Engineering majors. Principles of engineering mechanics applied to mechanical design. Theories of static and fatigue failure of metals. Design projects emphasizing the progression from concept formulation to hardware. Experimental stress analysis and mechanical measurements using strain gages. GE credit: SciEng | QL, SE, VL, WE—II, III, IV. (J. Shaw)

150B. Mechanical Design (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in course 150A. Restricted to Mechanical Engineering, Aerospace Science and Engineering, and Mechanical Engineering/Materials Science and Engineering majors. Principles of engineering mechanics applied to the design and selection of mechanical components. Design projects, which concentrate on conceptual design, engineering analysis, methods of
151. Statistical Methods in Design and Manufacturing (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 102. Course 150A. Restricted to the course in Engineering 100 and 102. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science and Engineering. Methods of statistical analysis with emphasis on applications in mechanical design and manufacturing. Applications include product evaluation and decision making, stress-strength interference, probabilistic design, systems reliability, and fatigue under random loading. GE credit: SciEng | QL, SE, VL—II, III, IV. Farouki, Linke, Ravani

152. Computer-Aided Mechanism Design (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 102; C- or better in course 5 or Computer Science Engineering 30. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science and Engineering. Principles of computer-aided mechanism design. Computer-aided kinematic, static, and dynamic analysis and design of planar mechanisms such as multiple-degree-of-freedom geared linkages. Introduction to kinematic synthesis of mechanisms. Offered in alternate years. GE credit: SciEng | QL, SE, VL—II. Cheng

154. Mechanotronics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in each of the following: Engineering 100 and Engineering 102 and course 50. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science and Engineering. Mechatronics system concept and overview, control system design, architecture, microcontroller and interface technology for mechatronics control, sensor for mechatronics systems, actuator drives. GE credit: SciEng | QL, SE, VL—II, III. Yamazaki

161. Combustion and the Environment (4)
Lecture—3 hours; lecture/discussion—1 hour. Pre-requisite: grade of C- or better in course 106. Introduction to combustion kinetics, the theory of premixed flames and diffusion flames, turbulent combustion, formation of air pollutants in combustion systems, concept of pollution devices which include internal combustion engines, gas turbines, furnaces and waste incinerators; alternative fuel sources. Offered in alternate years. GE credit: SciEng | QL, SE, VL—II. Erickson, Park

165. Heat Transfer (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in course 5 or Engineering 6 or Computer Science Engineering 30; C- or better in Engineering 103 and 105. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science and Engineering. Conduction, convection, and radiation heat transfer. Computational modeling of heat transfer in applications to engineering equipment with the use of digital computers. GE credit: SciEng | QL, SE, VL—II, III, IV. Aldredge, Davis, Kennedy, Shaw

171. Analysis, Simulation and Design of Mechanotronic Systems (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C- or better in Engineering 100 and 102. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science and Engineering. Modeling of dynamic engineering systems in various energy domains. Analysis and design of dynamic systems. Response of linear systems. Digital computer simulation and physical experiments. GE credit: SciEng | QL, SE, VL—II. Hubbard

172. Automatic Control of Engineering Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: C- or better in Engineering 100 and 102. Restricted to Mechanical Engineering, Aerospace Science and Engineering, Mechanical Engineering/Materials Science and Engineering. Classical feedback control; block diagrams; control system performance specifications; stability; feedback; Nyquist plots; stability; phase and gain margins; lead and lag compensators; state variable feedback controllers. GE credit: SciEng | QL, SE, VL—II, III. Eke, Joshi

185A. Mechanical Engineering Systems Design Project (4)
Lecture—1 hour; laboratory—3 hours. Prerequisite: C- or better in course 150A and course 165 (may be taken concurrently); Communications 1 or 3 recommended; upper division composition recommended. Restricted to Senior standing in Mechanical Engineering (EMEC). Major mechanical engineering design experience; the mechanical engineering design process and its use in the design of engineering systems involving appropriate engineering standards and multiple realistic constraints. (Deferred grading only, pending completion of project.) GE credit: SciEng | QL, SE, VL, WE—II, III, IV. Davis, Velinsky

185B. Mechanical Engineering Systems Design Project (4)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 185A and senior standing in the Department of Mechanical and Aerospace Engineering. Major mechanical engineering design experience; the mechanical engineering design process and its use in the design of engineering systems incorporating appropriate engineering standards and multiple realistic constraints. (Deferred grading only, pending completion of sequence.) GE credit: Sci | QL, SE, VL, WE—II, III, IV. Velinsky, C. Davis

189A-L. Selected Topics in Mechanical Engineering (1-5)
Prerequisite: consent of instructor. Directed group study of selected topics in separate sections in (A) Energy Systems and the Environment, (B) Engineering Controls, (C) Engineering Dynamics, (D) Biomechanics, (E) Fluid Mechanics, (F) Manufacturing Engineering, (G) Mechanical Engineering and Product Design, (H) Materials Systems, (I) MEMS/Nanotechnology, (J) Solid and Structural Mechanics, (K) Thermodynamics, (L) Vehicle and Transportation Systems. May be repeated for credit when the topic is different.

192. Internship in Engineering (1-5)
Internship. Preparation standing; approval of project prior to period of internship. Supervised work experience in mechanical engineering. May be repeated for credit. (P/NP grading only)

197C. Mentoring and Tutoring in Engineering in the Community (1-4)
Prerequisite: upper division standing; consent of instructor. Counseling, coaching, tutoring and/or supervision of programs in K-12 schools in engineering-related topics. May be repeated for credit. (P/NP grading only)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)
198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Courses in Mechanical and Aeronautical Engineering (MAE)
(Formerly courses in Aeronautical Science and Engineering and Mechanical Engineering)

Graduate

207. Engineering Experimentation and Uncertainty Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mechanical Engineering 107A and 107B. Design and analysis of engineering experiments with emphasis on measurement standards, data analysis, regression analysis, uncertainty analysis, including statistical treatment of experimental data intervals, propagation of bias and precision errors, correlated bias approximations, and using litter programs.—C. Davis

208. Measurement Methods in Fluid Mechanics and Combustion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 165 and Engineering 103. Application of shadown, schlieren and other flow visualization techniques. Introduction to optics and lasers. Measurement of velocity and concentrations in reacting and non-reacting flows with laser diagnostic techniques including LDV, Rayleigh, Raman and fluorescence scattering and CARS. —Aldredge

210A. Advanced Fluid Mechanics and Heat Transfer (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 105 and Mechanical Engineering 165. Development of differential equations governing continuity, momentum and energy transfer. Solutions in laminar flow for exact cases, low and high Reynolds numbers and lubrication theory. Dynamics of inviscid flow. —Aldredge

210B. Advanced Fluid Mechanics and Heat Transfer (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 210A. Study of stability and transition to turbulence. Introduction to the physics of turbulence. Modeling of turbulence for numerical determination of momentum and heat transfer. —Aldredge

211. Fluid Flow and Heat Transfer (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 105 and Mechanical Engineering 165 or the equivalent. Design aspects of selected topics; heat conduction, fins; heat transport in ducts, boundary layers, separated flows; heat exchangers. —Erickson, Park

212. Biomedical Heat and Mass Transport Processes (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mechanical Engineering 165 and Biological Systems Engineering 125, Chemical Engineering 153 or the equivalent. Application of principles of heat and mass transfer to biomedical systems related to heat exchange between the body and its environment, mass transfer across cell membranes and the design and analysis of artificial human organs. (Same course as Biomedical Engineering 212.) —Aldredge

213. Advanced Turbulence Modeling (4)
Lecture—4 hours. Prerequisite: course 210B. Methods of analyzing turbulence; kinematics and dynamics of homogeneous turbulence; Reynolds stress and high-order closure schemes and their simplification; numerical methods; application to boundary layer type flows; two-dimensional and three-dimensional hydrodynamic and environmental flows. —Aldredge

215. Biomedical Fluid Mechanics and Transport Phenomena (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103 or Chemical Engineering 150B or Civil and Environmental Engineering 141. Application of fluid mechanics and transport to biomedical systems. Flow in normal physiological function and pathological conditions. Topics include cardiovascular and respiratory flows, effect of flow on cellular processes, transport in the arterial wall and in tumors, and tissue engineering. (Same course as Biomedical Engineering 221.)

216. Advanced Thermodynamics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103 and 105, Mechanical Engineering 106. Restricted to graduate students. Review of chemical thermodynamics and chemical kinetics. Discussion of reacting flows, their governing equations and transport phenomena; detonations; laminar flame structure and turbulent combustion. —Alldredge, Kennedy, Shaw

218. Advanced Engineering Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103 and 105, or the equivalent. Review of options available for advanced power generation. Detailed study of basic power balances, component efficiencies, and overall performance for one advanced concept such as a fusion, magnetohydrodynamic, or solar electric power plant. —Aldredge

219. Introduction to Scientific Computing in Solid and Fluid Dynamics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 103 and 104. Scientific calculations with finite element methods for multi-dimensional problems in solid and fluid dynam- ics are performed with examples in C, C++, FORTRAN, and MATLAB script files. Derivation of the basic equations of motion in finite volume form with applications to elasticity, waves. —Delplande

220. Mechanical Vibrations (4)
Lecture—4 hours. Prerequisite: Engineering 122. Multiple degrees of freedom; damping measures; Rayleigh’s method; vibration absorbers; eigenvalues and modeshapes; modal coordinates; forced vibrations; random processes and vibrations; auto-correlation; spectral density; first passage and fatigue failure; nonlinear systems; phase plane. —Aldredge

222. Advanced Dynamics (4)
Lecture—4 hours. Prerequisite: Engineering 102. Dynamics of particles, rigid bodies and distributed systems with engineering applications; generalized coordinates; Hamilton’s principle; Lagrange’s equations; Hamilton/jacobi theory; modal dynamics orthogonality; wave dynamics; dispersion.

223. Multibody Dynamics (4)
Lecture—4 hours. Prerequisite: Engineering 102. Coupled rigid-body kinematics/dynamics; reference frames; vector differentiation; configuration and motion constraints; holonomicity; generalized speeds; partial velocities; mass; inertia tensor/theorems; angular momentum; generalized forces; com- paring Newton/Euler, Lagrange’s methods; computer-aided equation derivation; orientation; Euler; Rodrigues parameters. (Same course as Biomedical Engineering 222.)

225. Spatial Kinematics and Robotics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C Language and course 222. Spatial kinematics, screw theory, spatial mechanisms analysis and synthesis, robotic kinematics and dynamics, robotic work space, path planning, robot programming, computer architecture and software implementation. (Same course as Biomedical Engineering 225.) Offered in alternate years. —Ravani
Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): AH=Arts and Humanities, SciEng=Science and Engineering, SecSci=Social Sciences; Div=Domestic Diversity; Wrt=Writing Experience
Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SciEng=Science and Engineering; SS=Social Sciences; ACGH=American Cultures; DD=Domestic Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; VL=Visual; WC=World Cultures; WE=Writing Experience

226. Acoustics and Noise Control (4)  
Lecture—4 hours. Prerequisite: Engineering 122. Description of sound using normal modes and wave interaction in inviscid fluids in infinite and finite regions. Sound fields; sound absorption in enclosed spaces; sound transmission through barriers; applications in design, acoustic enclosures and sound walls, room acoustics, design of quiet machinery. —Sarigül Klijn

227. Research Techniques in Biomechanics (4)  
Lecture—2 hours; laboratory—4 hours; term paper or discussion—1 hour. Prerequisite: Mathematics 228; and consent of instructor; Exercise Science 215 recommended. Experimental techniques for biomechanical analysis of human movement. Techniques evaluated include data acquisition and analysis by computer, force, strain, displacements, strength assessment, planar and three-dimensional videography, data reduction and smoothing, body segment parameter determination, electromyography, and biomechanical modeling. (Same course as Biomedical Engineering 227/Exercise Science 227)—Williams, Hawkins

228. Introduction to BioMEMS (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: SS engineering discipline or consent of instructor. Ideal for beginning graduate or advanced undergraduate students interested in microelectromechanical systems (MEMS) topics related to biological systems. Application of states of the art in finite element and optimization techniques. —van Dam

Lecture—4 hours. Prerequisite: consent of instructor; Engineering 45, 100, 104; Engineering 122 recommended. Mechanical design of microelectromechanical systems (MEMS). Model device functionality, lumped parameter models, energy methods; nonlinearities, electrical and mechanical noise sources. Actuation and measurement methods: capacitive, piezoresistive, piezoelectric, and optical techniques. Review of basic electronics: bridge circuits, amplitude modulation, lock-in detection. —Harsley

231. Musculo-Skeletal System Biomechanics (4)  
Lecture—4 hours. Prerequisite: Engineering 102. Mechanics of skeletal muscle and mechanical models of muscle, solution of the inverse dynamics problem, theoretical and experimental methods of kinematic and dynamic analysis, computational and experimental segmental load and muscle forces, applications to gait analysis and sports biomechanics. (Same course as Biomedical Engineering 231.) —Chen

232. Skeletal Tissue Mechanics (3)  
Lecture—3 hours; laboratory—1 hour. Prerequisite: Engineering 104B. Overview of the mechanical properties of the various tissues in the musculoskeletal system, the relationship of these properties to anatomic and histologic structure, and their implications in these properties caused by aging and disease. The tissues covered include bone, cartilage and synovial fluid, ligament and tendon. (Same course as Biomedical Engineering 232)—Fyhrie

234. Design and Dynamics of Road Vehicles (4)  
Lecture—4 hours. Prerequisite: Mechanical Engineering 134. Analysis and numerical simulation of road vehicles with emphasis on vehicle applications. —Velmis

236. Aerodynamics in Nature and Technology (4)  
Lecture—4 hours. Prerequisite: Engineering 103. Introduction to aerodynamics in nature, fundamentals of airflow, atmospheric boundary layers, pedestrian-level winds in urban areas. Criteria for laboratory modeling of atmospheric flows, wind-tunnel testing. —van Dam

237. Analysis and Design of Composite Structures (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 104 or equivalent. Modeling and analysis methodology for composite structures including response and failure. Laminated plate bending theory. Introduction to failure processes. Includes discussion of aerospace or civil structural analysis. —Sapora

238. Advanced Aerodynamic Design and Optimization (4)  
Lecture—4 hours; discussion—1 hour. Prerequisite: consent of instructor. Application of aerodynamic theory to aircraft and aerospace design applications. Advanced computer aided aerodynamic analysis. —van Dam

239. Advanced Finite Elements and Optimization (4)  
Lecture—4 hours. Prerequisite: Engineering 180 or Applied Science 115 or Mathematics 128C. Introduction to advanced finite element methods and optimization methods, with application to modeling of complex mechanical, aerospace and biomedical systems. Applications of states of the art in finite element methods to structural and applications under realistic loading conditions and constraints. (Same course as Biomedical Engineering 239)—Sarigül Klijn

240. Computational Methods in Nonlinear Mechanics (4)  
Lecture—4 hours. Prerequisite: Applied Science Engineering 115 or Mathematics 128B or Engineer 180. Deformation of solids and the motion of fluids treated with state-of-the-art computational methods. Numerical nonlinear dynamics; classification of coupled problems; applications of finite element methods to mechanical, aeronautical, and biological systems. (Same course as Biomedical Engineering 240).—Sarigül Klijn

242. Stability of Thin-Walled Structures (4)  
Lecture—4 hours. Prerequisite: Engineering 104 or equivalent. Static stability of thin-walled aerospace structures treated from both theoretical and practical design perspectives. Both analytical and computerized construction considered. Buckling of stiffened panels, shells, and thin-walled beams, experimental methods and failure/crippling processes. —La Sapora

248. Advanced Turbomachinery (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103 and 105. Preliminary aerodynamic design of axial and radial flow compressors and turbines. Design of diffusers. Selection of turbomachinery and configurations and approximations to optimum dimensions and flow angles. Introduction to flow analysis. Rotating stall and surge, and aerodynamic considerations. —R. Davis

250A. Advanced Methods in Mechanical Design (4)  
Lecture—4 hours. Prerequisite: Mechanical Engineer 150A and 150B or the equivalents, or consent of instructor. Advanced techniques of solid mechanics to mechanical design problems. Coverage of advanced topics in stress analysis and static failure theories with emphasis in design of machine elements. Design projects emphasizing advanced analysis tools for life cycle evaluation. —Ravani

250B. Advanced Methods in Mechanical Design (4)  
Lecture—4 hours. Prerequisite: course 250A. Applications of advanced techniques of solid mechanics to mechanical design problems. Advanced topics in variational methods of mechanics with emphasis in design of mechanical systems and projects emphasizing advanced analysis tools. —Hill

250C. Mechanical Performance of Materials (4)  
Lecture—4 hours. Prerequisite: undergraduate course in stress analysis and mechanical behavior of materials. Occurrence, mechanisms, and prediction of fatigue and fracture phenomena. Use of stress and strain to predict crack initiation. Use of fracture mechanics to predict crack failure and propagation phenomena. Effects of stress concentration, load sequence, irregular loading, and multi-axial loading. —Velmis

251. Mechatronics System Design (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: Mechanical Engineering 154 and 172 or Electrical and Computer Engineering 157A, 157B. Design of a mechatronics system, electric actuator, power electronics, micro control motion control, sensor technologies, personal computer-based control systems design, motion control. General operating systems design, motion system control software design, discrete event control software design. Offered in alternate years.—II. Yamazaki

252. Information Processing for Autonomous Robotics (4)  
Lecture—3 hours; discussion—3 hours. Prerequisite: Mechanical Engineering 126. Study of control of mobile and robotic systems. —Joshi

254. Engineering Software Design (4)  
Lecture—3 hours; laboratory—3 hours. Prerequisite: Mechanical Engineering 150B. Principles and design of engineering software. Advanced topics in engineering software design, applications of object-oriented programming, very high-level languages, real-time multi-thread computing and sensor fusion, Web-based network computing, graphics, and GUI in engineering. —Cheng

255. Computer-Aided Design and Manufacturing (4)  
Lecture—3 hours; laboratory—3 hours. Prerequisite: proficiency in a high level programming language such as Fortran, Pascal, or C. Representation and processing of geometrical information in design and manufacturing. Numeric and symbolic computations. Coordinate systems and transformations. Bezier and B-spline curves and surfaces. Interpolation and approximation methods. Intersections, offsets, and blends. Path planning and machine inspection, and robotics applications. —Farouki

258. Hybrid Electric Vehicle System Theory and Design (4)  
Lecture—3 hours; laboratory—3 hours. Prerequisite: Mechanical Engineering 150B, graduate standing in Mechanical and Aeronautical Engineering. Advanced vehicle design for fuel economy, performance, and low emissions, considering regulations, societal demands and manufacturability. Analysis and verification of computer design and control of vehicle systems in real vehicle tests. Advanced engine concepts. —Ravani

260. Gas Dynamics (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103 or the equivalent. Flow of compressible fluids. Inviscid flow. Flow with friction, heat transfer, chemically reacting gas and particle mixtures. Normal and oblique shock waves, combustion, blast and expansion waves. Method of characteristics. —Ravani

262. Advanced Aerodynamics (4)  
Lecture—2 hours; discussion—3 hours. Prerequisite: Aeronautical Engineering 126. Study of inviscid and viscous flows about aerodynamic shapes at subsonic, transonic and supersonic conditions. Application of aerodynamic theory to design for reduced drag and increased lift. —Ravani

263. Introduction to Computational Aerodynamics and Fluid Dynamics (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103 or consent of instructor. Introduction to numerical methods and their solution of fluid flow problems. Discretization techniques and solution algorithms. Finite difference solutions to classical model equations pertinent to wave phenomena, diffusion phenomena, or equations of the incompressible Navier-Stokes equation. —Hill

264. Computational Aerodynamics (4)  
Lecture—4 hours. Prerequisite: Aeronautical Science and Engineering 126, Engineering 180, or consent of instructor. Numerical methods and codes for aerodynamics flow simulation in the transonic regime. Solutions of steady and unsteady potential and compressible boundary layer equations. Numerical
One course focusing on literature written in English between 1800 and 1900: English 130, 133, 143, 144, 1558, 158A, 181A

One course focusing on literature written in English between 1900 and present: English 3, 13N, 138, 144N, 147, 1508, 155C, 156, 1588, 166, 167, 181B

Non-Historical Distribution Requirements …8

One course in literature and ethnicity, literature and gender, or literature and sexuality:
English 125, 139, 140, 141, 166, 167, 178, 179, 181A, 181B, 185A, 185B, 185C, 186

One course in film and media studies, language studies, cultural studies and contexts, literary and science/technology, or literature and the environment:

Please note that while some courses are identified as fulfilling more than one distribution requirement, a given course can only fulfill one such requirement.

Areas of Emphasis (choose one)……12

Literature, Criticism, and Theory

One upper division English elective.

Two advanced courses, one of which can be a seminar:
English 149, 153, 159, 163, 165, 177, 187A, 188A, 189, 194H, 195H

Creative Writing:
Three sections of English 100F, 100P, 100NF, 100FA, 100PA

Total Units for the Major…………………64

English Majors. Up to four upper division units in a national literature other than English or American, or in Comparative Literature, may count toward the requirements of the major.


Major Advising. All new and prospective English majors are encouraged to see the undergraduate staff adviser, individually, once per year, at minimum.

Foreign Languages. Students who contemplate advanced study in English should prepare for foreign language requirements for higher degrees and should consult with the graduate adviser.

Undergraduate Adviser. See Department website at http://english.ucdavis.edu or the Departmental Advising Office in 177 Voorhies Hall.

Minor Program Requirements:

UNITS

English …………………………….20

Five upper division courses, at least four of which will be literature courses. ……20

Honors and Honors Program. A Senior Honors Program is available to an invited group of English majors, who prepare and write a Senior Thesis [either a research paper or creative writing] in their final year. The honors program consists of four units of 194H and four units of 195H, normally taken during Winter and Spring quarters of the senior year. The senior honors program consists of four units of 194H and four units of 195H, normally taken during Winter and Spring quarters of the senior year. Completion of the program is a prerequisite for High or Highest Honors at graduation.

Eligibility criteria and application materials may be obtained at the Undergraduate Advising office in 177 Voorhies Hall or by accessing the advising website at http://english.ucdavis.edu. For more details, see Graduation Honors, on page 84.

Education Abroad Options. The department strongly encourages interested students to pursue their studies abroad. It is possible for students to complete significant portions of the English major provided that the course is evaluated as at least four UC Davis units; the course is considered upper division by the standards set forth by UC Davis Study Abroad: the student presents copies of the course-work, syllabus, and writing assignments to the department’s advising staff.

Teaching Credential Subject Representative. See the Teacher Education program.

Graduate Study. The Department of English offers programs of study and research leading to the M.A. in literature and creative writing and the Ph.D. in literature. Detailed information may be obtained from the graduate adviser or the Chairperson of the Department.

The department’s affiliation with the Critical Theory Program also provides the opportunity for students in English to prepare for the designated emphasis in Critical Theory (an interdisciplinary program in theories and methodologies in the humanities and social sciences).

Graduate Director. Mark Jerg. Ph.D.

Entry Level Writing. Students must have met the Entry Level Writing requirement before taking any course in English. C. Bates, Director.

Prerequisites. English 3 or University Writing Program 1 is required for all lower division courses (40, 43, 44, 45, 10A, 10B, 10C), and all upper division courses, unless otherwise stated in the course listings. Comparative Literature 1, 2, 3, or 4 and Native American Studies may normally be substituted for English 3 or University Writing Program 1.

Courses in English (ENL)

Lower Division ……………………3

1. Introduction to Literature (4)

Lecture/discussion—4 hours. Prerequisite: completion of Entry Level Writing requirement. Introductory study of several genres of English literature, emphasizing both analysis of particular works and the range of forms and styles in English prose and poetry. Frequent writing assignments will be made. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (I, II, III.)

4. Critical Inquiry and Literature: Freshman Seminar (4)

Seminar—4 hours. Prerequisite: completion of Subject A requirement and consent of instructor; enrollment limited to freshmen. Critical inquiry into significant literary texts. Emphasis on close reading, classroom dialogue, and the writing of several papers or a longer seminar paper. GE credit: ArtHum, Wrt | AH, WE.

5F. Introduction to Creative Writing: Fiction (4)

Lecture/discussion—4 hours. Prerequisite: completion of Entry Level Writing requirement. Elementary principles of writing fiction. Write both in prescribed forms and in experimental forms of their own choosing. No final examination. May be repeated one time for credit. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (I, II, III.)

5P. Introduction to Creative Writing: Poetry (4)

Lecture/discussion—4 hours. Prerequisite: completion of Entry Level Writing requirement. Elementary principles of writing poetry. Write both in prescribed forms and in experimental forms of their own choosing. No final examination. May be repeated one time for credit. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (I, II, III.)

10A. Literatures in English I: To 1700 (4)

Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or its equivalent. Historical introduction to English language and literature from 800-1700. Linguistic borrowing, innovation, and change. Emergence of key literary genres. Colonial America as a new site of English production and consumption. GE credit: ArtHum | AH.—I, II, III. (I, II, III.)

10B. Literatures in English II: 1700-1900 (4)

Lecture/discussion—3 hours; extensive writing. Prerequisite: course 10A. Historical introduction to English language and literature from 1700-1900. Linguistic borrowing, innovation, colonization, and change. Emergence and development of key literary genres. America, Britain, Ireland, England, and India as important sites of English literary production and consumption. GE credit: ArtHum | AH.—I, II, III. (I, II, III.)

10C. Literatures in English III: 1900 to Present (4)

Lecture/discussion—3 hours; extensive writing. Prerequisite: course 10B. Historical introduction to English language and literature from 1900–present. Linguistic borrowing, innovation, and change. Emergence and development of key literary genres. Formal experimentation. Modernism as transnational phenomenon. GE credit: ArtHum | AH.—I, II, III. (I, II, III.)

30A. Survey of American Literature (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. American literature from the seventeenth century to 1865. GE credit: ArtHum, Div, Wrt | ACGH, AH, WE.

30B. Survey of American Literature (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. American literature from 1865 to the present. GE credit: ArtHum, Div, Wrt | ACGH, AH, WE.

40. Introductory Topics in Literature (4)

Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or its equivalent. Study of a special topic. Literature written in English in any period or place or genre. Thematic, formal, or temporal focus. May be repeated two times for credit if content differs. GE credit: ArtHum, Wrt | AH, WE.—I, II, III.

42. Approaches to Reading (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Close reading and interpretation of literary works as a variety of techniques and contemporary approaches. Topics include textual and historical approaches; new criticism; formalism; psychological criticism; feminism and gender; reader-response; materialist approaches. GE credit: ArtHum, Wrt | AH, WE.

43. Introductory Topics in Drama (4)

Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or its equivalent. Close reading of, and topics relating to, selected works of British and American drama from a range of historical periods. May be repeated two times for credit when content differs. GE credit: ArtHum, Wrt | AH, WE.—I, II, III.

44. Introductory Topics in Fiction (4)

Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or its equivalent. Close reading of, and topics relating to, selected works of British and American fiction from a range of historical periods. May be repeated two times for credit when content differs. GE credit: ArtHum, Wrt | AH, WE.—I, II, III.

45. Introductory Topics in Poetry (4)

Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or its equivalent. Topical study and close reading of selections from English and American poetry. May be repeated two times for credit when content differs. GE credit: ArtHum, Wrt | AH, WE.
46A. Masterpieces of English Language (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Survey of literary conventions and backgrounds in religious thought, intellectual and social history, and related art forms. GE credit: ArtHum, Wrt | AH, WC, WE.

46B. Masterpieces of English Literature (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Selected works of principal writers from 1640 to 1832. Historical and thematically focused study of literary conventions and backgrounds in religious thought, intellectual and social history, and related art forms. GE credit: ArtHum, Wrt | AH, WC, WE.

46C. Masterpieces of English Literature (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Selected works of principal writers from 1832 to present. The history of literary conventions and backgrounds in religious thought, intellectual and social history, and related art forms. GE credit: ArtHum, Wrt | AH, WC, WE.

92. Internship in English (1-12) Internship—3-36 hours. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Internships in fields where students can practice their skills. May be repeated for credit for a total of 12 units. (P/NP grading only.)

98. Directed Group Study (1-5) Prerequisite: course 3 or University Writing Program 1. (P/NP grading only.)

99. Special Study for Undergraduates (1-5) (P/NP grading only)

Upper Division

100F. Creative Writing: Fiction (4) Discussion—4 hours; development and evaluation of written materials, and conferences with individual students. Prerequisite: course SF or SP, or consent of instructor; priority given to English (Creative Writing) majors. Writing of fiction. May be repeated for credit with consent of instructor. No final examination.—II, III.

100FA. Creative Writing Advanced Fiction (4) Discussion—4 hours. Prerequisite: course 100F. Priority given to English majors. Admission by application only. Development of evaluation of students' work in prose, primarily in the workshop format. Some reading and discussion of published novels and short stories. Conferences with individual students occur once a week; evaluation of students' work to be completed by the students. May be repeated for credit with consent of instructor.—II, III.

100NF. Creative Writing: Non-Fiction (4) Discussion—4 hours; development and evaluation of written materials, and conferences with individual students. Prerequisite: course 3 or University Writing Program 1, or consent of instructor; priority given to English (Creative Writing) majors. Writing of non-fiction. May be repeated for credit with consent of instructor. No final examination.—II, III.

100P. Creative Writing: Poetry (4) Discussion—4 hours. Prerequisite: course SF or SP, or consent of instructor; priority given to English (Creative Writing) majors. Writing of poetry. May be repeated for credit with consent of instructor. No final examination.—II, III.

100PA. Creative Writing Advanced Poetry (4) Discussion—4 hours. Prerequisite: course 100P. Priority to English majors. Admission by application only. Development and evaluation of students' work in poetry, primarily in the workshop format. Some reading and discussion of published works of poetry. Conferences with individual students occur once a quarter. May be repeated for one time credit with consent of instructor.—II, III.

105. History of the English Language (4) Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. History of the development of the English language, its evolution, and the role of principal writers and the English language as informed by contemporary linguistic theories. The major syntactic structures of English; their variation across dialects, styles, and registers; their development; and their usefulness in describing the conventions of English. (Same course as Linguistics 106 and University Writing Program 106.) GE credit: ArtHum, Wrt | AH, WE.—II, III.

106. English Grammar Practicum (2) Discussion—2 hours. Prerequisite: course 106/ Linguistics 106 (may be taken concurrently). Practice in teaching the principles of grammar to the kinds of audiences teachers encounter in California. Discussions with teachers who teach in these areas. Examination of pedagogical research on teaching grammar. (P/NP grading only.)

107. Freedom of Expression (4) Lecture—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historical development of fundamental issues in freedom of expression, with emphasis on freedom of literary and artistic expression. GE credit: ArtHum, Wrt | AH, WE.—II.

108. Introduction to Literary Theory (4) Lecture/discussion—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. Key theoretical terms, concepts, and thinkers from the Greeks to the modern era. GE credit: ArtHum, Wrt | AH, WE.—II, III.

109. Introduction to Modern Literary and Critical Theory (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. History of literary criticism in the modern era, with emphasis on the ties with the past and the special problems presented by modern literary theory. GE credit: ArtHum, Wrt | AH, WE.—II, III.

110. Topics in Medieval Literature (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of selected topics in Medieval British literature. GE credit: ArtHum, Wrt | AH, WC, WE.—II.

113A. Chaucer: Troilus and the "Minor" Poems (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Development of the poet's artistry and ideas from his first work to his masterpiece, "Troilus and Criseyde." GE credit: ArtHum, Wrt | AH, WC, WE.—II.

113B. Chaucer: The Canterbury Tales (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Literary analysis of the complete "Canterbury Tales." Courtly love, literary forms, medieval science and astrology, theology and dogma as they inform the reading of Chaucer's work. GE credit: ArtHum, Wrt | AH, WC, WE.—II.

115. Topics in Sixteenth and Seventeenth Century Literature (4) Lecture/discussion—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of works of the Renaissance. Offered irregularly. GE credit: ArtHum, Wrt | AH, WC, WE.

117. Shakespeare (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically, thematically, or specifically focused study of Shakespeare's works. May be repeated five times for credit. GE credit: ArtHum, Wrt | AH, WC, WE.—II, III.

120. Law and Literature (4) Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1, or the equivalent. Historically, thematically, or specifically focused study of the relationship between law and literature. Offered irregularly. GE credit: ArtHum, Wrt | ACGH, AH, DD, OL, WE.

122. Milton (4) Lecture/discussion—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. Selected major works, including Paradise Lost. GE credit: ArtHum, Wrt | AH, WC, WE.—II.

123. 18th-Century British Literature (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of 18th century English literature. GE credit: ArtHum, Wrt | AH, WC, WE.—II.

125. Topics in Irish Literature (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Intensive study or treatment of special topics relating to the emergence, invention, and reinvention of Irish literature. May be repeated two times for credit when content differs. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WE.

130. British Romantic Literature (4) Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of works of Romantic English literature. GE credit: ArtHum, Wrt | AH, WC, WE.—II.

133. 19th-Century British Literature (4) Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of works of 19th-century English literature. GE credit: ArtHum, Wrt | AH, WC, WE.—II.

137. British Literature, 1900-1945 (4) Lecture—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of the works of British literature (drama, poetry, prose fiction) from the period between 1900 and the end of World War II. GE credit: ArtHum, Wrt | AH, WC, WE.

138. British Literature: 1945 to Present (4) Lecture—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of the works of British literature (drama, poetry, prose fiction) from the period between 1945 and the present. GE credit: ArtHum, Wrt | AH, WC, WE.

140. Topics in Postcolonial Literatures and Cultures (4) Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Study of postcolonial literature of Anglophone colonies. Specific emphasis may include literature from and about Anglophone India, the Caribbean, the Middle East, South Asia, Africa, and/or South America. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WE.

141. Topics in Diasporic Literatures and Migration (4) Lecture/discussion—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Study of literature, histories, and cultures of one or more diasporic groups. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WE.—II.
142. Early American Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of American literature of the 17th and 18th centuries. GE credit: ArtHum, Wrt | ACGH, AH, WE.

143. 19th-Century American Literature to the Civil War (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of works of 19th-century American literature. GE credit: ArtHum, Wrt | ACGH, AH, DD, WE.

144. Post-Civil War American Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of works of post-Civil War American literature. GE credit: ArtHum, Wrt | ACGH, AH, WE.—II.

146. American Literature 1900-1945 (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of American literature (drama, poetry, prose fiction) from the period between 1900 and the end of World War II. GE credit: ArtHum, Wrt | ACGH, AH, WE.—III.

147. American Literature, 1945 to the Present (4)
Lecture—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of American literature (drama, poetry, prose fiction) from the period between 1945 and the present. GE credit: ArtHum, Wrt | ACGH, AH, WE.—II.

150A. British Drama to 1800 (4)
Lecture/discussion—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of works of English drama prior to 1800. GE credit: ArtHum, Wrt | AH, WE.—III.

150B. Drama from 1800 to the Present (4)
Lecture/discussion—3 hours; extensive writing or discussion. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused study of works of British drama from 1800 to the present. GE credit: ArtHum, Wrt | AH, WE.—II.

150C. 20th-Century British Novel (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically focused examination of the 20th-century British novel, with emphasis on impressionism; the revolt against naturalism; the expressionist novel; the anti-modernist reaction; Conrad; Joyce; Woolf; Lawrence; Drabble, Ryls. GE credit: ArtHum, Wrt | AH, WC, WE.

156. The Short Story (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. The short story as a genre; its historical development, techniques, and formal character as a literary form. European as well as American writers. GE credit: ArtHum, Wrt | AE2

158A. The American Novel to 1900 (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically organized examination of the rise and development of the American novel from its beginnings; Hawthorne, Melville, Twain, James, and others. GE credit: ArtHum, Wrt | ACGH, AH, WE.—III.

158B. The American Novel from 1900 to the Present (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically organized examination of American novelists of the twentieth century; Faulkner, Hemingway, Capote, Morrison, and others. GE credit: ArtHum, Wrt | ACGH, AH, WE.

159. Topics in the Novel (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historically or thematically organized examination of American novelists of the twentieth century. GE credit: ArtHum, Wrt | ACGH, AH, WE.—III.

160. Film as Narrative (4)
Lecture—3 hours; film viewing—3 hours. Prerequisite: course 3 or University Writing Program 1. A study of modern film as a storytelling medium. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE.—I, II.

161A. Film History I: Origins to 1945 (4)
Lecture—3 hours; film viewing—3 hours. Prerequisite: course 3 or University Writing Program 1. A study of modern film as a storytelling medium. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE.—I.

161B. Film History II: 1945 to present (4)
Lecture—3 hours; film viewing—3 hours. Prerequisite: course 3 or University Writing Program 1. A study of modern film as a storytelling medium. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE.—II.

162. Film Theory and Criticism (4)
Laboratory—3 hours; discussion—2 hours; lecture—1 hour. Prerequisite: course 3 or University Writing Program 1. Film theory and criticism, with a study of ten major works of international film art. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL.

163. Literary Study in the British Isles (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. Restricted to enrollment by application only through the Education Abroad Center. Literary Study in the British Isles: On-site study of the literature, film, and/or performance of the British Isles. May be repeated twice if subject matter differs. GE credit: ArtHum, Wrt | AH, VL—III.

164. Writing Science (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or Science and Technology Studies 1, or equivalent. Texts and writing practices in the production of scientific knowledge. Surveys the literary structure of scientific arguments; history of scientific genres; rhetoric and semiotics in scientific culture; graphical systems in the experimental laboratory; narratives of science, including science fiction. [Same course as Science & Technology Studies 164.] GE credit: ArtHum, Wrt | AH, SL, WE.—III, Millburn.

165. Topics in Poetry (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 and course 45. Intensive examination of various topics expressed in poetry from the turn of the century and American literature. May be repeated for credit when topic covers different poets and poems. GE credit: ArtHum, Wrt | AH, WE.

166. Love and Desire in Contemporary American Poetry (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Close reading of contemporary American poems on the themes of love and desire by poets of diverse ethnicities and of gay, lesbian, and heterosexual orientations. Offered in alternate years. GE credit: Div, ArtHum, Wrt | ACGH, AH, WE.

167. Twentieth-Century African American Poetry (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Twentieth-century African American poetry, including oral and written traditions. Authors covered may include Gwendolyn Brooks, Countee Cullen, Robert Hayden, and Langston Hughes. GE credit: ArtHum, Div, Wrt | ACGH, AH, WE.

168. 20th Century American Poetry (4)
Lecture—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Historical Study of American poetry since 1900, with thematic and formal focus at the instructor’s discretion. Offered irregularly. GE credit: ArtHum, Wrt | ACGH, AH, WE.—II.

171A. The Bible as Literature: The Old Testament (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. May be taken independently of course 171B. Selected readings from the Old Testament illustrating various literary forms. Emphasis on the Pentateuch, the Historical Books, and the Wisdom Books. GE credit: ArtHum, Div, Wrt | AH, WC, WE.

171B. The Bible as Literature: Prophets and New Testament (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. May be taken independently of course 171A. Selected readings from the Old Testament prophets and the New Testament. GE credit: ArtHum, Div, Wrt | AH, WC, WE.

173. Science Fiction (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 3 or Science and Technology Studies 1, or equivalent. The literary modes and methods of science fiction. Representation of the author, and themes of the genre—e.g., time travel, alternative universes, and utopias. Relations of science fiction to science, philosophy, and culture. [Same course as Science and Technology Studies 173.] GE credit: ArtHum, Wrt | AH, WE.—III.

175. American Literary Humor (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1, or standing above freshman. American humorous vision of man, nature, and the supernatural. Includes one or more of the following: colonial humor; southwestern and New England humor; pre- and post-Civil War masters; local colorism; journalistic gadflies; anti-provincialists; modernist poets and prose writers; black humor. GE credit: ArtHum, Wrt | ACGH, AH, WE.—III.

177. Study of an Individual Author (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 110A or 110B. In-depth study of an author’s works; historical context; relation to prede-
178. Topics in Comparative American Literatures

Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or equivalent. Literary production among different modes of racialization within and beyond U.S. borders. May be repeated twice for credit. GE credit: ArtHum, Div, Wrt | AH, WE.—III.

179. Topics in Comparative American Literatures

Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or equivalent. Comparative study of what constitutes “American” literature. Possible emphases: North American or Latin American literature; Pacific Rim or Circum-Pacific; Afrolatino literary production; literary production in the global South; literary production in the African diaspora; local, regional, national, transnational, or other geographical formation; e.g., the global South; literature of Australia. May be repeated twice for credit. GE credit: ArtHum, Div, Wrt | AH, WE.—III.

180. Children’s Literature

Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Historical and/or thematic survey of topics in writing about the environment. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, WE.—I.

181A. African American Literature to 1900

Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. African American literature from the colonial period to 1900. Particular attention to the rapid development of the African American literary culture from a primarily oral tradition to various literary genres, including the slave narrative. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, WE.—I.

181B. African American Literature 1900–Present

Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Major African American writers in the context of cultural history from 1900 to the present. Writers may include Richard Wright, Ann Petry, James Baldwin, Ralph Ellison, Paule Marshall, Toni Morrison, Alice Walker, Clarence Major. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, WE.—I.

182. Literature of California

Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. California literature in the context of California’s social, political, and intellectual history. Reading of poetry, fiction, and essays. Emphasis on nineteenth- and twentieth-century novelists, turn of the century novelists, the Beats, and writers of the last two decades. GE credit: ArtHum, Div, Wrt | ACGH, AH, WE.—III.

183. Adolescent Literature

Lecture—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1, or equivalent. Theoretical, critical, and practical issues informing the study and teaching of American adolescent literature. GE credit: ArtHum, Wrt | AH, WE.

184. Literature and the Environment

Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Historical and/or thematic survey of topics in writing about the environment. GE credit: ArtHum, Wrt | AH, WE.

185A. Women’s Writing I

Lecture/discussion—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. Women’s Writing in English before 1800; organized by period, place, genre, or theme. GE credit: ArtHum, Div, Wrt | AH, WE.—III.

185B. Women’s Writing II

Lecture/discussion—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. Women’s Writing in English after 1800; organized by period, place, genre, or theme. Offered irregularly. GE credit: Div, Wrt | AH, WE.

186. Literature, Sexuality, and Gender

Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Highbrow literary culture and sexuality in the nineteenth and twentieth centuries. May be repeated for credit. GE credit: ArtHum, Div, Wrt | AH, WE.—IV.

187A. Topics in Literature and Media

Seminar—3 hours; film viewing—3 hours. Prerequisite: course 110A or 110B; consent of instructor. Group study of a topic centered on the relationships between literature and film or other moving-image media. GE credit: ArtHum, Div, Wrt | AH, WE.—I, II.

188A. Topics in Literary and Critical Theory

Seminar—3 hours; term paper. Prerequisite: course 110A or 110B; consent of instructor. Intensive examination of theoretical, critical, and literary issues informing the literary investigation. (S/U grading only.)—I, II.

189. Seminar in Literary Studies

Seminar—3 hours; term paper. Prerequisite: course 110A or 110B. Intensive, focused study of literature at an advanced level. May be organized by topic, author, period, movement, or genre. High participation. GE credit: ArtHum, Wrt | AH, WE.—II, III.

190. Internship in English

Internship—3–36 hours. Prerequisite: course 3 or University Writing Program 1. Internships in fields where students can practice their skills. A maximum of four units is allowed toward the major in English. May be repeated for credit for a total of 12 units. (P/NP grading only.)

190H. Honors Internship

Independently supervised study—120 hours. Prerequisite: course 190H. Preparation of a thesis in course 195H. Limited enrollment; high level of participation expected. GE credit: ArtHum | AH, WE.—II, III.

191H. Honors Seminar

Seminar—3 hours; term paper. Prerequisite: course 191H. Independent study—12 hours. GE credit: ArtHum, Div, Wrt | AH, WE.—II, III.

192. Seminar in Graduate Studies

Seminar—3 hours; term paper. Prerequisite: course 110A or 110B; one advanced study course; admission to English Department Senior Honors Program in Literature. Critical preparation for writing an honors thesis in course 195H. Limited enrollment; high level of participation expected. GE credit: ArtHum | AH, WE.—II, III.

194. Seminar for Honors Students

Seminar—3 hours; term paper. Prerequisite: course 110A or 110B; one advanced study course; admission to English Department Senior Honors Program in Literature. Critical preparation for writing an honors thesis in course 195H. Limited enrollment; high level of participation expected. GE credit: ArtHum | AH, WE.—II, III.

195H. Honors Seminar

Seminar—3 hours; term paper. Prerequisite: course 195H. Independent study—12 hours. GE credit: ArtHum, Div, Wrt | AH, WE.—IV.

196. Directed Group Study

Directed study—1 hour; research papers. Selected topics for intensive investigation. May be repeated for credit when different topic or period is studied. (S/U grading only.)—I, III.

197. Tutored Group Study

Directed study—1 hour; research papers. Selected topics for intensive investigation. May be repeated for credit when different topic or period is studied. May be repeated for credit when different topic or period is studied. (S/U grading only.)—I, III.

198. Directed Group Study

Directed study—1 hour; research papers. Selected topics for intensive investigation. May be repeated for credit when different topic or period is studied. (S/U grading only.)—I, III.

199. Special Studies for Advanced Undergraduates

Seminar—3 hours; conference and term paper. GE credit: ArtHum, Div, Wrt | AH, WE.—II.

200. Introduction to Graduate Studies in English

Seminar—3 hours; term paper or discussion—1 hour. Prerequisite: graduate standing. Introduction to literary scholarship with specific attention to the elements of professionalism and to different modes of literary investigation. (S/U grading only.)—I, II.

205. Anglo-Saxon Language and Culture

Lecture—3 hours; conference and term paper. The language and culture of Anglo-Saxon England; readings in Old English prose and poetry.

206. Beowulf

Discussion—3 hours; oral and written reports; conferences with students. Prerequisite: course 205 or the equivalent. A study of the poem and the Heroic Age of Germanic literature.

207. Middle English

Discussion—3 hours; term paper. Study of the phonology, morphology, syntax, and lexicon between 1100 and 1350 with investigation of the major dialects; pertinent facts on both the internal and external linguistic history; intensive reading of texts.

210. Readings in English and American Literature

Seminar—3 hours; conference and term paper. Content varies according to specialty of instructor. May be repeated if topics differ. —I.

225. Topics in Irish Literature

Seminar—3 hours; conference and term paper. Prerequisite: graduate standing. Varied topics, including the nine-teenth-century novel, contemporary Irish poetry, rise of the drama, or a study of a major author. May be repeated for credit if topic differs.

230. Study of a Major Writer

Seminar—3 hours; conferences with individual students—1 hour; research papers. Artistic development of one major writer and his intellectual and literary milieu. May be repeated for credit when a different writer is studied.—III.

232. Problems in English Literature

Seminar—3 hours; conferences with individual students—1 hour. Selected issues in the current study and critical assessment of a limited period or topic in English literature. May be repeated for credit when different period or topic is studied.

233. Problems in American Literature

Seminar—3 hours; conferences with individual students—1 hour; research papers. Selected topics for intensive investigation. May be repeated for credit when different topic or period is studied. —I, III.

234. Dramatic Literature

Lecture—3 hours, conference—1 hour. Historical introduction to dramatic theory and practice. Dramaturgy, comedy, and tragicomedy. May be repeated for credit if topic differs.

235. Theory of Fiction

Seminar—3 hours; conference—1 hour. Prerequisite: graduate standing. Studies of fiction as it relates to the professional writer’s practice of the craft. For students in the Creative Writing Program. May be repeated for credit when focus differs.

236. Poetics

Seminar—3 hours; conference—1 hour. Prerequisite: graduate standing. Theories of poetry as revealed in structure, prosody, and idiom of British and American poems, variably approached—through intensive study of a single poet, historically, or theoretically—

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum | Arts and Humanities; SciEng | Science and Engineering; SocSci | Social Sciences; Div | Domestic Diversity; Wrt | Writing Experience
Fall 2011 and on Revised General Education (GE): AH | Arts and Humanities; SE | Science and Engineering; SS | Social Sciences; ACGH | American Cultures; DD | Domestic Diversity; OL | Oral Skills; QL | Quantitative; SL | Scientific; VL | Visual; WC | World Cultures; Wrt | Writing Experience
Entomology and Nematology

Formerly the departments of Entomology and Nematology

(Formerly the departments of Entomology and Nematology)

at the instructor's discretion. For students in the Creative Writing Program, May be repeated for credit when focus differs.—II.

238. Special Topics in Literary Theory (4)
Seminar—3 hours; term paper. Prerequisite: course 237 or the equivalent. Advanced topics in literary theory and criticism. Preparation and evaluation of research papers. May be repeated for credit when topic and/or reading lists differ. Offered in alternate years.—III.

240. Medieval Literature (4)
Seminar—3 hours; conference—1 hour. Studies of medieval literature from the Civil War to 1914. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.—II.

242. Sixteenth-Century Literature (4)
Seminar—3 hours; conference—1 hour. Studies in sixteenth-century literature. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.—II.

244. Shakespeare (4)
Seminar—3 hours; conference—1 hour. Studies in Shakespeare. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.—II.

246. Seventeenth-Century Literature (4)
Seminar—3 hours; conference—1 hour. Studies in seventeenth-century literature. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.—II.

248. Eighteenth-Century Literature (4)
Seminar—3 hours; conference—1 hour. Studies in eighteenth-century literature. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.—II.

250. Romantic Literature (4)
Seminar—3 hours; conference—1 hour. Studies in Victorian literature. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.—II.

254. Twentieth-Century British Literature (4)
Seminar—3 hours; conference—1 hour. Studies in twentieth-century British literature. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.—II.

256. Early American Literature (4)
Seminar—3 hours; conference—1 hour. Studies in Early American literature. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.

258. American Literature: 1800 to the Civil War (4)
Seminar—3 hours; conference—1 hour. Studies in American literature from 1800 to Civil War. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.

260. American Literature: Civil War to 1914 (4)
Seminar—3 hours; conference—1 hour. Studies in American literature from the Civil War to 1914. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.

262. American Literature after 1914 (4)
Seminar—3 hours; conference—1 hour. Studies in American literature after 1914. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.—II.

264. Studies in Modern British and American Literature (4)
Seminar—3 hours; conference—1 hour. Studies in modern British and American literature. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.

270. Studies in Contemporary World Literature (4)
Seminar—3 hours; conference—1 hour. Prerequisite: graduate standing, consent of instructor, with preference given to those enrolled in the master's program in Creative Writing. Emerging global, international or transnational theories, techniques, and individual works of contemporary world prose or poetry. Discussion, seminar reports, research papers. May be repeated for credit when topic differs.—II, III.

285. Literature by Women (4)
Seminar—3 hours; conference—1 hour. Studies in literature by women and the theoretical approaches to literature by women. Course materials to be selected by the instructor. Preparation and evaluation of research papers. May be repeated for credit when a different topic is studied.—II.

288. Prospectus Workshop (2)
Conference—2 hours. Must have passed Department Preliminary Exam. Training in writing the dissertation prospectus. Participation in group discussions of preparatory assignments and final proposal. (S/U grading only.)—I, II, III.

289. Article Writing Workshop (2)
Conference—2 hours. Prerequisite: consent of instructor, and at least 12 credits of upper division courses. Participation in group discussions of article drafts. May be repeated one time for credit. (S/U grading only.)—II, III.

290F. Seminar in Creative Writing of Fiction (4)
Seminar—3 hours, 1 additional hour of writing. Prerequisite: consent of instructor; graduate standing, with preference given to those enrolled in master's program in Creative Writing. Writing of literary fiction. Discussion of published fiction, with emphasis on autobiography, biography, memoir, the occasional or the second novel, and/or non-fiction prose narratives. May be repeated for credit.—I, II, III.

290N. Seminar in Creative Writing of Non-Fiction (4)
Seminar—3 hours, term paper. Prerequisite: consent of instructor, graduate standing, preference given to those enrolled in master's program in Creative Writing. The writing of literary non-fiction, with emphasis on autobiography, biography, memoir, the occasional or the second novel, and/or non-fiction prose narratives. May be repeated for credit.—II, III.

290P. Seminar in Creative Writing of Poetry (4)
Seminar—3 hours, 1 additional hour of writing. Prerequisite: consent of instructor; graduate standing, with preference given to those enrolled in master's program in Creative Writing. Writing of poetry. Examination of written materials and individual student conferences. May be repeated for credit.—I, II, III.

299. Directed Group Study (1-5)
Prerequisite: consent of instructor; graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III (1, II, III)

299D. Special Study for the Doctoral Dissertation (1-12)
Prerequisite: consent of instructor; graduate standing. May be repeated for credit. (S/U grading only.)

Professional

391. Teaching Creative Writing (2)
Discussion—2 hours. Prerequisite: graduate standing; appointment as Teaching Assistant in the English Department. Designed for new instructors of English 237 or 5P; discussion of ways to facilitate creative writing workshops and to respond to student manuscripts. (S/U grading only.)

393. Teaching Literature and Composition (2)
Discussion—2 hours. Prerequisite: graduate standing; appointment as Teaching Assistant in the English Department. Designed for new instructors of English 3 or the equivalent courses; discussion of problems related to teaching literature and composition to lower division students. (S/U grading only.)—II, III.

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: standing. May be repeated for credit. (S/U grading only.)—I, II, III (I, II, III)

Entomology and Nematology

Formerly the departments of Entomology and Nematology

(Formerly the departments of Entomology and Nematology)
The Major Program

The Entomology major is a general biological science program. The curriculum is designed to develop an understanding of fundamental biological concepts by studying insects. Insects offer unique opportunities to study biological systems and are model experimental animals. Many insects are either pests, or beneficials, that have great importance to the economy, environment, or public health. Students may focus on specific areas of interest including agricultural entomology, insect systematics and evolution, insect behavior and ecology, medical entomology, and insect molecular biology and toxicology.

The Program. Students begin their study in entomology with selected insect biology courses. After completing these courses, students may enroll in courses in their particular area of interest. The Entomology Faculty encourages students to do research internships in their laboratories.

Career Alternatives. Entomology graduates find careers in many different areas of applied or basic biology. Graduates have the opportunity to continue in professional graduate programs such as veterinary or human medicine, or get advanced degrees leading to careers in biotechnology, conservation biology, or academic teaching and research. Many graduates have participated in internship programs with the California Department of Food and Agriculture and found career diagnostic laboratories, conducting insect surveys, and/or developing entomological collections. Other graduates have worked in agriculture in the area of insect pest management. Graduates are prepared for managerial and technical positions with state and federal agencies and in agricultural production and supporting industries. Some entomology graduates pursue careers in primary, secondary, and college level science education.

B.S. Major Requirements:

Preparatory Subject Matter .......................... 49-53 Biological Sciences 2A, 2B, 2C .......................... 15 Chemistry 2A, 2B, 8A, 8B .......................... 16 Mathematics 1A-18B-16C or 17A-17B-17C or 21A-21B-21C 9-12 Physics 1A, 1B ............................................. 6 Statistics 13, 32, or Plant Sciences 120, 21 or Engineering 5 ............................................. 3-4 Depth Subject Matter ................................. 34-40 Microbiology 104, Plant Biology 14B, Plant Pathology 120 or Microbiology 162 3-5 Biological Sciences 101 .................................. 4 Entomology 105, Environmental Science and Policy 100 or Evolution and Ecology 101 ............................................. 4 Evolution and Ecology 100 ................................. 4 Biological Sciences 102 and 103 or Animal Biology 102 and 103 ............................................. 6-10 Entomology 100, 100L .................................. 6 At least 7 units from Entomology 102, 103, 104, 107, 109, or 116 or Nematology 110 ................................. 7 Restricted Electives .................................... 34 Upper division Entomology and Nematology courses ............................................. 14 Upper division electives related to student’s interest with approval of adviser ............ 20 Total: At least 12 units from Entomology 192, 197 and 199 may count toward fulfilling depth subject matter or restricted elective units. Total Units for the Major ................. 117-127

Major Adviser. S. Lawler, S. Nadler

Minor Program Requirements: The Department of Entomology has five minor programs open to students in other disciplines who are interested in rounding out their academic study with a concentration in the area of entomology.

Insect Biology ....................................... 19-33 Entomology 100, 100L ................................. 6 At least seven units from Entomology 102, 103, 104, 107, 109, 110, 116 ......... 7 At least two additional upper division Entomology courses [except courses 192, 198, 199] ............................................. 6-10 Agricultural Pest Management .......................... 21-23 Entomology 100, 100L, 110, 135 ............. 15 At least two courses: Animal Science 102, Plant Sciences 105, 176, Plant Pathology 120 ............................................. 6-8 Insect Ecology and Evolution ......................... 20-21 Entomology 100, 100L, and Entomology 105 or 104 ................................. 9-10 At least seven units from Entomology 103, 107, 109, 116, 158 ............................................. 7 Evolution and Ecology 149 or Environmental Science and Policy 150 ................................. 4 Medical-Veterinary Entomology ....................... 19 Entomology 100, 100L, 104, 153, 156, 160 ............................................. 15 At least four units from Entomology 156, 158, Microbiology 162 ................................. 4 Forensic Entomology ................................... 22 Entomology 100, 100L, 102, 158, 163 .................. 13 Biological Science 2A .................................. 5 Entomology 105, Evolution and Ecology 101, or Environmental Science and Policy 100 ................................. 4 Minor Adviser. S. Lawler, S. Nadler

Graduate Study, The Department of Entomology offers a program of study and research leading to the M.S. and Ph.D. degrees. See Graduate Studies, on page 111 and the Graduate Announcement, for further details.

Graduate Advisers. See http://entomology.ucdavis.edu/grad/.

Related Courses. See courses in Nematology.

Courses in Entomology (ENT)

Lower Division

1. Art, Science and the World of Insects (3) Lecture—3 hours, laboratory—3 hours. Fusion of entomology and art to create an appreciation of insects to human welfare. GE credit: SciEng, Wrt | SE, SL, WE.—I. (II.)


3. Evolution and Entomology (3) Lecture—2 hours, lecture/discussion—1 hour. Introduction to insect physiology and evolutionary biology. GE credit: SciEng.—II. (I.)

4. Environmental Entomology (3) Lecture—3 hours, laboratory—3 hours. GE credit: SciEng.—II. (I.)

5. Insect Behavior and Ecology (3) Lecture—2 hours, lecture/discussion—1 hour. GE credit: SciEng.—II. (I.)

6. Insect Pest Management (3) Lecture—2 hours, lecture/discussion—1 hour. GE credit: SciEng.—II. (I.)

7. Insect Systematics (3) Lecture—3 hours, laboratory—3 hours. GE credit: SciEng.—II. (I.)

8. Insect Toxicology (3) Lecture—2 hours, laboratory—2 hours. GE credit: SciEng.—II. (I.)

9. Insect Zoology (3) Lecture—2 hours, lecture/discussion—1 hour. GE credit: SciEng.—II. (I.)

10. Natural History of Insects (3) Lecture—3 hours. Designed for students not specializing in entomology. Not open for credit to students who have had course 100, but students who have taken this course may take course 100 for credit. An introduction to the insects detailing their great variety, structures and functions, habits, and their significance in relation to plants and animals including man. GE credit: SciEng | SE, SL—II. (II.)

11. Special Topics in Entomology (2) Seminar—2 hours. Freshman seminar course for in-depth examination of a special topic within the subject area. May be repeated two times for credit. (P/NP grading only)—I.-II., III.

12. Internship (1-12) Internships—3-36 hours. Prerequisite: consent of instructor. Work/learn experience on and off campus in all subject areas offered by the department, supervised by a member of the faculty. May be repeated up to 12 units of credit. (P/NP grading only).

13. Special Study for Undergraduates (1-5) (P/NP grading only).

Upper Division

100. General Entomology (4) Lecture—3 hours, term paper. Prerequisite: Biological Sciences 1B. Biology, anatomy, physiology, development, classification, ecology and relation of insects to human welfare. GE credit: SciEng, Wrt | SE, SL, WE.—I. (II.)

200. General Entomology Laboratory (2) Laboratory—6 hours. Prerequisite: course 100 (may be taken concurrently). Anatomy, development, population ecology, methods of collecting, classification and identification of insects. GE credit: SciEng.—II. (I.)

300. Functional Insect Morphology (3) Lecture—2 hours, laboratory—3 hours. Prerequisite: course 100. Study of the basic external and internal structures, organs and tissues of insects, with emphasis on functional systems. Functional anatomy, histology and fine structures of important organs and tissues will be discussed. GE credit: SciEng.—II. (I.)

400. Insect Physiology (4) Lecture—3 hours, discussion—1 hour. Prerequisite: course 100 or course in physiology or invertebrate zoology. Processes by which insects maintain themselves, reproduce, and adapt to their environments as models for basic/applied research through detailed analysis of metabolic, physiological, and behavioral processes. Emphasis on analysis of morphological, histological, and functional processes. GE credit: SciEng | SE, SL, WE.—II. (I.)


700. Insect Ecology (4) Lecture/discussion—3 hours, term paper. Prerequisite: Biological Sciences 2B. Introduction to insect ecology, combining fundamental concepts and questions in ecology with ideas, hypotheses and insights from insects. Integrates aspects of individual, population, community and ecosystem ecology. Emphasis on the scientific process: observing nature, asking...
135. Introduction to Biological Control (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 100 or 110. Principles of biological control of arthropod pests and weeds. Biology of parasitic protozoa, nematodes, and predators. Introduction to classical and augmentative biological control. Role of biological control in pest management. Offered in alternate years—II. (I.) Yang

153. Medical Entomology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1B, upper division standing in one of the biological sciences, or consent of instructor. Basic biology and classification of medically important arthropods with special emphasis on the ecology of arthropod-borne diseases and principles of their control. Relationships of arthropods to human health. GE credit: SciEng, Wrt | SE, SL, WE.—II. (II.) Scott

156. Biology of Parasitism (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A or consent of instructors. Lectures on the biology of ectoparasites and their interactions with their hosts. Offered in alternate years—I. Kaya, Forrester

158. Forensic Entomology (3)
Lecture—2 hours; laboratory—4 hours. Prerequisite: Biological Sciences 1A or Entomology 100, upper division standing. Arthropods, their general biology, succession, development and population cycles and population biology in matters of criminal prosecution and civil litigation. Emphasis on basic entomological, biological and development concepts and methods, development of reasoning abilities, implication, development of opinions and evidence. GE credit: SciEng or SocSci, Wrt | WE.—III. (III.) R. Kimsey, Nadler

180A. Experimental Ecology and Evolution in the Field (4)
Lecture/laboratory—3 hours; fieldwork—3 hours. Prerequisite: course 105, or Environmental Science and Policy 100; Evolution and Ecology 100; Evolution and Ecology 101. Experimental design in ecological field examination. Examination of primary literature, experimental design, independent and collaborative research, analysis of original research paper based on field experiments. (Same course as Evolution and Ecology 180A.) Offered in alternate years. (Deferred grading only; pending completion of sequence.) GE credit: SciEng | QL, VL, WE.—II. (II.) Yang

180B. Experimental Ecology and Evolution in the Field (4)
Lecture/laboratory—3 hours; fieldwork—3 hours. Prerequisite: Biological Sciences 1A or Entomology 100, Evolution and Ecology 100, Evolution and Ecology 101, or Environmental Science and Policy 100; course 105. Experimental design in field ecology. Examination of primary literature, experimental design, independent and collaborative research, analysis of data, development of original research paper based on field experiments. (Same course as Evolution and Ecology 180B.) Offered in alternate years. (Deferred grading only; pending completion of sequence.) GE credit: SciEng | QL, SE, SL, WE.—III. (III.) Yang

201. Internship (1-12)
Internship—3.3-6.6 hours. Prerequisite: completion of 84 units and consent of instructor. Laboratory experience or fieldwork off and on campus in all subject areas offered in the Department of Entomology. Internships supervised by a member of the faculty. (P/NP grading only.)
Environmental Horticulture

[College of Agricultural and Environmental Sciences] Faculty. See Plant Sciences, on page 476. The Program. Students of Environmental Horticulture learn how plants improve the environment and the quality of our lives. Plants are used to revegetate and restore disturbed land, control landscapes, control erosion, and reduce energy and water consumption. The ornamental use of plants to improve the aesthetic quality of urban and rural landscapes, recreational areas, and commercial sites is an important aspect of the study of environmental horticulture.

Students interested in Environmental Horticulture can obtain a B.S. degree in Environmental Horticulture and Urban Forestry and may specialize in Floriculture/Nursery Management, Urban Forestry, Landscape Management/Floral or Urban Biodiversity/Restoration. Students can develop an individual major with the help of an Environmental Horticulture faculty adviser and approval of the College's Individual Major Committee. A minor in Environmental Horticulture or Landscape Restoration is available to students in other majors.

Career Alternatives. Opportunities in this field include growing and/or managing plants in a variety of settings, including nurseries, golf courses and arboreta, consulting as an urban, landscape, or restoration horticulturist, business ownership, working for public agencies or private landscape firms/corporations, park management and landscape contracting. Students are encouraged to develop internships on or off campus to augment their activities in the classroom and laboratory.

Minor Program Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Horticulture 23-25</td>
<td></td>
</tr>
<tr>
<td>Environmental Horticulture 6 and 10S</td>
<td></td>
</tr>
<tr>
<td>Plant Sciences 171</td>
<td>4</td>
</tr>
<tr>
<td>Select three courses from: Environmental Horticulture 100, 120, 125, 130</td>
<td></td>
</tr>
<tr>
<td>133</td>
<td></td>
</tr>
<tr>
<td>Minor Adviser, J.A. Harding (Plant Sciences)</td>
<td></td>
</tr>
<tr>
<td>Related Undergraduate Programs. See the undergraduate majors in Ecological Management and Restoration, on page 229, Environmental Horticulture and Urban Forestry, on page 297, Plant Biology, on page 471, and Plant Sciences, on page 476.</td>
<td></td>
</tr>
</tbody>
</table>

Graduate Study. For graduate study related to this field, see the M.S. and Ph.D. degree programs in the graduate groups of Horticulture and Agronomy, Plant Biology, Ecology, and Genetics. Also see Graduate Studies, on page 111.

Related Courses. See Plant Biology and Plant Sciences.

Courses in Environmental Horticulture (ENH)

GE credit: SciEng | SE, VL. — I. (II) Volder

Lower Division

1. Introduction to Environmental Horticulture/Urban Forestry (3)

Lecture—3 hours. Introduction to the use of plants to enhance the physical, visual and social environment. The use of ecological principles in developing sustainable, low maintenance landscape systems will be presented. Career opportunities will be discussed. GE credit: SciEng, Wrt | SE, SL, VL. — I. (II) Volder

Upper Division

100. Urban Forestry (4)

Lecture—2 hours; laboratory—3 hours, term paper. Prerequisite: Biological Sciences 1C or Plant Sciences 2. Principles and practices of planning and managing urban vegetation. Basics of trees and shrubs, natural resource inventory, and development of long term urban forest management plans. GE credit: SciEng | SE. — I. (II) Cadonasso

101. Trees of the Urban Forest (2)

Lecture—1 hour, laboratory—2 hours. Prerequisite: course 6 or consent of instructor. Identification and evaluation of 200 tree species of the urban forest on campus, in the Arboretum, and in the city of Davis; appraisal and aesthetic values, condition, and branch structure; contribution of trees to this ecosystem. (I.) Gillett

102. Physiological Principles in Environmental Horticulture (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1C. Physiological principles and processes essential to floriculture, nursery crop production, turfgrass and landscape horticulture. Emphasis on the control of vegetative and reproductive development for a broad species range in greenhouse and extensive landscape environments. GE credit: SciEng | VL, SE. — I. (II) Harding

105. Taxonomy and Ecology of Environmental Plant Families (4)

Lecture—2 hours; laboratory—6 hours. Prerequisite: course 6 or consent of instructor. Classification and identification of introductions of native species used in urban forests, with emphasis on floral and vegetative characteristics of the prominent families of angiosperms and gymnosperms, adaptations to environmental variations in western landscapes, and horticultural classification. GE credit: SciEng | VL, SE. — I. (II) Evans

125. Greenhouse and Nursery Crop Production (5)

Lecture—3 hours, discussion—1 hour; laboratory—3 hours. Prerequisite: Plant Sciences 2 or Biological Sciences 1C. Principles and techniques for the production of ornamental greenhouse and nursery crops. Hands-on experience producing greenhouse crops. Optional weekend field trip. GE credit: SciEng | SE, WE.

129. Analysis of Horticultural Problems (4)

Lecture—1 hour; laboratory—6 hours. Prerequisite: course 102, Entomology 110, Plant Pathology 120, and Soil Science 100 or the equivalents. Methods of analysis of common plant disorders seen in the landscape, greenhouse, and nursery. Diagnosis of plant disorders caused by soil, water, chemical agents, climatic conditions or cultural practices. Approaches to diagnosis that emphasize acquisition and integration of information. GE credit: SciEng | SL, SE— I. (II) Durzan

130. Turfgrass and Amenity Grassland Utilization and Management (4)

Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: Biological Sciences 1C or Plant Sciences 2. Utilization and management of amenity

Environmental Geology

[College of Letters and Science] The minor in Environmental Geology examines the multidisciplinary factors of geology and related earth science fields, and planning and resources oriented programs. Students in the minor are encouraged to participate in internships that assist them in solidifying the Environmental Geology minor with their Geology major or other major field areas that include geologic components. The minor is sponsored by the Department of Earth and Planetary Sciences in 2119 Earth and Physical Sciences Building.

Minor Program Requirements:

<table>
<thead>
<tr>
<th>Category</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Geology</td>
<td>Geology 130, 134, and Environmental Science and Management 186</td>
<td>9</td>
</tr>
<tr>
<td>Hydrology</td>
<td>Hydrologic Science 118</td>
<td>4</td>
</tr>
<tr>
<td>Hydrologic Science</td>
<td>Hydrologic Science 141 or Civil and Environmental Engineering 142</td>
<td>4</td>
</tr>
<tr>
<td>Course Selections</td>
<td>Two courses chosen from Environmental Science and Policy 160, 171, 179, Hydrologic Sciences 144, 146</td>
<td>8-9</td>
</tr>
<tr>
<td>Minor Adviser</td>
<td>See Geology major advisers</td>
<td></td>
</tr>
</tbody>
</table>

Quarter Offered: Fall, II, IV, Summer, Pre-Fall 2011 General Education (GE): AH = Arts and Humanities; SC = Science and Engineering; SS = Social Sciences; AGCM = American Cultures, DD = Domestic Diversity, WR = Writing Experience Fall 2011 and on Revised General Education (GE): AH = Arts and Humanities; SE = Science and Engineering; SS = Social Sciences; AGCM = American Cultures, DD = Domestic Diversity, OL = Oral Skills, QL = Quantitative, SL = Scientific, VL = Visual, WC = World Cultures, WE = Writing Experience
150. Genetics and Plant Conservation: The Biodiversity Crisis (3)
Lecture/discussion—3 hours. Prerequisite: Biological Sciences 1C or the equivalent. Conservation of genic diversity, measurement of diversity, threats to diversity and reasons for protection, the process of extinction, distribution of diversity, determination of what to conserve and means of conservation. Examples drawn largely from forest tree species. GE credit: SciEng | SE, SL—III. (III) Neale

160. Restoration Ecology (3)
Lecture—3 hours. Prerequisite: Plant Biology/Evolutionary Ecology 117 or Evolution and Ecology 121 or Plant Biology 147 or the equivalent. Conceptual bases of restoration ecology; tools used by restoration ecologists to solve practical problems; scope and success of actual restoration projects. GE credit: SciEng | SE, SL, WE—II. (III) Eviner

160L. Restoration Ecology Laboratory (1)
Laboratory/discussion—3 hours. Prerequisite: course 160 (may be taken concurrently). Companion field course to course 160. A series of part-day and all-day visits to various field sites, involving site evaluations, guest field presentations by local restorationists, and actual restoration activities. Not open for credit to students who have completed course 160 prior to spring 2004. GE credit: SciEng | SE, SL—III. (III) Eviner

Graduate
229. Analysis of Horticultural Problems (5)
Lecture—1 hour; laboratory—8 hours; discussion—1 hour; project. Prerequisite: equivalent of B.S. degree in Environmental Horticulture and Urban Forestry, Plant Biology, Applied Biological Systems and Environment, or related major, or consent of instructor. Methods of analysis of common plant disorders seen in the landscape, greenhouse, and nursery. Diagnosis of plant disorders caused by soil, water, insects, disease, chemical agents, climatic conditions or cultural practices. Approaches to diagnosis that emphasize acquisition and integration of information. Not open for credit to students who have completed course 241.

Environmental Horticulture and Urban Forestry

(see page 476)

The Major Program
Students majoring in Environmental Horticulture and Urban Forestry learn how plants improve the environment and the quality of our lives. The major focuses on the biological and physical concepts and horticultural principles of plant production, management of plants and plant ecosystems in landscape settings and sociological aspects of plant/people interactions in the urban environment. Plants are used to revegetate and restore disturbed landscapes, control erosion, improve the environment and water consumption. The ornamental use of plants to improve the aesthetic quality of urban and rural landscapes, recreational areas, interspecies and commercial sites is an important aspect of the major. Students may select one or more of the following three areas of specialization: Floriculture/Nursery, Plant Biodiversity/Restoration, or Urban Landscape Management.

Internships and Career Opportunities. Students are encouraged to develop internships on or off campus to augment their activities in the classroom and laboratory. Internships are available with the departmental faculty, the UC Davis Arboretum, landscape designers, government agencies or regional nurseries. Career opportunities in this field include growing and/or managing plants in a variety of settings, including nurseries and arboretas, consulting as an urban, landscape, or restoration horticulturist; business ownership; working for public agencies or private landscape firms/corporations; park management and landscape contracting.

B.S. Major Requirements:
UNITS
Communications 1 recommended as part of the College English Composition Requirement or the Words and Images Core Literacy Component.
Preparatory Subject Matter
Environmental Horticulture 1 and 6 7
Landscape Architecture 30 4
Biological Sciences 2A, 2B, and Plant Sciences 2 2 14
Chemistry 2A-2B 10
Environmental Science and Policy 1 or 10 or 30 4-5
Physics 1A-1B 6
Plant Sciences 21 3-4
Mathematics 16A or Statistics 13 3-4
University Writing Program 102B, 102G, 104E, or other upper division composition course (may overlap with college composition requirement; may be satisfied by passing the English Composition exam) 4-6
Lower division restricted electives 6
Select one lower division science course and one lower division social science/humanities course in consultation with adviser; minimum 6 units.
Depth Subject Matter
Environmental Horticulture 102 or Plant Sciences 100A 3-4
Environmental Horticulture 105 or Plant Sciences 105A 4-5
Plant Biology 117 or Plant Sciences 150 4
Plant Sciences 171 4
Soil Science 100 5
Select two from: Plant Pathology 150, Plant Pathology 120, Plant Sciences 105 or 176 7-9
Select two from: Plant Sciences 192 (minimum of 3 units) 3
Upper division restricted electives 12
Select two upper division resource science courses and two upper division social science/humanities courses in consultation with adviser 14
Areas of Specialization (choose one)
No course may be used to satisfy more than one requirement.
Floriculture/Nursery Option
Environmental Horticulture 120, 125 8
Applied Biological Systems Technology 165 2
Entomology 135 4
Plant Sciences 100C or 158 or Soil Science 109 4
Plant Biodiversity/Restoration Option
Environmental Horticulture 160, 160 4

Environmental Horticulture 150, or Evolution and Eco 100, or Plant Biology 116 3-5
(a) Select one course from: Environmental Science and Management 141, Environmental Science and Policy 127, 155, Plant Sciences 130,130, Wildlife, Fish, and Conservation Biology 155 3-4
(b) Select one course from: Environmental Science and Policy 155, Plant Biology 108, 117, 119, Plant Sciences 102, 144, 147/147, 163, 176, Wildlife, Fish, and Conservation Biology 156, 157 3-5
Select one additional class from section a or b 3-5
Urban Landscape Management Option 16-17
Environmental Horticulture 100, 133 8
Applied Biological Systems Technology 165 2
Plant Sciences 162 3
Science and Society 18 or Landscape Architecture 150 3-4
Total Units for the Major 114-130

Major Adviser. T.P. Young

Advising Center for the major is located in 1224 Plant and Environmental Sciences 3307527738

Environmental Policy Analysis and Planning

(see page 476)

The Major Program
The major in environmental policy analysis and planning develops skills for designing and assessing policy in fields related to environmental quality and natural resource management and an understanding of governmental policymaking.

Any student in good standing is eligible to transfer to the major; to do so, please see the staff adviser, Melissa Whaley, in 2134 Wickson Hall, or the master adviser, Prof. J. Sanchirico, in 2102 Wickson Hall.

The Program. This major provides students with a strong background in policy analysis, including the evaluation of policy alternatives and the study of factors affecting policy formulation and implementation. Key components of this interdisciplinary training include a general background in the natural sciences relevant to environmental, economic, political science, statistics, and research methodology to quantitatively analyze environmental problems and policy options. In addition, students are encouraged to develop substantive knowledge in a specific field of environmental policy, such as urban and regional planning, water policy, transportation and energy, climate policy, or conservation management.

Careers. Environmental policy analysis and planning graduates are prepared for employment in environmental, natural resource, energy, and transportation focused public agencies, consulting firms, non-governmental organizations, and businesses, or as legislative aides for elected representatives. The major is also excellent preparation for students who want to go on to graduate work in law, planning, public policy, science, economics, or business.

B.S. Major Requirements:
UNITS
English Composition and Public Speaking Requirement 3-8
University Writing Program 101, 102A-G, 104A-E, or passing the Upper Division English Composition exam 0-4
Communication 1 or 3 or Dramatic Art 10 3-4
## Environmental and Resource Sciences

<table>
<thead>
<tr>
<th>Preparatory Subject Matter</th>
<th>46-52</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences 2A, 10, or 10V</td>
<td>4-5</td>
</tr>
<tr>
<td>Chemistry 2A</td>
<td>5</td>
</tr>
<tr>
<td>Plant Science 101, or Science 1</td>
<td>3</td>
</tr>
<tr>
<td>Economics 1A, 1B</td>
<td>8</td>
</tr>
<tr>
<td>Animal Science 1</td>
<td>3</td>
</tr>
<tr>
<td>Atmospheric Science 60</td>
<td>8</td>
</tr>
<tr>
<td>Biological Science</td>
<td>3</td>
</tr>
<tr>
<td>Environmental Science &amp; Management 100</td>
<td>3-5</td>
</tr>
<tr>
<td>Geology 1 or 134</td>
<td>3-5</td>
</tr>
<tr>
<td>Plant Sciences 12</td>
<td>8</td>
</tr>
<tr>
<td>Wildlife, Fish, &amp; Conservation Biology 11</td>
<td>3-5</td>
</tr>
<tr>
<td>Environmental Science &amp; Policy 1</td>
<td>4</td>
</tr>
<tr>
<td>Environmental Science &amp; Policy 1</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics 16A-16B</td>
<td>3-5</td>
</tr>
<tr>
<td>17A-17B</td>
<td>3-5</td>
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<tr>
<td>or 21A-21B</td>
<td>3-5</td>
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<tr>
<td>Statistics 100</td>
<td>3-5</td>
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<tr>
<td>or 108</td>
<td>3-5</td>
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<tr>
<td>Political Science 1</td>
<td>6</td>
</tr>
<tr>
<td>Statistics 13 or 32</td>
<td>3-4</td>
</tr>
<tr>
<td>Satisfaction of General Education requirement.</td>
<td></td>
</tr>
</tbody>
</table>

### Depth Subject Matter | 47-51

Students must take these units on a letter grade basis, and must attain an overall grade point average of 2.00 or higher in the Depth Subject Matter courses.)

- **Environmental Science & Policy 110, 160, 168A, 168B | 17**
- **Environmental Science & Policy 161 | 4**
- **Environmental Science & Policy 178 | 4**
- **Environmental Science & Policy 179 | 4**
- **Select one course from: Agricultural & Resource Economics 106, Sociology 106, Statistics 100, 103, 103P, or 108 | 4-5**
- **Agricultural & Resource Economics 100A or Economics 100 | 4-5**
- **Agricultural & Resource Economics 176, Environmental Science & Policy 125, or Environmental Science & Policy 175 | 4**
- **Applied Biological Systems Technology 150 | 4**
- **Environmental Science & Policy 179 | 2**
- **Select one course from: Applied Biological Systems Technology 181N, 182, or Environmental Science & Management 185 or 186 | 4-5**

### Areas of Specialization

*choose one* | 12-17

Students must select courses in the Areas of Specialization that have not been taken in the Depth Subject Matter.

### City & Regional Planning

- **Environmental Science & Policy 171 | 2**
- **and 172 | 8**
- **Select one course from: Civil & Environmental Engineering 162, 165 or Environmental Science 100 | 3-4**
- **Select one course from: Art History 168, Community & Regional Development 149, 152, 156, or 171, Environmental Science & Policy 173 or Political Science 100 | 2-5**

### Climate Change Policy

- **Environmental Science & Policy 165N | 3**
- **Select one course from: Agriculture & Resource Economics 176, Economics 125, Environmental Science & Policy 163, 167, or 171 | 4**

### Conservation Management

- **Select two courses from: Environmental Science & Policy 169, 170, or 172 | 6-8**
- **Select one course from: Environmental Science & Management 160, Environmental Science & Management 100, Environmental Science & Policy 100, 121, or 127, Evolution & Ecology 115, 138, or Wildlife, Fish, & Conservation Biology 154 or 153 | 3-5**

### Energy & Transportation Planning

- **Economics 125, Engineering 106, or Environmental Science & Policy 175 | 3-4**
- **Select two courses from: Civil & Environmental Engineering 162, 165, Environmental Science & Policy 163, 167, or 172 | 4**
- **Select one course from: Atmospheric Science 116, Civil & Environmental Engineering 123, Engineering 160, Environmental Science & Management 131, or Geology 130 | 4-5**

### Environmental Policy & Politics

- **Select one course from: Political Science 100, 104, 105, 107, or 109 | 4**
- **Select one course from: Political Science 162, 164, 165, or 170 | 4**
- **Select one course from: Civil Engineering 165, Environmental Science & Policy 165N, 166N, 167, 169, 170, 171, or 172 | 4**
- **Select one course from: Agricultural & Resource Economics 106, 176, Civil & Environmental Engineering 153, Economics 130, or Environmental Science & Policy 175 | 4**

### Integrative Policy

- **Students choosing this individualized track must consult with a faculty adviser to identify an area of emphasis within this track and to select four upper division courses with a common theme. Possible areas of emphasis are marine policy, pollutants in the environment, planning in the presence of environmental hazards, sustainable development, and environmental and natural resource economics. If you are considering this track, please contact the major adviser as soon as possible.**

### Water Management

- **Select two courses from: Environmental Science & Policy 166H, 169, or Hydrologic Science 150 | 6**
- **Select two courses from: Environmental Science & Management 100, 121, or 127, Environmental Science & Policy 151, 155, Geology 134, Hydrologic Science 141, 143, Soil Science 118, Wildlife, Fish, & Conservation Biology 120, Biological Sciences 124, Environmental Science & Policy 116N, 124, 150C, or 152 | 6-8**

### Total Units for the Degree | 108-128

### Major Adviser

J. Sanchirico *(Environmental Science and Policy)*

### Minor Program Requirements:

The faculty for environmental policy analysis and planning offers the following minor. The Environmental Policy Analysis minor is natural and social science students desiring basic training in policy analysis theory and methods.

<table>
<thead>
<tr>
<th>Minor Program Analysis</th>
<th>23-25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation: Economics 1A</td>
<td>basic course in political science</td>
</tr>
<tr>
<td>Environmental Science &amp; Policy 1</td>
<td>4</td>
</tr>
<tr>
<td>Environmental Science &amp; Policy 160, 161, 168A</td>
<td>13</td>
</tr>
<tr>
<td>Select two courses from: Environmental Science &amp; Policy 163, 165N, 166N, 167, 168B, 169, 171, 172, or 179</td>
<td>8-8</td>
</tr>
</tbody>
</table>

### Environmental and Resource Sciences

(Continued from page 298)

The **Environmental Science and Management** (ESM) major is designed for students who are interested in solving environmental problems from an interdisciplinary perspective linking the natural and social sciences.

Students who choose this major will study the interaction of physical, biological, and social components of environmental problems. Students completing the program will understand the scientific basis for environmental decision making and the legal, economic, and political issues involved in management of the environment.

**The Program.** Courses in biology, chemistry, physics, economics, geology, and calculus form the lower-division preparatory foundation of the curriculum. These are then tied together with Environmental Science and Policy 1, “Environmental Analysis” which provides an interdisciplinary analysis of social-environmental problems. The upper-division core consists of foundation courses in physical, biological, and social sciences, as well as applied courses in environmental monitoring, GIS, impact reporting, and statistical analysis. In their junior year, students must choose a specialized track from the following six options:

- (a) Ecology, Biodiversity, and Conservation
- (b) Natural Resource Management
- (c) Climate Change and Air Quality
- (d) Geospatial Information Science
- (e) Watershed Science
- (f) Soils and Biogeochemistry

A capstone course is required for all seniors and serves to integrate the science, policy, management and biology aspects of the ESM major. All students gain practical experience through field courses and a required internship. Selected students may also pursue an honors thesis in their senior year. The ESM major is jointly administered by the Departments of Environmental Science and Policy (ESP) and Land, Air and Water Resources (LAWR). Any student in good standing is eligible to transfer to the major, to do so, please see the student affairs officers in 2134 Wickson Hall or in 1150 Plant and Environmental Sciences Building.

**Careers.** Graduates from this program are prepared to pursue careers as practicing environmental scientists, resource analysts and planners working for public agencies and private firms specializing in environmental quality, natural resources or ecological research. The major is also an excellent preparation for graduate or professional training in physical and/or biological environmental science graduate programs, as well as in environmental law, administration and environmental policy.
B.S. Major Requirements:

**UNITS**
- English Composition and Public Speaking requirement ........................................... 3-8
  - University Writing Program 101, 102A-G, 102A-E, or passing the Upper Division English Composition exam .......................... 0.4
  - Communication 1, 3, or Dramatic Art 1 ................................. 3-4
- Preparatory Subject Matter ............................................. 44-52
  - Biologica Sciences 2A, 2B, 2C .................................. 15
  - Geology 1 or 50 (Geology 50 recommended) ................................. 3-4
  - Chemistry 2A, 2B, or 2AH ........................................... 3-5
  - Physics 1A, 1B, 7A, 7B ........................................... 6-12
  - Economics 1A ..................................................... 4
  - Mathematics 16A, 16B, 17A, 17B, or 21A, 21B (Mathematics 17A, 17B recommended) ........................................ 6-8
  - Environmental Science and Policy ....................................... 1
  - Satisfaction of the General Education requirement ... 3-4

**Depth Subject Matter** .................................................. 28-32
  - Environmental Science and Management .................................. 120
  - Environmental Science and Policy 100 or Evolution and Ecology 101 .................. 4
  - Environmental Science and Policy 162 ................................. 3-4
  - Statistics 131 or 100 (Statistics 100 recommended) ........................ 4
  - Select three courses from: Environmental Science and Management 10B or Environmental Science and Policy 179 ................................. 3-4
  - Applied Biological Systems Technology 150 ............................ 4
  - Internship-Environmental Science and Management or Environmental Science and Policy 192 ........................................... 3-4
  - Core Course-Environmental Science and Management 195 .......... 2
  - Honors Thesis (optional)-Environmental Science and Management 194H .......................... 0.3

**Ecology, Biodiversity and Conservation Track** ............................................. 36-46
  - Select one course from: Atmospheric Science 60, 116, 133, Environmental Science and Policy 121, 131, Environmental Science and Policy 152, Geology 134, or Soil Science 100 ........................................... 3-5
  - Select one course from: Environmental Science and Policy 170, 171, 172 or 179 ........................................... 4
  - Evolution and Ecology 100 ........................................... 4
  - Select one course from: Environmental Science and Policy 127 or Wildlife, Fish, and Conservation Biology 154 ........................................... 4
  - Select one course from: Environmental Science and Policy 123, 124, Plant Sciences 147 and 147L, or Wildlife, Fish, and Conservation Biology 100 ........................................... 3-4
  - Select one course from: Environmental Science and Policy 121 or Wildlife, Fish, and Conservation Biology 122 ........................................... 4
  - Evolution and Ecology 104, 115, Environmental Science and Policy 151, 155, Plant Biology 117 or Wildlife, Fish, and Conservation Biology 155 ........................................... 3-4
  - Select one course from: Evolution and Ecology 147 or Environmental Horticulture 160 ........................................... 3-4
  - Select one biome level course on wetlands, forests, or water (See adviser for list) ............ 3-5
  - Select one organismal biology course on birds, mammals, or plants (See adviser for list) ........................................... 3-5
  - Complete one lab associated with either the biome level or organismal biology course ........................................... 2-3

**Natural Resource Management Track** ............................................. 32-42
  - Select three courses from: Environmental Science and Management 116, 166N, 167, 168A, 169, 171, 172 or 179 ........................................... 9-13
  - Select one course from: Environmental Science and Policy 161 or Hydrologic Science 150 ........................................... 3-4
  - Statistics 103 (or equivalent upper-division statistics) .......................... 4
  - Select two courses from: Entomology 104, Environmental Science and Policy 141, 144, Environmental Science and Policy 151, 155, Evolution and Ecology 115, Plant Biology 117, Plant Sciences 130 or Wildlife, Fish, and Conservation Science 10, 111, 120, or 134 ........................................... 6-8
  - Select two courses from: Atmospheric Science 116, Environmental Science and Management 121, 131 or Soil Science 100 ........................................... 6-9
  - Environmental Science and Management 185 or 186 ........................................... 4

**Climate Change and Air Quality Track** ............................................. 32-41
  - Atmospheric Science 60 ........................................... 4
  - Select three courses from: Atmospheric Science 115, 116, 133, Environmental Science and Management 131, Geology 108 ........................................... 9-12
  - Select two courses from: Environmental Science and Policy 100, 121, Environmental Science and Policy 116N, Hydrologic Science 143 or Soil Science 100 ........................................... 6-9
  - Select one course from: Environmental Science and Management 145 .......................... 4
  - Environmental Science Policy and Management 124, 150C, 151, 155, Evolution and Ecology 115 or Plant Sciences 130 ........................................... 3-4
  - Select one course from: Evolution and Ecology 147 or 149 ........................................... 4
  - Select two courses from: Environmental Science and Policy 163, 165N, 166N, 167, 171, 172 or 179 ........................................... 6-8

**Geospatial Information Science Track** ............................................. 31-39
  - Select two courses from: Applied Biological Systems Technology 181N, 182, Environmental Science and Management 185, or 186 ........................................... 8-9
  - Select two courses from: Environmental Science Policy and Management 163, 165N, 166N, 167, 171, 172 or 179 ........................................... 6-8
  - Select two courses from: Environmental Science Policy and Management 121, Statistics 104, 106, 108, 130A, 130B or 137 ........................................... 8
  - Other applicable intertechnology courses from the Engineering department including database management, digital library science and network and Web technologies, if documented for spatial information with approval.
  - Select three courses from the following options. Must cover both physical and biological courses from Atmospheric Science 110, 116, 133, Soil Science 100, Environmental Science and Policy 124, 150C, 151, 152, 155, Geology 136, Plant Sciences 100 or 108, 109, 111, or 120 ........................................... 16-21
  - Select two courses from: Environmental Science and Policy 121, Environmental Science Policy and Management 108 or Hydrologic Science 101, 108, 110, 111, 130A, 130B or 137 ........................................... 8
  - Other applicable intertechnology courses from the Engineering department including database management, digital library science and network and Web technologies, if documented for spatial information with approval.

**Watershed Science Track** ............................................. 38-46
  - Select two courses from: Atmospheric Science 160, Environmental Science and Management 144, Environmental Science and Policy 116N, 150A, 150C, 151, 155, Geology 132, Plant Biology 117 or Plant Sciences 130 ........................................... 6-8
  - Select two courses from: Environmental Science and Policy 121 or Hydrologic Science 150 ........................................... 5
  - Soil Science 100 ........................................... 6
  - Select two courses from: Environmental Science and Policy 100 or Hydrologic Science 141 (but not both), Hydrologic Science 142, 143, Environmental Science and Management 108 or Hydrologic Science 151 (but not both) ........................................... 6-8
  - Select one course from: Geology 33, 139, 140 ........................................... 3-5
  - Select one course from: Applied Biological Systems Technology 181N or 182 ........................................... 4
  - Select one course from: Soil Science 105, 118, or 120 ........................................... 4-5
  - Select two courses from: Environmental Science and Policy 166N, 168A, 169, 172, 179, Hydrologic Science 150, or Landscape Architecture 60 ........................................... 6-9
  - Atmospheric Science 133 ........................................... 4
  - Select one course from: Entomology 116, Environmental Science and Policy and Management 108 or Hydrologic Science 151, or Wildlife, Fish, and Conservation Biology 120 ........................................... 3-4

**Total Units for the Major** ............................................. 110-143

**Major Advisers.** Marcel Holyoak (Environmental Science and Policy) and Tarrance Nathan (Land, Air and Water Resources)

**Advising resources** for the major, including peer advising, are located in both the Environmental Science and Policy and Land, Air and Water Resources departments.

Students whose last names begin with the letters A-L, please see Melissa Whaley in 2134 Wickson Hall. Students whose last names begin with the letters M-Z, please see Elizabeth Shull in 1150 Plant and Environmental Sciences.

**Courses in Environmental Science and Management (ESM)**

**Lower Division**

**8. Water Quality at Risk (3)**
  - Lecture—2 hours; discussion—1 hour. Natural and human threats to water quality, science and policy in all aspects of attaining, maintaining, and managing water quality, water contamination. Decoding popular media coverage of water quality and water contamination. Students must co-requisite course as Science and Society 8.) Not open to students who have successfully completed Environmental and Resource Sciences 8. (Formerly Environmental and Resource Sciences 8.) GE credit: SciEng or SocSci, Wrt | SE, SS, WE.—II. (II.) Hernes

**30. World Ecosystems & Geography (3)**
  - Lecture—3 hours. Introduction to the earth’s major geographic regions and associated ecosystems, such as deserts, temperate forests, and oceans with an examination of how climate, vegetation regimes, ecological processes, agriculture and other human activities interact in different regions of the world. (Same course as Environmental Science and Policy 30.) Not open to students who have successfully completed Environmental and Resource Sciences 30. (Formerly Environmental and Resource Sciences 30.) Offered alternate years. GE credit: SciEng | SE, SS, WE.—II. (II.) Jackson

**47. Watershed Processes and Water Quality in the Tahoe Basin (2)**
  - Lecture/lab—21 hours; fieldwork—9 hours; discussion—3 hours. GE credit: Pre-requisite: basic knowledge of environmental, soil, or hydrologic sciences. Watershed processes, runoff, water-quality management, restoration in Lake Tahoe Basin. Sails, precipitation-runoff, remediation and adaptive management related to erosion control, effective solu-
tions, development of restoration strategies. Students develop field restoration. Course involves 3 days of instruction in Tahoe City as Hydrologic Science 47.) Not open to students who have successfully completed Environmental and Resource Sciences 47. (Formerly Environmental and Resource Sciences 47.) GE credit: SciEng | QL, SE, SL.—IV. (IV) Griser

92. Internship (1-12)
Internship—3-36 hours. Prerequisite: lower division standing and consent of instructor. Work experience off and on campus in resource sciences. Internship supervised by a member of the faculty. (P/NP grading only.) May be repeated for credit. —I, II, III. (I, II, III)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. Primarily for lower division students. (P/NP grading only.)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. Primarily for lower division students. May be repeated for credit. (P/NP grading only.)

Upper Division

100. Principles of Hydrologic Science (4)
Lecture—4 hours. Prerequisite: Chemistry 2B, Mathematics 1A, 1B, or Physics 7A or 9A. Topics include hydrology (surface and ground water), hydraulic flow through porous media, water in the soil-plant-atmosphere continuum, water quality, flow through open channels, and representative water-resource problems. Not open to students who have successfully completed Environmental and Resource Sciences 100. (Formerly Environmental and Resource Sciences 100.) GE credit: SciEng | QL, SE, SL.—I. (I) Griser

108. Environmental Monitoring (3)
Lecture/discussion—2 hours; laboratory—2 hours; fieldwork. Prerequisite: entry level course work in student's major, specifically, Evolution and Ecology 101 (Evolution and Ecology), Environmental Science and Policy 100 (Environmental Biology and Management), Environmental Toxicology 101 (Environmental Toxicology), Wildlife, Fish, and Conservation Biology 100 (Wildlife, Fish, and Conservation Biology), Environmental and Resource Sciences 100 (Hydrologic Science), Soil Science 100 (Soil Science, Environmental Horticulture 100 (Environmental Horticulture and Urban Forestry), Landscape Architecture 50 (Landscape Architecture) or the equivalent for any of these courses. Instrumentation and methods for environmental monitoring; GPS, sensors, datalogging, and GIS. Wide range of measurement techniques for environmental parameters. Not open to students who have successfully completed Environmental and Resource Sciences 108. (Formerly Environmental and Resource Sciences 108.) GE credit: SciEng | SE, SL.—III. (III)

120. Global Environmental Interactions (4)
Lecture—3 hours, discussion—1 hour. Prerequisite: one college level chemistry course, one college level biology course. Limited to 25 students per discussion section. Relationships among climate, hydrology, biogeochemical cycles, soils and vegetation distribution in diverse landscapes and biomes. Emphasis on physical, chemical, and biological processes affecting ecosystems from the poles to the equator, and human impacts on the environment. Not open to students who have successfully completed Environmental and Resource Sciences 60 or 120. (Formerly Environmental Resource Sciences 60 and 120.)—II. (II) Hotchkiss

121. Water Science and Management (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: Physics 10 or Geology 1. Role of water as an essential natural resource in contemporary society. Aspects of the water cycle, including descriptions of natural phenomena and underlying physical causes. Water for cities, agriculture, industry, wild life and recreation; case studies of water management. Not open to students who have successfully completed Environmental and Resource Sciences 121. (Formerly Environmental and Resource Sciences 121.) GE credit: SciEng | QL, SE, SL.—I. (I) Sandowal

131. Air as a Resource (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: Chemistry 10. Degradation of the atmospheric resource, historical aspects and effects of air pollution examined. Emphasis on primary and particulate pollutants and discussion of their impact. Not open to students who have successfully completed Environmental and Resource Sciences 131. (Formerly Environmental and Resource Sciences 131.) GE credit: QL, SE, SL.—II. (II) Zhang

141. Role of Fire in Natural Ecosystems (4)
Lecture—3 hours; term paper. Prerequisite: basic biological concepts: Biological Sciences 2A or Plant Sciences 2; ecology/evolution: Biological Sciences 2B or 2C. Fire regimes and roles in major North American vegetation types, especially in the west. Physics of fire, fire effects on organisms and ecosystems, functions, management, fires, fire use by indigenous people. Not open to students who have successfully completed Environmental and Resource Sciences 141. (Formerly Environmental and Resource Sciences 141.) GE credit: SciEng | SE, SL, WE.—II. (II) Latimer

144. Trees and Forests (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Plant Sciences 2 or Biological Sciences 1C or 2C. Biological structure and function of trees as organisms; understanding of forests as communities and as ecosystems; use of forests by humans; tree phenology, photosynthesis, respiration, soil processes, life histories, dormancy, forest biodiversity, and agroforestry. [Same course as Plant Sciences 144.] Not open for credit to students who have completed Plant Biology 1 144 or Environmental and Resource Sciences 144. (Former course Plant Biology/Environmental Horticulture/Environmental and Resource Sciences 144.) GE credit: SciEng | SE, SL.—I. (I) Berry, Dahlglen, Rice

185. Aerial Photo Interpretation and Remote Sensing (4)
Lecture—2 hours; laboratory—4 hours. Prerequisite: upper division standing. Basics of remote sensing and photogrammetry; aerial. Remote sensing applications. Not open to students who have successfully completed Environmental and Resource Sciences 185. (Formerly Environmental Resource Sciences 185.) GE credit: SciEng | SE, SL—III. (III)

186. Environmental Remote Sensing (5)
Lecture—3 hours; laboratory—6 hours. Prerequisite: Mathematics 16B and Physics 7C or 9B; upper division standing; Landscape Architecture 150 recommended. Overview of satellite, airborne, and ground-based remote sensing, building on properties of electromagnetic radiation. Applications include hydrologic processes, weather and climate, ecology and land use, soils, geology, forestry, and agriculture. Computer based analysis and visualization of images and processing techniques. Not open to students who have successfully completed Hydrologic Science 186 or Environmental and Resource Sciences 186. (Formerly Hydrologic Science 186 and formerly Environmental and Resource Sciences 186.) GE credit: SciEng | QL, SE, SL—II. (II) Utin

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: completion of 84 units; consent of instructor. Work experience off and on campus in resource sciences. Internship supervised by a member of the faculty. (P/NP grading only.)—I, II, III.

194H. Senior Honor Thesis (2-6)
Independent study—2-6 hours. Prerequisite: senior standing, overall GPA of 3.50 or higher and consent of master adviser. Independent study, guided research on an environmentally related subject of special interest to the student. GE credit: SciEng | SE, SL, WE

195. Integrating Environmental Science and Management (2)
Lecture/discussion—2 hours. Prerequisite: senior status in Environmental Science and Management major or other environmental science major (e.g. Environmental Resource Science; Environmental Biology and Management; Environmental Toxicology; Environmental Policy Analysis and Planning; Wildlife, Fish, and Conservation Biology; Hydrologic Science.) consent of instructor. Practical aspects of environmental improvement through integrated analyses of contemporary issues or problems associated with advocacy, regulation, science and resource management from the perspectives of the physical and ecological sciences and current policy/management. May be repeated two times for credit. GE credit: SciEng or SocSci | SS or SE.—II. (II) Griser

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)—I, II, III. (I, II, III)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)—I, II, III. (I, II, III)

Environmental Science and Policy

[College of Agricultural and Environmental Sciences] Susan Handy, Ph.D., Chairperson of the Department Marcel Holyoak, Ph.D., Vice Chairperson Mark N. Lubell, Ph.D., Vice Chairperson Department Office. 2132 Wickson Hall 530-752-3026

Faculty
Gwendolyn B. Arnold, Ph.D., Assistant Professor Marissa L. Baskett, Ph.D., Associate Professor Edwin D. Grosholz, Ph.D., Professor, Specialist in Cooperative Extension Susan L. Handy, Ph.D., Professor Susan P. Harrison, Ph.D., Professor Alan M. Hastings, Ph.D., Distinguished Professor Robert Hijmans, Ph.D., Associate Professor Marcel Holyoak, Ph.D., Professor John L. Largier, Ph.D., Professor Carol H. Lin, Ph.D., Associate Professor Environmental Science and Policy, Agricultural and Resource Economics Mark N. Lubell, Ph.D., Professor Steven G. Morgan, Ph.D., Professor Joan M. Ogden, Ph.D., Professor James F. Quinn, Ph.D., Professor Elsia Rejmanekova, Ph.D., Professor James N. Sanchirico, Ph.D., Professor Mark W. Schwartz, Ph.D., Professor Academic Senate Distinguished Teaching Award Andrew Sih, Ph.D., Professor Daniel Speiling, Ph.D., Professor (Environmental Science and Policy, Civil and Environmental Engineering) Michael Springborn, Ph.D., Assistant Professor Thomas P. Tomich, Ph.D., Professor Environmental Science and Policy, Human and Community Development

Emeriti Faculty
Howard V. Cornell, Ph.D., Professor Emeritus Charles R. Goldman, Ph.D., Professor Emeritus Distinguished Graduate Mentoring Award Robert A. Johnston, M.S., Professor Emeritus Benjamin S. Orlove, Ph.D., Professor Emeritus Seymour I. Schwartz, Ph.D., Professor Emeritus Academic Senate Distinguished Teaching Award Peter J. Richerson, Ph.D., Professor Emeritus
Environmental Science and Policy

The Program of Study

Environmental Science and Policy is a teaching and research department offering courses, workshops, and directed group study classes that focus on the complex relationships among environmental relations. The department offers Bachelor of Science degrees in Environmental Science and Management and in Environmental Policy Analysis and Planning. Courses in Environmental Science and Policy also supplement major programs in a wide variety of established disciplines.

Current Information. Through its continuing contacts with many other departments and teaching divisons of the school, the department develops a variety of special courses and workshops each year. Check with the Department office for up-to-date information about our courses and workshops.

Graduate Study. The Graduate Group in Ecology which focuses on Environmental Science & Policy offers an M.S. and Ph.D. degree program. Further information about graduate programs in ecology should be obtained from the chairperson of the Graduate Group in Ecology.

Group Office. 1005 Wicksom Hall 530; 752-6792; http://ecology.ucdavis.edu/

Courses in Environmental Science and Policy (ESP)

Lower Division

1. Environmental Analysis (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: University Writing Program 1 or English 3 or equivalent; sophomore standing. Economics 1A and Biological Sciences 28 recommended. Analysis of the physical, biological, and social interactions which constitute environmental problems. Emphasis on analysis of environmental problems, the consequences of proposed solutions, and the interaction of environmental scientific and public policy creating solutions. GE credit: SciEng or SocSci | SE or SS, SL.—I. (I.) Arnold, Baskett

10. Current Issues in the Environment (3)
   Lecture—3 hours. Prerequisite: elementary biology recommended. The science behind environmental issues, and policies affecting our ability to solve domestic and international environmental problems. Resources, environmental quality, regulation, environmental perception and conservation. Integrative case studies. Open only for credit to students who have completed course 1. GE credit: SciEng | SE or SS, SL, WE.—II. (II.) Holyoak

30. World Ecosystems & Geography (3)
   Lecture—3 hours introduction to the earth’s major geographic regions and associated ecosystems, such as deserts, temperate forests, and oceans with an examination of how climate, vegetation regimes, ecological processes, agriculture and other human activities interact in different regions of the world. (Same course as Environmental Science and Management 30.) Open to students who have successfully completed Environmental and Resource Sciences 30. (Formerly Environmental and Resource Sciences 30.) Offered in alternate years. GE credit: SciEng | SE, SL, WC.

92. Internship (1-12)
   Internship—3-36 hours. Prerequisite: lower division standing and consent of instructor. Work experience off and on campus in all subject areas offered in the College of Agricultural and Environmental Sciences. Internship supervised by member of the faculty. (P/NP grading only.)

98. Directed Group Study (1-5)
   Prerequisite: consent of instructor. Primarily for lower division students. (P/NP grading only.)

Upper Division

100. General Ecology (4)
   Lecture—3 hours; discussion—1 hour. Prerequisites: Biological Sciences 1A, 1B, 1C, Mathematics 16A, 16B, 16C, and 101B. Theoretical and experimental analysis of the distribution, growth and regulation of species populations, predator-prey and competitive interactions; and the organization of natural communities. Discovery and ecological principles to selected environmental problems. GE credit: SciEng | SE, SL.—I., II, (II.) Harrison

   Lecture—3 hours; discussion—1 hour. Prerequisite: Anthropology 1 or 2 or course 30 or Evolution and Ecology 100 or Biological Sciences 101. Interdisciplinary study of diversity and change in human societies, using principles of anthropology, evolutionary ecology, history, archaeology, psychology, and other fields. Topics include population dynamics, subsistence transitions, family organization, disease, environment, population, and resource conservation. (Same course as Anthropology 101.) GE credit: SocSci, Div, Wrt | SS, WC, WE.—II. (II.)

105. Evolution of Societies and Cultures (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: Anthropology 1 or 2 or course 30 or Evolution and Ecology 100 or Biological Sciences 101. Interdisciplinary study of social and cultural evolution in humans. Culture as a system of inheritance, psychology of cultural learning, culture as an adaptive system, evolution of maladaptations, evolution of technology and institutions, evolutionary transitions in human history. Consideration of genetic and cultural variation. Only 2 units of credit to students who have completed course 1 or Anthropology 101 prior to fall 2004. (Same course as Anthropology 105.) GE credit: SciEng or SocSci, WC, WE.

(a) Environmental Science

110. Principles of Environmental Science (4)
   Lecture—3 hours; discussion—2 hours. Prerequisite: Physics 1A or 7A, Mathematics 16B or 21B, and Biological Sciences 1A. Physical and biological principles and ecological concepts, and systems approach to policy analysis of atmospheric environments, freshwater and marine environments, land use, energy supplies and technology, and other resources. GE credit: SciEng | QL, SE, SL.—II. (II.) Holyoak

111. Marine Environmental Issues (1)
   Discussion—1 hour; seminar—2 hours. Prerequisite: upper division standing or consent of instructor; concurrent enrollment in at least one course from courses 124, 152, Evolution and Ecology 106, 110, 114; residence at or near Bodega Marine Laboratory required. Student must complete the application available at http://www.bml.ucdavis.edu. An examination of critical environmental issues occurring in coastal waters. Course links together material from concurrent courses at BML to develop an integrative understanding of marine environments and their conservation. Introduces students to group discussions, and interaction with visiting speakers. May be repeated twice for credit. (Same course as Evolution and Ecology 111.) GE credit: SciEng | SE, SL,—IV. (IV.) Gaylord, Largier, Morgan, Sanford

116N. Oceanography (3)
   Lecture—2 hours; laboratory—3 hours; field work. Prerequisite: one of Geology 1, 2, 16 or 50. Advanced oceanographic topics: Chemical, physical, geological, and biological research methods and data analysis; marine resources, anthropogenic impacts, and climate change; integrated earth/ocean/atmosphere systems; weekly lab and one weekend field trip. Offered in alternate years. (Same course as Geology 116N.) GE credit: SciEng | SE, SL.—II.

(b) Ecological Analysis

121. Population Ecology (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1B, 1C, Mathematics 16A-16B. Development of exponential and logistic growth models for plant and animal populations, analysis of age structure and genetic structure, analysis of competition and predation among species, development of models using data to make predictions and solving problems. GE credit: SciEng, Wrt | QL, SS, SE, SL.—II. (I.) Basket, Hashings

123. Introduction to Field and Laboratory Methods in Ecology (4)
   Lecture—3 hours; laboratory—6 hours. Prerequisite: course 100 or the equivalent. Credit: Statistics 102 or the equivalent. Introduces students to methods used for collecting ecological data in field and laboratory situations. Methods used by population ecologists and community ecologists; emphasis on experimental design, scientific writing and data analysis. GE credit: SciEng | SE, SL,—III. (III.) Groszklas

124. Marine and Coastal Field Ecology (3)
   Lecture—3 hours; discussion—1 hour; laboratory—3 hours; fieldwork—3 hours. Prerequisite: upper division standing or consent of instructor. Introductory animal biology (Biological Sciences 1B) recommended. Residence at or near Bodega Marine Laboratory required. Student must complete the application available at http://www.bml.ucdavis.edu. Ecology of marine populations and communities living in diverse habitats along the California coast. Hands-on learning using scientific process and tools of the biological trade to address ecological questions arising during field trips. Critical thinking through discussion of scientific literature. Offered irregularly. GE credit: SciEng | SE, SL.

127. Plant Conservation Biology (4)
   Lecture/discussion—3 hours; discussion—1 hour; term paper. Prerequisite: Environment and Policy 100 or equivalent in division general ecology. Principles governing the conservation of plant species and plant communities, including the roles of fire, exotic species, grazing, pollution, soils, and population genetics; analytic and practical techniques for plant conservation; and introduction to relevant legal, ethical, and policy issues. Limited enrollment. Offered irregularly. GE credit: SciEng | SE, SL.

(d) Aquatic Ecosystems Analysis

150A. Physical and Chemical Oceanography (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: Environmental Science and Policy/Geology 116, Physics 9B, Mathematics 22C, Chemistry 1C, or upper division standing in a natural science and consent of instructor. Physical and chemical properties of seawater, fluid dynamics, air-sea interaction, currents, waves, tides, mixing, major oceanic geochemical cycles. (Same course as Geology 150A.) GE credit: SciEng | QL, SE.—I. (II.) McClain, Spero, Largier

150B. Geological Oceanography (3)
   Lecture—3 hours. Prerequisite: Geology 50 or 116. Introduction to the origin and geologic evolution of ocean basins. Composition and structure of oceanic crust; marine volcanism; and deposition of marine sediments. Interpretation of geologic history of the ocean floor in terms of seafloor spreading theory. (Same course as Geology 150B.) GE credit: SciEng | SE.—II. (II.) McClain

150C. Biological Oceanography (4)
   Lecture—3 hours; discussion—1 hour; fieldwork—one weekend field trip required. Prerequisite: Biological Sciences 1A and a course in general ecology or consent of instructor. Ecology of major marine habitats, including intertidal, shelf benthic, deep-sea and plankton communities. Existing knowledge and contemporary issues in research. Segment devoted to human use. (Same course as Geology 150C.) GE credit: SciEng | SE, SL.—IV. (IV.) Gaylord, Spero, Largier

151L. Limnology (4)
   Lecture—3 hours; discussion—1 hour; special project. Prerequisite: Biological Sciences 1A and junior standing. The biology and productivity of inland waters with emphasis on the physical and chemical environment. GE credit: SciEng | SE, SL.

151L. Limnology Laboratory (3)
   Laboratory—4 hours; two weekend field trips. Prerequisite: course 151 (may be taken concurrently); junior, senior, or graduate standing. Limnological studies of lakes, streams and wetlands with interpretation of aquatic ecology. GE credit: SciEng | SE.
Environmental Science and Policy

152. Coastal Oceanography (3)
Lecture—2 hours; discussion—1 hour; laboratory—3 hours; fieldwork—3 hours. Prerequisite: upper division standing or consent of the instructor; physics (Physics 9B), calculus (Mathematics 21B) and exposure to physical and chemical oceanography (Geology/Environmental Science and Policy 150A) are recommended; residence at or near Bodega Marine Laboratory required. Must student complete the application available at http://www.bodega.ucsb.edu. Oceanography of coastal waters, including bays, river plumes, nearshore and estuaries; focus on transport patterns, how they are forced and implications for ecological and environmental problems for students in oceanography, ecology, environmental engineering, geology and hydrology. GE credit: SciEng | SE, SL—IV. (IV) Larger

155. Wetland Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or Plant Biology 117 required; course 110 or 151 recommended. Introduction to wetland ecology. The structure and function of major wetland types and principles that are common to wetlands and that distinguish them from terrestrial and aquatic ecosystems. GE credit: SciEng | SE, SL—I. (I) Rejmanek

155L. Wetland Ecology Laboratory (3)
Lecture—6 hours; fieldwork—2 one-day weekend field trips. Prerequisite: course 155 required (may be taken concurrently). Modern and classic techniques in wetland field ecology. Emphasis on sampling procedures, vegetation analysis, laboratory procedures, and examples of successful wetland restoration techniques. GE credit: SciEng | SE, SL—I. (I) Rejmanek

(c) Environmental Policy Analysis

160. The Policy Process (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Political Science 1; Economics 1A; Intermediate statistics; course 127. Alternative models of public policy-cyamaking and application to case studies in the U.S. and California. GE credit: SocSci | SS.—III. (III) Arnold

161. Environmental Law (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing and one course in environmental science (course 1, 10, 110, Biological Sciences 1A, Environmental Toxicology 10, or Resources Sciences 100); Political Science 1 and University Writing Program 1 recommended. Introduction for non-law School students to some of the principal issues in the law and the judicial interpretation of some important environmental statutes, e.g., NEPA. GE credit: SocSci, Wrt | SS.—II. (II) Ogden

162. Environmental Policy (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A. Comparison of economic with sociocultural approaches to understanding the causes of environmental problems and strategies for addressing them. Includes different approaches to the policy process, policy instruments, and environmental behavior. Applies these principles to several problems. GE credit: SocSci | SS.—II. (II) Springborn

163. Energy and Environmental Aspects of Transportation (4)
Lecture—3 hours. Intensive writing. Prerequisite: Economics 1A or Engineering 106. Engineering, economic, and systems planning concepts. Analysis and evaluation of energy, air quality and selected environmental impacts of transportation applications and strategies. Strategies for reducing pollution and petroleum consumption in light of institutional and political constraints. Evaluation of vehicle emission models. (Same course as Civil and Environmental Engineering 163.) Offered in alternate years. GE credit: SciEng or SocSci, Wrt | SE or SS, SL, WE—I. (I) Sperling

164. Ethical Issues in Environmental Policy (3)
Lecture—3 hours. Prerequisite: courses 160, 168A; seniors only in Environmental Policy Analysis and Planning or by consent of instructor. Basic modes of ethical reasoning and criteria of distributive justice applied to selected topics in environmental policy-making. Offered irregularly. GE credit: SocSci | SS.

165N. Climate Policy (3)
Lecture/discussion—3 hours. Prerequisite: course 1 Economics 1A, or consent of instructor. Models, data and assumptions behind competing arguments regarding society’s response to the prospect of climate change at the state, national and international level from economic, ethical and policy science perspectives. (III) Springborn

166N. Ocean and Coastal Policy (3)
Lecture—3 hours. Prerequisite: course 1 or consent of instructor. Limited enrollment. Overview of U.S. and International ocean and coastal policy, including energy, coastal land-use and water quality, protected areas and species. Offered in alternate years. GE credit: SocSci | SS.—II. (II) Sancilio

167. Energy Policy (4)
Lecture—4 hours; term paper. Prerequisite: Economics 1A, Mathematics 168, or consent of instructor. Survey of primary energy resources (fossil, renewable, nuclear), energy conversion methods, future energy demand scenarios, and environmental impacts of energy. Overview of energy policy in the U.S. Analysis of the government’s role in addressing energy-related environmental and national security issues. Offered in alternate years. GE credit: SocSci | SS.—III. (III) Ogden

168A. Methods of Environmental Policy Evaluation (5)
Lecture—3 hours; discussion—1 hour; term paper. Prerequisite: Statistics 13; Economics 100 or Agricultural and Resource Economics 100A, Mathematics 168 or 218; course 175. An introduction to the evaluation of complex environmental problems; impact analysis, benefit-cost analysis, distributional analysis, decision making under uncertainty, and multi-criteria evaluation. GE credit: SocSci | SS.—II. (II) Ogden

168B. Methods of Environmental Policy Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 168A. Continuation of course 168A, with emphasis on examination of the literature for applications of research and evaluation techniques to problems of transportation, air and water pollution, land use, and energy policy. Students will apply the methods and concepts by means of a major project. GE credit: SocSci | SS.—III. (III) Sancilio

169. Water Policy and Politics (3)
Lecture—3 hours. Prerequisite: Economics 1A or Political Science 1. Politics and policy making associated with water issues, including waters of pollution/quality and water supply. The politics of water decision making and effectiveness of water policy. Broad focus on federal water policy, with case examples from the national, state and local levels. GE credit: SciEng or SocSci | SS.—II. (II) Lubell

170. Conservation Biology Policy (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 and Economics 1A, Economics 100 or Agricultural and Resource Economics 100A recommended. Analysis of policies designed to conserve species and their habitats. Emphasis on how individual incentives affect the success of conservation policies. Valuation of biodiversity and non-timbered resources. Criteria for deciding conservation priorities. GE credit: SciEng or SocSci | SS.—II. (II) Schuwirth

171. Urban and Regional Planning (4)
Lecture—3 hours; discussion—1 hour. Term paper. Prerequisite: course 1; a course in social science and a course in environmental science. How cities plan for growth in ways that minimize environmental harm. Standard planning tools (general plan, zoning ordinance) and innovative new approaches. Focus on planning requirements and practices in California. Relationships between local, regional, state, and federal policy. GE credit: SocSci | SS, WE—II. (II) Handy

172. Public Lands Management (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A. An alternative approach to public lands managed by Federal and state agencies. The role each agency’s legislation plays in determining the range of resource allocations. GE credit: SocSci | ACHG, SS.—I. (I) Lubell

173. Land Use and Growth Controls (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Political Science 1, Economics 1A, intermediate statistics [Sociology 106 or Statistics 102 or the equivalent] and local government behavior (Sociology 157, 158 or Political Science 100, 102 or 104.) Exposes students to the economic, political, and legal factors affecting land use and growth controls, and helps students critically evaluate written materials in terms of their arguments and supporting data. GE credit: SocSci | SS.

175. Natural Resource Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Agricultural and Resource Economics 106 or Economics 100 or the equivalent. Economic concepts and policy issues associated with natural resources, renewable resources (ground water, forests, fisheries, and wildlife populations) and non-renewable resources (minerals and energy resources, soil). (Same course as Agricultural and Resource Economics 175.) GE credit: SciEng | VL, SS.

176. Applied Research Methods (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Statistics 103 or Sociology 106 or the equivalent. Research methods for analysis of urban and regional land use, transportation, and environmental problems. Application of various data collection and analysis techniques; demographic analysis; basic forecasting, air quality, and transportation models. Collection, interpretation, and critical evaluation of data. GE credit: SocSci | VL, SS.—II. (II) Handly

179. Environmental Impact Assessment (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing and one course in environmental science (course 100, 110 or the equivalent). Introduction to the information resources and methods typically used in environmental impact analysis. Emphasis on how environmental information is applied to planning, environmental regulation, and public policymaking, with case studies from California land use and natural resource policy. GE credit: SocSci | SS.—II. (II) Quinn

191A. Workshop on Food System Sustainability (3)
Laboratory/discussion—2 hours; laboratory—4 hours. Prerequisite: course 179 concurrently. Introduction to Geographic Information Systems (GIS) by using ArcView for assessment and environmental planning. Not open for credit to students who have completed Applied Biological Systems Technology 180, 181 or Agricultural Systems and Environment 132. GE credit: SciEng | SE.

(g) Other Courses

90. Workshops on Environmental Problems (1-8)
Laboratory—2-16 hours. Prerequisite: consent of instructor. Workshops featuring empirical analyses of contemporary environmental problems by multidisciplinary student teams. Guided by faculty and lay professionals, the teams seek to develop an integrated view of a problem and outline a series of alternative solutions. Open to all upper division and graduate students (as space permits) only. GE credit: SE.—I, II, III. (I, II, III)

191A. Workshop on Food System Sustainability (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: upper division standing; Planned Behavior 15; Community and Regional Development 20, Agricultural and Resource Economics 121, Plant Sciences 150 or consent of the instructor. Priority enrollment for seniors in the sustainable agriculture core and systems major; limited to 25 students per section. First in a two-quarter senior capstone course sequence. Identifies projects addressing specific problems and
opportunities of sustainable agriculture and food systems, form multidisciplinary teams, and identify and connect with stakeholders to understand their needs and concerns. GE credit: SciEng | SE.—I. (I.) Tomich

191B. Workshop on Food System Sustainability (5) Lecture—2 hours; laboratory—3 hours. Prerequisite: course 191A. Priority enrollment for seniors in the sustainable agriculture and food systems major, limited to 25 students per section. Continuation of course 191A. Student teams conduct analyses of a specific issue in sustainable agriculture or food systems, prepare a critical assessment of technological, economic, environmental, and social dimensions of options, and present their results to stakeholders. GE credit: SciEng | SE.—II. (II.) Tomich

192. Internship (1-12) Internship—3-36 hours. Prerequisite: completion of 84 units and consent of instructor. Work experience off and on campus in all subject areas offered in the College of Agricultural and Environmental Sciences. Internships supervised by a member of the faculty. (P/NP grading only)

197T. Tutoring in Environmental Science and Policy (1-3) Tutorial—2-6 hours. Prerequisite: upper division standing and consent of instructor. Experience in teaching under guidance of faculty member. (P/NP grading only)

198. Directed Group Study (1-5) (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only.)

Graduate

212A. Environmental Policy Process (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course in public policy (e.g., Environmental Science and Policy 160); environmental law (e.g., Environmental Science and Policy 161); course in bureaucratic theory (e.g., Political Science 187 or Environmental Science and Policy 164); course in statistics (e.g., Sociology 106 or Agricultural and Resource Economics 106). Introduction to selected topics in the policy process, applications to the field of environmental policy. Develops critical reading skills, understanding of frameworks of the policy process and political behavior, and an ability to apply multiple frameworks to the same phenomena. Offered in alternate years. (Same course as Ecology 212A.)—III. Lubell

212B. Environmental Policy Evaluation (4) Lecture—1 hour; discussion—1 hour; seminar—2 hours. Prerequisite: intermediate microeconomics (e.g., Economics 100); Statistics 108 or Agricultural and Resource Economics 106; policy analysis (e.g., Environmental Science and Policy 168A or the equivalent); Agricultural and Resource Economics 176. Methods and practices of policy analysis; philosophical and intellectual bases of policy analysis and the political role of policy analysis. (Same course as Ecology 212B.) Offered in alternate years. —(III.) Sparhawk

220. Tropical Ecology (3) Lecture—2 hours; discussion—1 hour. Prerequisite: advanced introductory ecology course—course 100, Evolution and Ecology 101, 117; Evolution and Ecology 138 recommended. Open to graduate and undergraduate students who meet requirement subject to consent of instructor. An overview of present status of knowledge on structure and processes of major tropical ecosystems. Differences and similarities among tropical and temperate systems. Offered in alternate years. —(III.) Rejmanek

228. Advanced Simulation Modeling (3) Lecture—2 hours; discussion—1 hour. Prerequisite: courses 128-128L, Statistics 108 or Agricultural and Resource Economics 106. Advanced techniques in simulation modeling; optimization and simulation, dynamic parameter estimation, linear models, error propagation, and sensitivity testing. Latter half of course will introduce model evaluation in ecological and social system models.

252. Sustainable Transportation Technology and Policy (3) Lecture—2 hours; discussion—1 hour. Prerequisite: course 160 or the equivalent. Role of technical fixes and demand management in creating a sustainable transportation system. Emphasis on transportation options, including alternative fuels, electric propulsion, and IVHS. Analysis of market demand and travel behavior, environmental impacts, economics and politics. (Same course as Civil and Environmental Engineering 252.)—III. Spetich

275. Economic Analysis of Resource and Environmental Policies (4) Lecture/discussion—4 hours. Prerequisite: Agricultural and Resource Economics 204/Economics 204. Development of economic analysis with particular emphasis on market failure concepts, welfare economics, theory of renewable and non-renewable resource use, and political economic models. Applications to policy issues regarding the agricultural/environment interface and managing resources in the public domain. (Same course as Agricultural and Resource Economics 275.)—III. (III.)

278. Research Methods in Environmental Policy (3) Lecture/discussion—3 hours. Prerequisite: Agricultural and Resource Economics 106 or the equivalent. Introduction to scientific research in environmental policy. Major issues in the philosophy of the social sciences. How to design research that acknowledges theoretical assumptions and that is likely to produce evidence in an intersubjectively reliable fashion with explicit recognition of its uncertainties.

298. Directed Group Study (1-5) (P/NP grading only)

299. Research (1-12) Prerequisite: graduate standing. (S/U grading only.)

Environmental Sciences

See Agricultural Management and Rangeland Resources, on page 143; Atmospheric Science, on page 173; Environmental and Resource Sciences, on page 298; Environmental Biology and Management, on page 295; Environmental Horticulture and Urban Forestry, on page 297; Environmental Policy Analysis and Planning, on page 297; Environmental Toxicology, on page 303; Hydrology, on page 348; Landscape Architecture, on page 365; Soil and Water Science, on page 511; and Wildlife, Fish, and Conservation Biology, on page 544.

Environmental Toxicology

[College of Agricultural and Environmental Sciences] Ronald S. Tjeerdema, Ph.D., Chairperson of the Department
Department Office, 4138 Meyer Hall 530-752-1142; http://evtxx.ucdavis.edu

Faculty

Gary N. Cher, Ph.D., Professor (Environmental Toxicology, Nutrition) Michaela S. Deriess, Ph.D., Professor Niles Gaskwad, Ph.D., Assistant Professor Michele La Merrill, Ph.D., M.P.H., Assistant Professor Patricia Oteiza, Ph.D., Professor (Environmental Toxicology, Nutrition) Robert H. Rice, Ph.D., Professor Takayuki Shibamoto, Ph.D., Distinguished Professor Ronald S. Tjeerdema, Ph.D., Professor Barry W. Wilson, Ph.D., Professor (Animal Science, Environmental Toxicology) Andrew Whitehead, Ph.D., Assistant Professor Matthew J. Wood, Ph.D., Associate Professor Qizhang, Ph.D., Associate Professor

Emeriti Faculty

Arthur Craigmill, Ph.D., Specialist in Cooperative Extension, Emeritus Donald G. Crosby, Ph.D., Professor Emeritus Dennis P. H. Hsieh, Sc.D., Professor Emeritus James N. Seiber, Ph.D., Professor Emeritus Michael W. Stimmann, Ph.D., Specialist in Cooperative Extension, Emeritus Dorothy E. Woolley, Ph.D., Professor Emeritus

Affiliated Faculty

George V. Alexeeff, Ph.D., Adjunct Professor Deborah Bennett, Ph.D., Associate Professor (Public Health Sciences, School of Medicine) Matt Hengel, Ph.D., Assistant Adjunct Professor Dirk Holstege, Ph.D., Assistant Professor Norman Kado, Ph.D., Adjunct Professor Sree Kanthaswamy, Ph.D., Associate Adjunct Professor John Knezovich, Ph.D., Adjunct Professor Charlie Li, Ph.D., Assistant Adjunct Professor Melanie Marty, Ph.D., Associate Adjunct Professor Alyson E. Mitchell, Ph.D., Professor (Food Science and Technology) Cecilia Van Breda, Ph.D., Lecturer (UC Davis Extension Forensics Program and Department of Justice) Zachary A. Wong, Ph.D., Adjunct Professor

The Major Program

Toxic agents found in the environment include pesticides, food additives, industrial waste, and metals as well as chemicals produced by animals, plants, fungi and bacteria. Students in the Environmental Toxicology major learn how toxicants produce adverse effects by understanding both their environmental fates and biological activities. They learn about monitoring concentrations and the distribution and persistence of agents found in water, soil, air and foods. Toxicity testing procedures and exposure assessments are used to help evaluate potential for harm to humans and other species. By understanding the cellular targets and biochemical mechanisms of perturbation by toxicants, toxicologists can better estimate adverse effects. Overall, students learn mechanisms by which toxic agents act, their origin and fate and how toxicologists evaluate the risk of adverse effects and balance them against the benefits of us.

The Program. Preparatory courses in biology, chemistry, mathematics, and physics are required to provide fundamental principles which underlie toxicology. Students in the major are expected to understand the environmental fates and biological activities of different classes of toxic substances, and the legislative issues which arise from chemical use. Opportunities are available to develop in-depth understanding in areas of emphasis through selection of electives.

Specializations/Emphases. Elective coursework in many disciplines can complement the required core courses. Providing a framework for selecting restricted electives, the major offers specializations in (1) Environmental Toxicology and Chemistry, (2) Forensic Science and Regulatory Toxicology, and (3) Molecular and Biomedical Toxicology. The first category includes topics in chemical fate, transport and degradation, as well as ecology, wildlife, etc.

Quarter Offered: I—Fall; II—Winter; III—Spring; IV—Summer; 2015-2016 offering in parenthesis

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SS—Social Sciences; AS—Baccalaureate Programs; DD—Diverse Communities; Div—Diverse Diversity; Wrt—Writing Experience


Environmental Sciences 303
Environmental Toxicology

and aquatic toxicology. The second category includes forensic science, environmental policy and management. The third category includes pharmacology, biotechnology, medicine, veterinary medicine, and food toxicology. Students are encouraged to select course work from these specializations and beyond to match their interests.

Internships and Career Alternatives. Occupations that use environmental toxicology include risk assessment, pharmaceutical development, food additive toxicity testing, managing regulatory compliance, use of forensic analysis, pest control, monitoring and field sampling, industrial hygiene, and environmental health and safety. A substantial proportion of graduates elect to pursue advanced training in graduate or professional schools. Others with the B.S. degree have gone on to law, medical, pharmacy, or veterinary medical school, as well as to graduate degrees in pharmacology, toxicology, agricultural and environmental chemistry, or public health. During undergraduate study, optional internships or research projects are recommended to provide training and work experience to help students pursue future goals.

B.S. Major Requirements:

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<th>Course Title</th>
<th>Units</th>
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<tr>
<td>Environmental Toxicology</td>
<td>18-26</td>
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<tr>
<td>Restricted Electives</td>
<td>24-26</td>
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Minor Program Requirements:

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<th>Course Title</th>
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<tr>
<td>Environmental Toxicology</td>
<td>18-26</td>
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<tr>
<td>Completion of two upper division Environmental Toxicology elective courses</td>
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Courses in Environmental Toxicology (ETX)

Lower Division

10. Introduction to Environmental Toxicology (3)

Lecture—3 hours. Hazardous substances, their effects on human and environmental health, and environmental and public health. During undergraduate study, optional internships or research projects are recommended to provide training and work experience to help students pursue future goals.

Minor Adviser, M.S. Denison

Graduate Study. Programs of study leading to M.S. and Ph.D. degrees through related Graduate Groups such as Pharmacology and Toxicology, Biochemistry, Molecular, Cellular, and Developmental Biology, Agricultural and Environmental Chemistry, and Master’s Degree Program. For information on graduate study, contact the Advising Office or the appropriate graduate adviser; see Graduate Studies, on page 111.
130. The Role and Applications of Toxicology in Modern Industry (3) Lecture—3 hours. Prerequisite: course 101 required; course 112A recommended. Role of toxicology in industry research and development, human health and environmental protection, hazard and risk evaluations, risk assessment, and communications, product stewardship, and regulatory compliance. Scientific principles and methods of toxicology in chemical, energy, pharmaceutical, pesticide, biotechnology industries. GE credit: SciEng | QL, SE, SL, VL, WE. —III. (III.) Wong


138. Legal Aspects of Environmental Toxicology (3) Lecture—3 hours. Prerequisite: course 10 or 101 recommended. Federal and California legislation concerning air and water pollution, pesticide use, food and feed additives, consumer protection, and occupational exposure to toxic substances; roles of federal regulatory agencies; alternatives to government control. GE credit: SciEng | SE, VL, WE. —II. (II.) Alexeiff

146. Exposure and Dose Assessment (3) Lecture—3 hours. Prerequisite: course 112A; course 135 recommended. The exposure component of risk assessment; air and water pollution, pesticide use, food and feed additives, consumer protection, and occupational exposure to toxic substances; roles of federal regulatory agencies; alternatives to government control. GE credit: SciEng | SE, VL, WE. —II. (II.) Alexeiff

190. Seminar (1) Seminar—1 hour. Prerequisite: consent of instructor. Selected topics presented by students, faculty, or outside speakers covering current research and instructional activities within environmental toxicology. Reports and discussion concerning oral and written presentations, literature sources, and career opportunities. P/N credit: SciEng | SE, VL, WE. —I. (I.) Bennett

190C. Research Group Conference (1) Discussion—1 hour. Prerequisite: consent of instructor. Weekly conference of advanced research methods and the interpretation of research results. P/N credit: SciEng | SE, VL, WE. —II. (II.) Clunie

190S. Environmental Toxicology Career Seminar (1) Seminar—1 hour. Careers in environmental toxicology: discussions with graduates from the Department of Environmental Toxicology and other experts in the field. P/N credit: SciEng | SE. —II. (II.) Heiken

192. Internship (1-12) Internship—3.6 hours. Prerequisite: completion of 84 units and consent of chair. Work experience off and on campus in all subject areas offered in the College of Agricultural and Environmental Sciences. Internships supervised by a member of the faculty. P/N credit: SciEng | SE. —I. (I.) Holsteg

194HA-194HB. Honors Research (3-3) Discussion—1 hour; laboratory—6 hours. Prerequisite: senior standing, minimum GPA of 3.250, consent of instructor. Specific research project conducted under the supervision of a faculty sponsor. Experience to include experimental design, learning new techniques, data analysis and interpretation of findings. P/N credit only; deferred grading standing completion of sequence. GE credit: SE.

194HC. Honors Research (3) Laboratory—6-9 hours; discussion—1 hour. Prerequisite: senior standing, minimum GPA of 3.250; and consent of instructor. Additional standing completion of sequence. GE credit: SciEng | QL, SE, SL, VL, WE. —III. (III.) Love

197T. Tutoring in Environmental Toxicology (1-5) Hours and duties will vary depending upon course being tutored. Prerequisite: advanced standing in Environmental Toxicology, a related major, or the equivalent experience and consent of instructor. Teaching Toxicology including conducting discussion groups, regular departmental courses under direct guidance of staff. May be repeated for credit up to a total of 5 units. (P/N grading only.) GE credit: SE.

198. Directed Group Study (1-5) P/N grading only. GE credit: SE.

199. Special Study for Advanced Undergraduates (1-5) (P/N grading only.) GE credit: SE.

Graduate

203. Environmental Toxicants (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 128C (or the equivalent), or Chemistry 8B recommended. Mechanisms of toxicants, selected toxicants illustrating their occurrence, structure, and the reactions undergoing detection, toxicity, fate, and ecological importance. Offered in alternate years. —II. Beck, Seibe

214. Mechanisms of Toxic Action (3) Lecture—3 hours. Prerequisite: Biological Sciences 102, 103, and consent of instructor. Chemical, biochemical, and molecular mechanisms underlying the adverse effects of toxic agents. Students are required to write a grant proposal and participate in a grant review panel. Offered in alternate years. —II. Denison, Hammond

220. Analytical Toxicants (3) Lecture—3 hours. Prerequisite: coursework in organic chemistry. Principles of microanalysis of toxicants. Theoretical considerations regarding separation, detection and quantitative determination of toxicants using various instrumental techniques. (Same course as Forensic Science 220.)—I. (I.) Zhang

220L. Analysis of Toxicants Laboratory (2) Laboratory—6 hours. Prerequisite: course 220 (may be taken concurrently). Laboratory techniques for microanalysis of toxicants. Separation, detection, and quantitative determination of toxicants using chemical and instrumental methods. —II. (II.) Zhang

228. Gas Chromatography/Mass Spectrometry of Toxic Chemicals (3) Lecture—1 hour; discussion—1 hour; laboratory—3 hours. Prerequisite: course 220 and Chemistry 129C; or consent of instructor. Application of GC/MS techniques to investigate toxic chemicals. Mass spectral fragmentations and their application to the structural elucidation. Practical application of GC/MS in current research. Preference to Environmental Toxicology graduate students. Offered in alternate years. —III. Holsteg

232. Current Topics in Neurotoxicology (3) Lecture—3 hours. Prerequisite: core courses in one of the following courses: Pharmacology and Toxicology, Agricultural and Environmental Chemistry, Biochemistry and Molecular Biology, Cell and Developmental Biology, Immunology, Molecular Cellular and Integrative Physiology or Neuroscience. Restricted to upper level undergraduate students must obtain permission from the course coordinator. General principles of neurotoxicology, the cell and molecular mechanisms, and health impacts of specific neurotoxicants and the contribution of neurotoxic compounds to complex neurodevelopmental disorders and neurodegenerative diseases. (Same course as Forensic Science 232 )—III. (III.) Lin

240. Ecotoxicology (3) Lecture—3 hours. Prerequisite: elementary course in toxicology and ecology or the equivalent. Consent of instructor. Principles of toxicology as applied to chemical action on natural populations, communities, and ecosystems. Physical, chemical, and biological characteristics which make toxicants ecologically toxic, modeling, and field research. Selected case histories are analyzed and presented in class. —III. (III.) Whitehead

250. Reproductive Toxicology (3) Lecture—3-1/2 hours, lecture/discussion—1.5 hours. Prerequisite: Physiology 220 or Pharmacology—Toxicology 203. Application of toxicological principles in reproductive studies. Effects of toxicants on the male, female, and developing embryo/fetus. Critical evaluation of reproductive toxicity studies and development of mechanistic approaches to understanding how chemical exposure can adversely affect reproduction. Offered in alternate years. —II. Cherr, Golub

260. Immunotoxicology (3) Lecture—3 hours. Prerequisite: undergraduate or graduate introduction to immunology coursework recommended, but not required; consent of instructor. Provides students with skills and knowledge for evaluating and applying research on the impact of environmental toxicants on immunological function in human and wildlife populations. Offered in alternate years. —Golub.

270. Toxicology of Pesticides (3) Lecture—3 hours. Prerequisite: one course each in (a) Organic Chemistry, (b) Biochemistry, (c) Toxicology (course 101 or equivalent), or consent of instructor; graduate standing. Classification and chemical properties of pesticides, their mode of action, metabolism and disposition, pesticide resistance, effects on human health and ecology and methods of risk benefit analyses. Offered in alternate years.

278. Molecular Techniques (3) Lecture—3 hours. Prerequisite: graduate standing or consent of instructor. Recombinant DNA technology and its applications. (Some course as Forensic Science 278.) Offered in alternate years. —II. Denison, Rice

280. Forensic DNA Analysis (3) Lecture—3 hours. Prerequisite: coursework in genetics and molecular biology; recommended: graduate standing. Critical analysis of forensic DNA analysis; past, present, and emerging technologies; legal and quality assurance issues. DNA extraction, DNA quantitation, multiplex amplification of STR systems, and analysis of STR typing data. (Same course as Forensic Science 280.)—II. (II.) von Beroldingen

281. Principles and Practice of Forensic Serology and DNA Analysis (3) Lecture—2 hours; lecture/discussion—3 hours. Prerequisite: Forensics/course 278 or Forensics/course 280, or equivalent; consent of instructor. Restricted to students enrolled in the M.S. in Forensic Science Program or by consent of Forensic Science Program Director. Comprehensive overview of forensic serology and DNA typing techniques and technologies. Strong emphasis on real-world applications and the understanding and practice of forensic DNA analysis; past, present, and emerging technologies; legal and quality assurance issues. DNA extraction, DNA quantitation, multiplex amplification of STR systems, and analysis of STR typing data. (Same course as Forensic Science 281.)—II. (II.) Rice

284. Non-Human Forensic DNA—Thy and Casework Application (2) Lecture—2 hours. Prerequisite: consent of instructor required for all students enrolled in the MS Forensics program; upper division Molecular Biology and Genetics or its equivalent. Restricted to graduate standing. Provides a comprehensive understanding of plant and animal forensic biology in terms of sam-

Environmental Toxicology 305
Epidemiology

See Medicine and Epidemiology (VME), on page 339.

Epidemiology (A Graduate Group)

David R. Gibson, Ph.D., Chairperson of the Group
Group Office. 5215 VM3A
530-752-2657, Fax 530-754-0225
http://www.epi.ucdavis.edu

Faculty
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E. Robert Avril, D.V.M., Ph.D., Professor (Population Health and Reproduction)
Rahman Azari, Ph.D., Lecturer (Statistics)
Hsing Jung Bang, Ph.D., Associate Professor (Public Health Sciences)
Christopher M. Barker, Ph.D.
(Internal Medicine)
Deborah Bennett, Associate Professor (Department of Public Health Sciences)
Waltter Boyce, D.V.M., Ph.D., Professor (Population Health and Reproduction)
Kenneth Brown, M.D., Professor (Nutrition)
Diana Cassady, D.P.H., Associate Professor (Department of Public Health Sciences)
Munirah Chigwewe, M.P.H., Ph.D., Assistant Professor (Medicine and Epidemiology)
Bruno Cheomel, D.V.M., Ph.D., Professor (Population Health and Reproduction)
Patricia Cogliano, D.V.M., Ph.D., Assistant Professor (Pathology, Microbiology, and Immunology)
Rosemary Cress, Ph.D., Associate Professor (Public Health Sciences)
Beate Crossley, Ph.D., Associate Professor (California Animal Health and Food Safety Laboratory)
Kathryn DeRiemer, Ph.D., Associate Professor (Public Health Sciences)
Lori Dermaley, M.D., M.P.H., Assistant Professor (Internal Medicine)
Kathryn Dewey, Ph.D., Professor (Nutrition)
Christian Drake, Ph.D., Professor (Statistics)
Jonathan Ducore, M.D., Professor (Pediatrics)
Holly Ernest, D.V.M., Ph.D., Professor (Population Health & Reproduction)
Thomas B. Farver, Ph.D., Professor (Population Health and Reproduction)
Janet Foley, M.S., Ph.D., Emeritus (Medicine and Epidemiology)
Estella Gerraghty, M.D., M.S., M.P.H., Assistant Professor (Internal Medicine)
David R. Gibson, Ph.D., Professor (Public Health Sciences)
Ellen Gold, Ph.D., Professor (Public Health Sciences)
Lynette Hart, Ph.D., Professor (Population Health and Reproduction)
Danielle Harvey, Ph.D., Associate Professor (Public Health Sciences)
Iva Hertz-Picciotto, Ph.D., Professor (Public Health Sciences)
Ashley Hill, D.V.M., M.V.P.M., Ph.D., Assistant Professor (California Animal Health and Food Safety Laboratory)
Martin Hoffman, M.D., Professor (Physical Medicine and Rehabilitation)
Ana Maria Isail, Ph.D., Associate Professor (Public Health Sciences)
Jiming Jiang, Ph.D., Professor (Statistics)
Philip Kass, M.V.P.M., D.V.M., Ph.D., Professor (Population Health and Reproduction)
Kyoumung Kim, Ph.D., Associate Professor (Department of Public Health Sciences)
Sunny Kim, Ph.D., Associate Professor (Public Health Sciences)
Richard L. Kravitz, M.D., Professor (Internal Medicine)
Christine Kreuder-Johnson, Ph.D., Associate Professor (Wildlife Health Center)
Michelle A. La Merrill, M.P.H., Ph.D., Assistant Professor (Public Health Sciences)
Gay Yung Kim, Ph.D., Associate Professor (Department of Public Health Sciences)
Jerry Binns, M.D., Ph.D., Professor (Family and Community Medicine)
Diana L. Migliore, Ph.D., Assistant Professor (Public Health Sciences)
William Reisen, Ph.D., Professor (Center for Vectorborne Diseases)
Lihong Qi, Ph.D., Associate Professor (Department of Public Health Sciences)
David M. Rocke, Ph.D., Professor (Department of Public Health Sciences)
Patrick Romano, M.D., M.P.H., Professor (Internal Medicine)
Joan Dean Rowe, M.P.V.M., D.V.M., Ph.D., Associate Professor (Population Health and Reproduction)
Christian Sandrock, M.D., M.P.H., Associate Professor (Internal Medicine)
Marc Schenker, M.D., Ph.D., Professor (Public Health Sciences)
Thomas Scott, Ph.D., Professor (Entomology)
Woutina Smith, D.V.M., M.P.H., Ph.D., Associate Professor (Pathology, Microbiology and Immunology)
Christine Stewart, M.P.H., Ph.D., Assistant Professor (Department of Nutrition)
Robert Szabo, M.D., Professor (Orthopedic Surgery)
Daniel Tancredi, Ph.D., Assistant Professor (Pediatrics)
Xiaowei Yang, Ph.D., Assistant Professor (Department of Public Health Sciences)
Michael Ziccardi, Ph.D. (Wildlife Health Center)

Emeriti Faculty
Robert Bondurant, D.V.M., Professor Emeritus
James Case, D.V.M., Ph.D., Professor Emeritus
Nancy East, M.V.P.M., D.V.M., Professor Emeritus
Bruce Eldridge, Ph.D., Professor Emeritus
Neil Flynn, M.D., M.P.H., Professor Emeritus
Sharon Hietala, Ph.D., Professor Emeritus
Robert Shumway, D.V.M., M.V.P.M., Ph.D., Emeritus
Mark Thurmond, D.V.M., M.V.P.M., Ph.D., Emeritus
Alvin Wiggins, Ph.D., Emeritus

Graduate Study. The Graduate Group in Epidemiology offers programs of study and research leading to the M.S. and Ph.D. degrees. Areas of emphasis include environmental/occupational epidemiology; infectious disease epidemiology; zoonotic and vector-borne diseases; epidemiologic methods and biostatistics; health services and health economics; nutritional epidemiology; reproductive, perinatal, developmental and pediatric epidemiology; wildlife epidemiology; and social and behavioral epidemiology. For detailed information regarding the program, address the chairperson of the group or see the website.

Graduate Advisers. Janet Foley (Medicine and Epidemiology), Lihong Qi (Public Health Sciences), and William Reisen (Center for Vectorborne Diseases)

Required Courses for the Program
Prerequisite Courses. Prerequisites may be taken concurrently with required and/or advanced courses below.
Mathematics 16A-16B or 21A-21B Statistics 102, 106, and 108, or Preventive Veterinary Medicine 402, 403

Required Courses. These courses are required of all students in the program; M.S. and Ph.D. degrees. These requirements cannot be waived and must be met before a student’s Qualifying Examination.
Epidemiology 202, 203, 204, 205, 206, 207, 208 and 290 One course from: Population Health and Reproduction 202 or Statistics 44

Related Courses. For additional course work in Epidemiology, please see Medicine and Epidemiology, Preventive Veterinary Medicine, Population Health and Reproduction, Public Health Sciences, and Statistics.

Courses in Epidemiology (EPI)

Graduate
202. Quantitative Epidemiology I: Probability (5)
Lecture—4 hours, laboratory—2 hours. Prerequisite: Mathematics 16A/B or 17A/B or 21A/B or equivalent; Statistics 102 and 108 or Population Health and Reproduction 402 and 403 or equivalent; concurrent or previous enrollment in a basic epidemiology course (e.g., course 205). Foundations in probability for epidemiologists. Emphasis on properties of and relationships between distributions and application of probability concepts to epidemiology. Includes a mathematical skills laboratory to assist in solution of epidemiologic problems.

203. Quantitative Epidemiology II: Statistical Inference (4)
Lecture—3 hours, laboratory/discussion—1 hour. Prerequisite: course 202, or Statistics 130A, or 131A, or 133; basic course in Epidemiology (205 or equivalent). Provides the mathematical statistics foundation for statistical models, methods, and data analysis.
204. Quantitative Epidemiology III: Statistical Models (4)
Lecture—4 hours; laboratory/discussion—1 hour. Prerequisite: course 203, or Statistics 130B, or 131B, or 133; Statistics 108 recommended; basic course in Epidemiology (205 or equivalent); consent of instructor. Introduces statistical models, methods, and data analysis in the areas of generalized linear model and survival analysis methodology.

204A. Foundation of Statistical Models, Methods, and Data Analysis for Scientists (4)
Lecture—3 hours; laboratory/discussion—1 hour. Prerequisite: Statistics 130A, or Statistics 131A, or Statistics 133, course 228 recommended. Provides the mathematical statistics foundation for statistical models, methods, and data analysis. —II. (II) Bang

204B. Statistical Models, Methods, and Data Analysis for Scientists (4)
Lecture—3 hours; laboratory/discussion—1 hour. Prerequisite: course 204A; Statistics 108 recommended. Introduces statistical models, methods, and data analysis in the areas of generalized linear, survival, and correlated data methodology. —III. (III) Li

205A. Principles of Epidemiology (4)
Lecture—4 hours. Prerequisite: Preventive Veterinary Medicine 202 or consent of instructor. Basic epidemiologic concepts and approaches to epidemiologic research, with examples from veterinary and human medicine, including outbreak investigation, infectious disease epidemiology, properties of tests, and an introduction to epidemiologic study design and surveillance. (Same course as Preventive Veterinary Medicine 405).—Gold

206. Epidemiologic Study Design (4)
Lecture—30 sessions; discussion—9 sessions; laboratory—2 sessions. Prerequisite: course 205 or consent of instructor. Builds on concepts presented in course 205. Concepts of epidemiologic study design—clinical trials, observational cohort studies, case–control studies—introduced in course 205A are covered in more depth, using a problem-based format. Discussion of published epidemiologic studies. (Same course as Preventive Veterinary Medicine 406A).—Gold

207. Advanced Epidemiologic Methodology (4)
Lecture/discussion—4 hours. Prerequisite: course 206. In-depth development of advanced epidemiologic concepts, theory, methods, and applications for observational studies, including random and systematic error, confounding, causal inference, effect modification, internal and external validity, estimability and interpretation of effect measures, and advanced study designs. —Hertz-Picciotto, Kass

208. Analysis and Interpretation of Epidemiologic Data (3)
Lecture—16 sessions; laboratory—21 sessions; project. Prerequisite: course 204 (may be taken concurrently) and 207, and either Statistics 144 or Population Health and Reproduction 202 and entry level statistical software [e.g., SPSS, BMDP, SAS, MiniTab, S-Plus]. Application of theory and concepts of statistics and epidemiology to analysis and interpretation of data typically found in veterinary and human epidemiologic research. —I. (I) Beckett

220. Problems in Epidemiologic Study Design (4)
Lecture—3 hours; term paper. Prerequisite: Preventive Veterinary Medicine 405 and 406 or the equivalent; Population Health and Reproduction 207 concurrently; Statistics 102 and 106 or the equivalent. Design and development of research protocols and funding applications for peer review. Application of research methods data collection and management and statistical analysis in research proposals. Methods of evaluating research proposals, mechanisms of funding, specifying human subject considerations. —II. (II) Romano

222. Epidemiological Modeling (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Preventive Veterinary Medicine 405. Techniques of model building and simulation of infectious diseases will be discussed using selected modeling philosophy, construction and validation will be emphasized. Offered in alternate years. —II.

223. Spatial Epidemiology (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Preventive Veterinary Medicine 405 or Environmental Studies 126 or Veterinary Medicine 409. Geographic Information Systems (GIS) and spatial statistics. Students are expected to complete a term project based on their graduate research. Offered in alternate years. —II.

224. Health and Ecological Risk Analysis (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Preventive Veterinary Medicine 406 or consent of instructor; background in statistics, including multiple variable techniques; a course in differential equations. A methodological approach to risk analysis for human and animal-related health and ecological issues. Basic principles of risk analysis, including perception, communication, assessment, and management. Emphasis on the assessment of risk. —III.

225. Advanced Topics in Epidemiology Methods (2)
Discussion—2 hours. Prerequisite: courses 205B, 206, and 207 (or equivalents, with consent of instructor). A in-depth study of topics in epidemiology: theory and methods, selected from: causal inference, confounding, study design, or other related areas, with year to year variation. Readings are assigned and students are expected to lead discussions on them. May be repeated for credit when topic differs. Offered irregularly. —III. Hertz-Picciotto

226. Methods for Longitudinal and Repeated Measurement Data (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 204 or consent of instructor. Mixed models for longitudinal data (LD)/repeated measurements; Mean and covariance models; General linear LD models; Random effects models; Linear mixed effects models for continuous outcome; Generalized linear mixed effects model for discrete outcome including binary, ordinal and count data. —I. (I) Gold

229. Geographic Information Systems for Health Professionals (4)
Lecture—2 hours; laboratory—6 hours. Emphasis on basic geographic and data management principles. Focus on software proficiency in application to analyzing/solving health-related problems. For graduate and professional students in epidemiology, public health, preventive veterinary medicine, health informatics with interest in spatial techniques in research. —III. (III)

240. Principles of Injury Epidemiology (3)
Lecture/discussion—3 hours. Overview of the epidemiology of human injury, including general principles, surveillance methods, analysis of injury patterns, environmental factors, treatment issues and engineering and legal interventions related to vehicular injuries, drownings, falls, fires and burns, poisonings, firearm injuries, and other intentional injuries. —II. (II) Romano

250. Introduction to Clinical Research Design and Epidemiology (1)
Lecture—1 hour. Prerequisite: graduate standing or medical/nursing personnel. For medical personnel who are or will be involved in medical research. Review of basics of clinical study design and analysis of clinical data. (S/U grading only.)—I. (I) McCurdy, Romano

251. Environmental Epidemiology (3)
Lecture—3 hours. Prerequisite: Preventive Veterinary Medicine 405 (may be taken concurrently); upper division undergraduates who have completed Environmental Studies 126; or the equivalent. Examination of the human health effects and the risk of disease from community, occupational, and personal exposure to toxic substances. Offered in alternate years. —I. Schenker

252. Social Epidemiology (2)
Lecture/discussion—2 hours. Prerequisite: course 205A; consent of instructor. Social determinants of health; psychosocial and physiological pathways; health and social inequality; gender and racial/ethnic disparities in health; social support, social cohesion and health; social gradient in behavioral risk factors; social ecological approaches to health intervention; interventions addressing social determinants. (Same Course as Public Health Sciences 252.)—III.

260. Epidemiology of Chronic Diseases and Aging (3)
Lecture—discussion—3 hours. Overview of the epidemiology of chronic disease in old age. Topics include biology of aging, epidemiology of cardiovascular disease, neoplasms, osteoporosis and fractures, psychosocial factors and health in old age, dementia, functional status and prevention of disease. —II.

270. Research Methods in Occupational Epidemiology (3)
Lecture—discussion—3 hours. Prerequisite: Environmental Studies 126 or Preventive Veterinary Medicine 405; and Statistics 102 or Epidemiology and Preventive Medicine 402. Methods used in epidemiologic research on occupational hazards. Topics include design and analysis of cohort and case-control studies, sample size, measuring dose, choosing a control group, validation of employment and health data, interpreting negative studies, and analysis software. Offered in alternate years. —III.

272. Cancer Epidemiology (2)
Recitation—1 hour; discussion—1 hour. Prerequisite: must have basic understanding of epidemiologic and statistical concepts that are covered in courses 205A, 205B, 206 (may be taken concurrently), and Statistics 102. We will cover the underlying concepts essential to understanding cancer epidemiology, such as trends in incidence and survival, epidemiologic methods used to assess cancer etiology, prevention and control, and an introduction to the cancerinitiation and progression multi-stage model. —II. (II) Cress

290. Seminars in Epidemiology (1)
Seminar—1 hour. Students will actively participate in presentation and discussion of ongoing or published research projects in epidemiology. (S/U grading only.)—III.

291. Seminars in Human Health Services Research and Clinical Epidemiology (1)
Seminar—1 hour. Critical review, evaluation, and discussion of research in health services and clinical epidemiology. Presentation of statistical, epidemiologic, and econometric methods. Students present their own research and critique the work of others. May be repeated for credit. [Same course as General Medical 291.] (S/U grading only.)—I, II, III. (I, II, III)

298. Group Study (1-5).
Seminar—1-5 hours. Group study in selected areas of epidemiology.

299. Research (1-12).
Research in selected areas of epidemiology. (S/U grading only.)

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer, 2015-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): AH—Arts and Humanities; SC—Science and Engineering; SS—Social Sciences; ACH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SC—Science and Engineering; SS—Social Sciences;
Evolution and Ecology

Within the humanities and social sciences. The A.B. degree is especially appropriate for those students who wish to combine the arts or languages with evolution and ecology for career preparation in such areas as scientific writing, translating or illustration.

Career Alternatives. A degree in Evolution, Ecology and Biodiversity prepares the student for career opportunities in research, teaching, health professions, veterinary medicine, agriculture, environmental management, and industry. Many students gain some research experience while at UC Davis and choose to continue their training at the graduate level. This track offers careers in academics, government, environmental organizations, or business.

A.B. Major Requirements:

Preparatory Subject Matter .......................... 41-45
Biological Sciences 2A-2B-2C ............. 15
Chemistry 2A-2B-2C ....................... 10
Mathematics 17A-17B (17C recommended) or 21A-21B (21C recommended) or Statistics 100 or 102 ............ 4-8
Physics 1, 1A-1B or 8A-8B ................. 6

Depth Subject Matter ......................... 36
Biological Sciences 101 ................. 4
One course from: Evolution and Ecology 100; Geology 107; Anthropology 151 .......... 3-4
One course from: Evolution and Ecology 101; Environmental Policy 100; Wildlife, Fish, and Conservation Biology 151 .............. 4
Additional upper division coursework in biological science to achieve a total of 36 or more units ........................................ 24-25
Include at least one course from each of the areas of study below.

Areas of Study:

(1) Biodiversity: Entomology 103; Evolution and Ecology 105, 108, 112, 140; Microbiology 105; Nematology 110; Plant Biology 116, 148; Plant Sciences 147; Wildlife, Fish, and Conservation Biology 110, 111, 120, 134.


Note: A maximum of four units of variable-unit courses (numbered 192, 198, 199) may be applied to the upper division elective unit requirement. Courses numbered 197T are not applicable to the upper division elective unit requirement.

Total Units for the Major .................. 77-81

B.S. Major Requirements:

Preparatory Subject Matter .......................... 56-66
Biological Sciences 2A-2B-2C ............. 15
Chemistry 2A-2B-2C ....................... 15
Chemistry 8A-8B or 118A-118B-118C .......... 6-12
Mathematics 17A-17B-17C or 21A-21B (21C recommended) ............ 8-12
Physics 7A-7B-7C ................. 12

Depth Subject Matter ......................... 49
Biological Sciences 101, 105 (or 102+103), 107, 109, 110 ........ 10-14

Laboratory or field course: At least one of the courses taken to fulfill these requirements must include a laboratory or field component.

Two courses in Advanced Evolution or Evolution and Ecology 102, 103, 107, 115, 117*119*, 120, 121, 123, 138, 141, 147, 149, 150, 161, 180A and 180B, 181.

Minor Program Requirements:

Quarter Offered: Fall, II-Winter, III-Spring, IV-Summer, 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; DivDom=Domestic Diversity; Wr=Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences;

AOGH=American Cultures; DD=Domestic Diversity; OL=Oral Languages; QL=Quantitative; SL=Scientific; VL=Visual; WC=World Cultures; WE=Writing Experience
Major Advisers. Students transferring to UC Davis from another institution and majoring in Evolution, Ecology and Biodiversity must consult an adviser immediately upon matriculation so that their transfer credits can be applied to the major requirements. All new students in the major should contact the Biology Academic Success Center for adviser assignment. Substitutions of courses not on the above list for major requirements are arranged with the adviser.

Advising Center for the major is located at the Biology Academic Success Center (BASC), 1023 Sciences Laboratory Building, 530/752-0410; http://www.biosci.ucdavis.edu/BASC. Pre-professional students should establish contact with the Pre-health Sciences Advising office in 111 South Hall, to learn what specific courses are required on their transcripts.

Teaching Credential Subject Representative. Students planning for a teaching career should consult the School of Education in regard to requirements for certification, see the Teaching Credential/M.A. Program on page 115.

Courses in Evolution and Ecology (EVE)

Lower Division

2. Biodiversity (3)
Lecture—2 hours; lecture/discussion—1 hour. Introduction to nature, scope and geographical distribution of biodiversity (the diversity of life, with emphasis on plants and animals, especially insects). Humans and biodiversity—domestication, aesthetics, ethics and valuation. Species richness and “success.” Biodiversity through time; monitoring, evaluation of conservation; global and continental. (Same course as Entomology 2.) Offered irregularly. GE credit: SciEng, Wrt | JE, SL, WE.

10. Evolution for Non-Biologists (4)
Lecture—3 hours. Introduction to evolutionary biology for the general public. Offered in alternate years. GE credit: SciEng | QL, SE, SL — (I) Begun.

Lecture—3 hours; discussion—1 hour. Prerequisite: elementary biological recommended. Ecological principles with emphasis on humans and their interactions with the environment; how humans affect and depend on natural ecosystems; the future of the Earth’s biota considered irregularly. GE credit: SciEng | QL, SE, SL, WE.

12. Life in the Sea (3)

92. Internship (1-12)
Internship—3-36 hours. Prerequisite: lower division standing; consent of instructor. Work experience off and on campus in all subject areas offered in the Department of Evolution and Ecology. Internships supervised by a member of the faculty. May be repeated for credit. (P/NP grading only) — (I, II, III, (I, II, III) — Begun.

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only) GE credit: SE.

99. Special Study for Lower Division Students (1-5)
(P/NP grading only) GE credit: SE.

Upper Division

100. Introduction to Evolution (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C; Biological Sciences 101; Mathematics 16A, 16B, 16C or the equivalent; Statistics 13 or 100 (Statistics 100 recommended). A general survey of the origins of biological diversity and evolutionary mechanisms. GE credit: SciEng | QL, SE, SL — (I, II, III, (I, II, III) — Begun. Course:

101. Introduction to Ecology (4)
Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C; Mathematics 16A, 16B, 16C or the equivalent. A general examination of ecological principles. GE credit: SciEng | QL, SE, SL, VL — (I, II, III, (I, II, III) Gaylord, Rejmanek, Schoener, Strong, Williams.

101Q. Introduction to Computer Models in Ecology (1)
Autotutorial—1.5 hours; extensive problem solving—1.5 hours. Prerequisite: concurrent enrollment in course 101. Computational methods and mathematical models used to study ecological phenomena. Offered irregularly.

102. Population and Quantitative Genetics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 101, and Statistics 100 or 102, and computer literacy obtained by randomly generating, genetic drift, natural selection, inbreeding, migration, and mutation in theory and actuality. The resemblance between relatives and consequences of selection for application of these ideas to topics such as the evolution of sex. Offered in alternate years. GE credit: SciEng | SE — (I) Langley.

103. Phylogeny, Speciation and Macroevolution (4)
Lecture—3 hours; laboratory/discussion—3 hours. Prerequisite: course 100. Statistical inference of evolutionary patterns and processes above the species level. Topics include phylogenies and divergences times, character evolution, biogeographic history, and rates and patterns of lineage diversification, with an emphasis on the origin of species. Offered in alternate years. GE credit: SciEng | QL, SE, SL — (I, II) Moore, Turelli

104. Community Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 101 or Environmental Science and Policy 101. Population growth and density dependence; predation; exploitative, interference and apparent competition; coexistence mechanisms; niches, spatial and temporal variation; stability, diversity, and productivity of food webs; applications to conservation and biological control. Emphasis on quantitative understanding through models, concepts, and empirical evidence. GE credit: SciEng | SE, SL, VL.

105. Phylogenetic Analysis of Vertebrate Structure (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1A and 1B, or 2B and 2C. The structure of the classes and subclasses of vertebrates is described. Prerequisites: upper division standing or consent of instructor; introductory animal biology (Biological Sciences 1B or 2B), invertebrate zoology (course 112), and/or ecology (course 101) are recommended. Survey of the invertebrate phyla, emphasizing aquatic forms, and focusing on morphology, development, natural history, ecology, and phylogenetic relationships. Limited enrollment. Offered in alternate years. — (II) Grosberg, Sanford

112. Biology of Invertebrates (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1B, or 2B and 2C; courses in systematics, ecology, and evolution recommended. Survey of the invertebrate phyla, emphasizing aquatic forms, and focusing on morphology, development, natural history, ecology, and phylogenetic relationships. Limited enrollment. Offered in alternate years. — (II) Grosberg, Sanford

112L. Biology of Invertebrates Laboratory (2)
Lecture—6 hours. Prerequisite: Biological Sciences 1B, or 2B and 2C; course 112 concurrently. Field and laboratory experience with representative members of the major invertebrate phyla discussed in course 112. Emphasis on comparative morphology, natural history, ecology, and behavior of living invertebrates. Two field trips required. Offered in alternate years. — (II) Grosberg, Sanford

114. Experimental Invertebrate Biology (3)
Lecture—2 hours; discussion—1 hour; laboratory—3 hours; fieldwork—3 hours. Prerequisite: upper division standing or consent of instructor; introductory animal biology (Biological Sciences 1B or 2B), invertebrate zoology (course 112), and/or ecology (Evolution and Ecology 101, and/or Evolution and Ecology 100) are recommended; residence at or near Bodega Marine Lab required. Student must complete the application available at http://www.bml.ucdavis.edu. This course includes an intensive study of the invertebrate phyla, emphasizing aquatic forms, and focusing on morphology, development, natural history, ecology, and phylogenetic relationships. Limited enrollment. Offered in alternate years. — (II) Grosberg, Sanford

Pre-Fall 2011 General Education (GE): Arts & Humanities; SciEng—Science and Engineering; SocSci—Societal Studies; DivD—Diverse Diversity; Wrt—Writing Experience
Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; AGCH—American Cultures; DD—Diverse Diversity; QL—Oral Skills; QQ—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

Quarter Offered: I-Fall, II—Winter, III—Spring, IV—Summer, 2011-2016 offering in parentheses.
115. Marine Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A or 1B, or Biological Sciences 2A, or consent of instructor. Processes affecting the distribution, abundance, and diversity of plant and animal life in the sea. Introduction to marine habitat diversity and human impacts on marine ecosystems. Offered in alternate years. GE credit: SciEng | SE, SL, VI, WE. —II. Stanichewicz

117. Plant Ecology (4)
Lecture—3 hours; fieldwork—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C. Plant Biology 111 recommended. The study of the interactions between plants, plant populations or vegetation types and their physical and biological environment. Special emphasis on California. Four full-day field trips and brief write-up of class project required. (Same course as Plant Biology 117.) —II. Latimer, Rejmanek

119. Population Biology of Invasive Plants and Weeds (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C; introductory statistics recommended. Origin and evolution of invasive plant species and weeds, reproduction and dispersal, seed ecology, modeling of population dynamics, interactions between invasive species and native species, crop/weed competition, biological control. Laboratories emphasize design of competition experiments and identification of weedy species. (Same course as Plant Biology 119.) GE credit: SciEng | SE. —II. III. Dow, Rejmanek

120. Global Change Ecology (3)
Lecture/discussion—3 hours. Prerequisite: course 100 and 101 or equivalents. Treatment of historical evolution of the biosphere resulting from physical, chemical and biological influences. Special focus upon changes caused by humans. Topics pertain to biodiversity, resources, conservation, and ecosystem services. —II. Strong

131. Human Genetic Variation and Evolution (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1B or 2B. Introduction to genome-wide nucleotide sequence variation in human populations and computational methods for its analysis. Topics to include forensics, disease gene mapping, and studies of human evolutionary history. Misuses, such as eugenics, and ethical/legal issues will be discussed. Offered in alternate years. —II. Remmela

138. Ecolatitudes (5)
Lecture—3 hours; discussion—1 hour. Extensive writing. Prerequisite: one course in Biological Sciences, Entomology, Wildlife, Fish, and Conservation Biology. Geography, or tropical experience, or consent of instructor. Biological and human-related aspects of the ecology of low latitudes. Distribution, numbers, and relationships of tropical organisms. Problems of development and conservation in the context of ecological and evolutionary theory. Offered in alternate years. GE credit: SciEng, Writ | SE, SL, WE. —III. Shapiro

140. Paleobotany (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C. Introduction to plant fossil record, beginning with invasion of land in the Silurian, emphasizing origin and evolution of major groups and adaptations and changing composition and distribution of floras in relation to plate tectonics and climatic change. —Doyle

141. Principles of Systematics (3)
Lecture—2 hours; independent study. Prerequisite: Biological Sciences 1B or 2B; course 100 recommended. Historical background, philosophical rationale, contemporary approaches, and working rules of biosystematics, including International Code of Zoological Nomenclature. Offered in alternate years. GE credit: SciEng, Writ | OL, QL, SE, SL, VI, WE. —III. Shapiro

147. Biogeography (4)
Lecture—3 hours, term paper. Prerequisite: Biological Sciences 1A and 1B, or 2A, 2B. Movement of terrestrial and marine organisms and biotic and biologic changes in the geographic distribution of organisms. Offered in alternate years. GE credit: SciEng | SE, SL, WE. —II. Shapiro

149. Evolution of Ecological Systems (4)
Lecture—3 hours; term paper. Prerequisite: course 101 or Environmental Studies 100 (or the equivalent), and course 100 (or the equivalent). Evolution as an organizing force in natural communities. Co-adaptation in trophic and competitive relationships. Ecology of polynuromorphs, clines, and speciation. Offered in alternate years. GE credit: SciEng | SE, SL, WE. —I. Shapiro

150. Evolution of Animal Development (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101; and course 100 (may be waived for graduate students with consent of instructor). Comparative analysis of animal development and the genetic basis for morphological differences. Offered in alternate years. GE credit: SE, WE. —II. Kopp

161. Microbial Phylogenomics—Genomic Perspectives on the Diversity and Diversification of the Biosphere (4)
Lecture—3 hours. Prerequisite: Biological Sciences 2A, 2B, or 2C or equivalent. Use of DNA and genomic sequencing in studying the diversity of microorganisms. Diversity of microbes, phylogenetics, genome sequencing, comparative phylogenomics, lateral gene transfer, molecular ecology, metagenomics, and studies of the human microbiome. Offered in alternate years. GE credit: SciEng | SE or (II) | Eisen

175. Computational Genetics (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: Biological Sciences 101 and Statistics 100 or 102. The use of computers to solve problems in genetics and evolution. Introduction to a general purpose computer language (Python), computational statistical methods, and applications such as QTL mapping, linkage detection, estimation of rates of evolution, and gene finding. Offered irregularly.

180A. Experimental Ecology and Evolution in the Field (4)
Lecture/laboratory—3 hours; fieldwork—3 hours. Prerequisite: course 100; course 101, or Environmental Science and Policy 100; Entomology 102. Experimental design in field ecology. Examination of primary literature, experimental design, independent and collaborative research, analysis of data, development of original research paper based on field experiments. (Same course as Entomology 180A.) Offered in alternate years. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE, SL, WE. —III. Yang

180B. Experimental Ecology and Evolution in the Field (4)
Lecture/laboratory—3 hours; fieldwork—3 hours. Prerequisite: Evolution and Ecology or Entomology 180A; course 100; Environmental Science and Policy 100; Entomology 105. Experimental design in field ecology. Examination of primary literature, experimental design, independent and collaborative research, analysis of data, development of original research paper based on field experiments. (Same course as Entomology 180B.) Offered in alternate years. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | QL, SL, VI, WE. —III. Yang

181. Ecology and Evolution of Animal-Plant Interactions (4)
Lecture—1.5 hours; lecture/discussion—1.5 hours; term paper; intensive writing or discussion. Prerequisite: Biological Sciences 2B and 2C required. Biological Sciences 2C may be taken concurrently. Animal adaptations for eating plants, pollinating flowers, dispersing seeds. Plant adaptations to herbivore defense, attraction of mutualists; role of coevolutionary arms race, mutualists and cheaters in plant/animal speciation. Exploration through lectures, original scientific literature, discussions and term paper. Offered in alternate years. GE credit: SciEng | QL, QI, SE, SL, WE. —II. Strauss

189. Introduction to Biological Research (1)
Discussion—1 hour. Prerequisite: upper division standing in Evolution and Ecology or related biological science; consent of instructor. Introduction to research methods in biology and discussion of research by faculty, graduate, and undergraduate students. May be repeated for credit up to a total of 6 units. (P/NP grading only) GE credit: SE. —I, II, III, IV, V

190. Undergraduate Seminar (2)
Seminar—2 hours. Prerequisite: upper division standing in the biological sciences or a related discipline. Student reports on current topics with emphasis on integration of concepts, synthesis, and state-of-the-art research approaches. Reviews of literature and reports of undergraduate research may be included. May be repeated for credit. (P/NP grading only) GE credit: SE. —II. Shapiro

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: completion of 84 units and consent of instructor. Work experience off and on campus in all subjects offered in the Department of Evolution and Ecology. Internships supervised by a member of the faculty. (P/NP grading only)

194HA-194HB-194HC. Research Honors Laboratory—6 hours. Prerequisite: Students who have completed 135 units and qualify for the honors program (as defined by the current catalog). Students pursue intensive research under the guidance of a faculty advisor. Students are expected to complete the full three-quarter sequence culminating in the writing of an honors thesis. (Deferred grading only, pending completion of sequence.) GE credit: SciEng | SE, WE.

197. Tutoring in Biological Sciences 2B (1-2)
Tutorial—3-6 hours. Prerequisite: Biological Sciences 1B or Biological Sciences 2B with a grade of B or better. Assisting the instructor by tutoring students in a Biological Sciences 2B laboratory. Tutoring is voluntary and is supervised by a Laboratory Teaching Assistant and the Biological Sciences 2B Laboratory Coordinator. May be repeated three times for credit. (P/NP grading only) GE credit: SE

198. Directed Group Study (1-5)
(P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only) GE credit: SE. —I, II, III. (I, II, III)

Graduate

210. Molecular Phylogenetic Analysis (3)
Lecture—2 hours; laboratory—3 hours. Theory and practice of inferring phylogenetic trees using molecular sequence data. Practical techniques for obtaining sequence data, advantages and disadvantages of common approaches for inferring trees, statistical methods for comparing alternative hypotheses. (Same course as Entomology 210.) Offered irregularly. —Nadler

211. Applied Phylogenetics (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 103 or 210 or Population 165N, or the equivalent, graduate standing. Applications of phylogenetic methods to fields outside of systematics. Core lectures/labs in remedial phylogenetics, phylogenography, conservation, and comparative morphology. Special topics vary yearly. May be repeated one time for credit. —II. Moore, Wainright

220. Species and Speciation (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 100, Philosophy 108 or the equivalent. History and Philosophy of Science 130B recommended. Current status of species concepts, models of specia-
phy, History, Native American Studies, Performance Studies, Psychology, Sociology, and Spanish.

The Designated Emphasis in Feminist Theory and Research affords graduate students in affiliated programs the opportunity to augment their Ph.D. in a given discipline with a specialization Feminist Theory and Research. Typically a doctoral student in good standing may seek admission to the Designated Emphasis in Feminist Theory and Research and enroll in Designated Emphasis in Feminist Theory and Research courses. Those students in affiliated Ph.D. programs who complete the requirements of the Designated Emphasis will have this noted on their transcripts and their Ph.D. diploma will note the “Special Emphasis in Feminist Theory & Research.” Students must complete all the requirements for the Ph.D. in their home department. The requirements for the Designated Emphasis in Feminist Theory and Research are the successful completion of the two core courses in fiber and polymer synthesis and Women’s Studies 200B, and two additional courses focusing on women and gender, one in the student’s home department and one outside their home department. A member of the DE affiliated faculty must be a member of the student’s qualifying examination. Analysis of gender is expected to be a central component of both the student’s qualifying examination and doctoral research.

Students should consult with the Chair of the Designated Emphasis in Feminist Theory and Research before enrolling in a graduate course for which they wish to receive credit to ensure that it will count toward fulfilling the requirements of the Designated Emphasis. If possible, please bring a copy of the syllabus or an expanded course description to your meeting.

Graduate Adviser. Contact Maxine Craig in 1101 Hart Hall 530-522-6429; mbcraig@ucdavis.edu.

Fiber and Polymer Science

(College of Agricultural and Environmental Sciences) Faculty. See under Textiles and Clothing, on page 525.

The Major Program
The Fiber and Polymer Science major is concerned with the physical, chemical, and structural properties of fibers and polymers and how these relate to fiber and polymer performance and end-use.

The Program. All students in this major take a common core of course work in chemistry, physics, and mathematics, and depth subject matter in fiber and polymer science; polymer chemistry and physical chemistry, and technical writing. In the restricted electives, students select courses from areas such as computer science and mathematics, chemistry, marketing and management, material and advanced fiber and polymer science, and textiles.

Career Alternatives. The major prepares the student for a career in a wide range of industries in the areas of research and development, technical marketing and management, production, quality control, and science teaching (on completion of an additional year in the teaching credential program). The companies employing Fiber and Polymer Science graduates are those in fiber, polymer, industrial product, textile and/or chemical business. Graduates are prepared to enter the graduate program in textiles or agricultural and environmental chemistry with a specialization in fiber and polymer chemistry, and fiber and polymer science programs at other universities.

Exercise Biology

See Neurobiology, Physiology, and Behavior, on page 443.

Family and Community Medicine

See Medicine, School of, on page 396.

Feminist Theory and Research

Maxine Craig Ph.D., Advisor

Program Office. 2222 Hart Hall 530-752-6429; http://wms.ucdavis.edu/wgssite/

Graduate Study. The Gender, Sexuality and Women’s Studies Program at UC Davis offers a Designated Emphasis in Feminist Theory & Research. Currently graduate students in the following fourteen affiliated Ph.D. programs are eligible to participate: Anthropology, Comparative Literature, Cultural Studies, Education, English, French, German, Geogra-
Film Studies

See Cinema and Technocultural Studies, on page 195.

First-Year Seminar Program

Formerly Freshman Seminar Program

Christopher J. Thaiss, Ph. D., Program Director

Program Office, 1350 Surge III (Center for Excellence in Teaching and Learning); cell@ucdavis.edu; http://cell.ucdavis.edu/courses-and-events/

Committee in Charge

Amy Clarke, Ph.D. (University Writing Program)
Haruko Sakakibara, Ph.D.

Yuuko Uchikoshi, Ph.D. (School of Education)
W. Jeffrey Weidner, Ph.D.

(Neurobiology, Physiology and Behavior)

Courses in First-Year Seminar (FRS)

Questions pertaining to the following course should be directed to the instructor or to the Center for Excellence in Teaching and Learning.

Lower Division

1. First-Year Seminar (1)
   Seminar—1 hour. Open only to: students who have completed fewer than 45 quarter units; transfer students in their first academic year at UC Davis. Investigation of a special topic through shared readings, discussions, written assignments, term papers, and special activities (such as fieldwork, site visits, laboratory work, etc.). Emphasis placed upon student participation in learning. Students may take more than one First-Year Seminar, but may not take more than one in any given quarter. May be repeated for credit if topic differs. —I, II, III. (I, II, III.)

2. First-Year Seminar (2)
   Seminar—2 hours. Open only to: students who have completed fewer than 45 quarter units; transfer students in their first academic year at UC Davis. Investigation of a special topic through shared readings, discussions, written assignments, term papers, and special activities (such as fieldwork, site visits, laboratory work, etc.). Emphasis placed upon student participation in learning. Students may take more than one First-Year Seminar, but may not take more than one in any given quarter. May be repeated for credit if topic differs. —I, II, III. (I, II, III.)

3. First-Year Seminar (3)
   Seminar—1 hour. Open only to: students who have completed fewer than 45 quarter units; transfer students in their first academic year at UC Davis. Investigation of a special topic through shared readings, discussions, written assignments, term papers, and special activities (such as fieldwork, site visits, laboratory work, etc.). Emphasis placed upon student participation in learning. Students may take more than one First-Year Seminar, but may not take more than one in any given quarter. May be repeated for credit if topic differs. —I, II, III. (I, II, III.)

4. First-Year Seminar (2)
   Seminar—2 hours. Open only to: students who have completed fewer than 45 quarter units; transfer students in their first academic year at UC Davis. Investigation of a special topic through shared readings, discussions, written assignments, term papers, and special activities (such as fieldwork, site visits, laboratory work, etc.). Emphasis placed upon student participation in learning. Students may take more than one First-Year Seminar, but may not take more than one in any given quarter. May be repeated for credit if topic differs. (P/NP grading only).—I, II, III. (I, II, III.)

Fisheries

See Animal Science, on page 153; Biological and Agricultural Engineering, on page 179; and Wildlife, Fish, and Conservation Biology, on page 544.

Food Science

(College of Agricultural and Environmental Sciences)

The Major Program

Food science is a discipline in which biological, physical, and sensory sciences are integrated for the study of foods to ensure their safety, quality, and healthful properties. The food science curriculum encompasses food chemistry and biochemistry, food safety and microbiology, food processing and preservation, and sensory and consumer sciences.

Career Alternatives. Opportunities for employment include positions in the food and allied industries, government agencies, and educational and research institutions. Graduate study for the food science student may lead to the M.S. or Ph.D. degree in food science, or in related fields such as agricultural chemistry, biochemistry, microbiology, and nutrition.

B.S. Major Requirements:

Preparatory Subject Matter..................... 61

Depth Subject Matter.......................... 49

Food Science and Technology 100A, 100B, 100C, 100E, 104E

Communication 1

Mathematics 16A-16B-16C

Biological Sciences 2A

Chemistry 2A-2B-2C; 8A, 8B (or more advanced series)

Physics 7A-7B-7C

Food Science and Technology 50

Nutrition 10 (or approved substitute)

Select one of the following five options:

Food Science Option

The Food Science option provides a broad exposure to food chemistry, food microbiology and food processing. Students find positions in quality assurance, product development, and food processing in the food industry.

Restricted Electives for the Food Science option .................................................. 18

The restricted electives are:

1. Provide a broad exposure to students who would seek positions in quality assurance, product development, and processing in the food industry
2. Prepare students for graduate study in food science or related programs,
3. Prepare students for professional school in the health sciences. Select courses from a...
Food Science (A Graduate Group)

Gary M. Smith, Ph.D., Chairperson of the Group
Group Office, 1204 RMI South Building 530-752-8035; Fax 530-752-0382; http://www.foodscience.ucdavis.edu

Food Science and Technology (College of Agricultural and Environmental Sciences)

Michael J. McCarthy, Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award

Food Science (A Graduate Group)

Food Science and Technology Option

The Brewing Science option prepares students for careers in production or quality assurance within the brewing industry or other food fermentation industries (e.g., other alcoholic beverages, vinegar and cheese). The option also prepares students for graduate study in food science or related programs, exposes the students to diverse topics, including chemistry, biochemistry, microbiology, and processing.

Specific course requirements

18
Food Science and Technology 102A, 102B, 109, 123

Selected additional courses

9
Select courses from a master list available from the department Advising Center

Total Units for the Degree

132

Major Adviser
A.E. Mitchell (Food Science and Technology)

Advising Center
For the major is located in 1208 RMI South Building 530-752-8368.

Graduate Study
A program of study and research leading to the M.S. and Ph.D. degrees in Food Science is available (see below). For further information on graduate study, contact the graduate advisor.

Food Science (A Graduate Group)

Gary M. Smith, Ph.D., Chairperson of the Group
Group Office, 1204 RMI South Building 530-752-8035; Fax 530-752-0382; http://www.foodscience.ucdavis.edu

Faculty
Includes members from twelve departments in the Colleges of Agricultural and Environmental Sciences and Engineering, and the Schools of Medicine and Veterinary Medicine.

Graduate Study
The interdepartmental Graduate Group in Food Science offers programs of study leading to the M.S. degree and to the Ph.D. degree.

Graduate studies stress the application of the biological, chemical, physical, and behavioral sciences to the processing, preservation, quality evaluation, public health aspects, and utilization of foods. For the M.S. degree, there are four areas of specialization: chemistry-biochemistry, microbiology, engineering-technology, and sensory science. Individually designated programs are also acceptable. For the Ph.D., there are four areas of emphasis: biochemistry, chemistry, microbiology/fermentation, and sensory science. Detailed information regarding graduate study is available through the Group Chairperson or the Group Office.

Graduate Advisers
Contact the Food Science Graduate Group office at jlblevins@ucdavis.edu.

Food Science Technology

[College of Agricultural and Environmental Sciences]

Michael J. McCarthy, Ph.D., Chairperson of the Department
Department Office, 1136 RMI North Building 530-752-1482; http://foodscience.ucdavis.edu

Faculty
Charles W. Bamforth, Ph.D. D.Sc., Distinguished Professor
Dania Barile, Ph.D., Assistant Professor

Food Science and Technology

Charlotte Bilkeffoff, Ph.D., Assistant Professor
Food Science and Technology, American Studies

Stephanie R. Dungan, Ph.D., Professor
Food Science and Technology, Chemical Engineering and Materials Science

Bruce Germer, Ph.D., Professor

Jean-Xavier Guiraud, Ph.D., Professor
Maria L. Marco, Ph.D., Assistant Professor
Kathy L. McCarthy, Ph.D., Professor
Food Science and Technology, Biological and Agricultural Engineering

Michael J. McCarthy, Ph.D., Professor
Food Science and Technology, Biological and Agricultural Engineering

David A. Mills, Ph.D., Professor
Food Science and Technology, Viticulture and Enology

Alison Mitchell, Ph.D., Professor
Nitin N. Nitin, Ph.D., Assistant Professor
Food Science and Technology, Biological and Agricultural Engineering

Michael A. O'Mahony, Ph.D., Professor
Food Science and Technology, Viticulture and Enology

Robert Powell, Ph.D., Professor
Food Science and Technology, Chemical Engineering and Materials Science

Mashe Rosenbaum, Ph.D., Professor and Specialist in Cooperative Extension

Charles F. Shoemaker, Ph.D., Professor
Christopher Simmons, Ph.D., Assistant Professor
R. Paul Singh, Ph.D., Distinguished Professor
Food Science and Technology, Biological and Agricultural Engineering

Carolyn L. Slupsky, Ph.D., Associate Professor
Food Science and Technology, Nutrition

Gary M. Smith, Ph.D., Professor
Glenn M. Young, Ph.D., Professor

Emeriti Faculty

Everett Bandman, Ph.D., Professor Emeritus

Ericka L. Barrett, Ph.D., Professor Emeritus

John C. Bruhn, Ph.D., Specialist in Cooperative Extension

Dieter W. Gruenenweld, Ph.D., Professor Emeritus

Norman F. Haard, Ph.D., Professor Emeritus

Christopher Simmons, Ph.D., Assistant Professor

R. Paul Singh, Ph.D., Distinguished Professor

Walter G. Jensen, Ph.D., Professor Emeritus

John M. Krochta, Ph.D., Professor Emeritus

Food Science and Technology, Biological and Agricultural Engineering

Michael J. Lewis, Ph.D., Professor Emeritus

Academic Senate Distinguished Teaching Award

R. Larry Merson, Ph.D., Professor Emeritus

David M. Ogrydziak, Ph.D., Professor Emeritus

Chester W. Price, Ph.D., Professor Emeritus

David S. Reid, Ph.D., Professor Emeritus

Gerald F. Russell, Ph.D., Senior Lecturer Emeritus

Barbara G. Schneeman, Ph.D., Professor Emeritus (Food Science and Technology, Internal Medicine, Nutrition)

Howard G. Schutz, Ph.D., Professor Emeritus

Charles F. Shoemaker, Ph.D., Professor Emeritus

Lloyd M. Slusky, Ph.D., Professor Emeritus

Aloya L. Toppel, Ph.D., Professor Emeritus

John R. Whitaker, Ph.D., Professor Emeritus

Major Program and Graduate Study
See the major in Food Science, on page 312, and for graduate study, see Graduate Studies, on page 111.

Related Courses
See courses in Consumer Science, Engineering, Molecular and Cellular Biology, Nutrition, Viticulture and Enology, Environmental Toxicology, Population Health and Reproduction, and Plant Biology.

Courses in Food Science and Technology (FST)

Quarter Offered:

I = Fall, II = Winter, III = Spring, IV = Summer; 2015-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; ACHG—American Cultures; DD—Domestic Diversity; Wrt—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; AGCH—American Cultures; DD—Domestic Diversity; QL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WRT—Writing Experience

1. Principles of Food Science (3)
Lecture—2 hours; discussion—1 hour. Food science fundamentals. Fresh and processed food technologies; world food problems; food composition; food microbiological and toxicological safety; food laws; evaluation of acceptability and nutritional value. Not open for credit to students who have completed any Food Science and Technology course except course 101. GE credit: SciEng | GE credit: SciEng | SE, VL. —I, II, III. (I) Barile

2. Introduction to Brewing and Beer (3)
Lecture—3 hours. Basic description of brewing and associated processes, from raw materials to final product; history of brewing and brewing science; types of beer worldwide; world beer market; basics of beer quality, including wholesomeness; role of scientist in brewing. GE credit: SciEng | SE, SL—II, III. (I, II, III) Smith, Young

3. Introduction to Food Preservation (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: Chemistry 2A, Biological Sciences 2A, Statistics 13. Restricted to Food Science Majors. Introduction to modes of fresh food preservation including use of chemicals and microbes, heat and energy, control of water and atmosphere, and by indirect approaches such as packaging, hypothermy design and sanitation. GE credit: SciEng | QL, SE. —II. (I) McCarthy

4. Food Product Development Field Study (1)
Discussion—6 hours; fieldwork—2 days (course given between winter and spring quarters). Prerequisite: advance enrollment required in winter quarter with instructor; background knowledge in foods from such courses as Food Science and Technology 1. Commercial aspects of the large-scale development, distribution, and evaluation of food products intended for human consumption. (Former course Consumer Science 47.) (P/NP grading only.) GE credit: SE

50. Introduction to Food Preservation (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: Chemistry 2A, Biological Sciences 2A, Statistics 13. Restricted to Food Science Majors. Introduction to modes of fresh food preservation including use of chemicals and microbes, heat and energy, control of water and atmosphere, and by indirect approaches such as packaging, hypothermy design and sanitation. GE credit: SciEng | QL, SE. —II, III. (I, II, III) Smith, Young

99. Special Study for Undergraduates (1-5)
(P/NP grading only.)

Upper Division

100A. Food Chemistry (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 8B; Biological Sciences 1A recommended. Chemical aspects of food composition. Emphasis on the functional properties and reactions of the major components of foods: carbohydrates, lipids, proteins, and water. GE credit: SciEng | SE, VL. —II. (I) Young

100B. Food Chemistry Laboratory (2)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A or consent of instructor. Sensory quality, chemical and microbial safety, and nutritional properties of foods. Effects of food processing and preservation on these properties. Selected properties of food commodities. GE credit: SciEng | QL, SE, VL. —II. (I) German

101A. Food Chemistry Laboratory (2)
Lecture/laboratory—4 hours. Prerequisite: course 100A (may be taken concurrently). Chemical aspects of food composition described in course 100A. GE credit: QL, SE, VL. —II. (I) Slusky

101B. Food Properties Laboratory (2)
Lecture/laboratory—1 hour/3 hours. Prerequisite: course 100B (may be taken concurrently). Study of properties of food described in course 100B. GE credit: SciEng | QL, SE, VL. —II. (II) Barile

102A. Malting and Brewing Science (4)
Lecture—4 hours. Prerequisite: Biological Sciences 102, 103, senior standing required. The technology of the malting, brewing and fermentation processes is integrated with the chemistry, biochemistry and microbiology that determine industrial practices and product quality. GE credit: QL, SE. —I. (II) Bamforth
102B. Practical Malting and Brewing (4)
Lecture/discussion—2 hours; laboratory—6 hours. Prerequisite: course 102A and analytical experience beyond Chemistry 2C, such as Viticulture and Enology 123. Food Science and Technology 103, 123L, Molecular and Cellular Biology 120L. Open to seniors only in Fermentation Science or Food Science and Technology. Provides practical working knowledge of analytical methods used in malting and brewing experience with brewing materials and processes and chemical analysis of samples that illustrate the range of values experienced in practice and pilot scale brewing. GE credit: SciEng | QL, SE, —II. (Ill.) Bamforth

103. Physical and Chemical Methods for Food Analysis (4)
Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: Chemistry 2C, Biological Sciences 102 or the equivalent; calculus recommended. Not open for credit to students enrolled in College of Engineering. Applications of the conservation of mass and energy to food processing. Elements of engineering thermodynamics, fluid mechanics, heat and mass transfer. Quantitative analysis through problem solving and simula-

110A. Physical Principles in Food Processing (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: Physics 5A and 5B or 7A/7B-7C or the equivalent; calculus recommended. Not open for credit to students enrolled in College of Engineering. Applica-
tions of the conservation of mass and energy to food processing. Elements of engineering thermodynamics, fluid mechanics, heat and mass transfer. Problem solving. GE credit: SciEng | QL, SE, VL, —I. (I.) McCarthy

110B. Heat and Mass Transfer in Food Processing (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: course 110A or the equivalent. Applied Biological Systems Technology 110L recommended (may be taken concurrently). Rate processes: conduction, convection, and radiation heat transfer; microwave heating, refrigeration, freezing, condensation; mass transfer during drying and storage. GE credit: SciEng | QL, SE, VL, —I. (I.) Singh

110L. Food Processing Laboratory (2)
Laboratory—3 hours; discussion—1 hour. Prerequi-
site: course 110A may be taken concurrently. Open to Science majors only. Laboratory exercises to gain experience with common food processing oper-
ations at the bench and pilot plant scales. GE credit: SciEng | QL, SE, VL, —I. (I.) Rishwurm

117. Design and Analysis for Sensory Food Science (4)
Lecture—3 hours; discussion—1 hour. Methods of design and analysis for sensory food science. Experimen-
tal design strategies and statistical models for product development and consumer testing. Data analysis and computation including the relative merits and limitations of para-

119. Chemistry and Technology of Milk and Dairy Products (4)
Lecture—4 hours; demonstrations and a field trip. Prerequisite: Biological Sciences 1A and 102, or consent of instructor. Composition, structure and properties of milk and products derived from milk. Prepa-
ration and processing of milk and its products. GE credit: SciEng | QL, SE, VL, —I. (I.) Rosenberg

120. Principles of Meat Science (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A. Anatomical, physiological, developmental, and biochemical aspects of muscle underlying the con-
version of muscle to meat. Includes meat processing, preservation, microbiology and public health issues associated with meat. (Same course as Ani-
mal Science 120.) GE credit: SciEng

120L. Meat Science Laboratory (2)
Discussion—1 hour; laboratory—3 hours. Prerequi-
site: Biological Sciences 1A; course 120 may be taken concurrently. Laboratory exercises and stu-
dent participation in transformation of live animal to carcass and肉, structural and biochemical changes related to meat quality, chemical and sen-
yory evaluation. GE credit: SciEng | QL, SE, VL, —II. (II.)

121. Introduction to Enzymology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 103. Principles of physical, chemical and catalytic properties of enzymes and their importance. Purifica-
tion, characterization, and quantitative evaluation of reaction conditions on activity are stressed. Specif-
icity and mechanism of action by use of selected enzymes. (Former course Biochemistry and Biophysics 123.) GE credit: SciEng | QL, SE, VL, —II. (II.) G. Smith

123L. Enzymology Laboratory (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: Biological Sciences 103, course 123C (if concurrently). Laboratory procedures involved in detection, purifi-
cation and characterization of enzymes. (Former course Biochemistry and Biophysics 123L.) GE credit: SciEng | QL, SE, VL, —II. (II.) Smith

127. Sensory Evaluation of Foods (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Agricultural Management and Rangeland Resources 120 or course 117. A critical examination of meth-
ods and sensory measurements applied to food and beverage systems; descriptive analysis and con-
troller tests and their application to quality assur-
ance, product development and optimization. GE credit: SciEng | QL, SE, VL, —II. (II.)

128. Food Toxicology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 102, 103. Chemistry and biochemistry of toxins occurring in foods, including plant and animal tox-
ins, intentional and unintentional food additives. The assessment of food safety and toxic hazards. (Same course as Environmental Toxicology 128.) GE credit: SciEng | SE.—II. (III.) Mitchell, Shibamoto

131. Food Packaging (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 8B, Biological Sciences 1A, Physics 7C. Principles of food packaging. Functions of pack-
ing. Properties of metal, glass and paper materials and packages. Design, fabrication, and applications of food packaging. Packaging of fresh and processed foods, including fruits and vege-
tables, dairy foods, beer and wine. GE credit: SciEng | QL, SE, VL, —II. (II.)

151Y. Food Freezing (1)
Discussion—1 hour; web virtual lecture. Prerequisite: course 110A or the equivalent. Mechanisms of ice crys-
talization, interpretation of freezing diagrams, and models of heat transfer in biological systems. GE credit: SciEng | QL, SE, VL, —II. (II.)

159. New Food Product Ideas (3)
Lecture—3 hours. Prerequisite: upper division stand-
ning with background course work in food science (course 50 or 100A), biological sciences (Biological Sciences 2A, 2B, 2C), or the physical sciences (Phys-
ics 7A, 7B, 7C or Chemistry 2A, 2B, 2C). Create, refine, test and present viable ideas for new food products. Activities include trend monitoring, consumer research, idea generation, concept screening, and new product concept presentations. GE credit: ArtHum or SocSci | AH or SS, OL, WE.—I. (I.) Biltle-
kof

160. Food Product Development (4)
Lecture—1 hour; discussion—1 hour; laboratory—6 hours. Prerequisite: upper division standing with back-
ground course work in food science (course 50 or 100A), biological sciences (Biological Sciences 2A, 2B, 2C), or the physical sciences (Physics 7A, 7B, 7C or Chemistry 2A, 2B, 2C). Product imple-
mentation stage of food product development includ-
ing preliminary product description, prototype development, product testing, and formal presenta-
tion of a new product development. GE credit: SciEng | OL, SE, VL, —III. (III.)

190. Senior Seminar (1)
Seminar—1 hour. Prerequisite: senior standing or consent of instructor. Selection of topics and students on recent advances in food science and technology. Reports and discussions concerning oral and written presentations, literature sources and career opportunities. GE credit: SciEng | OL, SE, —II. (II.)

192. Internship for Advanced Undergraduates (1-12)
Internship—3.36 hours. Prerequisite: consent of instructor. Work experience on or off campus in the practical application of food science. (P/NP grading only.) GE credit: SE.

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.
Food Service Management

(Continued)


tion of food as an analytical tool and as a measure of consumer perception and acceptance. Advanced examination of the sensory and cognitive systems associated with the perception of flavor.—I. (I) O’Mahony

219. Biochemistry, Microbiology and Technology of cheeses of the World (4)

Lecture—4 hours. Prerequisite: course 119 and Biological Sciences 103 or course 100A, 123, Biological Sciences 103, Chemistry 1078, 1288 or consent of instructor. Restricted to graduate level students or senior undergraduate students with appropriate background in biochemistry and microbiology. Compositional and physico-chemical aspects of milk and their implications on cheesemaking; enzymatic, microbiological and physical aspects of cheesemaking; cheese as a biological composite; designing cheese quality attributes; cheese aging. Cheese from fresh and processed foods. Students will be required to read and critically evaluate flavor chemistry literature. [Same course as Viticulture and Enology 213].—II. (III) Ebeler, Heymann

227. Food Perception and the Chemical Senses (2)

Lecture—2 hours; laboratory—3 hours. Prerequisite: course 107 (may be taken concurrently) or consent of instructor. Basic principles of chemistry and biochemistry to in tissues and foods. Regulation of absorption, transport, and metabolism of lipids. Implications of dietary fats and supplements. Students will become familiar with basic principles of flavor chemistry, analysis, and formation in fresh and processed foods. Students will be required to read and critically evaluate flavor chemistry literature. [Same course as Viticulture and Enology 213].—II. (III) Geraghty

213. Flavor Chemistry of Foods and Beverages (3)

Lecture/discussion—3 hours. Prerequisite: Chemistry 88, Viticulture and Enology 123, Viticulture and Enology 123L, or course 103 or consent of instruc-

199. Special Study for Advanced Undergraduates (1-5)

(P/NP grading only) GE credit: SE.

Graduate

201. Food Chemistry and Biochemistry (4)

Lecture—4 hours. Prerequisite: undergraduate course in organic chemistry and biochemistry; undergraduate course in food chemistry is recom-

202. Chemical and Physical Changes in Food (4)

Lecture—3 hours; term paper. Prerequisite: Biological Sciences 103, Chemistry 1078. Fundamental principles of chemistry and physics are applied to a study of changes in water binding properties and activity, changes in proteins, nutrients, toxic constitu-

204. Advanced Food Microbiology (3)

Lecture—3 hours. Prerequisite: Biological Sciences 1C, 103, course 104 or a course in microbiology. Principles of and recent developments in food microbiology, including food pathogen virulence and detection, parameters of microbial growth in food, and the microbiology of food and beverage fermentations.—II. (II) Nilin

205. Industrial Microbiology (3)

Lecture—3 hours. Prerequisite: Biological Sciences 1A, 102, 103, Microbiology 130A-130B or Biological Sciences 101 recommended. Use of microorgan-

207. Advanced Sensory-Instrumental Analyses (3)

Lecture—2 hours; laboratory—3 hours. Prerequisite: course 107 and consent of instructor. Basic prin-

210. Proteins: Functional Activities and Interactions (3)

Lecture—3 hours. Prerequisite: Biological Sciences 103, Chemistry 1078, 1288. Chemistry of proteins as it pertains to research in food and nutrition. Relations between lipid structure and their physical properties

198. Directed Group Study (1-5)

(P/NP grading only)—Steinberg

199. Special Study for Advanced Undergraduates (1-5)

(P/NP grading only)—Steinberg

Food Service Management

(Continued)

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): Environ and Soci Sci; Div=Dominant Diversity; Wrt=Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; ACGH=American Cultures; DD=Dominant Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; VL=Visual; WC=World Cultures; WE=Writing Experience

192. Internship (1-12)

Internship—3.36 hours. Prerequisite: one upper divi-
sion course in Food Service Management and con-
sent of instructor. Work experience on or off campus in practical aspects of food service management, supervised by a faculty member. (P/NP grading only)—Steinberg

197. Tutoring in Food Service Management (1-2)

Discussion/laboratory—3 or 6 hours. Prerequisite: Dietetics or related major; completion of the Food Service Management course in which tutoring is done. Tutoring of students in food service management assistance with discussion groups or labora-
tory sections; weekly conference with instructor in charge of course; written evaluations. May be repeated if tutoring a different course. (P/NP grading only)—Steinberg

198. Directed Group Study (1-5)

(P/NP grading only)—Steinberg

199. Special Study for Advanced Undergraduates (1-5)

(P/NP grading only)—Steinberg

Food Service Management

(Continued)

199. Special Study for Advanced Undergraduates (1-5)

(P/NP grading only) GE credit: SE.

Graduate

201. Food Chemistry and Biochemistry (4)

Lecture—4 hours. Prerequisite: undergraduate courses in organic chemistry and biochemistry; undergraduate course in food chemistry is recom-

202. Chemical and Physical Changes in Food (4)

Lecture—3 hours; term paper. Prerequisite: Biological Sciences 103, Chemistry 1078. Fundamental principles of chemistry and physics are applied to a study of changes in water binding properties and activity, changes in proteins, nutrients, toxic constitu-

204. Advanced Food Microbiology (3)

Lecture—3 hours. Prerequisite: Biological Sciences 1C, 103, course 104 or a course in microbiology. Principles of and recent developments in food microbiology, including food pathogen virulence and detection, parameters of microbial growth in food, and the microbiology of food and beverage fermentations.—II. (II) Nilin

205. Industrial Microbiology (3)

Lecture—3 hours. Prerequisite: Biological Sciences 1A, 102, 103, Microbiology 130A-130B or Biological Sciences 101 recommended. Use of microorgan-

207. Advanced Sensory-Instrumental Analyses (3)

Lecture—2 hours; laboratory—3 hours. Prerequisite: course 107 and consent of instructor. Basic prin-

210. Proteins: Functional Activities and Interactions (3)

Lecture—3 hours. Prerequisite: Biological Sciences 103. The relationships of structure of proteins to their biological functions. Structural proteins, complexing proteins, and catalytic proteins in plant and animal materials and products.

211. Lipids: Chemistry and Nutrition (3)

Lecture—3 hours. Prerequisite: Biological Sciences 103, Chemistry 1078, 1288. Chemistry of lipids as it pertains to research in food and nutrition. Relations between lipid structure and their physical properties

in tissues and foods. Regulation of absorption, transport, and metabolism of lipids. Implications of dietary fats and supplements. Students will become familiar with basic principles of flavor chemistry, analysis, and formation in fresh and processed foods. Students will be required to read and critically evaluate flavor chemistry literature. [Same course as Viticulture and Enology 213].—II. (III) Geraghty

213. Flavor Chemistry of Foods and Beverages (3)

Lecture/discussion—3 hours. Prerequisite: Chemistry 88, Viticulture and Enology 123, Viticulture and Enology 123L, or course 103 or consent of instruc-

217. Advanced Food Sensory Science (3)

Lecture—3 hours. Prerequisite: course 107 (may be taken concurrently) or consent of instructor. Advanced study of the techniques and theory of the sensory measurement of food as an analytical tool and as a measure of consumer perception and acceptance. Advanced examination of the sensory and cognitive systems associated with the perception of food.—I. (I) O’Mahony

219. Biochemistry, Microbiology and Technology of Cheeses of the World (4)

Lecture—4 hours. Prerequisite: course 119 and Biological Sciences 103 or course 100A, 123, Biological Sciences 103, Chemistry 1078, 1288 or consent of instructor. Restricted to graduate level students or senior undergraduate students with appropriate background in biochemistry and microbiology. Compositional and physico-chemical aspects of milk and their implications on cheesemaking; enzymatic, microbiological and physical aspects of cheesemaking; cheese as a biological composite; designing cheese quality attributes; cheese aging. Cheese from fresh and processed foods. Students will be required to read and critically evaluate flavor chemistry literature. [Same course as Viticulture and Enology 213].—II. (III) Ebeler, Heymann

227. Food Perception and the Chemical Senses (2)

Lecture—2 hours; laboratory—3 hours. Prerequisite: course 107 (may be taken concurrently), or consent of instructor. Examination of the anatomy and physiology of the chemical senses (taste, smell, and the trigeminal senses) and how they are involved in the perception of food and food intake.—II. Guiraud

290. Seminar (1)

Seminar—1 hour. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III)

290C. Advanced Research Conference (1)

Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Critical presentation and evaluation of original research by graduate students. Planning of research programs and proposals. Discussion led by individual major instructors for their research group. (S/U grading only)—I, II, III. (I, II, III)

291. Advanced Food Science Seminar (1)

Seminar—1 hour. Prerequisite: completion of at least one quarter of course 290. Oral presentation of student’s original research, discussion, and critical evaluation. (S/U grading only)—I, II, III. (I, II, III)

298. Group Study (1-5)

(S/U grading only)

299. Research (1-12)

Prerequisite: graduate standing. (S/U grading only)

Professional

396. Teaching Assistant Training Practicum (1-4)

Prerequisite: graduate standing. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III)

Food Service Management

(Continued)
Forensic Science (A Graduate Group)

Robert H. Rice, Ph.D., Chairperson of the Group
Group Office, 1909 Galileo Ct., Suite B
Davis, CA 95618; 530-747-3922; http://forensicscience.ucdavis.edu

Faculty
Faculty members are listed on the website.

Graduate Study. The Forensic Science Graduate Group offers the degree of MS in Forensic Science. This program, offering a Plan I Thesis or a Plan II Capstone Project option, has two tracks, DNA or Criminalistics, enabling the student to take core courses emphasizing the physical or biological sciences. Each track requires the student to take eight to nine core courses, totaling 24-27 units, three units of seminar, and the appropriate number of elective/research units, depending on the selection of Plan I or Plan II, for a total of 54 units. Students can take courses outside their specializations, but they must complete the courses required for their own track. The FOR seminar course in the fall quarter is required for new students. The FOR spring seminar can be taken in any spring quarter before graduation. Students must also take one additional Seminar course in another department or program.

Preparation. Appropriate preparation is an under-graduate degree in physical or natural sciences engineering or a closely related field with a GPA of 3.00 or higher. Examples include Biochemistry, Chemistry, Molecular Biology, Biology, Genetics, and Environmental Toxicology. The student must have completed at least one year each of general chemistry, organic chemistry, general physics and math through calculus I.

Offered recommended courses include general biology, biochemistry, genetics and statistics.

Graduate Advisors. Ralph Aldredge (Mechanical and Aerospace Engineering), Youn Hsieh (Division of Textiles and Clothing), Christopher J. Hopkins (Forensic Science Graduate Program), Sree Kanthaswamy (Anthropology), Robert B. Kinsey (Entomology), Donald Land (Chemistry), Terence Murphy (Plant Biology), Ben Sacks (Population Health & Reproduction)/Canid Diversity and Conservation (Laboratory-Center for Veterinary Genetics), Bahram Ravani (Mechanical & Aeronautical Engineering), Moshe Rosenberg (Food Science and Technology), Matt Wood (Environmental Toxicology)

Courses in Forensic Science (FOR Graduate)

200. Fundamental Concepts in Forensic Science (3)
Lecture—2 hours; fieldwork—0.25 hours; lecture/ laboratory—0.25 hours; seminar—0.5 hours. Overview of forensic science. Problem solving strategies for problem solving, analytical tools, and professional and ethical considerations. —I. (Sensabaugh)

205. Microscopy and Microanalytical Methods in Forensic Science (3)
Lecture—2 hours; seminar—1 hour. Prerequisite: consent of instructor. Introduction to optical and electron microscopy. Transmission, diffraction, reflection and absorption; polarized light and polarization crystals, phase contrast, radiography, image recording, SEM analysis of gunshot residues, prints, glass, EDS, XRF analysis, signal-to-noise ratios, minimum detection limits, and statistics. Restricted to students enrolled in the M.S. in Forensic Science Program. As a minimum, year each of the following chemistry, organic chemistry, calculus, + physics. Offered in alternate years. —III. (van Berthemb)

210. Advanced Spectroscopy Methods in Forensic Science (3)
Lecture—3 hours. Restricted to Forensic Science Graduate program or consent of instructor. Discuss, evaluate and interpret advanced molecular spectra/structure, Infrared Spectroscopy, such as chemical applications of spectroscopic methods, vibrational, rotational spectra, electron spectra, photoelectron spectroscopy generated by various analytical instruments used in forensic science community. Offered in alternate years. —II. (Wood)

210. Personal Identification Methods in Forensic Science (3)
Lecture—2 hours. Prerequisite: restricted to students enrolled in the M.S. Forensic Science Program or consent of instructor. Methods for identifying individuals from evidence at a crime scene, suspects or victims, crime scene examination and analytical methods used to support such investigations. Topics include forensic anthropology and odontology, taxonomy, facial reconstruction/recognition; eyewitness identifications, biometric systems. —III. (Hopkins)

212. Scientific Evidence and Courtroom Testimony (3)
Lecture—2 hours; discussion—1 hours. Prerequisite: graduate students enrolled in the MS Forensic Science program or by consent of instructor. Explores the relationship between science and the criminal justice system. Admissibility of scientific testimony and documentary proof during the trial, concepts of relevancy, hearsay and opinion rule, examination of expert witnesses, impact of Kelley-Fry and Daubert decisions & court testimony. —II. (Harmon, Maucieri)

215. Forensic Fire and Arson Investigation (3)
Lecture—3 hours. Prerequisite: open only to students enrolled in the M.S. Forensic Science program or by consent of the Forensic Science Program Director. Principles and techniques of scientific investigation of fires and related crimes; offer peer-reviewed protocols for processing and analysis of scenes, discussion, collection, analysis of physical evidence, and describe the scientific method for decision-making in fire/arson investigation. Offered in alternate years. —III. (DeHart)

218. Technical Writing in Forensic Science (3)
Lecture—2 hours; extensive writing or discussion—1 hour. Prerequisite: consent of the instructor required for all students not enrolled in the Forensic Science graduate program. Restricted to graduate standing in the Forensic Science Program. How to write clearly, credible forensic science reports and scientific articles, that [a] serve the forensic system, (b) meet their readers’ varying needs and (c) reflect well on the author. —III. (Neumann)

220. Analysis of Toxicants (3)
Lecture—3 hours. Prerequisite: coursework in organic chemistry. Principles of microanalysis of toxicants. Theoretical considerations regarding separation, detection and quantitative determination of toxicants using chemical and instrumental techniques. (Same course as Environmental Toxicology 220.) —I. (Zhang)

221L. Forensic Science Analytical Instrumentation (2)
Lecture/discussion—1 hour; laboratory—3 hours. Methodology and instruments used for the analysis of substances of interest in the discipline of Forensic Science. Practical experience with modern instrumental techniques & methodologies used in the advanced forensic laboratory. Limited to students accepted in the Forensic Science Graduate program subject to the approval of the instructor if the student has the appropriate chemistry, calculus and physics courses required of students in the graduate forensic science program. Offered in alternate years. —II. (Land)

240. Homicide Crime Scene Investigation (3)
Lecture—3 hours; laboratory—3 hours. Processing and evaluating complex homicide scenes. Functions and activities of police agencies. Recognition, documentation, identification, and collection of evidence. —IV. (Land)


263. Forensic Computer Science Investigations (3)
Lecture—3 hours. Prerequisite: graduate student. Restricted to students in the Forensic Science Graduate program unless approved by the Forensic Science Program Director. Statistics that are used by the forensic scientist, their limitations/applications in presenting forensic science in such as areas such as DNA, STR results, trace evidence correlation, fingerprint statistics, population sampling and the Bayes method. Offered in alternate years. —II. (Peiser)

268. Statistics in Forensic Science (3)
Lecture—3 hours. Prerequisite: consent of instructor. Restricted to students enrolled in the M.S. Forensic Science Program or by consent of Forensic Science Program Director. Statistics that are used by the forensic scientist, their limitations/applications in presenting forensic science in such as areas such as DNA, STR results, trace evidence correlation, fingerprint statistics, population sampling and the Bayes method. Offered in alternate years. —II. (Land)

277. Forensic Genetics: Next Generation Techniques and Applications (3)
Lecture—3 hours. Prerequisite: undergraduate courses in fundamental and applied principles of: genetics, biochemistry, and molecular biology, or consent of instructor. Restricted to Forensic Science Graduate students (GFOR) or consent of instructor. Review organization/function of the human genome, recent developments, next generation sequencing techniques including preparation of DNA samples, principles of the new generation sequencing assay formats and biochemical reactions. Will include quality control parameter, and bioinformatic approaches. Offered in alternate years. —I. (Kanthaswamy)

278. Molecular Techniques (3)
Lecture—3 hours. Prerequisite: graduate standing or consent of instructor. Recombinant DNA technology and its applications. (Same course as Environmental Toxicology 278) Offered in alternate years.—I. (Denison, Rice)

280. Forensic DNA Analysis (3)
Lecture—3 hours. Prerequisite: coursework in genetics and molecular biology. Foundation in theory and practice of forensic DNA analysis; past, present, and emerging technologies, legal and quality assurance issues. DNA extraction, DNA quantitation, multiplex amplification of STR markers, fingerprinting, electrophoresis of amplified products, and analysis of STR typing data. (Same course as Environmental Toxicology 280.) —II. (Von Berndaligen)

281. Principles and Practice of Forensic Serology and DNA Analysis (3)
Lecture—2 hours; lecture/discussion—3 hours. Prerequisite: course/Environmental Toxicology 278 or course/Environmental Toxicology 280, or equivalent; consent of instructor. Restricted to students enrolled in the M.S. in Forensic Science Program or by consent of Forensic Science Program Director. Comprehensive overview of forensic serology and DNA typing techniques and technologies. Long emphasis on real-world applications, including preservation and tracking of biological evidence, detection and identification of bodily fluids, and methods to detect, quantify, and type human DNA. (Same course as Environmental Toxicology 281.)—II. (Rodzen)

283. Forensic Biology (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: consent of instructor. Restricted to students enrolled in the M.S. in Forensic Science Program or by consent of Forensic Science Program Director. Overview of the foundational concepts in forensic biology, chemical and molecular biology of biologi cal evidence, genetic basis of biological uniqueness, evolutionary basis of species differences, patterns and dynamics of evidence deterioration, and the legal professions considerations associated with biological evidence. —II. (Sensabaugh)

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE) Courses: Arts and Humanities; Science and Engineering; Social Sciences; Diversity and Domesticity; Writing Experience

Fall 2011 and on Revised General Education (GE) Courses: Arts and Humanities; Science and Engineering; Social Sciences; Diversity and Domesticity; Writing Experience

284. Non-Human Forensic DNA—Theory and Casework Application (2)

Lecture—2 hours. Prerequisite: consent of instructor required for all students not enrolled in the MS Forensics program; upper division Molecular Biology and Genetics or its equivalent. Restricted to graduate standing. Focus on comprehensive understanding of plant and animal forensic biology in terms of sample collection, preservation, analytical methods, and of the invaluable lines of inquiry these forensic evidence may permit. (Same course as Environmental Toxicology 284.) Offered in alternate years. —I. Kanthawamy

289. Survey in Forensic Science (3)

Lecture—3 hours. Analytical methods in contemporary forensic science. Clandestine laboratories in California, crime scene management, examination and analysis of human hair, forensic ballistics/trajectory reconstruction, shoe/tire print impressions, serial murder restoration, forensic aspects of alcohol impairment, bloodstain pattern interpretation, microscopy of building materials, biological aspect of forensic science. May be repeated for credit when topic differs. —I, II, III. Hopkins

290. Seminar in Forensic Science (1)

Seminar—3 hours. Students will be exposed to topical areas in Forensic Science by presentations conducted by expert guest speakers. The seminar will also serve as a medium whereby the exiting students will present the research conducted as part of their thesis requirement. May be repeated for credit when topic differs. Restricted to students enrolled in the M.S. Forensic Science Program. (S/U grading only)—I, II, III. Hopkins

290C. Graduate Research Conference in Forensic Science (1)

Independent study—1 hour. Individual and/or group conference on problems, progress and techniques in forensic science and research. May be repeated for credit when topic differs. (S/U grading only)—I, II, III. Hopkins

293. Forensic Science Research Methodology (2)

Lecture—1.5 hour; extensive writing or discussion—0.5 hours. Prerequisite: graduate students enrolled in the MS Forensic Science Program or by consent of instructor. Introduction to identification, formulation, and solution of meaningful scientific problems encountered in the Forensic Science area including experimental design and/or theoretical analysis of new and prevailing techniques, theories and hypotheses. Students will present and defend their thesis research/journal article proposals. Limited enrollment. (S/U grading only)—I, II, III. Kimsy

298. Group Study in Forensic Science (1-5)

(S/U grading only)

299. Research in Forensic Science (1-12)

Prerequisite: consent of instructor. (S/U grading only)

A.B. Major Requirements:

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparatory Subject Matter</td>
<td>15</td>
</tr>
<tr>
<td>Depth Subject Matter</td>
<td>4</td>
</tr>
<tr>
<td>Total Units for the Major</td>
<td>48-78</td>
</tr>
</tbody>
</table>

French

(College of Letters and Science)
Julia Simon, Ph.D., Chairperson of the Department
Department Office, 213 Sproul Hall
530-752-1219; http://french.ucdavis.edu

Faculty
Jeff Fort, Ph.D., Associate Professor
Claire Goldstein, Ph.D., Associate Professor
Noah Guynn, Ph.D., Associate Professor
Eric Ruesch, Associate Professor
Julia Simon, Ph.D., Professor Emeritus
Toby Warner, Ph.D., Assistant Professor

Emeriti Faculty
Claude Abraham, Ph.D., Professor Emeritus
Edward M. Bloomberg, Ph.D., Professor Emeritus
Simone Clay, Ph.D., Emeritus Lecturer
Gerald Herman, Ph.D., Senior Lecturer Emeritus

Margo R. Kaufman, M.A., Senior Lecturer Emerita
Manfred Kusche, Ph.D., Senior Lecturer Emeritus
(Comparative Literature, French and Italian)
Marshall Lindsay, Ph.D., Professor Emeritus
Maria I. Manoliu, Ph.D., Professor Emerita
Michèle Prager, Ph.D., Professor Emerita
Leslie Robic, Professor Emerita
(French and Italian, Women and Gender Studies)
Ruth B. York, Ph.D., Senior Lecturer Emerita

The Major Program

The major program assures proficiency in all four of the language skills—speaking, understanding, reading, and writing—and acquaints students with the intellectual and cultural contributions of the French-speaking world through the study of its literature, traditions, and institutions.

The Program. The department encourages its students to work closely with the academic adviser in designing their course to meet their interests and internships within the broad requirements prescribed by the program and to avail themselves of the guidance of an excellent teaching faculty. Each year, a substantial number of students with good preparation in French participate in the university's very popular Education Abroad Program, which maintains centers at four French universities.

Career Alternatives. Foreign language teachers, a cardiologist, a naval commander at the Pentagon, a professor of Political Science, lawyers, sales representatives, journalists, speech pathologist, a law professor, translators, a senior applications programmer, travel agents, independent business owners, a curator museum curators, nurses, financial managers, stock brokers, and an industrial attaché for a French Trade Commission, all graduated with a major in French from UC Davis and represent only a small fraction of the career choices documented in a recent survey of department graduates.

One French literature course from among the following: 101, 102, 103, 115, 116, 117A, 117B, 118A, 118B, 119A, 119B, 120, 121, 124, 125, 127, 128, 130, 133, 140, 141, 140, 160, 161, 162...


Two elective courses in French literature, language, or culture from among the following: 101, 102, 103, 104, 105, 106, 107, 108, 127, 128...


French 100...

Honors Program. Candidates for high or highest honors in French must write a senior thesis under the direction of a faculty member. For this purpose, honors candidates must enroll in French 194H (4 units) and French 195H (4 units). Normally, a student will undertake the honors project during the first two quarters of the senior year; other arrangements must be authorized by the department chair. Only students who, at the end of the junior year (135 units), have attained a cumulative grade-point average of 3.500 in courses required for the major will be eligible for the honors program. The requirements for earning high and highest honors in French are in addition to the regular requirements for the major in French.

Education Abroad Program. The department of French and Italian encourages students to study abroad in the Summer Abroad program, the Quarter Abroad Program, or the Education Abroad program. With the approval of a major adviser, applicable courses taken abroad may be accepted in the major or minor programs.

Teaching Credential Subject Representative. See the Teaching Credential/M.A. Program on page 115.

Graduate Study. The Department offers programs of study and research leading to the Ph.D. degree in French. Candidates for the Ph.D. have the option of enriching their degree program by preparing a designated emphasis in African American and African Studies, Critical Theory, Feminist Theory and Research, Classics and Classical Reception, Second Language Acquisition, or Studies in Performance and Practice. Detailed information may be obtained from the graduate adviser or the department chairperson.

Graduate Adviser. C. Goldstein

Prerequisite Credit. Credit will normally be given for a course if it is the prerequisite of a course already successfully completed. Exceptions can be made by the department chairperson only.

Courses in French (FRE)

Students offering high school language preparation as a prerequisite must take a placement test.

Course Placement. Students with two years of high school French normally take French 2, those with three years take French 3 and those with four years take French 21.

Major Adviser. J. Fort

Minor Program Requirements:

French

French 100...

French 1 A.

One French literature course from among the following: 101, 102, 103, 115, 116, 117A, 117B, 118A, 118B, 119A, 119B, 120, 121, 124, 125, 127, 128, 130, 140, 141, 140, 160, 161, 162...


French 100...

Quarter Offered: I-Fall; II-Winter; III-Spring; IV-Summer; 2015-2016 offering in parent program.

Pre-Fall 2011 General Education (GE): A:Art/Humanities; S:Science and Engineering; SS:Social Sciences; Div:Domestic Diversity; Wrt:Writing Experience

1A. Accelerated Intermediate Elementary French (15)
Lecture/discussion—15 hours. Prerequisite: placement exam required. Introduction to French grammar and development of all language skills in a cultural context with special emphasis on communication. Open only to students who have completed course 1. GE credit: ArtHum | AH, WC.—I, II, III. (I, II, III.) Simon

15. Elementary French (5)
Discussion—5 hours; laboratory—1 hour. Introduction to French grammar and development of all language skills in a cultural context with special emphasis on communication. Course is taught abroad. Open only to students who have completed course 1 or 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student’s P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed. Not open for credit to students who have completed course 1 or 1A. GE credit: ArtHum | AH, WC.—I. (I.)

2. Elementary French (5)
Discussion—5 hours; laboratory—1 hour. Prerequisite: course 1. Continuation of course 1. Not open for credit to students who have taken course 1A. GE credit: ArtHum | AH, WC.—I, II, III. IV. (I, II, III, IV.) Webb

3. Elementary French (5)
Discussion—5 hours; laboratory—1 hour. Prerequisite: course 2 or 2 or 3. Not open for credit to students who have taken course 1A. Continuation of course 2. GE credit: ArtHum | AH, WC.—I, II, III, IV. (I, II, III, IV.) Webb

21. Intermediate French (5)
Lecture/discussion—4 hours; laboratory—1 hour. Prerequisite: course 2A or 2A or 3A. Review of grammar and vocabulary acquired in the elementary sequence, as well as the study of new grammatical structures and a continuing enrichment of vocabulary through oral work in class, written exercises, readings and compositions. Not open for credit to students who have completed course 2A or 2A or 2A. GE credit: ArtHum | AH, OL, WC, WE.—I, II, II, II, III, III. Simon

22. Intermediate French (5)
Lecture/discussion—4 hours; laboratory—1 hour. Prerequisite: course 21 or 21 or 21S. Continuation of course 21 or 21 or 21S. Review of grammar and vocabulary, as well as the study of new grammatical structures and a continuing enrichment of vocabulary. Not open for credit to students who have completed course 22S. GE credit: ArtHum | AH, OL, WC, WE.—I, II, III, II, III, III. Simon

225. Intermediate French (5)
Lecture/discussion—4 hours; laboratory—1 hour. Prerequisite: course 21 or 21 or 21S. Continuation of course 21 or 21 or 21S. Review of grammar and vocabulary, as well as the study of new grammatical structures and a continuing enrichment of vocabulary. Not open for credit to students who have completed course 22S. GE credit: ArtHum | AH, OL, WC, WE.—I, II, III, II, III, III. Simon

50. French Film (4)
Lecture—1 hour; discussion—2 hours; term paper. Introduction to the tradition of French cinema from its invention by Melies and the Lumiere brothers through New Wave (especially the works of Truffaut and Godard) and more recent developments in French and Francophone film taught in English. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—II, III, III. Simon

51. Major Works of French Literature in Translation (4)
Lecture—2 hours; discussion—1 hour; term paper. Readings in English translation of key works of French and Francophone literature from the Middle Ages to the present. Particular attention is given to the long-standing interest of French writers in issues of social, regional, gender, sexual, and ethnic identity. GE credit: ArtHum, Div, Wrt | AH, WC, WE.—II, III, III, III. Fort, Guynn

52. France and the French-Speaking World (4)
Lecture—2 hours; discussion—1 hour; term paper. Taught in English. A survey of the history and culture of France and the French-speaking world, especially Canada, the Caribbean, and Africa. Study of social, cultural, and historical issues that occupy the French-speaking world, with particular attention to mass media. GE credit: ArtHum, Div, Wrt | AH, WC, WE.—III, III, III. Webb

53. French as a World Language (4)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Upper Division
Course 100 is the prerequisite for the majority of the upper division literature courses.

100. Composition in French (4)
Lecture—3 hours; term paper. Prerequisite: course 23. Introduction and practice in expository writing in French, with emphasis on organization, correct syntax, and vocabulary building. GE credit: ArtHum | AH, WC, WE.—II, II, III, III, III. Simon

101. Introduction to French Poetry (4)
Lecture—3 hours. Prerequisite: course 100 or consent of instructor. Analysis and evaluation of works representing the main types of French poetry. Study of French poetic conventions and versification. GE credit: ArtHum | AH, WC, WE.—II, II

102. Introduction to French Drama (4)
Lecture—3 hours. Prerequisite: course 100 or consent of instructor. Analysis and evaluation of plays representing the main types of French drama, with emphasis on dramatic structure and techniques. GE credit: ArtHum | AH, WC, WE.—II, II

103. Introduction to French Prose (4)
Lecture—3 hours; short papers. Prerequisite: course 100 or consent of instructor. Analysis and evaluation of works representing main types of French prose, with emphasis on narrative structure and techniques. GE credit: ArtHum | WC, WE.—III, III, Simon

104. Translation (4)
Lecture—3 hours; extensive writing. Prerequisite: course 100 or the equivalent. Practice in English-to-French and French-to-English translation using a variety of non-literary materials, illustrating different problems and styles. III, III. Russell Webb

105. Advanced French Grammar (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 23 or the equivalent. Understanding of and extensive practice with various grammatical structures in French. Lexical-semantic, morphological, and syntactic analysis. GE credit: Wrt.—II, Russell Webb

105S. Advanced French Grammar (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 23 or 23S. Understanding of, and extensive practice with, various grammatical structures in French. Lexical-semantic, morphological, and syntactic analysis. Taught abroad. Not open for credit to students who have taken course 105. GE credit: WE.—I. (I.)

106. French in Business and the Professions (4)
Lecture—1 hour; discussion—2 hours. Prerequisite: course 100 or consent of instructor. The French language as used in the commercial sphere. Emphasis on proper style and form in letter-writing, and in non-literary composition. Technical terminology in such diverse fields as government and world business. GE credit: WE.—I. (I.)

107. The Making of Modern France (4)
Lecture—3 hours, term paper. Prerequisite: course 100 or consent of instructor. Introduction to French culture through a historical approach to topics such as the citizen and the state (politics, justice, social security), the nation and centralization, the rise of public education, colonization, class and social relationships. Offered in alternate years. GE credit: ArtHum | WE.—II, II, Simon

107A. Pre and Early Modern France (4)
Lecture—3 hours, term paper. Prerequisite: course 100 or consent of instructor. Introduction to early modern French culture through a historical approach to topics such as the absolute monarchy, the role of the parlements, the French revolution, and the political regimes of the nineteenth century. Offered in alternate years. GE credit: ArtHum, Wrt.—I. (I.) Simon

107B. The Making of Modern France (4)
Lecture—3 hours, term paper. Prerequisite: course 100 or consent of instructor. Introduction to French culture through a historical approach to topics such as the nation-state, centralization of the monarchy, and the rise of public education, colonization, class and social relationships. Taught abroad. Not open for credit to students who have completed course 107. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE.—II, II, Simon

108. Modern French Culture (4)
Lecture—3 hours; extensive writing. Prerequisite: course 100 or consent of instructor. Survey of modern French culture from the Dreyfus affair to the present day. Topics may include women and French culture, decolonization and modernization, education, social welfare and immigration. GE credit: WE.—Simon

109. French Phonetics (4)
Lecture/discussion—3 hours; laboratory—1 hour. Prerequisite: course 23 or the equivalent. Introduction to the sound-inventory of French and practice in phonetic transcription, with a focus on ways in which phonetic contrasts signal grammatical contrasts, spoken forms and spelling, formal differences between the “Standard” and other varieties across the French-speaking world. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS.—III. Russell Webb

110. Stylistics and Creative Composition (4)
Lecture—3 hours; frequent papers. Prerequisite: course 100 or consent of instructor. Intensive course in creative composition using a variety of techniques
and literary styles, patterned on Queneau's Exercices de style. Practice in such stylistic modifications as its influences in tense, mood, modality, etc. The writing of poetry. GE credit: WC.—II. (II.)

115. Medieval French Literature and Society (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. Social and cultural life of medieval France as studied through its representation in such literary works as Chanson de Roland, courtly love lyric, Arthurian romances of Chrétien de Troyes, Aucassin et Nicolette, selected fabliaux and fables. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—I. Guynn

116. The French Renaissance (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. Overview of major works and writers with particular attention to the historical context of the turbulent 16th century. Writers to be read may include Rabelais, Marot, Ronsard, Du Bellay, Marguerite de Navarre, Montaigne, and D'Au- igne. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—I. (II.)

117A. Baroque and Preclassicism (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. The literature and intellectual culture of the period between the Renaissance and French classicism. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—II. (II.) Simon

117B. The Classical Moment (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. Literature, culture, and politics in the Age of Louis XIV. May be repeated one time for credit. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—II. (II.) Simon

118A. The Age of Reason and Revolution (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. History of the French roman from the Middle Ages to the Revolution with particular emphasis on the novels of the 18th century. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—III. (III.) Simon

118B. Private Lives and Public Secrets: The Early French Novel (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. History of the French roman from the Middle Ages to the Revolution with particular emphasis on the novels of the 18th century. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—II. (II.) Simon

119A. The Romantic Imaginary (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. Major concepts and themes of French romanticism, such as dream and the supernatural, isolation, love, eroticism, revolution, individuality, nature, the mal du siècle, Romantic irony, the creative imagination, the cult of ruin. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—II. (II.) Simon

119B. Realism, History and the Novel (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. Narrative and historical codes of French realist fiction, with emphasis on the representation of history in the realist novel, its depiction of social realities such as class and gender, and its relation to the historical situation of post-revolutionary society. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—II. (II.) Simon

119C. From Baudelaire to Surrealism (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. Study of the main poets and poetic movements from the mid-19th to the early 20th century, including Baudelaire, the Symbolists, and the Surrealists. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—I. (I.)

120. Modern French Thought (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. Overview of post-Second World War French intellectual currents from existentialism to structuralism and deconstruction. Readings will include Sartre and de Beauvoir, Camus, Lévi-Strauss, Lacan, Barthes, Foucault, Derrida, Kristeva, Sollies, Cixous, and Irigaray. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE.—I. (I.) Fort

121. Twentieth Century French Novel (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. Poets and theories of the novel, from Proust to the Nouveau Roman and beyond. Readings from among Gide, Sartre, de Beauvoir, Camus, Breton, Beckett, Robbe-Grillet, Sarrasite, Simon, Barthes, Duras, Tournier, Pèrec, Modiano, Guibert, Toussaint. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE.—II. (II.) Fort

122. French and Francophone Film (4)
Lecture/discussion—4 hours; extensive writing; fieldwork—3 hours. Prerequisite: course 100 or consent of instructor. Focus on the film from the Lumière Brothers to the present. Topics may include analysis of film form and narrative, major filmmakers and film trends, and film theory. May be repeated one time for credit. Offered in alternate years. GE credit: ArtHum | AH, VL, WC, WE.—II. (II.) Fort

124. Post-Colonialist and Francophone Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. Post-Independence Black African and/or Caribbean and/or African North literatures written in French. Selected topics include: identity and subjectivity in postcolonial, women's voices, languages and oral cultures, cultural syncretism, theories of postcolonialism. May be repeated one time for credit. Offered in alternate years. GE credit: ArtHum, Div | AH, VL, WC, WE.—II. (II.) Adejumobi

125. French Literature and Other Arts (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. Relationship between French literature and other arts: painting, music, cinema, architecture, opera—from different periods. May be repeated one time for credit when topic differs. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—I. (I.) Simon

125B. French Literature and Other Arts (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. Relationship between French literature and other arts, such as painting, music, cinema, architecture, opera, from different periods. Taught abroad. May be repeated one time for credit when topic differs. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—II. (II.) Simon

127. Paris: Modernity and Metropolitan Culture (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100. Representation of Paris in 19th and 20th century texts and its importance in defining the experience of French and Francophone culture. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE.—I. (I.) Simon

128. Topics in French Culture (4)
Lecture—3 hours; extensive writing. Prerequisite: course 100 or consent of instructor. In-depth study of a particular topic in French culture. May include the Court of Louis XIV, the French Revolution and Immigration. May be repeated one time for credit when topic differs. Offered in alternate years. GE credit: ArtHum | AH, VL, WC, WE.—II. (II.) Simon

140. Study of a Major Writer (4)
Lecture—3 hours; term paper. Prerequisite: course 100; consent of instructor. Concentrated study of works of a single author. May be repeated one time for credit if subject matter changes. GE credit: ArtHum | AH, WC, WE.—II. (II.)

141. Selected Topics in French Literature (4)
Lecture—3 hours; term paper. Prerequisite: course 100; consent of instructor. Subjects and themes such as satiric and didactic poetry of the Middle Ages, poetry of the Pléiade, theater of the eighteenth century, pre-romantic poetry, autobiography, literature and film, etc. May be repeated two times for credit when topic differs. GE credit: ArtHum | AH, WC, WE.—II. (II.)

141B. Topics in French Literature (4)
Lecture—3 hours; term paper. Prerequisite: course 100; consent of instructor. Subjects and themes such as satiric and didactic poetry of the Middle Ages, poetry of the Pléiade, theater of the eighteenth century, pre-romantic poetry, autobiography, literature and film, etc. Taught abroad. May be repeated two times for credit when topic differs. GE credit: ArtHum | AH, WC, WE.—II. (II.)

150. Linguistic Study of French-Sound and Form (4)
Seminar—3 hours; term paper. Prerequisite: course 109 and Linguistics 1, or consent of instructor. Introduction to the linguistic study of modern French, with focus on sound structure and form, inflection and derivation. GE credit: ArtHum or SocSci | AH or SS, WE.—II. (II.) Simon

161. Linguistic Study of French—Form and Meaning (4)
Seminar—3 hours; term paper. Prerequisite: course 104, 105, 160, 162 and Linguistics 1, or permission of instructor. Applied linguistic study of modern French, with focus on sentence construction and constituency, meaning and discourse functions. GE credit: ArtHum or SocSci | AH or SS, WE.—III. (III.) Russell Webb

162. History of the French Language (4)
Lecture—3 hours; term paper. Prerequisite: one from course 105, 109, 160, or 161; Linguistics 1 or consent of instructor. Major periods in development of the French language, from Latin to contemporary popular aspects, with emphasis on relationship between socio-cultural patterns and evolution of the language. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS, WC, WE.—II. (II.) Russell Webb

192. Internship (1-12)
Internship—3.5-6 hours; term paper. Prerequisite: upper division standing and consent of instructor. Practical application of the French language through work experience in government and/or business, culminating in an analytical term paper on a topic approved by the sponsoring instructor. (Fall/ Winter grading only.)

194H. Special Study for Honors Students (4)
Independent study—4 hours. Prerequisite: open only to French majors of senior standing who qualify for honors program. Guided topical research, under the direction of a faculty member, leading to a senior honors
thesis on a topic in French literature, civilization, or language studies. (P/NP grading only.) GE credit: AH, WC, WE.

195H. Honors Thesis (4)
Independent study—4 hours. Prerequisite: course 194H. Writing of an honors thesis on a topic in French literature, civilization, or language studies under the direction of a faculty member. (P/NP grading only.) GE credit: AH, WC, WE—(I, II, III, (I, II, III.)

197T. Tutoring in French (1-4)
Seminar—1-2 hours; laboratory—1-2 hours. Prerequisite: upper division standing and consent of Chairperson. Tutoring in undergraduate courses including leadership in small voluntary discussion groups affiliated with departmental courses. May be repeated for credit for a total of 6 units. (P/NP grading only.)

197C. Tutoring in the Community (2-4)
Seminar—1-2 hours; laboratory—1-2 hours. Prerequisite: upper division standing and consent of Chairperson. Tutoring in public schools under the guidance of a departmental faculty member. May be repeated for credit for a total of 6 units. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

198S. Directed Group Study II (1-5)
Group study on focused topics in French literature and culture. May be repeated for credit. (P/NP grading only.)—II. (III.)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only)

Graduate

200. Introduction to Graduate Study in French (2)
Seminar—2 hours. Prerequisite: graduate standing. An introduction to a range of methodologies and critical practices in the field of French Studies, including literature, culture, and linguistics. The course will cover basic principles of bibliographic research in the humanities. (S/U grading only.)—I. (I.)

201. History of French (4)
Seminar—3 hours, term paper. Presentation of the main changes in the grammatical structures of French, from Latin to contemporary usage, involving textual analysis and sociolinguistic description.—I. (I.) Guynn, Russell Webb

202. Topics in French Civilization (4)
Seminar—3 hours, term paper. Prerequisite: graduate standing. Interdisciplinary approach to the study of French and Francophone civilization from the Middle Ages to the present. Course content will vary by instructor. May be repeated for credit.—(I.) Simon

204. Topics in Medieval Literature (4)
Seminar—3 hours; term paper. Study of Medieval French literature, focusing on a particular period, milieu, literary genre, or theoretical approach. May be repeated for credit when topic differs.—I. (I.) Guynn

205A. Sixteenth-Century Literature: The Humanists (4)
Seminar—3 hours. French humanism in its most varied forms. Although at different times Rabelais and Montaigne will be primarily studied, other leading intellectuals and religious writers will also receive attention. May be repeated for credit when different topic is studied.—I. (I.)

206A. Seventeenth-Century Literature: Theater (4)
Seminar—3 hours. Works of Corneille, Racine, Molière, and minor dramatists. One or more authors may be covered. May be repeated for credit with consent of instructor when different topics are studied.—I. (II.) Guynn

206B. Seventeenth-Century Literature: Prose (4)
Seminar—3 hours; term paper and/or exposé. Works of authors such as Pascal, Descartes, Mme de Lafayette. One or more authors may be covered. May be repeated for credit with consent of instructor when different topics are studied from quarter to quarter.—I. (I.)

206C. Seventeenth-Century Literature: Poetry (4)
Seminar—3 hours; term paper and/or exposé. Studies of the works of one or more poets of the period. May be repeated for credit with consent of instructor.—II. (III.)

207A. Eighteenth-Century Literature: Philosophies (4)
Seminar—3 hours; term paper. Not a course in philosophy, but an examination of the role of philosophy in the design and context of literary works. Study of one or more authors. May be repeated for credit.—II. (II.) Simon

207B. Eighteenth-Century Literature: Novel (4)
Seminar—3 hours. Rise of the novel. Study of narrative experiments in the context of the philosophical climate and new literary values. Course may treat one or more novelists of the period. May be repeated for credit when different topics are studied.—I. (I.)

208A. Nineteenth-Century Literature: Fiction (4)
Seminar—3 hours. Study of the works of one or several novelists and/or short-story writers of the period. May be repeated for credit with consent of instructor when different topics are studied.—I. (I.)

208B. Nineteenth-Century Literature: Poetry (4)
Seminar—3 hours. Study of the works of one or several poets of the period. May be repeated for credit with consent of instructor when different topics are studied.—III. (III.)

209A. Twentieth-Century: Prose (4)
Seminar—3 hours; term paper. Study of the works of one or several novelists of the period.—II. (II.) Fort

209B. Twentieth-Century: Theater (4)
Seminar—3 hours; term paper. Study of the works of one or several dramatists of the period. May be repeated for credit with consent of instructor.—II. (II.) Fort

209C. Twentieth-Century: Poetry (4)
Seminar—3 hours; term paper. Study of the works of one or several poets of the period. May be repeated for credit with consent of instructor.—II. (II.)

210. Studies in Narrative Fiction (4)
Seminar—3 hours. May be repeated for credit with consent of instructor when different topic is studied.—I. (I.)

211. Studies in Criticism (4)
Seminar—3 hours. May be repeated for credit with consent of instructor when different topic is studied.—II. (II.)

212. Studies in the Theater (4)
Seminar—3 hours. May be repeated for credit with consent of instructor when different topic is studied.—I. (I.)

213. Studies in Poetry (4)
Seminar—3 hours. May be repeated for credit with consent of instructor when different topic is studied.—I. (I.)

214. Study of a Literary Movement (4)
Seminar—3 hours. May be repeated for credit with consent of instructor when different topic is studied.—III. (III.)

215. Topics in French and Francophone Film (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing. Aspects of French and Francophone film from the Lumière Brothers through the present. Topics may include a specific historical period of filmmaking, film theories and the analysis of film form and narrative, and major filmmakers and filmic traditions. May be repeated two times for credit.—III. (III.)

224. Francophone Literatures (4)
Seminar—3 hours; term paper. Study of cultural productions (literature, film, visual arts) by Francophone peoples such as found in North Africa, West Africa, the Caribbean, South-East Asia, the Americas, and Metropolitan France. May be repeated for credit when topic differs and with consent of instructor.—Adjemunobi

250A. French Linguistics I (4)
Seminar—3 hours; term paper. Theoretical approach to the forms and functions of French, with emphasis on phonology and morphology. Overview of current linguistic theories and their application to French. Offered in alternate years.—II. (I.) Russell Webb

250B. French Linguistics II (4)
Seminar—3 hours; term paper. Theoretical approach to the forms and functions of French, with emphasis on syntax and semantics. Overview of current linguistic theories and their application to French. Offered in alternate years.—II. (I.) Russell Webb

251. Topics in the Linguistic Study of French (4)
Seminar—3 hours; project. Overview of approaches to university-level foreign language instruction and the pedagogical notions underlying current trends in classroom practices across commonly taught foreign languages. (Same course as German 291 and Spanish 291.)—I, II. (II.)

297. Individual Study (1-5)
(S/U grading only)

298. Group Study (1-5)
Seminar—1-5 hours. May be repeated for credit with consent of instructor.

299. Research (1-12)
(S/U grading only)

300. Dissertation Research (1-12)
(S/U grading only)

Professional

300. Teaching of a Modern Foreign Language (3)
Lecture/discussion—3 hours. Prerequisite: senior or graduate standing; a major or minor in a modern foreign language.—III. (III.)

300A. The Teaching of French in College (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing or consent of instructor. Course designed for graduate teaching assistants with emphasis on problems and procedures encountered by teachers of lower division classes at the university. May be repeated for credit with consent of instructor. (S/U grading only.)—I. (I.) Russell Webb

300B. The Teaching of French in College (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing or consent of instructor. Course designed for graduate teaching assistants with emphasis on problems and procedures encountered by teachers of lower division classes at the university. May be repeated for credit with consent of instructor. (S/U grading only.)—I. (I.)

306. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III. (I, II, III.)
Fungal Biology and Ecology

(College of Agricultural and Environmental Sciences)

The minor in Fungal Biology and Ecology is open to all students interested in a concentrated exposure to and knowledge of fungi and allied organisms. The minor is sponsored by the Plant Pathology Department.

Minor Program Requirements:

Fungal Biology and Ecology ............... 18-20

Plant Pathology 130, 148, 150 ............... 10
Select 7.9 units from Food Science and Technology 104, Plant Pathology 40, 135, 185, Science and Society 30, Soil Science 111; Plant Pathology 224 (available to advanced students with consent of instructor) ........................................ 7.9

Minor Adviser. T. Gordon

Genetics

See Molecular and Cellular Biology, on page 430; and Integrative Genetics and Genomics (A Graduate Group), on page 352.

Geographic Information Systems

(College of Agricultural and Environmental Sciences)

The Department of Biological and Agricultural Engineering offers a minor in Geographic Information Systems with an emphasis on spatial analysis. This minor is ideal for students interested in information processing of spatial data related to remote sensing, land information systems, marine cartography, thematic mapping, surface modeling, environmental modeling resources management, public utility planning, emergency response, geomarketing, geotechnology, precision agriculture, archaeology, military exercises, and computer-aided design. Prerequisites include Mathematics 16A-16B, Statistics 13 or Plant Sciences 120 or Civil and Environmental Engineering 114, and Plant Sciences 21 or Computer Science Engineering 15.

Minor Program Requirements:

Geographic Information Systems .......... 18

Applied Biological Systems Technology/Landscape Architecture 150, Applied Biological Systems Technology 181N or 182, Environmental Science & Management 186, 186L ............................................. 13
Select five or more units from: Applied Biological Systems Technology/Hydrologic Science 181N or 182 Environmental Science & Management 108, 185 Environmental Science and Policy 168A, 168B, 171, 179 .................................................. 5

Minor Adviser. S. K. Upadhyaya and S.G. Vougioukas (Biological and Agricultural Engineering Department)

Geographic Studies

(College of Agricultural and Environmental Sciences)

The interdepartmental minor in Geographic Studies is defined by students in conjunction with their major program. Students must have completed at least one year of college-level geography and must have the approval of the minor’s advisor. Students must complete a minimum of 30 units, with at least 12 units at the 100 level or above. The minor is sponsored by the Department of Environmental Design.

Minor Program Requirements:

Geography (A Graduate Group), below.

Geography

(A Group Graduate)

See Geography (A Graduate Group), below.

Geography

(A Graduate Group)

Chris Benner, Ph.D., Chairperson of the Group
Group Office. Carrie Armstrong-Report, Student Affairs Officer, 133 Hunt Hall 530.752.4119, caruport@ucdavis.edu
http://geography.ucdavis.edu

Faculty

Gwen Arnold, Ph.D., Assistant Professor (Environmental Science and Policy)
Chris Benner, Ph.D., Associate Professor
Stephen Boucher, Ph.D., Associate Professor
(Marine and Environmental Economics)
Mary Cadena, Ph.D., Associate Professor (Plant Sciences)
Diana Davis, Ph.D., Associate Professor (History)
Adela de la Torre, Ph.D., Professor (Chicana/o Studies)
Natalia Deeb-Seikas, Ph.D., Associate Professor (Chicana/o Studies)
Patsy Ebanks-Obwens, M.L.A., Professor and Chair (Human Ecology)
Ryan Galt, Ph.D., Associate Professor (Human Ecology)
Steven Greco, Ph.D., Associate Professor (Human Ecology)
Luis Guarracino, Ph.D., Professor (Human Ecology)
Erin Hamilton, Ph.D., Assistant Professor (Sociology)
Susan Handy, Ph.D., Professor (Environmental Science and Policy)
Andrew Hargadon, Ph.D., Professor and Chair (Graduate School of Management)
Lynette Hart, Ph.D., Professor (Population Health and Reproduction)
Robert Hijmans, Ph.D., Associate Professor (Environmental Science and Policy)
Frank Hirtz, L.L.D., Ph.D., Sr. Lecturer SOE (Human Ecology)
Suad Joseph, Ph.D., Professor (Anthropology)
Carl Keen, Ph.D., Professor (Nutrition)
Martin Kenney, Ph.D., Professor (Environmental Health and Reproduction)
Jonathan London, Ph.D., Assistant Professor (Human Ecology)
Jeff D. Loux, Ph.D., Assistant Adjunct Professor (Human Ecology)

Minor Adviser. T. Gordon
Geography (A Graduate Group)

Nguyen Kien, Ph.D., Professor Emeritus (Anesthesiology)
F. Thomas Hyslop, Ph.D., Adjunct Professor Emeritus (Plant Sciences)
Dean MacCannell, Ph.D., Professor Emeritus (Human Ecology)
Heath Mossman, Ph.D., I.A., Professor Emeritus (Human Ecology)
E. Steve McNeil, M.L.A., Sr. Lecturer, SOE Emeritus
Landscape Architecture
Jay Mechling, Ph.D., Professor Emeritus (American Studies)
Patricia Mokhtarian, Ph.D., Professor Emeritus (Human Ecology)
Hugh Safford, Ph.D., Regional Ecologist/Lecturer (Human Ecology)
Patricia Mohktarian, Ph.D., Professor Emeritus (Human Ecology)
Eric Larsen, Ph.D., Associate Research Scientist (Public Service Research Program-JMIE)
Stefano Varese, Ph.D., Professor Emeritus (American Studies)
Geoffrey Wandeford-Smith, Ph.D., Associate Professor Emeritus (Human Ecology)
Miriam J. Wells, Ph.D., Professor Emeritus (Human Ecology)

Affiliated Faculty
Dave C. Campbell, Ph.D., Specialist in Cooperative Extension (Human Ecology)
Joyce Oudshoorn, Ph.D., Director (Public Service Research Program-JMIE)
Eric Larsen, Ph.D., Associate Research Scientist (Human Ecology)
Greg McPherson, Ph.D., Lecturer and Associate in the Agricultural Experiment Station
Lorene Oki, Ph.D., Associate Specialist in Cooperative Extension (Plant Sciences and Human Ecology)
Hugh Safford, Ph.D., Regional Ecologist/Lecturer WOS (Environmenal Science and Policy)
Kenneth Tate, Ph.D., Specialist in Cooperative Extension (Plant Sciences)
James Thorne, Ph.D. Research Scientist (Environmental Science and Policy)
Joshua Viers, Ph.D. Associate Research Scientist (John Muir Institute of the Environment)

Graduate Study. The Graduate Group in Geography (GGG) offers programs of study and research leading to the M.A. and Ph.D. degrees. Faculty and students share a common interest in spatial interaction between humans and the biophysical environment. The wide faculty interests attract a diverse set of students in such areas as biogeography, urban forestry and related natural science and engineering fields, as well as human geography and related social science fields. A number of faculty members use and teach geographic information systems, remote sensing, and related geographic techniques, and most have a strong orientation. The strengths of the Davis campus and its faculty enable the program to focus on important issues including people, place and power, community and regional identity, environmental interaction, agricultural sustainability, landscape architecture, environmental change, biogeography, natural resource management, and technological innovations in computing and use of geographic information systems. Students are mentored by faculty across the many colleges of the university.

Preparation. Most students considered for admission will have an undergraduate major in geography or a closely related field. Generally, a student without an undergraduate degree in geography will be required to complete the equivalent of a minor in geography, consisting of one course each in human geography, physical geography and geographic methods, plus any additional undergraduate course work required as background for the student’s research emphasis as determined by the student’s guidance committee.

Graduate Advisers. Chris Benner (Human Ecology), Ryan Galt (Human Ecology), Robert Hijmans (Environmental Science and Policy) and James Quinn (Environmental Science and Policy)

Courses in Geography (GEO)

Graduate
200AN. Geographical Concepts (4)
Lecture/discussion—3 hours; term paper. Prerequisite: graduate standing. This course introduces students to the methods and findings of geography. Students are introduced to the approaches and content of the discipline, including contemporary research questions. A brief overview of the history of geographic thought and practice is done at the beginning of the course. I, II, III
200BN. Theory & Practice of Geography (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing. Class size limited to 20. Development, application, and philosophical background of the theory in discipline of geography and geographical knowledge production. Similitudes and differences in theories employed in physical and human geography and cartography. Geographic contributions to interdisciplinary topics including biogeosciences, social sciences, and humanities. —II (II) Galt, Rios
200CN. Quantitative Geography (4)
Lecture—2 hours; laboratory—6 hours. Class size limited to 25. Prerequisites: a foundational understanding of quantitative approaches in spatial data analysis. Overview of different approaches used for inference, modeling, and prediction. Also learn how to write computer programs to implement these methods. —III (III) Hijmans
200DN. Socio-Spatial Analysis in Geography (4)
Lecture/discussion—4 hours. Class size limited to 25. Introduction to and overview of methodological approaches in social science analysis in interviews, and ethnographic fieldwork. Students develop a critical understanding of different methodological and theoretical approaches, and their appropriate applications in overall research design. —II (II) Benner, Ebanks-Owens
200E. Advanced Research Design in Geography (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing; courses 200AN, 200BN, 200CN, and 200DN. Class size limited to 15. Helps Ph.D. students develop their research question, design their research plan and complete a full dissertation research prospectus. —III (III) Hijmans
201. Sources and General Literature of Geography (4)
Discussion—4 hours. Prerequisite: graduate standing in geography; consent of instructor. Designed for students preparing original geography. May be repeated for credit in one or more of the following subfields: physical, cultural, economic, urban, historical, political, conservation, and regional geography.
210. Topics in Biogeography (3)
Lecture—2 hours; discussion—I hour. Prerequisite: Evolution and Ecology 147 or Wildlife, Fish, and Conservation Biology 156 (may be taken concurrently) or equivalent; consent of instructor. For undergraduates. Current topics in historical and ecological biogeography, including macroecology and aeroecology, GIS and remote sensing, phylogeography, vegetation geography, community and species geography. Systematics, climate change, and conservation will be addressed. Offered in alternate years.
211. Physical Geography Traditions and Methodology (3)
Lecture/discussion—2 hours; term paper. Prerequisite: Introductory course in physical geography. Graduate-level standing in geography or related discipline. Course Description: Discussion of the physical aspects of human geography, including key concepts and current research in climatology, geography, soils geography, biogeography, predict aspects of climate change, watershed science, and coastal studies. Research paradigms, programs, and methodologies as used by physical geographers will be discussed. May be repeated for credit. Offered in alternate years. —I
212. Water Resource Management (3)
Lecture—3 hours. Prerequisite: Civil and Environmental Engineering 114, 141, and 142; and Environmental Engineering 153 recommended. Engineering, institutional, economic, and social basis for managing local and regional water resources. Examples in the context of California’s water development and management. Uses of computer modeling to improve water management. (Same course as Civil and Environmental Engineering 267) I, II, III
214. Seminar in Geomorphological Evolution (3)
Seminar—2 hours. Prerequisite: Evolution and Ecology 100 or 101 or consent of instructor. Recent developments in theoretical and experimental biogeography, historical biogeography and related themes in systematics, the biology of colonizing species, and related topics. (Same course as Population Biology 296) [S/U grading only].—III (III) Shapiro
230. Citizenship, Democracy, & Public Space (4)
Seminar—4 hours. Prerequisite: graduate standing or consent of instructor. Introduction to seminal works in political theory, philosophy, and the social sciences that focus on citizenship and the public sphere; development of academic and critical understanding regarding restructuring of public space in a pluralistic and global culture; discussion of contemporary case studies. (Same course as Landscape Architecture 200) III, Rios
233. Physical Planning and Design (4)
Lecture—2 hours; discussion—2 hours. Limited to graduate students. Regulation, design, and development of the built landscape, planning and land development processes, zoning and subdivision regulation, site planning, urban design goals and methods, public participation strategies, creatively designing landscapes to meet community ecological goals. (Same course as Landscape Architecture 205) Offered irregularly.—Wheeler
236. Transportation Planning and Policy (4)
Lecture/discussion—I hour. Transportation planning process at the regional level, including the role of transportation regional planning and transportation planning, tools and techniques used in regional transportation planning, issues facing regional transportation planning agencies, pros and cons of policy and planning strategies. Students taking this course previously as Transportation Planning and Policy 289 cannot repeat it for credit. Taking other Transportation Planning and Policy 289 offerings does not preclude taking Transportation Planning and Policy 220 for credit. (Same course as Transportation Planning and Policy 220) Offered in alternate years. —III
240. Community Development Theory (4)
Lecture/discussion—4 hours. Introduction to theories of community development and different concepts of community, poverty, and development. Emphasis on building theory; linking applied development techniques to theory; evaluating development policy; and examining case studies of community development organizations and projects. (Same course as Community & Regional Development 240) —I, II
244. Political Ecology of Community Development (4)
Lecture—4 hours. Prerequisite: graduate standing. Community development from the perspective of geographical political ecology. Social and environmental outcomes of the dynamics of relationships between communities and land-based resources, and between social groups. Cases of community conservation and development in and industrialized countries. (Same course as Community and Regional Development 244) —II (II) Galt
245. The Political Economy of Urban and Regional Development (4)
Lecture—4 hours. Prerequisite: Community and Regional Development 157, 244, or the equivalent. The political and economic restructuring and national and state policies are mediated by competing social production of urban form; role of the state in uneven development; dynamics of urban growth and decline, regional development in California. (Same course as Community & Regional Development 245.) (I, II.) (I, II.) (III.)

246. The Political Economy of Transnational Migration (4)
Lecture—4 hours. Prerequisite: graduate standing. Theoretical perspectives and empirical research on social, cultural, political, and economic processes of transnational migration to the U.S. Discussion of conventional theories will precede contemporary comparative perspectives on class, race, ethnicity, citizenship, and the ethnic economy. (Same course as Community & Regional Development 246.)—II. (II.) Guarnizo

248. Social Policy, Welfare Theories and Communities (4)
Seminar—4 hours. Prerequisite: graduate standing. Theories and comparative histories of modern welfare states and social policy in relation to legal/normative, organizational, and administrative aspects. Application of theories to specific issues within the U.S. and California context. Not open for credit to students having completed Community & Regional Development 248A and 248B. (Same course as Community & Regional Development 248.) Offered in alternate years. (II.) Dubcovsky

252. Landscape and Power (4)
Seminar—4 hours. Prerequisite: graduate standing or consent of instructor. How various representations of landscape have historically worked as agents of cultural power. Course framework is interdisciplinary, including studies of landscape representation in literature, art, photography, cartography, cinema, and landscape architecture. (Same course as Landscape Architecture 260.)—I. (I.) Schenker

270. Experimental Design and Analysis (5)
Lecture—3 hours; discussion/laboratory—2 hours. Prerequisite: Plant Sciences 120 or equivalent. Introduction to the research process and statistical methods to plan, conduct and interpret experiments.—II. (II.) Dubcovsky

271. Applied Multivariate Modeling in Agricultural and Environmental Sciences (4)

279. Discrete Choice Analysis of Travel Demand (4)
Lecture—4 hours. Prerequisite: Civil and Environmental Engineering 114. Behavioral and statistical principles underlying the formulation and estimation of discrete choice models. Practical application of discrete choice models to characterization of choice behavior, hypothesis testing, and forecasting. Emphasis on case studies from the real world data sets. (Same course as Civil and Environmental Engineering 254.)—I. (I.) (II.) (III.)

280. Field Studies in Geography (3)
Lecture—1 hour; fieldwork—6 hours. Prerequisite: undergraduate or graduate coursework in geography and consent of instructor. A topic or subdiscipline of geography will form the theme for the course in any given offering, with a focus on current research on this topic, field methodologies, and data analysis in human and physical geography. May be repeated twice for credit. Limited enrollment.

281. Transportation Survey Methods (4)
Lecture—4 hours. Prerequisite: Statistics 13; Civil and Environmental Engineering 251 recommended. Description of a variety of surveys commonly used in transportation demand modeling, including travel and activity diaries, attitudinal, panel, computer, and stated-response surveys. Discussion of sampling, experimental design, and survey design issues. Analysis methods, including factor, discriminant and cluster analysis. Not open for credit to students who have taken Civil and Environmental Engineering 255. (Same course as Transportation Technology and Policy 200.)—II. (II.)

286. Selected Topics in Environmental Remote Sensing (3)
Discussion—2 hours; lecture—1 hour; project. Prerequisite: consent of instructor; Environmental and Resource Sciences 186 or equivalent required; Environmental and Resource Sciences 186 recommended. In-depth investigation of advanced topics in remote sensing, geospatial information science, cartography, and sensor design and theory. Not open for credit to students who have taken Civil and Environmental Engineering 255. (Same course as Hydrologic Science 266.) May be repeated for credit. Offered irregularly.—Ustin

290. Seminar in Geographic Information Systems (1-3)
Seminar—1-3 hours. Prerequisite: Graduate standing or consent of instructor. The seminar will focus on specific topical areas within geography, which will vary from quarter to quarter. Students will be expected to present an oral seminar on an aspect of the general topic under discussion. May be repeated six times for credit. (S/U grading only)—I, II, III; (I, II, III.)

291. Seminar in Cultural Geography (4)
Seminar—3 hours. Prerequisite: consent of instructor. Individual study of a cultural topic under discussion. May be repeated three times for credit. (S/U grading only)—I, II, III. (II, III.)

295. Seminar in Urban Geography (4)
Seminar—3 hours. Prerequisite: graduate standing. (I, II, III.)

297. Graduate Group in Geography Seminar (2-4)
Seminar—Discussion—1 hour; term paper. Prerequisite: admission to the Graduate Group in Geography. Prerequisite: consent of faculty mentor. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III.)

A.B. Major Requirements:

Geology

[College of Letters and Science]

The Major Programs

"Civilization exists by geological consent—subject to change without notice."—Will Durant

Geology is the study of the Earth, and in particular its history, structure, and the processes that have molded our planet and its biosphere. Geology involves the origin of continents and ocean basins, earthquakes and volcanoes, variations in global climate, and how these physical changes impact the evolution of life. All of these planetary processes are viewed through the prism of "deep time," a perspective unique to geologists and one that distinguishes geology from most of the other physical sciences.

A significant component of geology is oriented toward the interaction between humans and the Earth. This aspect includes the study of resources such as minerals, oil, and water; identification and mitigation of Earth hazards such as earthquakes, landslides, floods, and volcanic eruptions; identification and mitigation of geologic processes in the natural environment; and in-depth study of the ancient and modern climate change.

The Program.

Students interested in becoming professional geologists or continuing their geological studies at the graduate level should complete the Bachelor of Science degree program. The Bachelor of Arts program is for students interested in an interdisciplinary program of study, or who plan to go into precollege teaching. Both programs allow students to emphasize an aspect of the field of particular interest to them. The upper division electives are not restricted to geology courses but must be chosen to provide a relevant, coherent, and indepth program of study. Transfer students should have completed as much as possible of the preparatory subject matter listed below.

Internships and Career Alternatives.

In recent years, UC Davis geologists have been environmental and geotechnical consulting firms, with oil companies, research laboratories and government agencies also providing opportunities. Students graduating with a Bachelor’s degree may get entry-level positions in the private sector or they may go on to attain their teaching credentials to fill the growing need for science teachers at all precollege levels. A Master’s degree is the most versatile professional level degree, and a Ph.D. is generally required for research and academic positions. Internships are strongly encouraged for undergraduates and are generally expected. A Ph.D. degree is generally required for most geologists or continuing their geology programs. Application requirements, it is possible for students to complete significant portions of the Geology major at an international institution provided that the student consults with one of the undergraduate advisors ahead of time and plans a course of study abroad that will complement their coursework at Davis. In recent years, UC Davis Geology majors have spent their junior or senior years completing upper division coursework at EAP partner institutions in New Zealand, Ghana, Chile, and the United Kingdom.

A.B. Major Requirements:

UNITs

Preparatory Subject Matter..............40-43

Geology 3, 3L, 50, 50L 60..........13

Mathematics 16A-16B or 21A-21B 6-8

Chemistry 2A-2B 8-10

Physics 7A-7B 8

Statistics 13 or 13V or 32 or 100 3-4

Depth Subject Matter.................36


Additional upper division electives chosen from upper division courses in geography and geology 20

Upper division courses in related fields may satisfy this requirement, approved in advance by the major advisor—16

Total Units for the Major..............76-79

Recommended. Chemistry 100 or Hydrologic Science 134, Physics 7C.
B.S. Major Requirements:

Preparatory Subject Matter: 57-59

Geology 3, 3L, 50, 50L, 60, 62  15
Mathematics 21A-21B-21C  12
Chemistry 2A-2B  10

Select one of the following three options:

General Geology option:

Chemistry 2C or Geology 132 or Hydrologic Science 134  5-6
Mathematics 32 or 100  3-4
Physics 7A-7B-7C or 9A-9B-9C  12

Geology/Paleontology option:

Chemistry 2C or Geology 132 or Hydrologic Science 134  5-6
Mathematics 32 or 100  3-4
Physics 9A-9B  4

Quantitative/Geophysics option:

Mathematics 21D and 22A  7
Physics 9A-9B-9C  15

Depth Subject Matter: 52


Additional upper division elective chosen from Geology 130-194 courses (only one of GEL/EDU 181 or GEL/EDU 183 may be applied toward elective credit), Hydrologic Science 144 and related fields (approved in advance by major advisor). No more than three units upper division elective credit for Geology 115-120 courses.

Maximal upper division elective credit for Geology 192 or 194A-194B or 194HA-194HB  16

Total Units for the Major: 107-111

English Composition Requirement. It is recommended that all majors complete the English composition requirement (University Writing Program 101 or 102 or 104) before or concurrently with the following courses: Geology 101, 105, 108, 109L, 110, 110L.

Recommended. For the B.S. degree, one or more of the following courses are recommended for any of the options or to supplement the options as listed:

Note that Mathematics 22A is not a prerequisite to Physics 9C.

- Geochmistry/Petrolgy option: Mathematics 22A, Physics 9C, Hydrology 134 or Chemistry 2C or Chemistry 100 or Chemistry 110A or Geology 132.
- Quantitative/Geophysics option: Mathematics 22B, Science 32 or 100, Hydrology 134 or Chemistry 2C or Chemistry 100 or Geology 132.

Major Advisers. K.M. Cooper, R. Molani, M. E. Oskin

Minor Program Requirements:

Students majoring in Geology can acquire a minor in the related fields of Oceanography, Geophysics or Environmental Geology. The requirements for these minors are listed alphabetically in this Catalog.

Geology: 19-24

Select one of the four emphases below:

- General Geology emphasis: 19-20
- Geology 50 or 1 and 50L  5-6
- Geology 101, 107, 108, 109, 110
- Geology 116 or 134  3

Minor Advisers. Same as major advisors.

Geology 60 emphasis: 19-22

Geology 50 and 50L  5
Civil Engineering 171, 171L  5

Three courses from: Geology 134, 161, 162, Hydrologic Science 103, 144, 146, Soil Science 118, 120  9-12

Minor Advisers. Same as major advisors.

- Geochemistry emphasis: 19-22
- Geology 60 and either 146 or 148  7
- Geology 110A and 110B, or Materials Science and Engineering 130 and 134  6
- Hydrologic Science 102  6

Minor Advisers. Same as major advisors.

- Paleobiology emphasis: 20-21
- Geology 101, 107, 109  8
- Geology 141 or 144  8

At least nine additional units from:

- Anthropology 131, 152, Evolution and Ecology 100, 105, 107, 112, 119, 140, 149, Geology 109, 150C  8-9

Minor Advisers. R. Molani, G. Vermeij

Science Teaching Credential. Students who wish to become a teacher should consult an advisor in the Geosciences and Science Teaching Program (MAST, http://mast.ucdavis.edu) at their first opportunity in order to combine the prerequisites for a credential with General Education requirements. MAST also offers seminars that give participants required experience in elementary, middle school, and high school classrooms. Students hoping to teach Earth and Planetary Science may prepare by satisfying the requirements for the B.S. degree in Natural Science (http://naturalsciences.ucdavis.edu) or the A.B. degree in Geology (77-79 units) and 36 additional units of science as outlined below. Students may also prepare for the science credential by completing the B.S. degree in Geology (107-111 units) and an additional 24 units as indicated by the asterisks (*) below:

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences 2A-2B-2C*</td>
<td>15</td>
</tr>
<tr>
<td>Chemistry 2C</td>
<td>5</td>
</tr>
<tr>
<td>Physics 7C</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics 16C</td>
<td>4</td>
</tr>
<tr>
<td>Geology 36*</td>
<td>4</td>
</tr>
<tr>
<td>Geology 116N*</td>
<td>3</td>
</tr>
</tbody>
</table>

Teaching Credential Subject Representative. H.W. Day. See also the Teaching Credential/M.A. Program on page 299.

Graduate Study. The Department of Earth and Planetary Sciences offers a program of study and research leading to the M.S. and Ph.D. degrees. For information regarding graduate study in geology, address the Graduate Adviser, Department of Earth and Planetary Sciences.

Graduate Advisers. M.L. Billen, E.S. Cowgill, Q. Yin

Courses in Geology (GEL)

Lower Division

1. The Earth (4)

- Lecture: 3 hours; discussion—1 hour. Introduction to the study of the Earth. Earth’s physical and chemical structure; internal and surface processes that mold the Earth; geological hazards and resources. Not open for credit to students who have completed course 50. Only 2 units of credit to students who have completed course 2. GE credit: SciEng | SE, SL, WE—II, II, III, (II, III), Osger

2. The Blue Planet: Introduction to Earth Science (3)

- Lecture: 3 hours. Study of the solid and fluid earth and its place in the solar system. Holistic examination of how the solid earth interacts with the atmosphere, hydrosphere, biosphere, and extraterrestrial environment. Not open for credit to students who have completed course 50. Only 2 units of credit to students who have completed course 1. GE credit: SciEng | SE, SL—II, (I)

3G. The Blue Planet: Introduction to Earth Science Discussion (1)

- Discussion: 1 hour. Prerequisite: course 2 concurrently. Small group discussion and preparation of short papers for course 2. GE credit: SciEng, Wrt | SE—I, II

3. History of Life (3)

- Lecture: 3 hours. Prerequisite: course 1 recommended. The history of life during the three and one-half billion years from its origin to the present day. Origin of life and processes of evolution; how to visualize and understand living organisms and their fossil remains. GE credit: SciEng | SE—II, II

3G. History of Life: Discussion (1)

- Discussion: 1 hour. Prerequisite: course 3 concurrently. Small group discussion and preparation of short papers for course 3. GE credit: SciEng, Wrt | SE, WE—II, II

3L. History of Life Laboratory (1)

- Laboratory: 3 hours. Prerequisite: course 3 concurrently. Exercises in understanding fossils as the clues to interpreting ancient life, including their functional morphology, paleoecology, and evolution. GE credit: SciEng | SE—II, II

4. Evolution: Science and World View (3)

- Lecture: 2 hours; discussion—1 hour. Introduction to biological evolution. Emphasis on historical development, major lines of evidence and causes of evolution; relationships between evolution and Earth history; the impact of evolution thought on other disciplines. GE credit: SciEng | SE, SL, WE—I, II

10. Modern and Ancient Global Environmental Change (3)

- Lecture: 3 hours. Fundamental scientific concepts underlying issues such as global warming, pollution, and the future of nonsustainable resources presented in the context of anthropogenic processes as well as natural forcing of paleo-environmental change throughout Earth’s history. GE credit: SciEng | SE, SL, VL—III, (III), Montaño

12. Evolution and Paleobiology of Dinosaurs (2)

- Lecture: 2 hours. Introduction to evolutionary biology: paleontology, ecology and paleoecology, using dinosaurs as case studies. GE credit: SciEng | SE—II, (II)

16. The Oceans (3)

- Lecture: 3 hours. Introductory survey of the marine environment. Oceanic physical phenomena, chemical constituents and chemistry of water, geological history, the seas biota and human utilization of marine resources. Not open for credit to students who have taken course 116. GE credit: SciEng | SE, SL, WE—II, II, III, (II, III), Hill, Summer

16G. The Oceans: Discussion (2)

- Discussion/labatory—2 hours; term paper or discussion. Prerequisite: course 16 (concurrent). Scientific method applied to discovery of the processes, biota and history of the oceans. Group discussion and preparation of term paper. Not open for credit to students who have taken course 116. GE credit: SciEng, Wrt | SE, WE—II, II, III

17. Earthquakes and Other Earth Hazards (2)


18. Energy and the Environment (3)

- Lecture: 3 hours. Conventional and alternative energy resources and their environmental impacts. Basic principles, historical development, current
20. Geology of California (2)
Lecture—2 hours. The geologic history of California, the origin of rocks and the environment in which they were formed, the structure of the rocks and the interpretation of their structural history, mineral resources, and appreciation of the California landscape. GE credit: SciEng | SE, SL.—II. (II.) Cowgill

25. Geology of National Parks (3)
Lecture—3 hours. Appreciation of the geologic framework underlying the inherent beauty of U.S. National Parks. Interpretation of individual parks to geologic processes such as mountain building, volcanism, stream erosion, glacial action and landscape evolution. GE credit: SciEng | SE, SL, VL—I. (I.) Osleger

28. Astrobiology (3)
Lecture—3 hours. Origin, evolution and distribution of life in our solar system and the Universe. Detecting habitable worlds, Drake equations, necessities and implications for the philosophical pursuit of the search for life elsewhere. GE credit: SciEng | SE, SL.—I. (I.) Yin

30. Fractals, Chaos and Complexity (3)
Lecture/discussion—3 hours. Prerequisite: Mathematics 21A or 21B. Familiarity with the basic ideas of fractal geometry and chaos and complexity. Basic theory and applications with examples from physics, earth sciences, mathematics, population dynamics, ecology, history, economics, biology, computer science, art and architecture. Offered in alternate years. (Same course as Physics 30.) GE credit: SciEng | QL, QF, SE.—II. (II.) Rundle

32. Volcanoes (3)
Lecture—3 hours. Study of eruptions and eruptive products of volcanoes in shaping the planet's surface, influencing its environment, and providing essential human resources. GE credit: SciEng | SE, SL

36. The Solar System (4)
Lecture—3 hours; discussion—1 hour. Nature of the sun, moons, and planets determined by recent observations and unannounced exploration of the solar system. Comparison of terrestrial, lunar, and planetary geological processes. Search for life on other planets. Origin and evolution of the solar system. (Former course 131-31G.) GE credit: SciEng, Writ | VI, VE, WE.—II. (II.) Iller, Wiersum

50. Physical Geography (3)
Lecture—3 hours. Prerequisite: high school physics and chemistry. The Earth, its materials, its internal and external processes, its development through time by sea-floor spreading and global plate tectonics. Students with credit for course 1 or the equivalent may receive only 2 units for course 50. GE credit: SciEng | SE, SL, VL—I. (I.) Iller, I. Iller, Billen, Zercher, Sienel

52. Physical Geography Laboratory (2)
Laboratory—6 hours. Prerequisite: course 50 [preferably taken concurrently]. Introduction to classification and recognition of minerals and rocks and to interpretation of topographic and geologic maps and aerial photographs. Students with credit for course 1L or the equivalent may receive only 1 unit for course 50L. GE credit: SciEng | SE, SL—I. (I.) Illey, I. Iller, Billen, Lesher

60. Earth Materials: Introduction (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Chemistry 2A; Mathematics 16A or 21A; course 1 or 50L. Physical and chemical properties of rocks, minerals and other earth materials; structure and composition of rock-forming minerals; formation of minerals by precipitation from silicate liquids and aqueous fluids and by solid state transformations. GE credit: SciEng | SE—I. (I.) Day

62. Optical Mineralogy (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 60 (may be taken concurrently). High school physics is strongly recommended. Optical properties of inorganic crystals; techniques of mineral identification using the polarizing microscope; strategies for studying rocks in thin section. GE credit: SciEng | SE, VL—I. (I.) Day

81. Learning in Science and Mathematics (2)
Lecture/discussion—2 hours; field work—2 hours. Limited enrollment. Exploration of how students learn and develop understanding in science and mathematics classrooms. Introduction to case studies and interview techniques and their use in K-6 classrooms to illuminate student learning. (Same course as Education 81.) P/NP grading only. GE credit: SS, VI, WE.—I, II, III. (II, III.)

91. Geology of Campus Waterways (1)
Lecture/discussion—1 hour; fieldwork—1 hour. Research capabilities in the identification of surface geologic processes in waterways on campus including links among hydrologic, atmospheric, physical, and human processes; carbon cycling and interpreting processes from sediments; field research techniques; research project design and implementation; implications of results for society and environmental policy. May be repeated for credit three times. (P/NP grading only.) GE credit: SE.—I, II, III

92. Internship—(1-12)
Internship—3-36 hours. Prerequisite: consent of instructor; lower division standing. Work-learning experience on and off campus in all subject areas offered by the department. Internships supervised by a member of the faculty. May be repeated for credit up to 12 units. (P/NP grading only.) GE credit: SE.—II, III, (II, III)

98. Directed Group Study—(1-5)
Prerequisite: consent of instructor. May be repeated for credit. May be repeated for credit up to three times. (P/NP grading only.) GE credit: SE.—I, II, III

99. Special Study for Undergraduates—(1-5)
Prerequisite: consent of instructor; lower division standing. (P/NP grading only.) GE credit: SE.—I, II, III

101. Structural Geology (3)
Lecture—3 hours. Prerequisites: courses 50 and 50L, Physics 7A or 9A, Mathematics 16B or 21B, or consent of instructor. Study of processes and products of rock deformation. Introduction to structural geology through a survey of the forms and geometries of faults and folds, techniques of strain analysis, and continuum mechanics of rock deformation. GE credit: SciEng | SE—I, II, III. (II.) Cowgill, Oskin

101L. Structural Geology Lab (2)
Laboratory—6 hours; fieldwork—2 hours. Prerequisite: courses 50 and 50L, Physics 7A or 9A, and 101 (may be taken concurrently); or consent of instructor. Class size limited to 15 students per session. Laboratory exercises on the identification of structures and products of rock deformation. Introduction to the practice of structural geology through observations and analysis of rock deformation, including field measurement techniques and geologic mapping. GE credit: SciEng | SE, VL—I, II. (II.) Cowgill, Oskin

103. Field Geology (3)
Fieldwork and laboratory—9 hours; 7-8 days on weekends during quarter. Prerequisite: course 101L or consent of instructor; enrollment of pre-conference project and writing geological reports. Weekly classroom meetings devoted to preparation of maps, cross sections, stratigraphic sections, rock descriptions, and reports. GE credit: SciEng | SE, VL, WE—I, II, III. (II.) Cowgill

105. Earth Materials: Igneous Rocks (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 105, Mathematics 16A or 21A, Chemistry 2B (may be taken concurrently). Origins and occurrence of igneous rocks. Laboratory exercises emphasize the study of these rocks in hand specimen and thin section. GE credit: SciEng, Writ | VI, VE, WE—I, II. (II.) Cooper, Lesher

106. Earth Materials: Metamorphic Rocks (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 105, Chemistry 2B, Mathematics 16A or 21A. Physical and chemical properties of metamorphic rocks; interpretation of metamorphic environments. Laboratory exercises emphasize the study of these rocks in hand specimen and thin section. GE credit: SciEng, Writ | VI, WE—I, II. (II.) Carlston, Matano

107L. Earth History: Paleobiology Laboratory (2)
Laboratory—6 hours. Prerequisite: courses 3-3L or Biological Sciences 11B; course 107 (may be taken concurrently). Exercises in determining the ecological functions and evolution of individuals, populations, and communities of fossil organisms in field and laboratory. GE credit: SciEng | SE.—III. (III.) Carlson, Matano

108. Earth History: Paleoclimates (3)
Lecture—3 hours. Prerequisite: course 1 or Geology/Environmental Science and Policy 26; and Chemistry 2A; or consent of instructor. Geological and environmental factors controlling climate change, the greenhouse effect with a detailed analysis of the history of Earth's climate fluctuations over the last 600 million years. Past and present climate records are used to examine potential future climatic scenarios. GE credit: SciEng, Writ | VI, SL, WE.—I, II, III. (III.) Spera, Montezino

109. Earth History: Sediments and Stratata (2)
Lecture—2 hours. Prerequisite: courses 50-50L. Principles of stratigraphic and sedimentologic analysis. Evaluation of historical and modern global changes in sedimentation within terrestrial and marine environments. Examination of the plate tectonic, climatic and oceanographic factors controlling the distribution and exploitation of economic fluids within sedimentary rocks. GE credit: SciEng | SE—I, II. (II.) Summer

109L. Earth History: Sediments and Stratata Laboratory (2)
Laboratory—6 hours (includes four 1-day field trips). Prerequisite: course 109 (may be taken concurrently). Methods of stratigraphic and sedimentologic analysis of modern and ancient sediments. Identification of major sediment and sedimentary rock types. Outcrop and subsurface mapping of sedimentary basins. GE credit: SciEng, Writ | VI, VE, WE.—II. (II.) Summer

110. Summer Field Geology (8)
Fieldwork—8 hours/day, 6 days/week for six weeks. Prerequisite: course 105 recommended. Advanced application of geologic and geophysical field methods to the study of rocks. Includes development and interpretation of geologic maps and cross sections, paleomagnetic, electrical resistivity and seismic surveys; and field analysis of plutonic and volcanic rock suites. GE credit: SciEng, Writ | VI, VE, WE.—IV (IV) McClain, Oskin, Cowgill

115. Earth Science, History, and People (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing; course 1. Study of interplay between the Earth and its human inhabitants through history, including consideration of ancient events such as earthquakes and eruptions as well as the geology of resources, topography, and water. GE credit: SciEng or SocSci, Writ | VI, OL, SE, WE.—II. (II.) Verosub
138. Introductory Volcanology (4)
Lecture—2 hours; fieldwork—6 hours. Prerequisite: upper division standing, course 60 and 109 or the equivalent, or consent of instructor. Principles of physical and chemical volcanology. Taught in a vol-
canically active setting (e.g., Hawaii) with a strong field component. GE credit: SciEng | SE—II. (III) Zierenberg
139. Rivers: Form, Function and Management (4)
Lecture—2 hours; fieldwork—3 hours. Prerequisite: courses 50, 50L, or equivalent; Mathematics 16B or 21B, or equivalent; course 116/Environmental Science and Policy 116; Mathematics 21D; Chemistry 2C or upper division standing, course 60 and 109 or the equivalent. Morphology, systematics, evolution, and direct use applications. Includes one day field trip on a weekend during the quarter. GE credit: SciEng | QL, SE—II. (III) Yin
140. Introduction to Process Geomorphology (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 1 or 50 or equivalent; Mathematics 16B or 21B, or equivalent. Qualitative description and interpretation of landscapes with emphasis on the relationships between physical processes, mass conservation, and landform evolution. Topics covered include physical and chemical weathering, hillslopes, debris flows, fluvial systems, alluvial fans, pedogenesis, eolian transport, glacial and Quaternary geochronology. Offered in alternate years. GE credit: SciEng | SE—II. (III) Motani
141. Evolutionary History of Vertebrates (3)
Lecture—2 hours. Prerequisite: course 141 (may be taken concurrently). Augments lecture course 141 through handling of specimens enabling in-person examination of three dimensional features observed in vertebrate skeletons, both fossil and living. Offered in alternate years. GE credit: SciEng | SE—II. (II) Motani
142. Basin Analysis (3)
Laboratory—2 hours; lecture—3 hours. Prerequisite: courses 50, 50L, and 109. Analysis of sedimentary basins from the identification of controls on sedimentary fill, subsidence analysis, sequence stratigraphy, core logs, and applications to petroleum exploration and hydrology. One two-day field trip. Offered in alternate years. GE credit: SciEng | SE, VL—II. (III) Summer
143. Advanced Igneous Petrology (5)
Lecture—3 hours; laboratory—6 hours. Prerequisite: course 105, Mathematics 16C or 21C, Chemistry 2C, or equivalent and chemical properties of magmatic environments and processes of igneous rock forma-
tion. Laboratory study of representative igneous rocks. GE credit: SciEng, WRT—II. (II) Cooper, Lesher
144. History of Geology (3)
Lecture—3 hours. Prerequisite: upper division course in environmental science or ecology, or an introduc-
tory course in paleobiology. Ancient ecosystems and the factors that caused them to change. Species, expansion and contraction of life forms, and geological caused variations in resource supply, and extinction provide historical perspective on the bio-
sphere of future. GE credit: SciEng | SE, WE—II. (II) Verneuil
145. Advanced Metamorphic Petrology (5)
Lecture—3 hours; laboratory—6 hours. Prerequisite: course 106, Hydrologic Science 134 or Chemistry 2C, Mathematics 16C or 21C. Metamorphic processes and the origin of metamorphic rocks. Labora-
tory study of representative rock suites. Offered in alternate years. GE credit: SciEng, WRT | SE—Day
146. Radiogenic Isotope Geochemistry and Cosmochemistry (3)
Lecture—3 hours. Prerequisite: Chemistry 2C, Phys-
ics 7C, and Mathematics 16C. Basic principles of nuclear chemistry and physics applied to geology to determine the ages of terrestrial rocks, meteorites, and other solar system objects, the age of the Earth, to trace geo-
logical/environmental processes, and the formation of the chemical elements in the Universe. Offered in alternate years. GE credit: SciEng | QL, SE—II. (III) Zierenberg
147. Geology of Ore Deposits (3)
Lecture—3 hours; laboratory—3 hours; optional one-weekend field trip. Prerequisite: Chemistry 2C or Hydrologic Science 134, courses 60, 62, and 105. Tectonic, lithologic and geochronological setting of major metallic ore deposits emphasizing ore deposit genesis, water/rock interaction and the envi-
ronmental effects of mining. Offered in alternate years. GE credit: SciEng | QL, SE—II. (II) Zierenberg
149. Geothermal Systems (3)
Lecture—2 hours; fieldwork. Prerequisite: courses 50 and 50L, Chemistry 2B or consent of instructor. Geophysical, geochemistry, and geochronology of geothermal systems, including electrical power generation and direct use applications. Includes one day field trip on a weekend during the quarter. GE credit: SciEng | QL, SE—II. (II) (III) Yin
150A. Physical and Chemical Oceanography (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 116/Environmental Science and Policy 116, Physics 9B; Mathematics 21D; Chemistry 2C or upper division standing in a natural science and con-
sent of instructor. Physical and chemical properties of seawater, fluid dynamics, air-sea interaction, cur-
rrents, waves, tides, mixing, major oceanic chem-
ical cycles. (Same course as Environmental Science and Policy 150A.) GE credit: SciEng | QL, SE—II. (II) (III) Yin
151C. Biological Oceanography (3)
Lecture—3 hours. Prerequisite: course 50 or 116. Introduction to the origin and geologic evolution of ocean compositions. Structure and composition of oceanic crust, marine volcanism, and deposition of marine sediments. Interpretation and explanation of the history of the ocean floor in terms of sea-floor spreading theory. (Same course as Environmental Science and Policy 150B.) GE credit: SciEng | SE—II. (II) (III) Yin
152. Paleobiology of Protista (4)
Lecture—2 hours; laboratory—2 hours. Prerequisite: courses 107 or Biological Sciences 1A or consent of instructor. Morphology, physiology, and ecology of single-celled organisms that are pre-
served in the fossil record. Offered in alternate years. GE credit: SciEng | SE—II. (III) (IV) Hu
153. Hydrogeology and Contaminant Transport (5)
Lecture—3 hours; laboratory—3 hours, term paper. Prerequisite: Hydrologic Science 145, Civil and En-
vironmental Engineering 144 or the equivalent.
Physical and chemical processes affecting groundwater flow and contaminant transport, with emphasis on analytical and conceptual techniques. Geophysical, hydrologic, and chemical fundamentals of hydrology and water resources. 3 units. GE credit: SciEng | SE. —II. (II.) Fogler

160. Geophysical Field Methods (3)
Lecture/discussion—3 hours; term paper. Prerequisite: Math 21C, Physics 7C or 9C, or consent of instructor. Introduction to quantitative methodologies for determining geologic data, including basic principles of statistics and probability, error analysis, hypothesis testing, inverse theory, time series analysis and directional data analyses. Use of computer in lectures and homework. GE credit: SciEng | QL, SE.—II. Rundle

161. Geophysical Geology and Geophysics (3)
Lecture—3 hours. Prerequisite: Mathematics 21C, Physics 5C or 7C or 9C, or consent of instructor. Geophysical methods applied to determining subsurface structure in tectonics, hydrogeology, geotechnical engineering, hydrocarbon and mineral exploration. Theory, survey design and interpretation of gravity, electrical resistivity, electromagnetic, reflection and refracted seismology, and ground-penetrating radar measurements. GE credit: SciEng | QL, SE.—I. Billen

162. Geophysics of the Solid Earth (3)
Lecture—3 hours. Prerequisite: Mathematics 21C, Physics 5C or 7C or 9C, or consent of instructor. Theory and use of physics in the study of the solid earth, including gravity, geomagnetism, and heat flow. Application to the interpretation of the regional and large-scale structure of the earth and to plate tectonics. Offered in alternate years. GE credit: SciEng | QL, SE.—III. Yin

163. Planetary Geology and Geophysics (3)
Lecture—3 hours. Prerequisite: Mathematics 21C, Physics 7C or 9C, and course 50 or 36 or Astronomy 10, or consent of instructor. Principles of planetary science. Planetary dynamics, including orbit mechanics, tidal interactions and ring dynamics. Theory of planetary interiors, gravitational fields, rotational dynamics. Physics of planetary atmospheres. Geological processes, landforms and their modification. Methods of analysis from Earth-based observations and spacecraft. GE credit: SciEng | QL, SE.—I. Yin

175. Advanced Field Geology (3)
Discussion—3 hours; fieldwork—6 hours. Prerequisite: consent of instructor. Advanced field studies of selected geologic terrains, interpretation and discussion of field observations. May be repeated two times for credit when instructors vary. (P/NP grading only.) GE credit: SE.—Cooper, Roeseke

181. Teaching in Science and Mathematics (2)
Lecture/discussion—2 hours; field work—2 hours. Prerequisite: major in mathematics, science, or engineering, or completion of a one-year sequence of science or calculus and consent of the instructor. Class size limited to 40 students per section. Exploration of effective teaching practices based on examination of how middle school students learn math and science. Selected readings, discussion and field experiences in high school classrooms. (Some course as Education 181) (P/NP grading only.) GE credit: SS, WE.—I, II, III, (II, III). Horn

182. Field Studies in Marine Geochemistry (2-8)
Lecture—3 hours; laboratory—1.5-3 hours, fieldwork—6.40 hours. Prerequisite: consent of instructor. Marine geochemistry with the opportunity of going to sea or into the field on land. Techniques of sea-floor sampling, including photography, marine geochemical sampling, and method of data reduction and sample analysis. Analysis of data/samples collected. GE credit: SciEng | SE.—Hill

183. Teaching High School Mathematics and Science (3)
Lecture/discussion—2 hours; field work. Prerequisites: course 81/Education 81 or course 181/Education 181 and major in mathematics, science, or engineering; or completion of a one-year sequence of science or calculus and consent of the instructor. Limit to 40 students per section. Exploration and creation of effective teaching practices based on examination of how high school students learn mathematics and science. Field experience in high school classrooms. (Same course as Education 183) GE credit: SocSci | OL, SS, WE.—I, II, III, (II, III, III). Pass/fail, more

190. Seminar in Geology (1)
Discussion—1 hour; seminar—2 hours; written abstraction. Prerequisite: major in Geology. Presentation and discussion of current topics in geology by visiting lecturers, staff, and students. May be repeated for credit. (P/NP grading only.) GE credit: SE.—I.

192. Internship in Geology (1-12)
Internship. Prerequisite: upper division standing; project approval prior to internship. Supervised work experience in geology. May be repeated for credit for a total of 10 units. (P/NP grading only) GE credit: SE.

194A-194B. Senior Thesis (3-3)
Prerequisite: open to Geology majors who have completed 135 units and who do not qualify for the honors program. Independent study of a selected topic, leading to the writing of a senior thesis. (Deferred grading only, pending completion of course work.) GE credit: SciEng | SS, WE.

198. Directed Group Study (1-5)
Lecture—1 hour; seminar—2 hours. Prerequisite: senior standing in Geology or consent of instructor. Open to all. Undergraduates (1-5). Offered in alternate years. —II. Spero

205. Advanced Field Stratigraphy (3)
Lecture—1 hour; field work—2 hours. Prerequisite: courses 109 and 110 or consent of instructor; course 206 recommended. Fieldwork over spring break. Application of stratigraphic techniques to research problems. Collection, compilation, and interpretation of field data. Integration of data with models for deposition and interpretations of Earth history. Topics vary. May be repeated for credit.—III. (II.) Sumner

206. Stratigraphic Analysis (3)
Lecture—3 hours. Prerequisites: courses 109, 109L or consent of instructor; course 144 recommended. Topics in advanced methods of stratigraphic analysis, regional stratigraphy and sedimentation, and sedimentary basin analysis. Emphasis on techniques used to interpret stratigraphic records and on current issues in stratigraphy and sedimentation. May be repeated for credit when topics differ.—II. (II.) Montañez

214. Active Tectonics (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing or consent of instructor. Active deformation associated with faults, landslides, and volcanoes. Geodetic measurement techniques such as triangulation, trilateration and continuous recording System (GPS), and radar interferometry. GPS data acquisition and analysis. Inversion of geodetic data and mechanical models of crustal deformation.—III. (II.) Oskin

216. Tectonics (3)
Lecture/discussion—3 hours. Prerequisite: course 101 or consent of instructor. Nature and evolution of tectonic features of the Earth. Causes, consequences, and evolution of plate motion, with selected examples from the Earth’s deformed belts. Offered in alternate years when possible. —II. (III.) Bills, Falletti, McClain

217. Topics in Geophysics (3)
Lecture—1 hour; seminar—2 hours. Prerequisite: consent of instructor. Discussion and evaluation of current research in a given area of geophysics. Topic will change from year to year. May be repeated for credit.—II. (I.) Bills, Billen, Falletti

218. Analysis of Structures in Deformed Rocks (3)
Seminar—3 hours. Prerequisite: courses 100, 100L, 101, 101L, 170; or consent of instructor. Recent advances in the understanding and analysis of structures in brittlely and ductly deformed rocks. Detailed investigation of the characteristics of the structures, models for their formation, and applications to inferring the kinematics of larger scale tectonics. Offered in alternate years. —II. Cowgill

219. Fracture and Flow of Rocks (3)
Lecture—3 hours. Prerequisite: courses 100, 101, Mathematics 21 or 16, Physics 7 or 9, or consent of instructor. Origins of fractures in rocks and their role in fracture mechanisms, association with brittle and ductile deformation. Theoretical analysis, using continuum mechanics, and experimental evidence for the origin of the structures with emphasis on deformational processes in the earth. Offered in alternate years.—III. Billen

220. Mechanics of Geologic Structures (3)
Lecture—3 hours. Prerequisite: course 170, Mathematics 21C, Physics or 5A, or consent of instructor. Advanced petrography and geochemistry of sediments and sedimentary rocks. Geochemo, textural and mineralogical evolution of sedimentary rocks reflecting depositional or burial processes. Laboratory work emphasizes thin section study of rocks. May be repeated for credit when topic differs.—Sumner

227. Stable Isotope Biogeochemistry (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 144 or consent of instructor. Advanced topics in marine geochemistry. Principles of stable isotope fractionation and specific techniques for individual research using stable isotopes.—Spero

228. Topics in Paleoclimatology (3)
Lecture—3 hours. Prerequisite: courses 108, 150A or consent of instructor. Critical discussion and review of selected topics in paleoclimatology and paleoclmatology relating to the history of the processes controlling and affecting climate change and ocean circulation throughout the Phaneror. Topics may vary. May be repeated for credit. Offered in alternate years.—II. Spero

230. Geomorphology and River Management (3)
Seminar—3 hours. Prerequisite: graduate standing, course 139 or equivalent. Impacts of management and land use activities on the geomorphology of rivers and streams. Evaluation and use of analytical tools for river assessment and management, and stream restoration strategies and emerging issues in river management. May be repeated for credit when topic differs.

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer. 2015-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): Art/Humanities = AH; Science and Engineering = SciEng; Social Sciences = SS; Oral = Oral; Quantitative = QL; Science = Sci; Visual = Vis; World Cultures = WC; Writing Experience = WE.
232. The Oceans and Climate Change (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing or consent of instructor. Modern climate change and linkages between the ocean-atmosphere-terrestrial climate system. Importance of the ocean in forcing climate change, and the impacts of anthropogenic processes on the ocean. Topics may vary. May be repeated three times for credit. Offered in alternate years. — (III.) Hill

235. Surface Processes (3)
Seminar—3 hours. Prerequisite: courses 50, 50L, 139Y, Mathematics 218 or 168 recommended. Recent advances in the analysis of landscapes and their evolution. Detailed investigation of the tools used to document surface processes. Evaluation of concepts and processes that govern landscape evolution. May be repeated for credit when topic differs. — (III.) Oskin

236. Inverse Theory in Geology and Geophysics (3)
Lecture—3 hours. Prerequisite: consent of instructor. Inversion of data for model parameters. Evaluation of parameter uncertainties. Linear and nonlinear problems for discrete and continuous models. Bakus-Gilbert inversion. Offered in alternate years. — McClain

238. Theoretical Seismology (3)
Lecture—3 hours. Prerequisite: consent of instructor. Elastodynamic wave equation. Greens functions and source representations. Ray theory. Plane and spherical waves and boundary conditions. Elastic wave propagation in stratified media. Offered in alternate years. (P/NP grading only.) —McCain

240. Geoophysics of the Earth (3)
Lecture—3 hours. Prerequisite: Earth Sciences and Resources 105; Mathematics 228. Physics of the earth’s crust, mantle, and core. Lapse rate’s equation and spherical harmonic expression of gravity and magnetic fields. Elastic wave equation in geologic media. Body and surface seismic waves. Equations of state, thermal structure of the earth. Offered in alternate years. — (III.)

241. Geomagnetism (3)

242. Paleomagnetism (3)

246. Physical Chemistry of Metamorphic Processes (3)
Lecture—3 hours. Prerequisite: course 145, Chemistry 110A, or consent of instructor. Physicochemical principles of metamorphic mineral assemblages and methods of interpreting the paragenesis of metamorphic rocks. Offered in alternate years. — Day

247. Metamorphic Petrology Seminar (3)
Seminar—3 hours. Prerequisite: course 145 or consent of instructor. Manufacturing and laboratory techniques. Instrumentation. Analysis of paleomagnetic data. Statistical methods. Rock magnetic properties. Geologic and geophysical applications. Offered in alternate years. — Versob

250. Advanced Geochemistry Seminar (3)
Seminar—3 hours. Prerequisite: course 146 or consent of instructor. Critical review of selected topics in geochemistry including: ore genesis, hydrothermal and geothermal fluids, recent and ancient sediments, isotope geochemistry, origin and chemistry of the oceans. Subject varies yearly depending on student interest. May be repeated for credit. Offered in alternate years.

251. Advanced Topics in Isotope Geochemistry and Cosmochemistry (3)
Lecture/discussion—2 hours; term paper. Prerequisite: graduate standing or consent of instructor. Astrophysical and petrologic origins of Solar System: synthesis of chemical elements, condensation sequence, star and planet formation, cosmochemistry, building blocks of planets, development on planets’ layered structure, atmosphere and the role of comets/asteroids for volatile delivery. May be repeated three times for credit when topics differ. Offered in alternate years. — (II.) Yin

253. Current Trends in Igneous Petrology (3)
Seminar—3 hours. Prerequisite: standing in Geology; course 143 or consent of instructor. Topical seminar designed to help graduate students develop and maintain familiarity with current and past literature in current subfields of petrology. May be repeated for credit when topic differs. (S/U grading only) — II. Lesher, Cooper

254. Physical Chemistry of Igneous Processes (3)
Lecture—3 hours. Prerequisite: course 142 or consent of instructor; Chemistry 110A required; Chemistry 110B and 110C recommended. Introduction of modern concepts in chemical thermodynamics and kinetics, and fluidic dynamic systems for graduate students in petrology. Offered in alternate years. — Lesher

255. Experimental Petrology (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 143 or consent of instructor. Introduction to techniques and methods of design and executing experiments on Earth-forming minerals and rocks. Problems and examples from igneous and metamorphic petrology will be utilized. Offered in alternate years. — Lesher

260. Paleontology (3)
Seminar—3 hours. Prerequisite: graduate standing in geology or a biological science. Selected problems in paleontology. Subject to be studied will be decided at an organizational meeting. May be repeated for credit when topic differs. — I. III. Vermeij

261. Paleobiology Graduate Seminar 1: Evolutionary Aspects (3)
Lecture—1 hour; seminar—2 hours. Prerequisite: graduate standing in Geology or a biological science; qualified undergraduates accepted on an exception-only basis. This content will treat one or more of several topics in paleobiology from a phylogenetic perspective, including major patterns in evolution, building the tree of life, extinction and phylogeny, phylogeography, and the relation between taxonomy and phylogeny. May be repeated for credit when topic varies. — I. III. Carlson

262. Paleobiology Graduate Seminar: Methodological Aspects (3)
Lecture—1 hour; seminar—2 hours. One or more major methods used in the study of fossils: Morphometrics and three-dimensional reconstruction of fossils, phylogenetic methodology, the application of geochemical techniques, and electron microscopy: May be repeated four times for credit if topic varies. — II. Motani

281N. Instrumental Techniques for Earth Scientists (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Mathematics 21A, 21B, 21C, Physics 7A, 7B, 7C or 9A, 9B, 9C or consent of instructor. Laboratory research techniques for new graduate students in Geology. Demonstration of and exposure to appropriate techniques in research. — III. Spero, Yin

285. Field Studies in Marine Geochemistry (2-8)
Lecture—3 hours; laboratory—1-3 hours; field work—4-60 hours. Prerequisite: consent of instructor. Marine geochemistry with the opportunity of going to sea or into the field on land. Techniques of sea-floor mapping using bottom photography, marine geochemical sampling, and method of data reduction and sample analysis. Analysis of data/samples collected. — Hill

290. Seminar in Geology (1)
Seminar—1 hour; discussion—1 hour. Presentation and discussion of current topics in geology by visiting lecturers, staff, and students. (S/U grading only) — I, II, III. (I, II, III)

291. Geology of the Sierra Nevada (1)
Seminar. Prerequisite: consent of instructor. Short oral presentations by students and faculty concerning results of their past work and potential for future work in the Sierra. A written abstract is required following the format required at professional meetings. (S/U grading only) — Day

292. River Forum (1)
Seminar—1 hour. Prerequisite: graduate standing. Review and discussion of latest research and fundamental issues surrounding riverine systems, with emphasis on physical processes. Topics vary. (S/U grading only) — I, II, III. (I, II, III)

293. Geologic Event of the Week (1)
Discussion—0.5 hours; seminar—0.5 hours. Prerequisite: graduate standing. Seminar/discussion group to review and discuss recent earthquakes, volcanic eruptions, and other significant geologic events. The focus is on understanding the available observations, the physical processes behind each event, the geological setting, and societal consequences. May be repeated for credit when topic differs. (S/U grading only) — I, II, III. (I, II, III) Roese

295. Advanced Problems in Geodynamics (3)
Seminar—3 hours. Prerequisite: courses 100 and 101 or consent of instructor. Seminar dealing with problems in geodynamics. Topics will vary (e.g., ductile deformation mechanisms, brittle fracture, earthquake prediction, driving forces for plate tectonics, mantle convection). Emphasis on recent literature. May be repeated for credit when topic differs. Offered in alternate years. (S/U grading only)

296. Advanced Problems in Tectonics (3)
Seminar—3 hours. Prerequisite: course 101 or consent of instructor. Seminar dealing with current problems in tectonics of selected regions. Topics will change from year to year. Emphasis on study of recent literature. May be repeated for credit. Offered in alternate years. (S/U grading only) — I. Cowgill

297. Geophysics Forum (1)
Seminar—0.5 hours; discussion—0.5 hours. Prerequisite: graduate student status in the Geology Department, or consent of instructor. Seminar/discussion group to review and discuss latest research in structural geology and tectonics, and on-going research of participants. Topics will vary each quarter depending on the interests of the group. Occasional field trips to areas of current interest. May be repeated for credit when topic differs. Offered in alternate years. (S/U grading only)

298. Group Study (1-5)
Seminar—1 hour. Prerequisite: consent of instructor. Topics will be decided at an organizational meeting. May be repeated three times for credit when topic differs. Offered in alternate years. (S/U grading only)

299. Research (1-12)
(S/U grading only)

Professional

300. Methods of Teaching Geology (2)
Extensive writing or discussion—2 hours. Prerequisite: graduate standing student status in Geology. Introduction to graduate-level writing and undergraduate-level teaching skills in geology. Persuasive (propositional) writing workshop; discussions on campus teaching resources, presentation of techniques in teaching, and student management. (S/U grading only)

Quarter Offered: I,II,III; Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Domestic Diversity; Wrt—Writing Experience Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
room dynamics, evaluating student performance. Participation in teaching program required for Ph.D. in Geology. (S/U grading only.)—I, II, III, (I, II, III)

391. Academic Senate Distinctive Teaching Award
Winder McConnell, Ph.D., Professor Emeritus
Karl R. Menges, Dr.Phil., Professor Emeritus
H. Guenther Nerjes, Ph.D., Associate Professor Emeritus
Fritz Sammern-Frankenegg, Dr.Phil., Lecturer

The Major Program
The Minor Program offers in-depth study in the language and literature, the culture and commerce of the German-speaking world (primarily Germany, Austria and Switzerland). The key to the major lies in the careful balance between solid core requirements and the possibility to explore German subject areas through the lens of other disciplines, such as music, art, philosophy, history, and economics.

The Program. The department offers courses that highlight literary figures, movements and themes. These courses form the core of upper-division literature electives, but we also offer courses that discuss contemporary culture and commerce in German-speaking countries. Regardless of emphasis, students will find maximum practice in spoken and written German as well as in listening comprehension in all upper-division courses offered in German.

Career Alternatives. Completion of the major prepares students for study in German or for career opportunities in international fields ranging from employment in business and government to careers in the fine arts and sciences. Also, it permits admission to professional schools such as law and medicine.

A.B. Major Requirements:

Preparatory Subject Matter.............0-27
German 12-3 (or the equivalent).........0-15
German 20, 21, 22.................................0-12

Depth Subject Matter.........................44
General Program

German 101A, 101B, 103.....................12
German 120 or 118E.........................0-12
Four courses chosen from upper-division offerings taught in German .....................16
Three additional upper-division courses selected from either 104-109 or 121-129............12
Or courses in other disciplines that focus on German history, thought, and culture, upon approval of the major advisor. Electives include, but are not limited to:

Art History 176C, 177A, 177B
Comparative Literature 138, 140-142, 147
Economics 110B, 116, 160A and 160B, 162
Film Studies 142, 176A, 176B
History 142A, and 142B, 144A and 144B
Music 110B, 110C, 110D, 110E
Philosophy 170, 175
Political Science 117, 118C, 137

Note: Many of the above electives from other disciplines have prerequisites. The total of 44 upper-division units may include units earned in the Education Abroad Program.

Total Units for the Major.....................44

Minor Program Requirements:

The Department offers a German minor consisting of at least 20 upper-division units of courses taught in German. Students wishing to minor in German should consult the undergraduate advisor.

UNITS

German .............................................20

Major Adviser, C. Zhang

Honors and Honors Program. The honors program consists of two quarters of research (194H) terminating in an honors thesis. For details consult the undergraduate major advisor. Graduation with high or highest honors requires participation in the honors program.

Graduate Study. The Department offers programs of study and research leading to the M.A. degree and to the Ph.D. degree in German literature. Additional degree options for a designated emphasis are available through departmental affiliations with the programs in Social Theory and Comparative History, Critical Theory, Feminist Theory, and Second Language Acquisition. Detailed information may be obtained by writing to the Department Chairperson or the Graduate Advisor.

Graduate Adviser, SE Rose

Prerequisite Credit. Credit normally will not be given on the lower-division level for a course that is the prerequisite of a course already successfully completed.

Courses in German (GER)

Lower Division
Course Placement: Students with two years of high school German normally continue in German 2; those with three years, German 3; those with four years, German 20.

1. Elementary German (5)
Discussion—5 hours, laboratory—1 hour. Introduction to German grammar and development of all language skills in a cultural context with special emphasis on communication. Students who have successfully completed German 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student's P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed. Not open to students who have taken course 1A. GE credit: ArtHum | AH, WC.—I, II, III, (II, III)

Am. Mark Gottschalk

1A. Accelerated Intensive Elementary German (15)
Lecture/discussion—15 hours. Special 12 week accelerated, intensive summer session course that combines the work of courses 1, 2, and 3. Introduction to German grammar and development of all language skills in a cultural context with emphasis on communication. Not open to students who have completed courses 1, 2, or 3.—IV (IV) McCollum

2. Elementary German (5)
Discussion—5 hours, laboratory—1 hour. Prerequisite: course 1. Continuation of course 1 in areas of grammar and basic language skills. Not open for credit to students who have taken course 1A. GE credit: ArtHum | AH, WC.—I, II, (II, II)

Am. C. Zhang

3. Elementary German (5)
Discussion—5 hours, laboratory—1 hour. Prerequisite: course 2. Completion of grammar sequence and continuing practice of all language skills through cultural texts. Not open to students who have taken course 1A. GE credit: ArtHum | AH, WC.—I, II, (II, II)

Am. C. Zhang

6. Conversational German (4)
Discussion—3 hours, term paper. Prerequisite: course 3. Course 6 may be taken concurrently with course 20. Designed to develop intermediate language skills with special emphasis on communication and grammatical accuracy. GE credit: ArtHum | AH, WC.—I

Am. C. Zhang

10. German Fairy Tales from the Grimm to Disney (4)
Lecture/discussion—3 hours, term paper. Introduction to the genre of fairy tale with a focus on the Brothers Grimm and Hans Christian Andersen in their respective political/cultural contexts. Discusses filmic adaptations by Disney, DEFA and Hollywood. GE credit: ArtHum, Div, Wrt | AH, VL, WE.—I, II

Am. C. Zhang

Minor Program Requirements:

The Department offers a German minor consisting of at least 20 upper-division units of courses taught in German. Students wishing to minor in German should consult the undergraduate advisor.

UNITS

German .............................................20

Major Adviser, C. Zhang

Honors and Honors Program. The honors program consists of two quarters of research (194H) terminating in an honors thesis. For details consult the undergraduate major advisor. Graduation with high or highest honors requires participation in the honors program.

Graduate Study. The Department offers programs of study and research leading to the M.A. degree and to the Ph.D. degree in German literature. Additional degree options for a designated emphasis are available through departmental affiliations with the programs in Social Theory and Comparative History, Critical Theory, Feminist Theory, and Second Language Acquisition. Detailed information may be obtained by writing to the Department Chairperson or the Graduate Advisor.

Graduate Adviser, SE Rose

Prerequisite Credit. Credit normally will not be given on the lower-division level for a course that is the prerequisite of a course already successfully completed.

Courses in German (GER)

Lower Division
Course Placement: Students with two years of high school German normally continue in German 2; those with three years, German 3; those with four years, German 20.

1. Elementary German (5)
Discussion—5 hours, laboratory—1 hour. Introduction to German grammar and development of all language skills in a cultural context with special emphasis on communication. Students who have successfully completed German 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student's P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed. Not open to students who have taken course 1A. GE credit: ArtHum | AH, WC.—I, II, III, (II, III)

Am. Mark Gottschalk

1A. Accelerated Intensive Elementary German (15)
Lecture/discussion—15 hours. Special 12 week accelerated, intensive summer session course that combines the work of courses 1, 2, and 3. Introduction to German grammar and development of all language skills in a cultural context with emphasis on communication. Not open to students who have completed courses 1, 2, or 3.—IV (IV) McCollum

2. Elementary German (5)
Discussion—5 hours, laboratory—1 hour. Prerequisite: course 1. Continuation of course 1 in areas of grammar and basic language skills. Not open for credit to students who have taken course 1A. GE credit: ArtHum | AH, WC.—I, II, (II, II)

Am. C. Zhang

3. Elementary German (5)
Discussion—5 hours, laboratory—1 hour. Prerequisite: course 2. Completion of grammar sequence and continuing practice of all language skills through cultural texts. Not open to students who have taken course 1A. GE credit: ArtHum | AH, WC.—I, II, (II, II)

Am. C. Zhang

6. Conversational German (4)
Discussion—3 hours, term paper. Prerequisite: course 3. Course 6 may be taken concurrently with course 20. Designed to develop intermediate language skills with special emphasis on communication and grammatical accuracy. GE credit: ArtHum | AH, WC.—I

Am. C. Zhang

10. German Fairy Tales from the Grimm to Disney (4)
Lecture/discussion—3 hours, term paper. Introduction to the genre of fairy tale with a focus on the Brothers Grimm and Hans Christian Andersen in their respective political/cultural contexts. Discusses filmic adaptations by Disney, DEFA and Hollywood. GE credit: ArtHum, Div, Wrt | AH, VL, WE.—I, II

Am. C. Zhang

Minor Program Requirements:

The Department offers a German minor consisting of at least 20 upper-division units of courses taught in German. Students wishing to minor in German should consult the undergraduate advisor.

UNITS

German .............................................20

Major Adviser, C. Zhang

Honors and Honors Program. The honors program consists of two quarters of research (194H) terminating in an honors thesis. For details consult the
40. Great German Short Stories (in English) (4)
Lecture/discussion—3 hours; extensive writing. Major German short stories from Goethe at the end of the eighteenth century to Thomas Mann at the beginning of the twentieth century. Offered in alternate years. GE credit: AH, VL, WE—II.

45. Vampires and Other Horrors in Film and Media (4)
Lecture—2 hours; discussion—1 hour; film viewing—3 hours. History of representations of vampires and horror generally from the 19th through 21st centuries. Emphasis on transnational history of the horror genre; psychologies of horror effects; issues of race, gender, and class; intersections with prejudice, medicine, modernity. (Same course as Film Studies 45.) Offered in alternate years. GE credit: ArtHum | ACGH, AH, DD, OL, VL, WC, WE—II, III. Fisher

48. Myth and Saga in the Germanic Cultures (4)
Lecture—3 hours; term paper. Knowledge of German not required. Reading in English translation from the Norse Eddas, the Volsung and Sigurd-Siegfried cycles, and the Gudrun lays, literary mythology in German Romanticism culminating in Wagner’s “total artwork” concept and The Ring of the Nibelung cycle. May not be counted toward major in German. GE credit: ArtHum, Wrt | AH, WC, WE—I, II. (I.)

49. Freshman Colloquium (2)
Seminar—2 hours. Prerequisite: open only to students who have completed 40 or fewer quarter units of transferable college-level work. Readings, discussion and term papers on treating topics such as communist-capitalist tension in German literary culture; masculine “versus” feminine authorial consciousness; disintegration of free association and language reflecting cultural transformation; exercising post-Holocaust national guilt and individual frustration—Germany’s new European “mission.”—II. (II.)

92. Field Work in German (1-12
Internship—3-56 hours. Lower division standing. Total immersive program in Germany or a German speaking setting in the U.S. to further develop students’ proficiency in the German language. (P/NP grading only.)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. Primarily for lower division students. (P/NP grading only.)

99. Special Study for Undergraduates (1-15)
(P/NP grading only.)

Upper Division

101A. Survey of German Literature, 800-1800 (4)
Lecture/discussion—3 hours. Prerequisite: course 22. German literature from the Middle Ages to Classicism (800-1800) with an overview of major movements and authors. GE credit: ArtHum | AH, WC, WE—I. (I.)

101B. Survey of German Literature, 1800-Present (4)
Lecture/discussion—3 hours. Prerequisite: course 22. German literature from the Age of Romanticism (1800) to the present with an overview of major movements and authors. GE credit: ArtHum | AH, WC, WE—II. (II.)

103. Writing Skills in German (4)
Lecture—3 hours; extensive writing. Prerequisite: course 22. Practice in different kinds of writing, such as abstracts, correspondence, lecture summaries, analysis of or response to short literary texts. GE credit: ArtHum | AH, WC, WE.

104. Translation (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 22. Exercises in German-English, English-to-German translation using texts from the areas of culture and commerce. Not open for credit to students who have completed course 104A. Offered in alternate years. GE credit: ArtHum | AH, OL, VL, WE.

105. The Modern German Language (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 22. Introduction to the linguistic analysis of contemporary German, including its phonology, morphology, syntax and semantics, as well as sociolinguistic considerations. GE credit: ArtHum, Wrt | AH, OL, VL, WC, WE—I, II. (I.) Arnett

109A. Business German (4)
Lecture/discussion—3 hours; laboratory—1 hour. Prerequisite: upper division consent of instructor. Specialized language course using business-oriented information and publications as the basis for discussions, roleplay, reports, compositions and translations. GE credit: ArtHum, Wrt | AH, OL, VL, WC, WE—II. (I.)

109B. Advanced Business German (4)
Lecture/discussion—3 hours; laboratory/discussion—1 hour. Prerequisite: course 22 or consent of instructor. Specialized advanced language course involving in-depth study of major business topics with the help of authentic texts and videos. Offered in alternate years. —II. (II.)

112. Topics in German Literature (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: upper division consent of instructor. Investigation of significant themes and issues within their European context. Knowledge of German is not required. May be repeated one time for credit. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE—III.

113. Goethe’s Faust (4)
Discussion—3 hours; term paper. Knowledge of German not required. Intensive study of Goethe’s Faust in its entirety. Discussions in English; reading the text in the original is encouraged. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, WC, WE—II, III.

114. From Marlene Dietrich to Run, Lola Run: German Women in Alternate and Film (4)
Lecture/discussion—3 hours; extensive writing. Knowledge of German not required. Women in German film from the Weimar Republic to present, with special emphasis on conceptualizations of gender, historical and political context, aesthetic and filmic innovations. GE credit: ArtHum, Wrt | AH, VL, WC, WE—II, III.

115. German Literature Since 1945 (4)
Lecture—3 hours; extensive writing. Knowledge of German not required. Major writers of the postwar generation of Austria, Switzerland and Germany: novelists, such as Celan, Walser, Handke; playwrights such as Frisch, Durrenmatt and Hochhuth, and poets, such as Celan, Enzensberger, and Aichinger. May be repeated for credit in different topic area. GE credit: ArtHum, Wrt | AH, WC, WE—II, III.

116. Readings in Jewish Writing and Thought in German Culture (4)
Lecture—3 hours; term paper. Prerequisite: Religious Studies 23 or consent of instructor. Historical tradition of Jewish thought in the German cultural context; unique contributions of Jewish writers to culture of the German-speaking world; what it means to be “other” in the mainstream culture. No credit will be given to those students who have completed Humanities 121. May be repeated two times for credit if topic differs. Offered in alternate years. (Same course as Jewish Studies 121.) GE credit: ArtHum, Div, Wrt | AH, OL, VL, WC, WE—II, III.

117. After the Catastrophe: Jews and Jewish Life in Post-1945 Germany (4)
Lecture/discussion—3 hours; term paper. Jews and Jewish culture in post-1945 Germany, with special attention to the 20th-century debate, photography, film, as well as websites and other media. Offered in alternate years. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, OL, VL, WC, WE—II. (II.) Fisch

118A. Vienna at the Turn of the Twentieth Century (The End of the Habsburg Empire) (4)
Lecture—1 hour; discussion—2 hours; extensive writing. Knowledge of German not required. Cultural ferment in Vienna, capital of the multinational Habsburg empire, at the turn of the century, with consideration of innovations in music, graphic arts, architecture, philosophy and psychology, heralding European modernism. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE—I. Finney

118B. Weimar Culture: Defeat, the Roaring Twenties, the Rise of Nazism (4)
Lecture—1 hour; discussion—2 hours; extensive writing. Prerequisite: Knowledge of German not required. Expressionism in graphic arts, literature, film, New Objectivity, Brecht and Bauhaus considered in the context of the failure of the German experiment in democracy, the Weimar Republic of 1919-33. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE—III.

118C. Germany Under the Third Reich (4)
Lecture/discussion—3 hours; term paper. Prerequisite: background in modern European history; course 118B recommended. Not open to students who have completed German 126C. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE—II.

119. From German Fiction to German Film (4)
Lecture—3 hours; discussion—1 hour; term paper. Examines a number of film adaptations of major German prose works and plays to ascertain the types of changes involved in the shift from novel to film. The positive and negative effects achieved by such transferences. GE credit: ArtHum, Wrt | AH, OL, VL, WC, WE—II.

120. Survey of German Culture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 22. Major developments in German art, philosophical thought, social institutions, and political history. GE credit: ArtHum | AH, WC, WE—II.

121. The Medieval Period in German Literature (4)
Discussion—3 hours; extensive writing. Prerequisite: course 22. Literary-historical profile of the Mittelhochdeutsche Blutezeit in terms of the significant epic, romances, and lyric poetry. Readings in German. Offered in alternate years. GE credit: ArtHum | AH, WC, WE—II.

122. Reformation and Baroque (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 22. Exemplary literary works of the 16th and 17th centuries tracing the principal lines of development and showing the reflection in literature of the social, as well as religious, scenes. Offered in alternate years. GE credit: ArtHum | AH, WC, WE—I.

123. Literature of the Classical Age (4)
Discussion—3 hours; term paper. Prerequisite: course 22. A critical assessment of principal works of Goethe and Schiller within the historical and philosophical context of their times. Offered in alternate years. GE credit: ArtHum | AH, WC, WE—I.

124. Major Movements in German Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 22. Significant movements and schools in German literary history (e.g., the medieval troubadours, Storm and Stress, the romanticists, the George Circle, the expressionists), with emphasis on the broader cultural dynamics and ideologies as
these apply to individual literary works. May be repeated one time for credit when topic differs. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—II.

125. Short Fiction: 1880-1914 (4)
 Lecture—3 hours; term paper. Prerequisite: course 22. Reading of short German fiction from the fin-de-siècle period and representative of various prose styles and cultural currents. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—III.

126. Modern German Literature (4)
 Discussion—3 hours; extensive writing. Prerequisite: course 22. Selection of significant works by major writers, set in the broader cultural context: Works of Goethe to Kafka. Examination of representative authors from Goethe to Kafka. Offered in alternate years. GE credit: ArtHum | AH, OL, VI, WC, WE.—II.

143. Language Through Media (4)
 Lecture/discussion—3 hours; term paper. Prerequisite: course 22. Study of contemporary German-language news media (press, video, film, CD-ROM, internet) for insight into political and cultural developments in the German-speaking countries. Offered in alternate years. GE credit: ArtHum | AH, OL, VI, WC, WE.—II.

144. Marx, Nietzsche, Freud (4)
 Lecture/discussion—3 hours; term paper. Study of major texts of Marx, Nietzsche, and Freud, selected with an eye to their impact on 20th-century economic, political, and social thought. Focus on the political and social scene. Offered in alternate years. [Same course as Humanities 144.] GE credit: ArtHum, Wrt | AH, WC, WE.—I.

160. Love in the Middle Ages (4)
 Lecture—3 hours; discussion—1 hour. Prerequisite: course 22. Analysis of the phenomenon of love in selected medieval lyrical poems and romances of the twelfth and thirteenth century. Offered in alternate years. GE credit: ArtHum, Div | AH, WC, WE.—I.

168. Multiculturalism in German Literature (4)
 Lecture/discussion—3 hours; term paper or discussion—1 hour. Prerequisite: course 22. Examples of German literature from the High Middle Ages to the present that explore 'the encounter with the other': people of color, different beliefs and cultures, and inner-German minorities. Offered in alternate years. GE credit: ArtHum | AH, OL, VI, WC, WE.—II.

176A. Classic Weimar Cinema (4)
 Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: Humanities 1. German Weimar (1919-1933) cinema. Fritz Lang, F.W. Murnau, and G.W. Pabst among others. Influence on world-wide (esp. Hollywood) film genres such as film noir, horror, science fiction, and melodrama. Not open for credit to students who have completed Humanities 176. Offered in alternate years. [Same Course as Film Studies 176A.] GE credit: ArtHum, Wrt | AH, OL, VI, WC, WE.—I.

185. The Age of Bismarck (4)
 Discussion—3 hours; term paper. Prerequisite: course 22. Notable literary repercussions of the zenith of Germany's international status at the time of Bismarck's Chancellorship. The poetry of Storm, the prose of Fontane, the drama of Hauptmann. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—II.

192. Field Work in Germany (1-12)
 Internship—3-36 hours. Prerequisite: course 109A or consent of instructor. Total immersion program in Germany or a German-speaking setting in the U.S. to further develop student proficiency in the German language. May be repeated two times or up to 12 units of credit with consent of instructor. (P/NP grading only.)

194HA-194HB. Honors Program (3-3)
 Independent study—2 hours; term paper. Prerequisite: open only to majors with a 3.50 minimum GPA in at least 135 graduation units. (A) Research of an integrative nature (in either "General" or "Area Studies Emphasis" fields of major), guided by thesis advisor chosen by student; (B) Writing of Honors Thesis on topic selected by student in consultation with thesis advisor. (P/NP grading only. Deferred grading only, pending completion of course sequence.)

197T. Tutoring in German (1-4)
 Tutorial—3-12 hours. Prerequisite: consent of German Program Director. Tutoring in undergraduate courses included in German language program. May be repeated for credit with consent of instructor. (Same course as Film Studies 142) GE credit: ArtHum, Wrt | AH, OL, VI, WC, WE.—I. (I) Fisher

198. Directed Group Study (1-5)
 (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
 (P/NP grading only.)

Graduate

202. Middle High German (4)
 Discussion—3 hours; lecture—1 hour. Outline of grammar; selections from Middle High German epic, romance, and lyric poetry. —II. (II)

 Lecture/discussion—3 hours; term paper. Prerequisite: graduate standing. Introduction to cognitive grammar and application of cognitive grammar to language instruction. Syntactical problems and analyses relevant to the language the student will teach. Offered irregularly.—II. (II)

210. Techniques of Literary Scholarship (4)
 Seminar—3 hours; term paper. The bibliographical, organizational, and methodological tools and resources for advanced, independent research.—I. (I)

211. Concepts in Literary Theory (4)
 Seminar—3 hours. Advanced course in concepts of literary theory and criticism. Discussion of the emergence of theoretical concepts and their impact on the understanding and appreciation of literary works. Discussion in German and English, readings in German.—II. (II)

212. Contemporary Approaches to Literary Theory (4)
 Seminar—3 hours; term paper. Study of contemporary theoretical approaches to narrative texts, structuralism, deconstruction, feminism, Marxism/Frankfurt School, and reception theory in conjunction with the works of major authors.—II. (III)

239. Narrative and Narrative Theory (4)
 Seminar—3 hours; term paper. Study of narrative, in a theoretical and literary historical context, major elements of 19th- and 20th-century narrative, such as techniques of framing, refraction, and montage; narrative perspective; mimesis; and self-consciousness. Focus on paradigmatic prose texts alongside a spectrum of critical approaches. Offered in alternate years.—I. (I)

240. Forms of German Verse (4)
 Seminar—3 hours; term paper. The development of German verse from the Middle Ages to the present, with special emphasis on different techniques of text analysis and interpretation. May be repeated for credit with consent of instructor. Offered in alternate years.—II. (II)

241. The German Drama (4)
 Seminar—3 hours; term paper. The major forms of German drama from its origins to the middle of the twentieth century. May be repeated for credit with consent of instructor.—I. (I) Fisher

242. The German Novelle (4)
 Seminar—3 hours; term paper. The major German Novellisten, with particular emphasis on the flowering of this genre in the nineteenth century. May be repeated for credit with consent of instructor.—II. (II)

243. Fontane and the Rise of the Modern German Novel (4)
 Seminar—3 hours; term paper. Fontane, the father of the modern German novel and the chief German representative of the European novel at its greatest, in the context of the nineteenth-century European political and social scene.—II. (II)

244. Gender and Comedy (4)
 Seminar—3 hours; term paper. Analysis of plays of gender and gender in German-language comedy by male and female writers from the 18th century to the present. Authors treated include Lessing, Kleist, Buchner, Eberhard Eschenbach, Hauptmann, Hofmannsthal, Frisch, Langner, and Jelinek. Offered in alternate years.—III. (III)

252. The Writings of Lessing (4)
 Seminar—3 hours; term paper. Study of Lessing's theory of literature with particular emphasis upon his critical attacks on French drama.—I. (I)
Global and International Studies

253. Goethe (4) Seminar—3 hours; term paper. Study of the origins of Goethe's thought in German Romanticism, and his principal artistic, philosophical, scientific, and philosophical works. —I (I).

254. Schiller (4) Seminar—3 hours; term paper. A critical analysis of Schiller's major works and his impact on the intellectual climate in Germany during the late eighteenth and early nineteenth centuries. —II (II).

255. Aesthetics in the Age of Goethe (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Emergence of aesthetic autonomy from eighteenth century normative poetics during the Age of Goethe. The shift from a model based on the imitation of nature (and the Ancients) to a new concept grounded in the individuality of aesthetic experience. —I (I).

257. Heinrich von Kleist (4) Seminar—3 hours; term paper. Kleist's important dramatic and prose works; special attention will be given to the peculiar hermeneutic problems in modern German, French, and Anglo-American Kleist criticism. —III (III).

258. The Novels of Thomas Mann (4) Seminar—3 hours; term paper. Reading of selected novels with emphasis on aesthetic techniques, originally, historical, and psychological views, and influence on the contemporary literary scene in Germany. —II (II).

259. Studies in Kafka (4) Seminar—3 hours; term paper. Study of Kafka's narrative techniques with special emphasis in the shorter works on the existential development from its roots in Expressionism. —II (II).

260. The Poetry of Rilke (4) Seminar—3 hours; term paper. Study of the principal motifs, myths, images, and problems in the poetry of Rainer Maria Rilke. —I (I).

261. Brecht and the Epic Theater (4) Seminar—3 hours; term paper. A reading of Brecht's works with emphasis on the ideas which impelled the development of new literary forms and concepts. —III (III).

262. Studies in Turn-of-the-Century Culture (4) Seminar—3 hours; term paper. Investigates literary currents in turn-of-the-century Germany and Austria against the background of contemporaneous developments in psychology, the visual arts, philosophy, and music. Authors treated include Hauptmann, Holz and Schlaf, Schnitzler, T. Mann, Wedekind, Musil, Hofmannsthal. Offered in alternate years. —II (II), Finney.

285. Middle High German Literature (4) Lecture/discussion—3 hours; term paper. Prerequisite: consent of instructor. Exegetical reading of Middle High German literary language. Examines linguistic and literary problems. May be repeated for credit when topic differs. —I (I), III (III).

288. The Renaissance and Reformation in German Literature (4) Seminar—3 hours; term paper. The parabolic and didactic style in Germany's literature during the sixteenth century. May be repeated for credit with consent of instructor. —I (I).

289. German Literature of the Baroque (4) Seminar—3 hours; term paper. The "Elegiantideale" and the varying methods used to portray it in seventeenth-century German literature. May be repeated for credit with consent of instructor. —I (I).

290. The Enlightenment in German Literature (4) Seminar—3 hours; term paper. Revolt against the concept of the "Elegiantideale," and evolution of a new literature based on reason and wit. May be repeated for credit with consent of instructor. —I (I).

291. Foreign Language Learning in the Classroom (3) Seminar—3 hours; project. Overview of approaches to university-level foreign language instruction and the theoretical notions underlying current trends in classroom practices across commonly taught foreign languages. (Same course as French 291 and Spanish 291.) —I (I), II (II), III (III), Anderson, Arnett, Blake, Iwaski.

292. Sentimentality and Sturm und Drang in German Literature (4) Seminar—3 hours; term paper. Reaction to overemphasis on Reason: the works of Herder, Lessing, and Gotthold Lessing. May be repeated for credit with consent of instructor. —III (III).

293. The Classical Age of German Literature (4) Seminar—3 hours; term paper. Inquiry into the aesthetic and humanistic qualities of Germany's greatest literary period. May be repeated for credit with consent of instructor. —II (II).

294. The Romantic Period in German Literature (4) Seminar—3 hours; term paper. Survey of the works of early-nineteenth-century authors in reaction against the age of classicism. May be repeated for credit with consent of instructor. —I (I).

295. Poetic Realism in German Literature (4) Seminar—3 hours; term paper. Consider the evolution of the Hauptmann generation, Symbolism, Expressionism, and the current conditions of the contemporary scene. May be repeated for credit with consent of instructor. —I (I).

296. Twentieth-Century German Literature (4) Seminar—3 hours; term paper. Outstanding figures in German literature between 1840 and 1980. Important phases in their developments will be treated. May be repeated for credit with consent of instructor. —II (II).

297. Special Topics in German Literature (4) Seminar—3 hours; term paper. Various special topics in German literature, which may cut across the usual period and genre rubrics. May be repeated for credit when topic differs. —II (II).

298. Group Study (1-5) Individual Study (1-12) Special Study for the Doctoral Dissertation (1-12) (S/U grading only.)

299. Proposal for the Doctoral Dissertation (1-12) (S/U grading only.)

Professional

300A. The Teaching of German (2) Lecture—2 hours. Prerequisite: graduate standing or consent of instructor. Theoretical instruction in modern teaching methods and demonstration of their practical application. Required of new teaching assistants. (S/U grading only.) —I (I), Arnett.

300B. Teaching Advanced German (2) Lecture—2 hours. Prerequisite: graduate standing or consent of instructor. Theoretical instruction in modern teaching methods and demonstration of their practical application. Required of new teaching assistants. (S/U grading only.) —II (II), Arnett.

300C. The Teaching of German (2) Lecture—2 hours. Prerequisite: graduate standing or consent of instructor. Theoretical instruction in modern teaching methods and demonstration of their practical application. Required of new teaching assistants. (S/U grading only.) —III (III), Arnett.

360. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.) —I (I), II (II), III (III), Arnett.

Professional

400. Tutorial and Instructional Internship (1-3) 4-week regular and 1-3 week supervision session; may be repeated for credit. —I (I), II (II), III (III).

Global and International Studies

[College of Letters and Science]

The interdisciplinary minor in Global and International Studies will enable students to learn about global and international issues at UC Davis, as well as gain first-hand academic experience abroad. The minor is also available to study abroad or participate in an international internship. Students will be expected to work closely with an academic adviser in developing an intellectually coherent program of study. Each proposal must be approved by the Faculty Director of UC Davis Study Abroad.

The minor is sponsored by the Humanities Program. For more information, see http://studyabroad.ucdavis.edu/students/.

Minor Program Requirements:

UNITS

Global and International Studies........... 24

Arts and Humanities Emphasis:

One course from: Anthropology 4, 20, International Relations 1, Political Science 3 or Sociology 5......................... 4

One upper division UC Davis general course on global or international studies in the Arts and Humanities............................................. 3-4

See program advisor for a list of approved courses.

Course cluster requirement.................. 16-17

The minor requires the selection of interrelated courses totaling a minimum of 16-17 upper division units in area and regional studies or thematic course clusters in global and international studies in the Arts and Humanities.

Suggested course clusters include: (1) Country or region-specific courses: Western Europe, Russian and East/Central Europe, Asia and the Pacific, Latin America and South America; Africa and the Middle East; Jewish Studies; specific countries.

or (2) Courses clustered around a thematic field in global and international studies: people and nationalities; the individual and society, arts, language, literature and culture.

Study Abroad and International Internships.

The course cluster requirement may be met in one of two ways: (1) completion of a minimum of 16-17 units in the course cluster emphasis by taking approved UC Davis upper division courses in the area of global/international studies and/or approved upper division courses taken while participating in a UC Davis Study Abroad, UC/EAP or another approved study abroad program, or (2) completion of 12 units of course work in a UC Davis accredited international internship, plus UC Davis courses sufficient to total 16-17 units. Those students who are unable to study abroad or participate in an international internship may fulfill the requirement by taking approved global/international courses at UC Davis. Students must meet with the GIS advisor and complete a Course Cluster Worksheet to demonstrate subject interrelatedness.

Social Science Emphasis:

One course from: Anthropology 20, International Relations 1, Political Science 3, or Sociology 5.......................................................... 4
One upper division UC Davis general course on global or international studies in the Social Sciences or Humanities is required. See program advisor for a list of approved courses.

Course cluster requirement ………… 16-17

The minor requires the selection of interrelated courses totaling a minimum of 16-17 upper division units in a general and international studies in the Social Sciences.

Suggested course clusters for the Social Science Emphasis.

(1) Courses clustered around a thematic field in global and international studies: world trade and development, peace and security, global environment, health, and natural resources.

Study Abroad and International Internships. The course cluster requirement may be met in one of two ways: (1) completion of a minimum of 16-17 units in the course cluster emphasis by taking approved UC Davis upper division courses in the area of global/international studies and/or approved upper division courses taken while participating in a UC Davis Study Abroad, UCEAP or another approved study abroad program, or (2) completion of 12 units of course work in a UC Davis accredited international internship, plus UC Davis courses sufficient to total 16-17 units. Those students who are unable to study abroad or participate in an international internship may fulfill the requirement by taking approved global/international courses at UC Davis. Students must meet with the GIS advisor and complete a Course Cluster Worksheet to demonstrate subject content.

Restrictions. No more than two courses from a single UC Davis department may be offered in satisfaction of the minor requirements.

Foreign Language Study. Students are strongly encouraged to study a foreign language, particularly the language of the country in which and about which they intend to study. However, only upper division course work may be used to fulfill requirements for the minor.

Greek

See Classics, on page 198.

Health Informatics (A Graduate Group)

Formerly Medical Informatics (A Graduate Group)

Peter Yellowlees, M.B.B.S., M.D., Chairperson of the Group

Group Office. UC Davis Health System

Health Informatics Program

2450 48th St., Suite 2800, Sacramento, CA 95817

916-734-8710; healthinformatics@ucdavis.edu

Faculty

Nicholas Anderson, Ph.D., Assistant Professor (Pathology and Laboratory Medicine)

April Coad, M.D., M.P.H., Assistant Clinical Professor (Dermatology)

Aaron Bair, M.D., M.S., Associate Professor (Emergency Medicine)

Matt Bishop, Ph.D., Professor (Computer Science)

Dariusz Borys, M.D., Assistant Professor (Emergency Medicine)

Robert Christoph, Ph.D., Professor (Pathology and Laboratory Medicine)

Mary Christoffer, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology) 

Christina Davis, M.D., Assistant Professor (Mechanical and Aerospace Engineering)

Estella Geraghty, M.D., M.S., M.P.H., Assistant Professor of Clinical Internal Medicine (General Medicine)

Fred Gorin, M.D., Ph.D., Professor (Neurology)

Bernd Hamann, Ph.D., Professor (Computer Science)

Calvin Hinch, M.D., F.A.C.P, Professor (Internal Medicine and Public Health Sciences)

Michael Hogarth, M.D., Associate Professor (Pathology and Laboratory Medicine)

Anthony Jerant, M.D., Associate Professor (Family and Community Medicine)

Tae Youn Kim, Ph.D., R.N., Associate Professor (Nursing)

Patrice Koehler, Ph.D., Associate Professor (Computer Science)

James Marcin, M.D., M.P.H., Associate Professor (Pediatrics)

Thomas Niesditt, M.D., M.P.H., Professor (Family and Community Medicine)

Hien Nguyen, M.D., M.A.S, Assistant Professor (Infectious Diseases)

Alberto Odar, M.D., Adjunct Professor (Nursing)

Sean Peisert, Ph.D., Assistant Adjunct Professor (Computer Science)

Jason Roal, M.D., Assistant Clinical Professor (Psychiatry)

J. Anthony Seibert, Ph.D., Professor (Radiology)

Hendry Ton, M.D., M.S., Associate Professor (Psychiatry)

XiaoWen Yang, Ph.D., Assistant Professor (Biostatistics)

Peter Yellowlees, M.B.B.S., M.D, Professor (Radiology)

Heather Young, Ph.D., R.N., G.N.P., F.A.A.N., Associate Vice Chancellor (Nursing)

Emeriti Faculty

Richard Walters, Ph.D., Professor Emeritus (Computer Science)

Affiliated Faculty

Mark Carroll, M.P.H., Lecturer (Pathology and Laboratory Medicine)

Jim Greene, M.D., M.S., Faculty (Pathology and Laboratory Medicine)

Wasyi Malvy, Ph.D. (Pathology and Laboratory Medicine)

Michael Minear, Chief Information Officer (UC Davis Health System)

Graduate Study. The Group currently offers an M.S. degree in Health Informatics. The program is primarily designed for clinicians (M.D., D.O., D.V.M., V.M.D., M.P.H., Ph.D., M.R., others) and healthcare IT professionals with Bachelor's degree. The course of study provides research-oriented training that spans the use of computer systems in medicine today, including methods for clinical data acquisition, storage, retrieval, development, use and implementation of the electronic medical record, management of clinical data, and the use of medical decision support systems. A research project and thesis are mandatory degree requirements.

Preparation. The Group encourages application from clinicians and healthcare IT professionals who have had experience in the manipulation of clinical information. Basic qualifications include an advanced degree in a related field or the equivalent in work experience. Proof of proficiency in a programming language is required. Applicants with extensive computer science or information technology background but little knowledge of clinical information would need to gain considerable practical experience in dealing with clinical information to be competitive in applying to the program.

Graduate Advisors. M. Carroll (Pathology and Laboratory Medicine), E. Geraghty (General Medicine), M. Hogarth (Pathology and Laboratory Medicine), A.Odor (Nursing), P. Yellowlees (Psychiatry)

Courses in Health Informatics (HII)

Graduate

202. Computer-Based Patient Records (4) Lecture/discussion—3 hours; discussion—1 hour. Prerequisite: current enrollment within the Health Informatics graduate program or consent of instructor. Introduction and overview of computer-based clinical record systems. Topics include data modeling, health system standards and terminologies; security, privacy and confidentiality; workflow modeling; data visualization; legal; decision support; public health; and evidence-based practice.—II. (III.) Odor

207. Decision Support Systems (4) Lecture discussion—2 hours. Prerequisite: consent of instructor. Explores decision support systems for medical application. Topics include medical decision making, uncertainty, review of existing decision support systems, knowledge engineering, data mining, and knowledge based systems.—II. (III.) Maly

208. Medical Informatics in Web-Based Enterprise Computing (4) Lecture—2 hours; discussion—2 hours. Introduction to the decision making processes and technologies that are involved in developing Web-based distributed enterprise applications in medicine. Focus on the informationist’s role as a team member.—II. (III.) Hogarth

209. Data Acquisition and Analysis (4) Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Examines the nature, acquisition, and analysis of medical data. Data ranges from signals of electrical potentials, sounds, text, images (still and motion), and data from nucleic acid and protein expression and sequencing instruments.—I. (III.) Maly

211. Introduction to Health Informatics (4) Lecture—3 hours; discussion—1 hour. Overview course to give the student a broad exposure to the field of Health Informatics. Topics covered include, but are not limited to, networking, information systems, coding, HL7, Security and HIPAA. —I. (II.)

211V. Telemedicine (4) Web virtual lecture—3 hours; web electronic discussion—1 hour. Issues for the development and maintenance of a successful telemedicine program with focus on strategic planning, clinical applications, project management, risk management and legal issues; reimbursement and contracting; human resources and program sustainability.—I, II, III, (I, II, III) Yellowlees

212. Computer Security in Health Informatics (4) Lecture—3 hours; project. Prerequisite: course 210; 202; 209. Critical thinking about basic concepts in computer security and privacy. How the computer security and privacy impact health informatics, ranging from electronic health records to telemedicine to record, virtual surgery.—II, (I, II) Peisert


289A-E. G, I, Special Topics in Medical Informatics (1-5) Lecture, laboratory, or combination. Prerequisite: consent of instructor. Special topics in (A) Data Acquisition, (B) Electronic Medical Information, (C) Computer Based Patient Records, (D) Decision Support, (E) Medical Image Analysis, (F) Biostatistics, (H) Modeling Biological Systems, (I) Coding Systems. May be repeated for credit when topic differs.—I, II, (I, II, III)
334

Hebrew

289F. Database and Knowledge
Management (4)
Lecture/discussion—3 hours; term paper. Prerequisite: consent of instructor. Course objectives include
understanding the informatics techniques for data
capture, information management, and knowledge
generation that a student will use throughout their
career. May be repeated for credit.—I, II, III. (I, II,
III.) Lynch
289H. Modeling Biological Systems (4)
Lecture—3 hours; laboratory—1 hours.Class size
limited to 20 students. Create awareness of how
modern computer graphics have led to VR-Sim-Rob
applications, and how they are modifying the teaching of medicine and in some cases the diagnosis
and treatment of patients.—II. (II.) Odor
290. Seminar in Medical Informatics (1)
Seminar—1 hour. Restricted to 20 students. Discussion of current graduate research and topics in
Health Informatics. Oral presentations of individual
study. (S/U grading only.)—I, II, III. (I, II, III.) Odor
299. Research in Health Informatics (1-12)
Independent research in Health Informatics. (S/U
grading only.)—I, II, III. (I, II, III.)

Hebrew
See Classics, on page 198.

Hindi

Stylianos Spyridakis, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Daniel Stolzenberg, Ph.D., Associate Professor
Kathleen Stuart, Ph.D., Associate Professor
Baki Tezcan, Ph.D., Associate Professor
Cecilia Tsu, Ph.D., Associate Professor
Charles Walker, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Clarence E. Walker, Ph.D., Professor
Louis S. Warren, Ph.D., Professor

Emeriti Faculty
Arnold J. Bauer, Ph.D., Professor Emeritus
Robert Borgen, Ph.D., Professor Emeritus
Cynthia L. Brantley, Ph.D., Professor Emerita
David Brody, Ph.D., Professor Emeritus
Joan Cadden, Ph.D., Professor Emerita
Daniel H. Calhoun, Ph.D., Professor Emeritus
Robert O. Crummey, Ph.D., Professor Emeritus
Manfred P. Fleischer, Ph.D., Professor Emeritus
William W. Hagen, Ph.D., Professor Emeritus
Thomas H. Holloway, Ph.D., Professor Emeritus
Susan L. Mann, Ph.D., Professor Emerita
Ted W. Margadant, Ph.D., Professor Emeritus
Barbara Metcalf, Ph.D., Professor Emerita
Don C. Price, Ph.D., Professor Emeritus
Ruth E. Rosen, Ph.D., Professor Emerita
Academic Senate Distinguished Teaching Award
Alan S. Taylor, Ph.D., Professor Emeritus
UC Davis Prize for Teaching and Scholarly
Achievement
Richard N. Schwab, Ph.D., Professor Emeritus
Wilson Smith, Ph.D., Professor Emeritus
F. Roy Willis, Ph.D., Professor Emeritus
UC Davis Prize for Teaching and Scholarly
Achievement

The Major Program
See Classics, on page 198.

History
(College of Letters and Science)
Kathryn S. Olmsted, Ph.D., Chairperson of the
Department
Department Office. 2216 Social Sciences and
Humanities Building
530-752-9241; http://history.ucdavis.edu

Faculty
Ali Anooshahr, Ph.D., Associate Professor
Mario Biagioli, Ph.D., Professor
David Biale, Ph.D., Professor
UC Davis Prize for Teaching and Scholarly
Achievement
Beverly Bossler, Ph.D., Professor
Ian Campbell, Ph.D., Assistant Professor
Diana Davis, Ph.D., Associate Professor
Corrie Decker, Ph.D., Assistant Professor
Edward Dickinson, Ph.D., Professor
Omnia El Shakry, Ph.D., Associate Professor
A. Katie Harris, Ph.D., Associate Professor
Ellen Hartigan-O'Connor, Ph.D., Associate Professor
Quinn Javers, Ph.D., Assistant Professor
Ari Kelman, Ph.D., Professor
Kyu H. Kim, Ph.D., Associate Professor
Norma B. Landau, Ph.D., Professor
Lisa Materson, Ph.D., Associate Professor
Sally McKee, Ph.D., Professor
Susan G. Miller, Ph.D. Professor
Kathryn S. Olmsted, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Lorena Oropeza, Ph.D., Associate Professor
Eric Rauchway, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Andrés Reséndez, Ph.D., Professor
Michael Saler, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Marian Schlotterbeck, Ph.D., Assistant Professor
Sudipta Sen, Ph.D., Professor
John Smolenski, Ph.D., Associate Professor

The History major develops critical intelligence and
fosters an understanding of ourselves and our world
through the study of the past—both remote and
recent.
The Program. A student electing a major in History may complete Plan I or Plan II. Plan I enables
students to receive a broad education in histories of
several geographic areas. Plan II encourages interested students, including those preparing for graduate work in history, to enroll in a seminar, to
undertake independent work, and to study the history of historical thought as part of the major. Students preferring more active engagement in research
and writing are encouraged to follow Plan II.
Career Alternatives. A degree in history is excellent preparation for a professional career such as
teaching, law, journalism, public administration, or
business management. Professional schools in these
and related fields are looking for students who can
weigh conflicting evidence, evaluate alternative
courses of action or divergent points of view, and
express conclusions logically in everyday language.
These analytical skills are stressed in history classes,
and their mastery gives the history student a solid
preparation for subsequent training in a specialized
career.

A.B. Major Requirements:
UNITS
Preparatory Subject Matter
(Plan I or II) .......................................... 20
Five lower division courses chosen from the
following six fields, including at least two
from one field, one from a second field, and
one from a third field. The fifth course can be
taken from any field ............................. 20
(a) African and Middle East History: History
6, 15
(b) Asian History: History 6, 8, 9A, 9B
(c) European History: History 3, 4A, 4B, 4C
(d) Latin American History: History 7A, 7B,
7C
(e) U.S. History: History 17A, 17B, 72A,
72B
(f) World History: History 10A, 10B, 10C

Depth Subject Matter—Plan I............ 40-41
Four upper division courses from one of the
fields of concentration listed below......... 16
Two upper division courses from one of the
other fields of concentration listed
below................................................... 8
Two upper division courses from a field or
fields other than those chosen to satisfy the
two preceding requirements .................... 8
One additional upper division course
chosen from any of the fields ................... 4
One course from the following: History 101
or 102 or 103 (in field of
concentration) .....................................4-5
One of the courses taken to fulfill the above
requirements must deal with pre-modern
history.
Total Units for the Major, Plan I........ 60-61
Depth Subject Matter—Plan II................ 42
Four upper division courses from one of the
fields of concentration listed below. Include a
two-quarter sequence of courses ............ 16
Three upper division courses from one of the
other fields listed.................................. 12
History 101 .......................................... 5
History 102 in field of concentration (in
exceptional circumstances, a student may,
with the permission of an adviser, take the
seminar in another field) ......................... 5
History 103 in field of concentration ........ 4
One of the courses taken to fulfill the above
requirements must deal with pre-modern
history.
Total Units for the Major, Plan II............ 62
Fields of Concentration
(a) Europe: History 102A, 102B, 102C,
102D, 102E, 102F, 102I, 102P, 102X,
109A, 109B, 110A, 111B, 111C, 112A,
112B, 120, 121A, 121B, 121C, 122, 125,
130A, 130B, 130C, 131A, 131B, 131C,
132, 133, 134A, 135A, 135B, 136, 138A,
138B, 138C, 139A, 139B, 140, 141,
142A, 142B, 143, 144A, 144B, 145,
146A, 146B, 147A, 147B, 147C, 148A,
148B, 148C, 149, 151A, 151B, 151C,
151D, 160.
(b) United States History: History 102K,
102L, 102M, 102X, 120, 169A, 169B,
170A, 170B, 170C, 171A, 171B, 171D,
172, 173, 174A, 174B, 174C, 174D, 175,
176A, 176B, 177A, 177B, 178A, 178B,
179, 180A, 180B, 180C, 181, 182, 183A,
183B, 184, 185A, 185B, 188, 189.
(c) Asian History: History 102G, 102H,
102N, 102Q, 102R, 102X, 109A, 109B,
110, 110A, 111A, 112A, 112B, 112C,
113, 120, 190A, 190B, 190C, 190D,
191A, 191B, 191C, 191D, 191E, 191F,
193A, 193B, 193C, 194A, 194B, 194C,
194D, 194E, 195B, 196A, 196B.
(d) African History: 102O, 102X, 109A,
109B, 110, 110A, 112C, 115A, 115B,
(e) Latin American History: History 102J,
102X, 109A, 109B, 110, 110A, 160, 162,
163A, 163B, 164, 165, 166A, 166B, 167,
168, 169A, 169B.
(f) Within broad fields, a student may wish to
concentrate some of the courses on a
particular area or period, such as China or
Great Britain or Medieval Europe. Special
approval is not required.
Major Advisers. See the department’s website for
updated information.
History and Philosophy of Science. Courses
from the History and Philosophy of Science program
may count toward the History major. History and Philosophy of Science 130A fulfills upper division
requirements in the field of pre-industrial Europe. History and Philosophy of Science 130B, 150, and
180 fulfill upper division requirements in either the
U.S. or Modern Europe field.

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Domestic Diversity; Wrt=Writing Experience
Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences;
ACGH=American Cultures; DD=Domestic Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; VL=Visual; WC=World Cultures; WE=Writing Experience


The remaining major requirements can be fulfilled abroad provided that (a) the course should be evaluated as at least four UC Davis units, (b) the course should be considered upper division by the standards set forth by the UC Davis Study Abroad Program, and (c) the course should be offered in the field of History. Students may present copies of the course work, syllabus, and writing assignments to the department's liaison person with the Study Abroad office for approval.

Note: students who wish to receive credit for courses taken abroad under programs other than UC Davis Study Abroad Program and the Undergraduate Program Committee to do so.

Teaching Credential Subject Representative. See the Teaching Credential/M.A. Program on page 115.

Preparing for Careers in Teaching. History majors can pursue teaching. To ensure your undergraduate coursework prepares you for a subject matter competency test, please contact the History Project at 530-752-4383 or http://history.ucdavis.edu.

Graduate Study. The Department of History offers programs of study and research leading to the M.A. and Ph.D. degrees in history. Detailed information may be obtained by contacting the Graduate Adviser.

Graduate Advisers. See the department's website for updated information.

American History and Institutions. This University requirement can be satisfied by passing any one of the following courses in History: 17A, 17B, 72A, 72B, 170A, 170B, 170C, 171A, 171B, 171C, 172, 172A, 174A, 174B, 174C, 174D, 175, 176A, 176B, 177A, 177B, 178A, 178B, 180A, 180B, 181, 183A, 183B, 184, 189. The upper division courses may be used only with the consent of the instructor; see also Undergraduate requirements.

Courses in History (HIS)

Lower Division

3. Cities: A Survey of World Cultures (4)

Lecture—3 hours; lecture/discussion—1 hour. Survey of urban ways of life, focusing on up to ten cities selected by the instructor. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—I, II, III. Langland, Stuart

4A. History of Western Civilization (4)

Lecture—3 hours; discussion—1 hour. Growth of western civilization from late antiquity to the Renaissance. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—I, II. McKee

4B. History of Western Civilization (4)

Lecture—3 hours; discussion—1 hour. Development of western civilization from the Renaissance to the Eighteenth Century. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—II. Landau, Stuart

4C. History of Western Civilization (4)

Lecture—3 hours; discussion—1 hour. Development of Western Civilization from the Eighteenth Century to the present. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—II, III. Campbell, Sailer

6. Introduction to the Middle East (4)

Lecture—3 hours; discussion—1 hour. Survey of the major social, economic, political and cultural transformations in the Middle East from the rise of Islam (c. 600 A.D.) to the present; emphasizing themes in religion, politics, and society. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—I. Tezcan

7A. History of Latin America to 1700 (4)

Lecture—3 hours; discussion—1 hour. Introduction to the history of the Americas from the late pre-Columbian period through the initial phase and consolidation of a colonial regime (circa 1700). Topics include conquest, colonialism, racial mixture, gender systems. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—I. (I) C.F. Walker

7B. History of Latin America, 1700-1900 (4)

Lecture—3 hours; discussion—1 hour. Latin America from colony to republic. The nature of iberic colonialism, the causes for independence, the creation of nation states, the difficulties in consolidating these nations, and the rise of Latin America’s trade and export econmics in the nineteenth century. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—II. (II) Renendez

7C. History of Latin America, 1900-present (4)

Lecture—3 hours; discussion—1 hour. Latin America since the beginning of the 20th century. Themes include export economies, oligarchic rule, crises of depression and war, corporatism, populism revolution and reform movements, cultural and ethnic issues. U.S.-Latin American relationships and cultural restructuring. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—III. (III) Langland

8. History of Indian Civilization (4)

Lecture—3 hours; discussion—1 hour. Written reports. Survey of Indian civilizations from the rise of cities (ca. 2000 B.C.) to the present, emphasizing themes in religion, social and political organization, and art and literature that reflect cultural interactions and change. GE credit: ArtHum or SocSci, Div | AH or SS, WC, WE.—II. Sen

9A. History of East Asian Civilization (4)

Lecture—3 hours; discussion—1 hour. Surveys traditional Chinese civilization and its modern transformation. Emphasis is on how religion and political and social life, art and literature. Perspectives on contemporary China are provided. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—I. III. Bassler

9B. History of East Asian Civilization (4)

Lecture—3 hours; discussion—1 hour. Surveys traditional Japanese civilization and its modern transformation. Emphasis is on how religion and political and social life, art and literature. Perspectives on contemporary Japan are provided. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—II, III. Kim

10A. World History to 1530 (4)

Lecture—3 hours; discussion—1 hour. Historical examination of the changing relationship of human societies to one another and to their natural settings through the year 1530, with particular attention to long-term trends and to periodic crises that reshaped the links of culture and nature on a global scale. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—I, II, III. Ananthahpt

10B. World History, c. 1530-1850 (4)

Lecture—3 hours; discussion—1 hour. Major topics in world history from the 14th century to the beginning of the 19th century. Topics will vary but may include oceans as systems of human communication and conflict; the global consequences of “industrial revolutions” in Europe and Asia. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—II, III. Harris, Stolzenberg

10C. World History III (4)

Lecture—3 hours; discussion—1 hour. Major topics from world history of the 19th and 20th centuries, emphasizing the rise and fall of Western colonial empires; Cold War and the superpowers; the spread of the nation-states; and the processes of globalization. GE credit: ArtHum or SocSci, Div | AH or SS, WC, WE.—II, III. Dickinson, Ei Shakry

11. History of the Jewish People in the Modern World (4)

Lecture—3 hours; discussion—1 hour. Histories and cultures of the Jews since 1492. Topics include: the making of Jewish diasporas, roots of antisemitism, the Holocaust in images and texts, changing ideas of the self, Jews in America, and processes of modernizations of the Jewish past. Offered in alternate years. GE credit: ArtHum | AH, DD, VI, WC, WE.—I (I) Miller

12. Food and History (4)

Lecture—3 hours; discussion—1 hour. Survey of the ways humans have fed themselves from the dawn of humanity to the present. Transformation of plants and animals into food, cooking into cuisine, and ceremony into etiquette. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—II, III. Resendez

15. Introduction to African History (4)

Lecture—3 hours; discussion—1 hour. Examination of the longrange historical context as background to current conditions in Africa. Includes the early development of African civilizations, the slave trade and...
99. Special Study for Undergraduates (1-5) Lecture—3 hours; discussion—1 hour. The experiences of the American people from the Colonial Era to the Civil War. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, DD, WE. —II. Decker

17A. History of the United States (4) Lecture—3 hours; discussion—1 hour. The experiences of the American people from the Colonial Era to the Cold War. Not open for credit to students who have completed course 17C. GE credit: ArtHum or SocSci, Div, Wrt | AC GH, AH or SS, DD, WE.—II, III, IV, V. (Hartigan-O’Connor, Kelm an, Smolen ski, Taylor)

17B. History of the United States (4) Lecture—3 hours; discussion—1 hour. The experiences of the American people from the Civil War to the end of the Cold War. Not open for credit to students who have completed course 17C. GE credit: ArtHum or SocSci, Div, Wrt | AC GH, AH or SS, DD, WE.—II, III, IV, V. (Hartigan-O’Connor, Kelm an, Smolen ski, Taylor)

72A. Social History of American Women and the Family (4) Lecture—3 hours; discussion—1 hour. Social and cultural history of women, sex roles, and the family from colonial America to the late nineteenth century emphasizing changes resulting from the secularization, commercialization, and industrialization of American society. GE credit: ArtHum or SocSci, Div, Wrt | AC GH, AH or SS, DD, WE.—II. Hartigan-O’Connor

72B. Social History of American Women and the Family (4) Lecture—3 hours; discussion—1 hour. Social and cultural history of women, sex roles, and the family in the twentieth century, emphasizing female reformers and revolutionaries, working class women, consumerism, the role of media, the “feminine mystique,” changes in family life, and the emerging women’s movement. GE credit: ArtHum or SocSci, Div, Wrt | AC GH, AH or SS, DD, WE.—II. Materson


98. Directed Group Study (1-5) Prerequisite: consent of instructor. Primarily for lower division students. (P/NP grading only.)

99. Special Study for Undergraduates (1-5) (P/NP grading only)

Upper Division

101. Introduction to Historical Thought and Writing (5) Lecture/discussion—4 hours; term paper. Prerequisite: consent of instructor. Study of the history of historical thought and writing, analysis of critical and speculative philosophies of history and evaluation of modes of organization, interpretation, and style in historical writing. GE credit: WE.—II, III. (Saler, Stollzenberg)

102A-S. X. Undergraduate Proseminar in History (5) Seminar—3 hours, term paper. Designed primarily for history majors. Intensive reading, discussion, research, and writing in selected topics in the various fields of history. Consent of instructor. (B) Medieval; (D) Modern Europe to 1815; (E) Europe since 1815; (F) Russia; (G) China to 1800; (H) China since 1800; (I) Britain; (J) Latin America since 1810; (K) American History to 1787; (L) United States, 1787-1896; (M) United States since 1896; (N) Japan; (O) Africa; (P) Christianity and Culture in Europe, 50-1500; (Q) India; (R) Muslim Societies; (S) Education Abroad Program, GE credit: ArtHum, Wrt | AH or SS, WE; (X) Comparative History, selected topics in cultural, political, economic, and social history that deal comparably with more than one geographic field. May be repeated for credit. Limited enrollment.—I, II, III, IV, V, VI.

103. Topics in Historical Research (4) Discussion—3 hours; individual consultation with instructor, term paper. Prerequisite: consent of instructor. Individual research resulting in a research paper on a specific topic in one of various fields of history. May be repeated for credit. GE credit: WE.

104A. Introduction to Historical Research and Interpretation (4) Seminar—3 hours; term paper. Prerequisite: acceptance into History Department Honors Program. Directed reading and research aimed at preparing students to select appropriate topics and methodologies for a senior honors essay and to clarify their topics within a meaningful, broad context of historiographical interpretations. Culminates in the submission of a full prospectus for an honors essay. GE credit: WE.—II. (Spyridakis)

104B. Honors Thesis (4) Tutorial—4 hours. Prerequisite: course 104A. Research in preparation of a senior honors thesis under the direction of a faculty adviser. (Deferred grading only, pending completion of sequence.) GE credit: WE.—II.

104C. Honors Thesis (4) Tutorial—4 hours. Prerequisite: course 104A and 104B. Completion of a senior honors thesis under the direction of a faculty adviser. (Deferred grading only, pending completion of sequence.) GE credit: WE.—III. (Spyridakis)

108. Global Environmental History (4) Lecture/discussion—3 hours, project. Global, comparative study of environmental change, human perceptions of nature, and manipulations of nature have changed over time. Primary focus post-1500, emphasis on critically analyzing many common ideas of environmentalism. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE.—I. Davis

109A. Global Environmental History (4) Lecture/discussion—3 hours, project. Global, comparative study of how environmental change, human perceptions of nature, and manipulations of nature have changed over time. Primary focus post-1500, emphasis on critically analyzing many common ideas of environmentalism. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE.—Davis

109B. Environmental Change, Disease and Public Health (4) Lecture/discussion—3 hours, term paper. Analysis of environmental changes from pre-history to the present and their influence on disease distribution, virulence and public health, many of these changes have been driven by human action and transformations of pathogen ecosystems that have accelerated under globalization. GE credit: SciEng or SocSci, Div | SE or SS, SL—I, II. (Davis)

110. Themes in World History (4) Lecture—3 hours, term paper. Prerequisite: upper division standing. Issues and topics in world history. Topics will emphasize the interaction of diverse regions of the world as well as common patterns of historical change. May be repeated for credit if topic and/or instructor differs. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE, WC, WE.

101A. Colonialism and the Making of the Modern World (4) Lecture—3 hours, term paper. History of the modern world, focusing on struggles between Eurocentric and colonized peoples; the global formation of capitalism; the creation of nation-states; and the constitution of bourgeois bodies and racial selves in modern societies. Offered in alternate years. GE credit: ArtHum | AH or SS, VL, WE.—III. El Shamy

111A. Ancient History (4) Lecture—3 hours; discussion or paper (student option). History of ancient empires of the Near East and of their heirs, the Hellenistic World. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE.—I. Spyridakis

111B. Ancient History (4) Lecture—3 hours; discussion or paper (student option). Political, cultural and intellectual study of the Greek world from Minoan-Mycenaean period to end of Hellenistic Age. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE, WC.—II. Spyridakis

112A. History of Modern Jewish History (4) Lecture—3 hours, term paper. Topics in the history of Jews from the Biblical era to the era of Jewish emancipation. Topics can be framed chronologically (e.g., medieval Jewry) or thematically (e.g., trade and Jewish communities). May be repeated one time for credit. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE.

112B. Topics in Modern Jewish History (4) Lecture—3 hours, term paper. Topics in the history of Jews from the era of Jewish emancipation to the present. Topics can be framed chronologically or thematically (e.g., Zionism, assimilation, the post Holocaust diaspora). GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE.

112C. History of Jews in the Muslim World (4) Lecture—3 hours, term paper. Prerequisite: upper division standing recommended. History of Jewish communities in the lands of Islam from the time of the Prophet Muhammad to the present day. GE credit: SocSci, Div, Wrt | AH or SS, WE.

113. History of Modern Israel (4) Lecture—3 hours, term paper. Topics include the rise and fall of utopian Zionism, the century-long struggle between Jews and Arabs, the development of modern Hebrew culture, the conflict between religious and secular Jews, and the nature of Israel’s multicultural society. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE, WC, WE.—Bale

115A. History of Africa (4) Lecture—3 hours, term paper. Prerequisite: course 15 recommended. Introductory survey of the history of West Africa and/or the Congo region from the earliest times to the present. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE.

115B. History of East and Central Africa (4) Lecture—3 hours, term paper. Prerequisite: course 15 recommended. Introductory survey of the history of east and central Africa from earliest times to the present. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE, WC, WE.—Decker

115C. History of Southern Africa (4) Lecture—3 hours, term paper. Prerequisite: course 15 recommended. Introductory survey of the history of Southern Africa (including South Africa) from earliest times to the present. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE, WC, WE.—Decker


113F. History of North, Horn, Sudan and Nile Valley (North and North-East Africa) (4)

Lecture—4 hours; term paper. This course shall investigate the history of the north and northeast regions of continental Africa, encompassing the Mediterranean area, the Maghreb, Sahara, Horn of Africa, the Nile Valley and the Sudan, covering the ancient period to the present. May be repeated up to four times for credit when instructor differs. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE. —II. Miller

116. African History: Special Themes (4)

Lecture—3 hours; term paper. Prerequisite: courses 115A and 115B recommended. Themes of African history, such as African states and empires, slave trade, relationship of Egypt to rest of Africa, Bantu origins and migrations, and French policy of Assimilation and Association. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

120. World War II (4)

Lecture—3 hours; extensive writing. The Second World War from 1931 to 1945 in all of its theaters. Causes, conduct, and consequences of the war including military, political, economic, social, and cultural factors, with special emphasis on the battlefront strategy and mobilization of the home front. Offered irregularly. GE credit: SocSci | SS, WC, WE. —I, II, III, IV; Raino, R. L.

121A. Medieval History (4)

Lecture/discussion and panel presentations—3 hours. European history from “the fall of the Roman Empire” to the eighth century. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE. —McKee

121B. Medieval History (4)

Lecture/discussion and panel presentations—3 hours. European history from Charlemagne to the twelfth century. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE. —McKee

121C. Medieval History (4)

Lecture/discussion and panel presentations—3 hours. European history from the Crusades to the Renaissance. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE. —McKee

122. Selected Themes in Medieval History (4)

Lecture—3 hours; term paper. Each offering will focus on single major theme, such as medieval agrarian history, feudalism, the family, medieval Italy, the Crusades, which includes original sources in English translation and modern works. May be repeated for credit. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

125. Topics in Early Modern European History (4)

Laboratory/discussion—3 hours; term paper. Prerequisite: course 4B recommended. Social and cultural history, 1300-1800. Topics such as medieval and Renaissance Italian, early modern Italy, Ancient Regime France, family and sexuality, and material culture and daily life. May be repeated for credit. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

130A. Christianity and Culture in Europe: 50-1450 (4)

Lecture—3 hours; written report or research paper. A history of the ideas and institutions of Christianity and their impact on the late Roman Empire and medieval Europe in terms of outlook on life, art, politics, and economics. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

130B. Christianity and Culture in Europe: 1450-1600 (4)

Lecture—3 hours; written report or research paper. A history of the Lutheran, Zwinglian-Calvinist, Radical, Anglican, and Catholic Reformations as foundation stones of a new culture in Europe, with special attention to the interconnections between the revival of antiquity and the different reform movements. GE credit: ArtHum or SocSci | AH or SS, WC, WE. —Harris

130C. Christianity and Culture in Europe: 1600-1850 (4)

Lecture—3 hours; written report or research paper. A survey of the intellectual, cultural and political reorientation of European society in the aftermath of the Wars of Religion. “Secularization” will be discussed in the context of the Enlightenment and Romanticism. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

131A. Early Modern European History (4)

Lecture—3 hours; written reports. Prerequisite: courses 4A and 4B recommended. Western European history from about 1350 to about 1500. GE credit: ArtHum or SocSci | AH or SS, WC, WE. —Stuart

131B. European History During the Renaissance (4)

Lecture—3 hours; term paper. Survey of European society, politics, and culture from the late 15th through the early 17th centuries, with particular focus on the Italian and Northern Renaissance, the Protestant Reformation, and the Catholic Counter Reformation. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE. —Stuart

131C. The Old Regime: Absolution, Enlightenment, European Revolutions (4)

Lecture—3 hours; term paper. Survey of European society, politics, and culture in the 17th and 18th centuries, focusing on religious warfare, absolutism, Scientific Revolution, Enlightenment and the growth of religious tolerance, the French Revolution and the collapse of the old regime. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE. —Stuart

132. Crime and Punishment in Early Modern Europe (4)

Lecture—3 hours; term paper. Deviance and crime in early modern Europe, contrasting imaginary crimes, e.g. witchcraft, with “real” crimes such as highway robbery and infanticide. Examines impact of gender, sexual orientation, ethnicity, and class in process of criminalization. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE. —Stuart

133. The Age of Ideas (4)

Lecture—3 hours; written reports. The Enlightenment and its background in the eighteenth century. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE. —I. Stolzenberg

134A. The Age of Revolution (4)

Lecture—3 hours; written reports. Ideas and institutions during the French Revolution and the Napoleonic era. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

135A. History of Science, 18th to 20th Century (4)

Lecture/discussion—3 hours; term paper. Prerequisite: upper division standing. Survey of the development of science, technology, and medicine from the ancient world to the eighteenth century, with special emphasis on Isaac Newton as the culmination of the seventeenth century scientific revolution. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

135B. History of Science, 18th to 20th Centuries (4)

Lecture—3 hours; term paper. Prerequisite: upper division standing. Survey of the historical development of scientific thought in geology, biology, chemistry, and astronomy from the eighteenth century to the twentieth century, with special emphasis on the development of medical knowledge in epidemiology and anatomy; function of this knowledge, how it changed with technological breakthroughs and professionalization; and role of medicine in attitudes toward poverty, women, race, and disease. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

140. The Rise of Capitalism in Europe (4)

Lecture—3 hours; term paper. Prerequisite: course 4B or 4C. Comparative analysis of major interpretations of the rise of merchant capitalism during the Middle Ages and Renaissance; European expansion overseas, 1450-1815; the transition to modern capitalism via industrial revolution. Social, political, cultural, and economic history. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

141. France Since 1815 (4)

Lecture—3 hours; term paper. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE. —II. Biale

142A. History of the Holocaust (4)

Lecture—3 hours; term paper. Prerequisite: upper division standing. Topics include comparative genocides, medieval and modern antisemitism, modern German history, the rise of Nazism, Jewish life in Europe before the Nazi period, and the fate of the Jewish communities and other persecuted groups in Europe from 1933-1945. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE. —II. Biale

142B. The Memory of the Holocaust (4)

Lecture—2 hours; discussion—1 hour; term paper. History of European medicine, 18th to 20th centuries, by examining the development of medical knowledge in epidemiology and anatomy; function of this knowledge, how it changed with technological breakthroughs and professionalization; and role of medicine in attitudes toward poverty, women, race, and disease. Offered in alternate years. GE credit: ArtHum or SocSci | AH or SS, WC, WE.
143. History of Eastern Europe and the Balkans (4)
Lecture—3 hours; essays. History of the Baltic, Danubian, and Balkan lands since the Middle Ages. National cultures and conflicts in the Polish Commonwealth and the Habsburg and Ottoman Empires, nationalist movements, 1789-1914, the twentieth century, including an analysis of the contemporary scene. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

144A. History of Germany, 1450 to 1789 (4)
Lecture—3 hours; extensive writing. Survey of early modern Germany, 1450 to 1789, covering the theology and social history of the Reformation, the Peasants War of 1525, religious warfare, state building and absolutism, the rise of Prussia, Austro-Prussian dualism, and the German Enlightenment. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

144B. History of Germany since 1789 (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 144A recommended. History of the German lands in the age of the French Revolution; 19th-century liberalism, nationalism, and industrialization: the World Wars, National Socialism, and the Holocaust; West and East Germany in the Cold War; the post-reunification scene. [Not open for credit to students who have completed former course 144 (or equivalent).] GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

145. War and Revolution in Europe, 1789-1918 (4)
Lecture—3 hours; term paper. Survey of revolutionaries’ movements, international crises, and wars in Europe from the French Revolution to World War I. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

146A. Europe in the Twentieth Century (4)
Lecture—3 hours; term paper. Survey of the history of Europe from 1918 to 1939. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—I. Dickinson

146B. Europe in the Twentieth Century (4)
Lecture—3 hours; term paper. Survey of the history of Europe since 1945. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—II. Dickinson

147A. European Intellectual History, 1800-1870 (4)
Lecture—3 hours; term paper. European thought in the early industrial era. Shifting cultural frameworks, from romanticism to liberalism and social and socialist reactions to social change. Focus on the work of Goethe, Hegel, J.S. Mill, Marx, Darwin and Flaubert. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—I. Dickinson

147B. European Intellectual History, 1870-1940 (4)
Lecture—3 hours; term paper. Cultural and intellectual watershed of the late nineteenth and early twentieth centuries. Emergence of modern art and literature; psychoanalysis and the new social sciences. Focus on the work of Baudelaire, Wagner, Nietzsche, Freud, Weber and Kafka. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—II. Saler

147C. European Intellectual History, 1920-1970 (4)
Lecture—3 hours; term paper. European thought and culture since World War II. Coverage includes: literature and politics; Communism and Western Marxism; Fascism; Existentialism; Structuralism; Feminism. Particular attention to Lenin, Brecht, Hitler, Sartre, Camus, Beckett, Manzur, Foucault, Wollff and de Beauvoir. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Saler

148A. Women and Society in Europe: 1500-1789 (4)
Lecture—3 hours; term paper. Prerequisite: course 4B recommended. Roles and perceptions of women from the Renaissance to the French Revolution. Emphasis on social and economic factors as well as on discussions of women in the writings of political theorists and social commentators. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

148B. Women and Society in Europe: 1789-1920 (4)
Lecture—3 hours; term paper. Prerequisite: course 4C and 148A recommended. Roles and perceptions of women from the World Wars to the Cold War, 1920-1980, primarily in France and England. Emphasis on social and economic developments within a loosely chronological and comparative framework. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

148C. Women and Society in Europe: 1914-Present (4)
Lecture—3 hours; term paper. Prerequisite: course 148B recommended. The history of 20th-century Europe from the perspective of women and the family, and of sexual and gender relations. Emphasis on the impact on women of major events and movements, such as Soviet communism, World War II, the world state feminism, and mass culture. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

149. Comparative Cultural History of Modern Britain and France, 1880-1914 (4)
Lecture—3 hours; term paper. Cultural comparison of the histories of Britain and France during the fin de siècle. Addresses cultural debates of the period (including gender, race); the practices of cultural history. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

151A. England: The Middle Ages (4)
Lecture—3 hours; term paper. Prerequisite: course 4A recommended. Origins of England to the accession of the Lancaster dynasty. Survey includes: impact of Norman Conquest on Anglo-Saxon institutions; rise of the Church, common law, parliament, and the economy; thought, arts, and literature to the age of Chaucer and Wyclif. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

151B. England: The Early Modern Centuries (4)
Lecture—3 hours; term paper. Prerequisite: courses 4A, 4B; course 151A recommended. From Lancaster and York to the Glorious Revolution. Includes growth of the Church of England; beginnings of modern worldwide economy; rise of the gentry and parliament; thought, arts, and literature in the times of More, Shakespeare, Hobbes, Wren, and Newton. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.

151C. Eighteenth-Century England (4)
Lecture—3 hours; term paper. English history from the Glorious Revolution to the French Revolution. Examination of the transformation of Europe’s most politically unstable kingdoms into the firmly established constitutional monarchy which provided an environment fit to engender the industrial revolution. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—Landau

151D. Industrial England (4)
Lecture—3 hours; term paper. English history from Waterloo to the Battle of Britain; the rise and continuance of the first industrial society; examining the transformation of landed to class society, oligarchy to democracy and bureaucracy, Bentham to Bloomsbury, empire to commonwealth. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Landau

159. Women and Gender in Latin American History (4)
Lecture—3 hours; extensive writing. Prerequisite: one course either in Latin American or in women’s history in another world area. Role of women and men in the history of Latin America, with an emphasis on the intersection of gender with racial and class categories. Introduction to the theoretical premises of women’s and gender history. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Landau

160. Spain and America in the 16th Century (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. The Atlantic world in the 16th century, particularly the transcultural and reciprocal social and economic relations between Spain and America in the context of colonization. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—II. Harris

162. History of the Andean Region (4)
Lecture/discussion—3 hours; written and/or oral reports. History of the Andean region, the area that now comprises modern Peru, Bolivia, and Chile, from the beginning of human settlement to the present. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—III. III. III. C. F. Walker

163A. History of Brazil (4)
Lecture—3 hours; written reports. The history of the Brazilian republic from 1889 to the present. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

163B. History of Brazil (4)
Lecture—3 hours; term paper. The history of the Brazilian republic from 1889 to the present. GE credit: ArtHum or SocSci | AH or SS, WC, WE.—I. Langland

164. History of Chile (4)
Lecture—3 hours; term paper. Prerequisite: course 141A, 161B, 165, or 168 recommended. Emphasis on discussions of women in the writings of political and social thinkers. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

166A. History of Mexico to 1848 (4)
Lecture/discussion—3 hours; written and/or oral reports. Political, economic, and social development of pre-Columbian, colonial and national Mexico to 1848. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

166B. History of Mexico Since 1848 (4)
Lecture/discussion—3 hours; written and/or oral reports. History of Mexico from 1848 to the present. GE credit: ArtHum or SocSci | AH or SS, WC, WE.

167. Modern Latin American Cultural and Intellectual History (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Introduction to the cultural and intellectual history of modern Latin America, including architecture, cinema, painting, music, and literature. GE credit: ArtHum or SocSci, Wrt | AH or SS, WC, WE.—C.F. Walker, Resendez

168. History of Inter-American Relations (4)
Lecture—3 hours; term paper. Diplomatic history of Latin America since independence, intra-Latin American relations, relations with the United States, participation in international organizations, and communism in Latin America. GE credit: ArtHum or SocSci | AH or SS, WC, WE.—II. C.F. Walker

169A. Mexican-American History (4)
Lecture/discussion—3 hours; written and/or oral reports. Economic, social, religious, cultural and political development of the third-largest speaking population of the Southwestern United States from about 1800 to 1910. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Oropeza

169B. Mexican-American History (4)
Lecture/discussion—3 hours; written and/or oral reports. Role of the Mexican and Mexican-American or Chicano in the economy, politics, religion, culture and society of the Southwestern United States since 1910. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—I. Oropeza
170A. Colonial America (4)
Lecture—3 hours; term paper. Colonial society from 1607 to the American Revolution, with emphasis on European expansion, political, social and economic foundations, colonial thought and culture, and imperial rivalry. GE credit: AHC or SocSci, Div. Wrt | ACGH, AH or SS, WE.—II. Smolenski, Taylor

170B. The American Revolution (4)
Lecture—3 hours; term paper. Analysis of the Revolutionary War with emphasis on the structure of British colonial policy, the rise of revolutionary movements, the War for Independence and its consequences, and the Confederation period. GE credit: AHC or SocSci, Div. Wrt | ACGH, AH or SS, WE.—Ili. Smolenski, Taylor

170C. The Early National Period, 1789-1815 (4)
Lecture—3 hours. Political and social history of the American republic from the adoption of the Constitution through the War of 1812 and its consequences. GE credit: AHC or SocSci | ACGH, AH or SS, DD, WE.

171A. Jacksonian America (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. The political and social history of the United States from the War of 1812 to the economic crisis of 1850. How the market revolution transformed American life, and led the nation toward war. GE credit: AHC or SocSci, Div. Wrt | ACGH, AH or SS, DD, WE.—Kelman

171B. War and American Society: From the American Revolution to 1807 (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Examination of the political and social history of the United States from the Compromise of 1785 to the end of Reconstruction in 1867. Causes of the war, the war itself, and the peace of reconstruction after the war. GE credit: AHC or SocSci, Div. Wrt | ACGH, AH or SS, DD, WE.—I. Kelman

171F. The Civil War in American Film (1)
Discussion—1 hour; film viewing. Prerequisite: course 171B concurrently. Viewing and discussion of films with short writing assignments. (P/NP grading only.) GE credit: AHC or SS.

171D. Selected Themes in 19th Century American History (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Interpretative overview of a single topic in the history of the United States in the 19th century. Sample topics include social history, the 1850s, and southern history. May be repeated one time for credit when topic differs. Offered in alternate years. GE credit: AHC or SocSci, Wrt | ACGH, AH or SS, DD, WE.

172. American Environmental History (4)
Lecture—3 hours; term paper. Prerequisite: course 17A. Examination of changing relations between people and nature in the area of the current United States from pre-Columbian times to the present. Topics include ecological change; perceptions of nature; social conflicts over “proper” uses of nature; environmental movement. Offered in alternate years. GE credit: AHC or SocSci, Wrt | ACGH, AH or SS, WE.—II. Warren

173. Becoming an American: Immigration and American Culture (4)
Lecture—3 hours; term paper. Prerequisite: course 17B. Could not repeat for credit. An introduction to the wide range of immigrant experiences and cycles of nativism that have shaped American culture in the twentieth century. From novels, memoirs and films, students will explore how external and internal immigration has created a multicultural society. Offered alternate years. GE credit: AHC or SocSci, Div. Wrt | ACGH, AH or SS, DD, WE.—I. Tsu

174. The Modern Era and Progressive Era: United States, 1876-1917 (4)
Lecture—3 hours; term paper. Prerequisite: course 17B. U.S. history and the construction of modern America from the end of Reconstruction to U.S. entry into World War I. Importance of Southern redemption, Western incorporation, electoral corruption, labor movements, populism, progressivism, women's suffrage, U.S. imperial expansion, and immigration restriction. Offered only GE credit: AHC or SocSci, Wrt | ACGH, AH or SS, DD, WE.—Raukhwy

174AD. Emerging of Modern America: Discussion (1)
Discussion—1 hour; short papers. Prerequisite: course 174A concurrently. Intensive discussion of topics and readings for course 174A. (P/NP grading only.)

174B. War, Prosperity and Depression: United States, 1917-1945 (4)
Lecture—3 hours; term paper. Prerequisite: course 17A. America's emergence as a world power, the business cycle of the 1920s, the New Deal and World War II. Emphasis on such issues as government regulation of the economy, welfare capitalism, and class, racial, ethnic, and gender conflicts. Offered in alternate years. GE credit: AHC or SocSci, Wrt | ACGH, AH or SS, DD, WE.—Ili. Omlsted, Raukhwy

174BD. America in War, Prosperity and Depression: Discussion (1)
Discussion—1 hour; short papers. Prerequisite: course 174A concurrently. Intensive discussion of topics and readings for course 174B. (P/NP grading only.)

174C. The United States Since World War II, 1945 to the Present (4)
Lecture—3 hours; term paper. Prerequisite: course 174D concurrently. America's struggle to respond to new complexities in foreign relations, social tensions, family changes and media. Emphasis on such topics as: Cold War, anticommunist crusade; civil rights, feminism, and environmentalist movement; New Left; counterculture; Vietnam; Watergate; and the moral majority. GE credit: AHC or SocSci, Wrt | ACGH, AH or SS, DD, WE.—Ili. Omlsted, Raukhwy

174CD. The United States Since World War II: Discussion (1)
Discussion—1 hour. Prerequisite: course 174C concurrently. Intensive discussion of topics and readings for course 174C. (P/NP grading only.)

174D. Selected Themes in 20th Century American History (4)
Lecture—3 hours; term paper. Prerequisite: course 17B or the equivalent. Interpretive overview of a single topic in the history of the United States in the 20th century with attention to the phases and processes of historical change. May be repeated one time for credit when topic differs. Offered in alternate years. GE credit: AHC or SocSci, Wrt | ACGH, AH or SS, DD, WE.—Ili. Omlsted

174DD. Selected Themes in 20th Century American History: Discussion (1)
Discussion—1 hour. Prerequisite: course 174D concurrently. Intensive discussion of topics and readings for course 174D. May be repeated for credit. (P/NP grading only.)

175. American Intellectual History (4)
Lecture—3 hours; term paper. Prerequisite: course 17B and upper division standing. Ideas that have shaped politics and society in the United States from colonial times to the present. Topics include American liberalism, republicanism, democracy, constitutionalism, communalitarianism, utopianism, pragmatism, feminism, Darwinism, nationalism, conservatism, and economics. Offered in alternate years. GE credit: AHC or SocSci, Wrt | ACGH, AH or SS, WE.—Ili. Omlsted

176A. Cultural and Social History of the United States (4)
Lecture—3 hours; term paper. Study of social and cultural forces in American society in the nineteenth century, and their consequences. Issues of leisure, socialization and the family, social reform movements and changes in cultural values. GE credit: AHC or SocSci | ACGH, AH or SS, DD, WE.—II. Hartigan-O'Connor

176B. Cultural and Social History of the United States (4)
Lecture—3 hours; term paper. Study of social and cultural forces in American society in the twentieth century with emphasis on social structure, work and leisure, socialization and the family, social reform movements and changes in cultural values. GE credit: AHC or SocSci | ACGH, AH or SS, DD, WE.

177A. History of Black People and American Race Relations, 1450-1860 (4)
Lecture—3 hours; term paper. History of black people in the United States from the pre-Columbian background to Reconstruction. GE credit: AHC or SocSci, Div. Wrt | ACGH, AH or SS, DD, WE.—C.E. Walker

177B. History of Black People and American Race Relations, 1860-1945 (4)
Lecture—3 hours; term paper. History of black people and race relations from 1860-present. Emphasis on Civil War, Reconstruction, Segregation, Age of Accommodation, black nationalism, urbanization, civil rights, and changing ideas of race relations. GE credit: AHC or SocSci, Div. Wrt | ACGH, AH or SS, DD, WE.—Materson, C.E. Walker

178A. Race in America, 1492-1865 (4)
Lecture—4 hours. Prerequisite: course 178A or 17B or course 177A or 177B. Focus on the military, the Age of Discovery, the Colonial Period, Early National and Antebellum periods up to the Civil War. Not open for credit to students who have completed course 178B. Offered in alternate years. GE credit: AHC or SocSci, Div. Wrt | ACGH, AH or SS, DD, WE.—C.E. Walker

178B. Race in America, 1865-Present (4)
Lecture—3 hours; term paper. Racial Formation in the Post Civil War: United States from the mid-nineteenth century to the present. Migration, labor, community formation, race relations, women and gender, popular culture. GE credit: AHC or SocSci, Div. Wrt | ACGH, AH or SS, DD, WE.—II. C.E. Walker

179. Asian American History, 1850-Present (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing recommended. The historical experience of people of Asian ancestry in the United States from the mid-nineteenth century to the present. Migration, labor, community formation, race relations, women and gender, popular culture. GE credit: AHC or SocSci, Div. Wrt | ACGH, AH or SS, DD, WE.—I. C.E. Walker

180AN. American Political History, 1789-1896 (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Growth of American politics from the birth of the republic to the end of the nineteenth century. Development of political parties, the expanding electorate, and how social issues such as slavery shaped the political process. Not open for credit to students who have completed course 180A. Offered in alternate years. GE credit: AHC or SocSci, Wrt | ACGH, AH or SS, WE.

180BN. American Political History, 1896-Present (4)
Lecture—3 hours; term paper. Prerequisite: course 17B. Politics in the United States from 1896 to the present. Topics include race and partisan politics, communism and anti-communism, the New Deal and the centralization of government, and the rise of the imperial presidency. Not open for credit to students who have completed course 180A or 180C. GE credit: AHC or SocSci, Wrt | ACGH, AH or SS, WE.

181. Religion in American History to 1890 (4)
Lecture—3 hours; term paper. Prerequisite: course 17B. American religious history from colonization through the Gilded Age. Religious diversity in America: native American religion; Protestantism, gender and religion; religion and bigotry; African American religion, religion in the Civil War, and religion’s response to modernization. Offered in alternate years. GE credit: AHC or SocSci, Wrt | ACGH, AH or SS, WE.—Smolenski
182. Gender and Justice in American History (4)
Lecture/discussion—3 hours; term paper. Prerequisite: upper-division standing recommended. Intersection of gender and law in North America from the colonial period through the 20th century. Topics include: child custody, prostitution, labor laws, regulation of sexuality. Analysis of legal change, trends, and cultural influences. Offered in alternate years. GE credit: ArtHum or SocSci | ACGH, AH or SS, DD, WE.—Hartigan-O’Connor

183A. The Frontier Experience: Trans-Mississippi West (4)
Lecture—3 hours; written/oral reports. The fur trade, transportation, and the Oregon Trail, the Great Plains and Rocky Mountain Regions and political organization of the West. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, WE.—I. Warren

183B. The Frontier Experience: Trans-Mississippi West (4)
Lecture—3 hours; written/oral reports. Spread of the mining kingdom, the cattle industry, railroads, settlement of the Great Plains and Rocky Mountain Regions and political organization of the West. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, WE.—Taylor, Warren

184. History of Sexuality in America (4)
Lecture—3 hours; extensive writing. History of sexuality in America from pre-European through the late twentieth century. Topics include birth control, prostitution, homosexuality, sexual revolution, inter-religious relationships, homosexuality, the feminist, gay, and lesbian liberation movements, AIDS, and the commercialization of sexuality. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE.—I. Warren

185A. History of Science in America (4)
Lecture—3 hours; research paper. Survey of the European background. Study of American scientific institutions, ideas, and personalities, creative processes in science, and of relationships between science and science from colonial times to present. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE.

185B. History of Technology in America (4)
Lecture—3 hours; research paper. Study of American technology, emphasizing biographical approach to historical understanding of technological change, creative processes, institutions, ideas, and relationships between technology and society from colonial times to present. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE.

188. America in the 1960s (4)
Lecture—3 hours; extensive writing or discussion—1 hour. The role of American politics, culture, society, and culture 1961-1969. Civil rights, Vietnam, the draft and anti-war movement; rock and roll; and the counter-culture; modern feminism; modern conservatism; student movements; urban unrest and insurrection. Offered irregularly. GE credit: SocSci | ACGH, DD, SS, WE.—Kelman, Rauchway

189. California History (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing recommended. California history from the pre-colonial period to the present including dispossession of California’s Indians, political economy of the Spanish and Mexican periods, Gold Rush effects, industrialization, water politics, World War II, Proposition 13, and the emergence of the Silicon Valley. Not open for credit to students who have completed two courses of course 180C, 198, 189C. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, DD, WE.—III. Tsu, Warren

190A. Middle Eastern History I: The Rise of Islam, 600-1000 (4)
Lecture—3 hours; extensive writing. Middle Eastern history from the rise of Islam to the disintegration of the Abbassid Caliphate; the formative centuries of a civilization. Politics and religion, conquest and conversion, arts and sciences, Christians, Jews and Muslims, gender and sexuality, orthodoxy and heterodoxy. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Tezcan

190B. Middle Eastern History II: The Age of the Crusades, 1001-1400 (4)
Lecture—3 hours; extensive writing. Middle Eastern history during the rise of Islam and Mongo invasions. The idea of holy war, the Crusades, the Mongols as the bearers of Chinese arts, nomads and sedentary life, feudalism, mysticism, slavery, women in the medieval Middle East. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Tezcan

190C. Middle Eastern History III: The Ottomans, 1401-1730 (4)
Lecture—3 hours; extensive writing. Middle Eastern history from the foundation of the Ottoman Empire on the bordersland of Byzantine Anatolia through its expansion into Europe, Asia, and Africa, creating a new cultural synthesis of Greek, Islamic, Mongol, Persian, Slavic, and Turkish traditions. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Tezcan

190D. Middle Eastern History IV: Safavid Iran, 1300-1736 (4)
Lecture—3 hours; term paper. Middle Eastern history focusing on Safavid Empire (present-day Iran, Afghanistan, up to Georgia), beginning with the origins of the dynasty as a powerful religious family, to the establishment of the Empire, focusing on Social, Religious, Economic, and Political History. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—Mooshoah

191A. Classical China (4)
Lecture—3 hours; term paper. History of Chinese civilization from its origins through the establishment of city states and the flowering of classical philosophy, to the rise and fall of the First Empire. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.

191B. High Imperial China (4)
Lecture—3 hours; term paper. Political disunion and the influx of Buddhism; reunification under the great dynasties of Tang, Sung, and Ming with analysis of society, culture and thought. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—I. Bossler

191C. Late Imperial China (4)
Lecture—2 hours; discussion—1 hour; two long papers. Prerequisite: course 9A or higher division standing. Patterns and problems of Chinese life traced through the Ming and Ch’ing dynasties (c. 1500-1800), prior to the confrontation with the West in the Opium War. Readings include primary sources on warfare and international trade. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—I. Bossler

191D. Nineteenth Century China: The Empire confronts the West (4)
Lecture—2 hours; discussion—1 hour; term paper. Prerequisite: course 9A, or upper division standing. The decline and fall of the Chinese Empire, with particular attention to the social and political crises of the 19th century, and the response of government officials, intellectuals, and ordinary people to the increasing pressures of Western imperialism. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—I. Bossler

191E. The Chinese Revolution (4)
Lecture—2 hours; discussion—1 hour; extensive writing. Prerequisite: upper division standing. Analysis of Chinese revolution and transformation from Communist empire into Communist state. Focus on economic and political change. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—I. Bossler

191F. History of the People’s Republic of China (4)
Lecture—2 hours; discussion—1 hour; extensive writing. Prerequisite: upper division standing. Comprehensive analysis of recent Chinese history, including land reform, the Cultural Revolution, the post-Mao era, and the consequences of the new economic policies of the 1980s. Not open for credit to students who have completed course 190C. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—III.

1910. Special Topics in Chinese History to 1800 (4)
Lecture—3 hours; extensive writing. Prerequisite: course 9A or consent of instructor. Topics in the history of China from the beginning of the imperial period through the Qing dynasty. Topics may be framed chronologically (e.g., the Ming Dynasty) or thematically (e.g., Trade in early Chinese history). May be repeated one time for credit when topic differs. Offered irregularly. GE credit: AH, WC, WE.—Bosserly, Javers

191H. Special Topics in Chinese History after 1800 (4)
Lecture—3 hours; extensive writing. Prerequisite: consent of instructor. Topics in the history of China from 1800 to the present. Topics may be framed chronologically (e.g., The Republican Period [1911-1948]) or thematically (e.g., The Modern Evolution of Chinese Law). May be repeated one time for credit when topic differs. Offered irregularly. GE credit: AH, WC, WE.—Bosserly, Javers

1911. Sex and Society in Modern Chinese History (4)
Lecture—3 hours; term paper. Role of sex, gender, and family relations in the development of Chinese politics, society, and personal life in the modern period, 1900-present. Not open for credit to students who have completed course 190C. Offered irregularly. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WC, WE.—El-Shakry

193A. History of the Modern Middle East, 1750-1914 (4)
Lecture—3 hours; term paper. Prerequisite: course 6 recommended. Transformation of state and society within the Middle East from 1750 to 1914 under pressure of the changing world economy and European imperialism. Themes include colonialism, Orientalism, Arab intellectual renaissance, Islamic reform, state formation, and revolution. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, VI, WC, WE.—El-Shakry

193B. History of the Modern Middle East from 1914 (4)
Lecture—3 hours; term paper. Prerequisite: course 6 recommended. The Middle East from the turn of the 20th century to the present. Themes include the legacies of imperialism, cultural renaissance, the World Wars, nationalism, Palestine/Israel, Islamic revival, gender, revolutionary movements, politics of oil and war, cultural modernism, exile and diaspora. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, VI, WC, WE.—El-Shakry

193C. The Middle East Environment: Historical Change and Current Challenges (4)
Lecture/discussion—3 hours; project. Prerequisite: upper division standing recommended. Examines Middle East environment and human use of nature over last 10,000 years. Integrates environmental, historical and current environmental problems. Case Studies of Egypt, Maghreb countries, Arabian peninsula/Gulf countries, desertification, water, indigenous, Global Commons. GE credit: ArtHum or SocSci | AH or SS — Davis
Graduate

201A-N, P-O, S-T, W, X. Sources and General Literature of History (4)
Seminar—3 hours; term paper. Prerequisite: consent of instructor. Designed primarily for students preparing for higher degrees in history. (A) Ancient; (B) Medieval; (C) Renaissance and Reformation; (D) Early Modern Europe; (E) Europe since 1815; (F) China to 1880; (G) China since 1880; (H) Britain; (I) Latin America; (J) United States to 1877; (K) United States, 1878-1896; (L) United States since 1896; (M) Middle East; (N) Modern Japan; (P) African Historiography; (Q) Cross-Cultural Women’s History; (S) History of Science and Medicine; (T) Jewish History; (W) Sources and General Literature of History; (X) World History. May be repeated for credit when different subject area is studied.

202A-I. Major Issues in Historical Interpretation (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing. Fundamental issues and debates in the study of history. (A) Ancient; (B) Medieval Europe; (C) Modern Europe; (D) India; (E) Africa; (F) China; (G) Japan; (H) United States; (I) Latin America. Readings, papers, and class reports. May be repeated for credit when different subject area is studied. — I, II, III, (I, II, III).

203A Research Seminar (4)
Seminar—3 hours; tutorial—1 hour. Designed for students preparing for higher degrees in history. Individual research and analysis resulting in substantial research paper of publishable quality. Completion required of all Ph.D. candidates. The three courses must be taken in continuous sequence, ordinarily during second year. — I (I).

203B-203C Research Seminar (4-4)
Seminar—3 hours; tutorial—1 hour. Prerequisite: course 203A. Designed for students preparing for higher degrees in history. Individual research and analysis resulting in substantial research paper of publishable quality. Completion required of all Ph.D. candidates. The three courses must be taken in continuous sequence, ordinarily during second year. — II, III, (II, III).

204. Historiography (4)
Seminar—3 hours; term paper. Major issues in the philosophy and methodology of history. — I (I).

221. Medieval History (4)
Seminar—3 hours. Prerequisite: courses 121A, 121B, 121C recommended. Topics in the history of medieval and early Renaissance Europe.

245. Modern European History (4)
Seminar—3 hours. Prerequisite: course 201E. Primary sources and research methodologies in the history of modern France and Germany. May be repeated one time for credit. — III (III).

261. Latin American History (4)
Seminar—3 hours. Prerequisite: two courses in Latin American history, reading knowledge of Spanish or Portuguese. — I, II, III, (I, II, III).

271A-271B. United States History (4-4)
Seminar—3 hours; term paper. Prerequisite: course 2101 or 202H. Research in literature, methods, and sources on aspects of United States history culminating in each student completing a research paper in the field by the end of the second quarter. May be repeated for credit. (Deferred grading only, pending completion of sequence.)

291A. Chinese History (4)
Seminar—3 hours; term paper. Prerequisite: consent of instructor. Research on topics to be chosen by the students for the purpose of writing article-length papers. May be repeated for credit. (Deferred grading only, pending completion of sequence.) — Bossler

291B. Chinese History (4)
Seminar—3 hours; term paper. Prerequisite: consent of instructor. Completion of article-length papers on topics chosen by students. May be repeated for credit. (Deferred grading only, pending completion of sequence.) — Bossler

291C. Methods and Issues in Chinese History (4)
Seminar—2 hours; tutorial—1 hour. Prerequisite: reading knowledge of Chinese; consent of instructor. Readings in Chinese historical materials. Training in the use of Chinese reference works (including online resources). May be repeated for credit. — I (I) Bossler

292. College Teaching Internship (4)
Internship—4 hours. Prerequisite: course 300 (may be taken concurrently). Student prepares and teaches one lower division history course in a nearby community college under the supervision of a UC Davis instructor and a community college instructor. (S/U grading only.)

298. Group Study (1-5)

299. Research (1-12)
(S/U grading only.)

299D. Individual Study (1-12)
(S/U grading only.)

Professional

389. Introductory Seminar for Teaching Assistants (1)
Seminar—1 hour. Prerequisite: must be enrolled in course 390. An introduction to the broad comparative and theoretical issues of teaching methods and techniques in history. (S/U grading only.) — I (I).

390. Teaching History in College (2)
Discussion—2 hours. Designed for teaching assistants with emphasis on problems and procedures encountered by teachers of lower division classes at the university. (S/U grading only.)

History and Philosophy of Science

(University of California, Davis)

Department of History

Joseph Dumit, Ph.D., Program Director

Program Office, 1240 Social Sciences and Humanities Building
530-752-0703

Committee in Charge

Thomas Beamish, Ph.D. (Sociology)
Mario Biagioli, Ph.D. (Science and Technology Studies, School of Law)
Patrick Carroll, Ph.D. (Sociology)
Timothy Choy, Ph.D. (Anthropology, Science and Technology Studies)
Marisol de la Cueva, Ph.D. (Anthropology)
Joseph Dumit, Ph.D. (Anthropology, Science and Technology Studies)
James Griesemer, Ph.D. (Philosophy)
Caren Kaplan, Ph.D. (American Studies)
Camil Millburn, Ph.D. (History)
Roberta Milestein, Ph.D. (Philosophy)
Daniel Stolzenberg, Ph.D. (History)
Madhavi Sunder, J.D. (School of Law)

Minor Program Requirements:

The interdisciplinary minor in the history and philosophy of science invites students to examine historical and contemporary problems in a variety of scientific disciplines, and to explore concepts and procedures basic to science and how they have evolved. The
Horticulture and Agronomy (A Graduate Group)

Chairperson of the Group

M. Andrew Walker, Ph.D., Professor

Group Office. 1224 Plant and Environmental Sciences Building 530-752-7738 http://hpga.ucdavis.edu

Faculty

Douglas O. Adams, Ph.D., Professor (Plant Science)

Karen F. Alt, Ph.D., Professor (Plant Sciences)

Diane M. Beckles, Ph.D., Associate Professor (Plant Sciences)

Alan B. Bennett, Ph.D., Professor (Plant Sciences)

Alison M. Berry, Ph.D., Professor (Plant Sciences)

José A. Bommke, Ph.D., Professor (Plant Sciences)

Josef M. DiTomasso, Ph.D., Lecturer and Specialist in Cooperative Education (Plant Sciences)

Carlos J. Crispino, Ph.D., Lecturer and Specialist in Cooperative Education (Plant Sciences)

Joseph M. DiTomasso, Ph.D., Lecturer and Specialist in Cooperative Education (Plant Sciences)

Steven A. Fennimore, Ph.D., Lecturer and Specialist in Cooperative Education (Plant Sciences)

Luisa Ferguon, Ph.D., Lecturer and Specialist in Cooperative Education (Plant Sciences)

Matthew W. Fidelibus, Ph.D., Associate Specialist in Cooperative Extension (Plant Sciences)

W. Douglas Gubler, Ph.D., Lecturer and Extension Plant Pathologist (Plant Sciences)

Bradley D. Hanson, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Timothy K. Hartz, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

James E. Hill, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Stephen R. Kaffka, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

James A. Wolpert, Ph.D., Emeritus Cooperative Extension (Plant Sciences)

Mark Van Horn, M.S., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Affiliated Faculty

Kendra Baumgartner, Ph.D., Lecturer and Research Specialist in Plant Pathology (Plant Pathology)

Marita Cantwell, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Roger T. Cheletel, Ph.D., Lecturer and Agronomist (Plant Sciences)

Carlos H. Crispino, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Leslie Ferguson, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Matthew W. Fidelibus, Ph.D., Associate Specialist in Cooperative Extension (Plant Sciences)

W. Douglas Gubler, Ph.D., Lecturer and Extension Plant Pathologist (Plant Sciences)

Bradley D. Hanson, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Timothy K. Hartz, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

James E. Hill, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Stephen R. Kaffka, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Bruce D. Lampliner, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Bruce Linquist, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Bruce Linquist, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

David J. MacKillop, Ph.D., Adjunct Professor (Plant Sciences)

Andrew J. McElraine, Ph.D., Adjunct Assistant Professor (Viticulture and Enology)

Elizabeth J. Mitcham, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Jeffrey P. Mitchell, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Anita Oberholster, Ph.D., Lecturer and Specialist in Cooperative Extension (Viticulture and Enology)

Lorrence R. Oki, Ph.D., Lecturer and Associate Specialist in Cooperative Extension (Plant Sciences)

Don E. Parlin, Ph.D., Lecturer and Pomologist (Plant Sciences)

Ann Powell, Ph.D., Lecturer and Researcher (Plant Sciences)

Daniel H. Putnam, Ph.D., Lecturer and Specialist in Cooperative Extension (Plant Sciences)

Johan W. Six, Ph.D., Adjunct Professor (Plant Sciences)

Kerry L. Steenwerth, Ph.D., Adjunct Assistant Professor (Viticulture and Enology)

Jeffrey S. Ross-Ibarra, Ph.D., Associate Professor (Plant Sciences)

Kate M. Scow, Ph.D., Professor (Land, Air and Water Resources)

Kenneth A. Shackel, Ph.D., Professor (Plant Sciences)

David R. Smart, Ph.D., Associate Professor (Viticulture and Enology)

Dina St. Clair, Ph.D., Professor (Plant Sciences)

Kenneth W. Tate, Ph.D., Professor (Plant Sciences)

Larry R. Teuber, Ph.D., Professor (Plant Sciences)

L. Tran, Ph.D., Assistant Professor (Plant Sciences)

Chris van Kessel, Ph.D., Professor (Plant Sciences)

Astrid Volder, Ph.D., Assistant Professor (Plant Sciences)

M. Andrew Wachter, Ph.D., Professor (Viticulture and Enology)

Larry E. Williams, Ph.D., Professor (Viticulture and Enology)

John I. Yoder, Ph.D., Professor (Plant Sciences)

Florence Zakharov, Ph.D., Associate Professor (Plant Sciences)

Maciej Zwiencienki, Ph.D., Associate Professor (Plant Sciences)

Horticulture and Agronomy (A Graduate Group)
Human and Community Development

Interdisciplinarity and Career Alternatives. At least one practicum course is required. A second practicum or supervised independent study can be used to fulfill the restricted elective requirement for the major. In addition, students can intern in schools, early childhood education or senior centers, hospitals, rehabilitation centers, probation offices, group foster homes, mental health clinics, or as tutors for handicapped or bilingual students. Human development graduates fill a wide variety of positions in preschools, elementary and special educational settings, programs designed for parents, families, and the elderly, as well as governmental jobs related to social services for people of all ages. Students who emphasize biological aspects of human development can apply to medical school or pursue training for positions in the health sciences. Human development prepares students to pursue advanced degrees in behavioral and social sciences, education, social work, family law, or health sciences.

Preparatory Requirements. UC Davis students who wish to change their major to Human Development must complete the following courses with a combined grade point average of at least 2.50. All of the following courses must be taken for a letter grade:

- Psychology 1: 4 units
- Statistics 10 or 13: 4 units
- Sociology 46A or 46B: 4 units

One course from: Anthropology 1, 2 or 15
One course from: Biological Sciences 2A, 10, 10V, Microbiology 10, Molecular and Cellular Biology 10, Neurobiology, Physiology, and Behavior 12: 3-5 units

One course from: Molecular and Cellular Biology 10 or Biological Sciences 101: 4 units
One course from: History 17A, 17B, 72A, 72B, or Political Science 1: 4 units
Two courses from: Philosophy 5, 30, 31, 32, or 38: 8-9 units
One course from: Neurobiology, Physiology, and Behavior 101, or Psychology 101: 3-5 units
One course from: Psychology 41 or Sociology 46A and 46B, or Statistics 10 or 13: 3-5 units

B.S. Major Requirements: 38-47 units

Preparatory Subject Matter: 8-9 units

Two courses from: Anthropology 1, 2, or 15: 8-10 units

One course from: Biological Sciences 2A, 10, 10V, Microbiology 10, or Neurobiology, Physiology, and Behavior 12: 3-5 units

One course from: Molecular and Cellular Biology 10 or Biological Sciences 101: 4 units
One course from: History 17A, 17B, 72A, 72B, or Political Science 1: 4 units
Two courses from: Philosophy 5, 30, 31, 32, or 38: 8 units
One course from: Neurobiology, Physiology, and Behavior 101, or Psychology 101: 3-5 units
One course from: Psychology 41 or Sociology 46A and 46B, or Statistics 10 or 13: 3-5 units

Depth Subject Matter: 50-55 units

Life Span Human Development 100A, 100B, 100C: 4 units

Research Methods: Human Development 120: 12 units

Biological Processes: one course from: Biological Sciences 101H, Human Development 117, Nutrition 111A, or Psychology 121: 4 units

Social Processes - one course from: Human Development 102, 110, 130, or 160: 4 units

Cognitive Processes - one course from: Human Development 101, 103, 122, 161, or 163: 4 units

Practicum: one course from: Human Development 140-140L, 141 or 142 or 143: 4-6 units

Restricted Electives: 19-20 units

At least one of the courses from the Depth Subject groups or Restricted Electives listed above must focus on one of the followings:adin/adulthood/age (101, 102, 103, 110, 130, 132) and one on adulthood/aging (117, 143, 160, 161, 163).

English Composition Requirement: 4 units

In addition to the College English Composition requirements, choose one from University Writing Program 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 102H, 104A, 104B, 104C, 104D, 104E, 104F, 104G, 104H, 104I, 104J, 104K.

Total Units for the Major: 92-106 units

Biological Sciences 101 cannot be used to satisfy both the Preparatory Subject Matter and the Depth Subject Matter Requirements.

Major Adviser: Lisa Miller

Minor Program Requirements:

The Department of Human and Community Development offers two minors.

Aging and Adult Development: 3-6 units

Three of the following courses: Human Development 101C, 117, 143, 160, 161, or 163: 12 units

Two courses from the following: Human Development 110; Exercise Biology 117; Psychology 121, 123, 126, 130, or 155: 6-8 units

Minor Adviser: L. Miller, B. Ober

Human Development: 20 units

Human Development 100A and 100B: 8 units

Two courses from: Human Development 101, 102, 103, 130, 132, 161 or 163: 8-10 units

Minor Adviser: K. Conger

Graduate Study. Graduate study is available through a Master of Science degree in child development, and a Ph.D. degree in human development. See also Graduate Studies, on page 111.

Courses in Human Development (HDE)

Questions pertaining to the following courses should be directed to the instructor or to the Human and Community Development Advising Center in 1303 Hart Hall 530-752-2244.

Lower Division

12. Human Sexuality (3 units)

Lecture—3 hours. Vocabulary, structure/function of reproductive system; sexual response; pre-natal development; pregnancy and childbirth; development of sexuality; rape and sexual assault; birth control; sexually transmitted diseases; homosexuality; establishing/maintaining intimacy; sexual dysfunctions; communication; enhancing sexual interaction, cultural differences in attitudes towards sexuality. GE credit: SocSci, Div I | ACGH, DD, SS.—I, III. (I, II, III.)

92. Internship (1-12)

Internship—3-36 hours. Prerequisite: field work experience or at least one course (e.g., course 100A, 100B, 140 or 141) or supervisor's approval; consent of instructor. Supervised internship, off campus and on campus, in community and institutional settings. May be repeated for credit for a total of 12 units or if involves progressively greater (supervised) participation in program delivery or assessment. (P/NP grading only) —I, II, III. (I, II, III.)

98. Directed Group Study for Undergraduates (1-5)

Prerequisite: consent of instructor. (P/NP grading only)

99. Special Study for Undergraduates (1-5)

(P/NP grading only)
Upper Division

100A. Infancy and Early Childhood (4)
Lecture—4 hours. Prerequisite: Psychology 1, Biological Sciences 1A, or 2A, or 10. Biological, social, and cultural aspects of psychological growth and development of children, prenatal through age six. Two observations of preschool children required.—II, (I, II) Chen, Hibel

100B. Middle Childhood and Adolescence (4)
Lecture—4 hours. Prerequisite: course 100A, 120, or the equivalent; introductory biology. Interplay of biological and social-cultural factors in the emotional, cognitive and social development from middle childhood through adolescence.—II, III, (II, III) Guey, Nishina

100C. Adulthood and Aging (4)
Lecture—4 hours. Prerequisite: Psychology 1 or 1S. Development during early, middle, and late adulthood; cognitive, biological, and psycho-social aspects of adult development. Emphasis on normative patterns of development which characterize “successful aging.”—I, III, Ober

101. Cognitive Development (4)
Lecture—3 hours; term paper. Prerequisite: course 100A or 100B or Psychology 140. Pass One restricted to Human Development or Psychology majors. Theories, evidence, and debates in the field of cognitive development, such as nature/nurture, constraints on learning, and the role of plasticity. Topics include attention, memory, concepts about the physical and social world, and language. (Same course as Psychology 141.) GE credit: Wrt | WE—I, II, III, (II, III) Chen, Gibbs, Goodman, Graf, Estes, Lagattuta, Rivero

102. Social and Personality Development (4)
Lecture—3 hours; term paper. Prerequisite: course 100A or 100B or Psychology 140. Pass One open to Human Development or Psychology majors. Social and personality development of children, infancy through adolescence. Topics include the development of personality, achievement motivation, self-understanding, sex-role identity, and antisocial behavior. Emphasis on the interface between biological and social factors. (Same course as Psychology 142.) GE credit: SocSci, Wrt | SS, WE, WE—I, II, III, (II, III, II) Belsky, Gibbs, Hastings, Thompson

103. Cross-Cultural Study of Children (4)
Lecture—4 hours. Prerequisite: course 100A or Consent of instructor. Cross-cultural study of children in developing countries and among minority groups in the U.S. GE credit: SocSci, Div | ACGH, DD, SS, WC.—II, III

110. Contemporary American Family (4)
Lecture—4 hours. Prerequisite: Consent of instructor. Factors currently influencing American families including changing economic conditions, changing sex roles, divorce, and parenthood; theories and research on family interaction.—II, (I) K. Conger

117. Longevity (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing or consent of instructor. Nature, origin, determinants, and limits of longevity with particular reference to human aging; emphasis on implications of findings from non-human model systems including natural history, ecology and evolution of life span; description of basic demographic techniques including life tables. (Same course as Entomology 117.) GE credit: SciEng, Wrt | SE, SL, WE—I, II (II) Carey

120. Research Methods in Human Development (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Statistics 13 or Education 114 or Psychology 41 or Sociology 46A & 6B. Scientific process, research design, and experimental controls; APA manuscript style and scientific writing; statistical analysis and interpretation of results. Laboratory exercises to collect data, analyze and interpret results, and write scientific papers. GE credit: SocSci, Wrt | SS, WE—I, III, (II, III) Nishina, Liu

121. Psychological Assessment (4)
Lecture—4 hours. Prerequisite: courses 100A-100B; elementary statistics. Current issues and methodology related to the process of psychological assessment with children.

130. Emotionally Disturbed Children (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 100A and 100B or consent of instructor. Discussion of theories and related behaviors and learning difficulties in children.

132. Individual Differences in Cognition (4)
Lecture—4 hours. Individual differences in cognition, including learning disabilities and giftedness. Education implications and neurodevelopmental substrates of individual differences in cognition.

140. Communication and Interaction with Young Children (2)
Lecture—2 hours. Prerequisite: course 100A; concurrent enrollment in course 140, required; consent of instructor. Integration of research, theory and practice in child development, emphasizing the role of relationships in creating a growth-promoting environment for young children. Includes: peer relationships, emotional understanding and self regulation, attachment, communication and school readiness. To enroll, students must sign up for laboratory time with the Center for Child and Family Studies located at 244 First Street, Davis, CA.—I, II, III, (II, III, III) Chen

140L. Laboratory in Early Childhood (3-5)
Laboratory—6-12 hours; laboratory/discussion—3 hours. Prerequisite: course 140, must be taken concurrently for first 3 units of credit; students must contact the Center for Child and Family Studies to enroll. Application of theories of learning and development to interaction with infants, toddlers, and preschoolers at Early Childhood Center. Applied skills in communication, guidance and curriculum. Limited enrollment. May be repeated up to two times for credit. (P/NP grading only)—I, II, III, (II, III, III) Chen

141. Field Study With Children and Adolescents (4-6)
Lecture—2 hours, fieldwork—6-12 hours. Prerequisite: course 100A or 100B; consent of instructor. Study of children’s affective, cognitive and social development within home/school environments, hospitals and foster group homes. May be repeated for credit for a total of 12 units. —I, II, III, (II, III, III)

142. Field Study with Emotionally Distressed Children and Adolescents (4-6)
Discussion—1.5 hours; fieldwork—6-12 hours. Prerequisite: course 130 (may be taken concurrently); consent of instructor. Field study with children who are identified as emotionally distressed, including those with internalizing and externalizing behavioral problems. May be repeated for credit for a total of 12 units following consultation with and consent of instructor.

143. Field Studies of the Elderly (4-6)
Discussion—2 hours; field work—6-12 hours. Prerequisite: course 100C or 160 may be taken concurrently. Apply theory and research on adult development and aging, work with older adults in a variety of settings, and develop skills relevant to that application. Develop a small research project.—I, Miller

160. Social Aspects of Aging (4)
Lecture/discussion—4 hours. Prerequisite: Consent of instructor. Introduction to human development neuroscience, including contextual and genetic influences on adolescence, puberty, transitions, and social/family contexts and processes. Emphasis on multi-level mechanisms underlying adolescent behavioral and emotional development. Offered in alternate years.

164. Developmental Neuroscience and Adolescent Psychopathology (4)
Lecture—4 hours. Prerequisite: graduate standing in Human Development, Psychology, Education, Neuroscience or consent of instructor. Introduction to human development neuroscience. Understanding of adolescent development, adolescence and its characterization as a time of risky and unhealthy behavior and vulnerability to onset of mental disorder as well as issues around personality of the adolescent brain and prevention/intervention. Offered in alternate years.—I, (II) Guyer
239. Developmental Trajectories in Typical and Atypical Children; Birth to Five (4)
Lecture/discussion—3 hours; term paper. Prerequisite: graduate standing in Human Development. Psychology, Sociology, a related social science, or permission of the instructor. Discuss theories of development in typical and atypical children from birth to five from a socio-cultural perspective including parent-child interaction, peer interactions, cultural contexts of learning, as well as theoretical and empirical issues for understanding continuities and discontinuities in development. Offered in alternate years. —III.

240. Peer Relationships During Adolescence (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing in Human Development. Psychology, Education, or consent of instructor. Course examines the role of peer relationships in adolescent development including forms and functions at the individual, dyadic, and group levels. Ethnicity and cross-cultural research, including surveys, peer nominations/sociometric, experimental, and observational designs. —Nightingale.

250. Current Research on Family Relationships (4)
Lecture/discussion—6 hours; term paper. Prerequisite: graduate standing in Human Development. Graduate Group, Psychology, Sociology, a related social science, or permission of the instructor. Discussion of theories, methods, and current research on the nature and development of sibling, romantic, and parent-child relationships across the lifespan. Emphasis on interactional and family processes examined in ethnic/cultural contexts. Implications for individual development will be addressed. —III. K. Conger

252. Family Research, Programs and Policy (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing in Human Development. Psychology, Sociology, related social sciences, or consent of instructor. Course examines the competing interests of research, policy, and service on current issues of family functioning and individual well being. The course considers communication barriers between researchers, practitioners, and policy makers. Offered in alternate years. —III (K. Conger.

290. Seminar (3)
Seminar—3 hours. Discussion and evaluation of the theories, research, and issues in human development. Different topics each quarter. —I, II, III. (I, II, III)

290C. Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Supervising instructors lead research discussions with their graduate students. Research papers are reviewed and project proposals are presented and evaluated. May be repeated for credit. (S/U grading only.)—I, II, III. (I, II, III)

291. Research Issues in Human Development (4)
Seminar—4 hours. Prerequisite: graduate standing in the Behavioral Sciences. In-depth presentations of research issues in particular areas of behavioral development. —I, II, II R. Conger.

292. Graduate Internship (1-12)
Internship—3-36 hours. Prerequisite: consent of faculty (internship sponsor) and satisfactory completion of placement relevant course work, for example: Education 213, 216; course 222, 242; Law 272, 273. Individually designed supervised internship, off campus, in community or institutional setting. Developed with advice of faculty mentor. May be repeated for credit up to 12 units if justified skill acquisition and promise of informing evaluation research. (S/U grading only.)—I, II, III. (I, II, III)

298. Group Study (1-5)

299. Research (1-12)
(S/U grading only)

Human Development (A Graduate Group)

Katherine J. Conger, Ph.D., Group Chairperson
Group Office. 1315 Hart Hall
530-754-4109;
http://humandevelopment.ucdavis.edu

Faculty

Len Abbeduto, Ph.D., Professor
(Psychiatry and Behavioral Sciences and Director, M.I.N.D. Institute)
Jay Belsky, Ph.D., Distinguished Professor
(Human Ecology)

Zhe Chen, Ph.D., Professor (Human Ecology)
Katherine J. Conger, Ph.D., Professor (Human Ecology)
Rand Conger, Ph.D., Distinguished Professor (Human Ecology)

Nancy Ebstein, Ph.D., Assistant Researcher

Emilio Ferrer, Ph.D., Professor (Psychology)
Lorena Garcia, M.P.H., Dr.P.H., Assistant Professor
Kevin Gee, Ph.D., Assistant Professor (Education)

Beth Goodling, Ph.D., Associate Professor (Psychiatry, M.I.N.D. Institute)

Gail Goodman, Ph.D., Professor (Psychology)

Katharine Graf Estes, Ph.D., Assistant Professor (Psychology)

Amanda Guyer, Ph.D., Associate Professor (Human Ecology, Center for Mind and Brain)

Randi Hageman, M.D., Professor (M.I.N.D. Institute)

Robert L. Hansen, M.D., Professor (Pediatrics)

Lawrence V. Harper, Ph.D., Professor (Human Ecology)

Paul Hastings, Ph.D., Professor (Psychology)

David Hassl, Ph.D., Associate Clinical Professor

Psychiatry, M.I.N.D. Institute

Leah Hibel, Ph.D., Associate Professor (Human Ecology)

Ladson Hinton, M.D., Professor

Psychiatry and Behavioral Sciences

Luad Joseph, Ph.D., Professor

Psychiatry, M.I.N.D. Institute

Lorena Garcia, M.P.H., Dr.P.H., Assistant Professor

Emilio Ferrer, Ph.D., Professor (Psychology)

Paul Harter, Ph.D., Professor (Public Health Sciences)

Peter Mundy, Ph.D., Professor (Education, M.I.N.D. Institute)

Adrienne Nishina, Ph.D., Associate Professor

Human Ecology

Linda Oakes, Ph.D., Professor

Psychology, Center for Mind and Brain

Beth A. Osher, Ph.D., Professor

Human Ecology

Leonna Ontai, Ph.D. Associate Specialist in Cooperative Extension (Human Ecology)

Richard Ponzi, Ph.D., Emeritus Specialist in Cooperative Extension (Human Ecology)

Suzanne Porcaro, Ph.D.

(PSychology, Center for Mind and Brain)

Richard W. Robins, Ph.D., Professor (Psychology)

Sally Rogers, Ph.D., Professor

Psychiatry, M.I.N.D. Institute

Julie Schweitzer, Ph.D, Associate Professor

Psychiatry, M.I.N.D Institute

Phillip Shaver, Ph.D., Professor (Psychology)

Professional

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—II, III. (I, II, III)

Human Development (A Graduate Group)
Humanities

Martin Smith, Ph.D., Associate Specialist in Cooperative Extension (Human Ecology)
Emily Smith, Ph.D., Assistant Professor (Education)
Marjorie Solomon, Ph.D., Associate Professor (Psychiatry and Behavioral Sciences; M.I.N.D. Institute)
Tamarra Swaab, Ph.D., Associate Professor (Psychology)
Rosa A. Thompson, Ph.D., Professor (Psychology)
Susan Timmer, Ph.D., Clinical Specialist (Pediatrics)
Yuiko Unoki-Tonkovich, Assistant Professor (Education)
Brian Trainor, Ph.D., Associate Professor (Psychology)
Kali Trzesniowski, Ph.D., Associate Specialist in Cooperative Extension (Associate Director of Research for statewide 4-H Youth Development Program; Human Ecology)
Anthony Urquiza, Ph.D., Psychologist (Pediatrics)
Karen Watson-Gegge, Ph.D., Professor (Education)

Affiliated Faculty
Kristin Alexander, Ph.D., Associate Professor (California State University, Sacramento)

Graduate Study. The interdisciplinary and interdepartmental options are embedded within specific departmental courses. Each graduate program offers a program of study leading to the Ph.D. degree. The program provides lifespan study of human behavioral development, with a balance of emphasis on biological, cognitive, and socio-emotional development in context. Recipients of the degree will be prepared to teach, to conduct research, and to be actively involved in public service in human behavioral development.

Applicants seeking admissions and fellowships consideration must submit all materials by our priority December 15 deadline. The final admissions deadline is March 1. See our website for more details.

Graduate Adviser. Contact the Group office.

10. Issues and Concepts in the Humanities (2)
Discussion—2 hours. Prerequisite: course 1 concurrently. Small group discussions and preparation of short papers for course 1. May be repeated one time for credit if topic differs. GE credit: ArtHum, Wrt | AH, WE.

2A. Global Humanities Forum (4)
Lecture—3 hours; extensive writing. Introduction to humanities topics and methodologies; analysis of major figures, works, and genres in world arts and literatures, with emphasis on relationships between history, society, and culture. May be repeated one time for credit if topic differs. GE credit: ArtHum | AH, WC, WE.—I, II, III. (I, II, III.)

2B. American Humanities Forum (4)
Lecture—3 hours; extensive writing. Introduction to humanities topics and methodologies; analysis of major figures, works, and genres in American arts and literatures, with emphasis on relationships between history, society, and culture. May be repeated one time for credit if topic differs. GE credit: ArtHum | AH, WC, WE.—I, II, III. (I, II, III.)

3. Medicine and Humanities (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: completion of Subject A requirement. Evolution of the medical arts into the “science of medicine.” The culture of medicine in the context of society, medical ethics. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE.

4. Animals and Human Culture (2)
Lecture—2 hours. The meaning of human relations with animals studied across a variety of historical periods and culture and from a variety of humanistic perspectives. Offered in alternate years. GE credit: ArtHum, Wrt | AH.

4D. Animals and Human Culture Discussion (2)
Discussion—2 hours. Prerequisite: concurrent enrollment in course 4. Small group discussions and preparation of short papers for course 4. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WE.—I.

7. Travel and Travel Literature (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: Subject A requirement. History of travel from the age of exploration to the modern era. Contempary trends in travel, including mass tourism, adventure travel, and ecotourism. Social, economic, and cultural issues related to modern trends in travel. Analysis of literary representations of travel. GE credit: ArtHum, Div, Wrt | AH, WC, WE.

8. Introduction to Perspectives on Narrative (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: satisfaction of Subject A requirement. Interdisciplinary approach to the use of story across time, culture, and discipline. How the telling and retelling of particular stories reflect the values, concerns, and assumptions of their original audiences and genres. GE credit: ArtHum or SocSci, Div, Wrt | AH, WE.

9. Don Quixote and the Modern World (2)
Lecture—2 hours. Reading Don Quixote as emblem of modernity in the West. Issues of reality versus illusion, heroism, freedom and self-fulfillment, racial tolerance, and love. Don Quixote in other cultural and popular media: film, dance, art, musical drama, and television. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC.

9D. Don Quixote and the Modern World Discussion (2)
Discussion—2 hours. Prerequisite: course 9 concurrently. Small group discussions and preparation of short papers for course 9. Offered in alternate years. GE credit: ArtHum | AH, WC.

13. Witches: Myth and Historical Reality (4)
Lecture—3 hours; extensive writing. This course examines historical construction of the witch. The four areas covered are: European pagan religions and the spread of Christianity; the “Burning” Times in early modern Europe; 17th-century New England and the Salem witch trials; and fairytale. GE credit: ArtHum, Div, Wrt | AH or SS, WE.

15. Language and Identity (4)
Lecture/discussion—3 hours; extensive writing. Introduction to topics related to the construction of identity through language use, including geographical and social factors affecting language. Language ideology affecting linguistic groups, including bilinguals and non-native speakers of English. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, WE.

18. Performance and the 21st Century (4)
Lecture/discussion—3 hours; extensive writing. Live performance and globalization in the twenty-first century. Consideration of the cultural context of performing arts and artists including their methods of creativity. GE credit: ArtHum or SocSci, Div, Wrt | AH, WE.

30. Narrative and Argumentative Approaches to Major Current Issues in the Media, Culture, and Society (4)
Lecture/discussion—3 hours; term paper. Prerequisite: English A or the equivalent. Interdisciplinary approach to contemporary issues (abortion, AIDS, civil rights, war and peace, and other topics which individuals, communities and institutions define themselves in American society, by applying principles of narrative theory to the narratives where these issues are embedded. GE credit: ArtHum or SocSci, Div, Wrt | AH, WE.

92. Internship (1-12)
Internship—3-36 hours. Internships in fields where students can practice their skills. May be repeated for credit. (P/NP grading only.)

Upper Division

144. Marx, Nietzsche, Freud (4)
Lecture/discussion—3 hours; term paper. Study of major texts of Marx, Nietzsche, and Freud, selected with an eye to their impact on 20th-century economics, ethics, and attitudes toward eros. Particular focus on conceptions of the self and the individual’s relation to society. Offered in alternate years. GE course as German 144.) GE credit: ArtHum, Wrt | AH, WC.—I.

180. Topics in the Humanities (4)
Lecture/discussion—3 hours; term paper. Analysis of interdisciplinary issues in the Humanities. Topics will vary. May be repeated one time for credit. GE credit: ArtHum, Wrt | AH, WE.

192. Internship (1-12)
Internship—3-36 hours. Internships in fields where students can practice their skills. May be repeated for credit. (P/NP grading only.)

198. Directed Group Study (1-4)
Prerequisite: consent of instructor. GE credit: ArtHum, Div, Wrt | AH, WC, WE.

199. Special Study for Advanced Undergraduates (1-4)
Prerequisite: consent of instructor. (P/NP grading only.)

Graduate

250. Topics in the Humanities (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Topics in the humanities, selected by the instructor. May be repeated one time for credit.

292. Graduate Internship (1-15)
Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: consent of instructor required. Individually designed supervised internships in community or institutional setting. Developed with advice of faculty mentor. May be repeated for credit up to 15 units. (S/U grading only.)

298. Directed Group Study (1-5)
Prerequisite: graduate standing or consent of instructor. GE credit: ArtHum, Div, Wrt | AH or SS, WE.

299. Individual Research (1-4)
Individual research in the humanities resulting in a formal written research report. (S/U grading only.)

Quarter Offered: Fall, Winter, Spring, Summer 2015-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci-Social Sciences; Div—Domestic Diversity; Wrt—Writing Experience

Human Rights

(College of Letters and Science)

http://humanrightsminor.ucdavis.edu

The interdisciplinary minor in Human Rights gives students a chance to explore human rights as both a specific issue and within larger contexts through a wide variety of disciplines and courses.

Courses in the minor provide students with an opportunity to approach human rights as a practical, as well as an intellectual problem. The minor will be of special interest to students majoring in area studies and those planning to pursue careers in public service, law and international relations. Students will take courses in which human rights problems are the central focus of the course and other courses, which while not having human rights as their central theme, include elements that address the history, theory, practice, violation, promotion and protection of human rights, or in which students have the opportunity to conduct research projects relevant to the study of human rights.

The minor is sponsored by the Religious Studies Program.

Program Objectives

In addition to completing Religious Studies 90 or 134, students must take two additional Core Courses. In addition to the Elective Course list. Students must select courses from at least three different departments or programs to satisfy minor requirements.

Minor Program Requirements:

UNITS

Human Rights............................................ 20

Religious Studies 90 or 134 ..................... 4

Choose two core courses from the following:

History 142A, Religious Studies 131, Sociology 104, Spanish 159†...................... 8

Choose two elective courses from the following:


* With prior permission of the Interdisciplinary Minor in Human Rights advisor, students may substitute one course from the list of electives as a core course.
† When taught as “Witnessing in Latin America: Trauma, Violence and Memory.”
* Only if topic is related to human rights.

Graduate

Graduate 200A. History, Theory and Criticism of Human Rights (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Restricted to graduate students. Introduces the advanced study of human rights and the theoretical and practical elaboration of the international Human Rights system. Seminar will engage with criticism of Human Rights and develop research and teaching within disciplinary and interdisciplinary frameworks. (Same course as Study of Religion 231E.) Offered in alternate years. (II.) Waterpough

200B. Memory, Culture, and Human Rights (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Restricted to graduate students. Explores the multiple convergences among memory, culture, and human rights. Discusses diverse approaches to how societal actors in different historical, cultural, and national settings, construct meanings of past political violence, intergroup conflicts, and human rights struggles. (Same course as Cultural Studies 210.) Offered in alternate years. (I.) Lazzara

Hydrologic Sciences (A Graduate Group)

Gregory Pasternack, Ph.D., Chairperson of the Group

Group Office. 1152 Plant and Environmental Sciences Building 530-752-1669; http://gsgg.ucdavis.edu

Faculty

Fabian Bombardelli, Ph.D., Assistant Professor (Civil and Environmental Engineering)
William Casey, Ph.D., Professor (Chemistry)
Randy Dahlgren, Ph.D., Professor (Academic Senate Distinguished Teaching Award)
Helen Dahlke, Ph.D., Assistant Professor (Chemistry)
Sarah Dorr, Ph.D., Professor (Chemistry)
Peter Hermes, Ph.D., Associate Professor (Chemistry)
Jan Hopmans, Ph.D., Professor (Chemistry)
William Harworth, Ph.D., Professor (Chemistry)
S. Geoffrey Schladow, Ph.D., Professor (Civil and Environmental Engineering)
Mark Lubel, Ph.D., Professor (Environmental Science and Policy)
Douglas Mackay, Ph.D., Adjunct Professor (Civil and Environmental Engineering)
Jay Lund, Ph.D., Professor (Civil and Environmental Engineering)
Samuel Sandoval Solis, Assistant Professor, Cooperative Extension Specialist (Cooperative Extension Specialist)
Miguel Marino, Ph.D., Distinguished Professor (Environmental Science and Policy)
Kate Scow, Ph.D., Professor (Environmental Science and Policy)
Bryan Weare, Ph.D., Professor Emeritus (Environmental Science and Policy)
Wendy K. Silk, Ph.D., Professor (Environmental Science and Policy)
Susan Ustin, Ph.D., Professor (Environmental Science and Policy)
Tom Young, Professor (Civil and Environmental Engineering)

Emeriti Faculty

Charles Goldman, Professor Emeritus (Civil and Environmental Engineering)
Theodore Hsiao, Ph.D., Professor Emeritus (Civil and Environmental Engineering)
Jeffrey Mount, Ph.D., Professor Emeritus (Civil and Environmental Engineering)
Miguel Marin, Ph.D., Distinguished Professor Emeritus (Civil and Environmental Engineering)
Paul Sabatier, Ph.D., Professor Emeritus (Environmental Science and Policy)

Affiliated Faculty

Roger Bales, Ph.D., Professor (UC Merced School of Engineering)
Phil Dully, Ph.D., Adjunct Associate Professor (School of Natural Resources, UC Merced)
Stephen Grillot, Ph.D., Water Relations Specialist (UC Merced)
Richard Snyder, Ph.D., Biometeorological Specialist (UC Merced)

Graduate Study. The Graduate Group in Hydrologic Sciences is an interdisciplinary program offering M.S. and Ph.D. degrees. Course work is available from many programs, including Hydrologic Sciences, Civil and Environmental Engineering, Geology, and Soil Science. Education in the group broadens the skills and knowledge of the physical science or engineering student interested in the occurrence, distribution, circulation and properties of water.
Hydrology

of water on earth. Because of water’s ubiquity and importance to physical, chemical and biological pro-
cesses, water can involve the geologic, atmospheric and oceanic sciences, as well as engi-
neering and other applied physical sciences. Basic to the program are core courses in fluid dynamics, hydraulic geometry, hydrology, hydrogeo-
chemistry, hydrologic techniques, and hydrologic policy. Students can pursue specializations in hydro-
geochemistry, surface water, subsurface hydrology, infiltration and drainage, watershed hydrology and water resources management. The subsurface hydrology specialization includes hydrogeology and vadose-zone hydrology.

Preparation. Applicants to the program are expected to be familiar with techniques or to be completing an undergraduate degree in environmental or physical sciences, mathematics, or engineering. Undergradu-
ate study must include one year each of calculus, of physics with calculus, and of chemistry. A second year of vector calculus, linear algebra and differen-
tional equations is recommended and will be required, before completion of graduate work. Additional courses in applied statistics, computer programming, and geology are recommended.

Specialization. Each student will pursue an indi-
vidual program of advanced study under the direc-
tion of a group of faculty members with similar interests but different background. Course work in addi-
tion to the above is typically taken in the most appropriate departments.

Graduate Adviser. Graham Fogg, Ph.D., Peter Hennes, Ph.D., and Carlos Puente, Ph.D.

Graduate Admissions Adviser. Mark E. Gris-
mer, Ph.D.

Courses in Hydrologic Sciences (HYD)

Graduate

200. Survey of Hydrologic Sciences (1)
Seminar—1 hour; term paper. Prerequisite: open to students in the Hydrologic Sciences program. Semi-
nar covers current hydrologic sciences and the diversity of sci-
ces included in the program. Students prepare a paper and presentation in their area of research interest. May be repeated twice for credit. (S/U grading only.)—I. Ustin, Grismer

205. Continuum Mechanics of Natural Systems (4)
Lecture/discussion—4 hours. Prerequisite: Mathe-
matics 210 and 228, Physics 9B. Continuum mechanics of dynamic air, water, earth and biological systems using hydraulic, heat and electrical conductivity; diffusivity; dispersion; strain; stress; deformation gradient; velocity gradient; stretch and strain. A prerequisite to Biological Sciences 205.—I. Wallender

210. Vadose Zone Transport Processes and Modeling (3)
Lecture/discussion—3 hours. Prerequisite: Soil Sci-
cence 107, Mathematics 228, programming lan-
guage, or consent of instructor. Principles and modeling of water flow and chemical transport in the vadose zone, with specific applications to soils. Top-
ics include hydraulic properties, finite difference application to unsaturated water flow, parameter optimization, diffusive and convective transport in gaseous and liquid phases. Offered in alternate years.—I. Fogg

243. Water Resource Planning and Management (3)
Lecture—3 hours. Prerequisite: course 141 or Civil and Environmental Engineering 142. Applications of deterministic and stochastic mathematical program-
ting techniques to water resource planning, analy-
sis, design and management. Water allocation, capacity expansion, and reservoir operation. Con-
struction costs and water supply and drought. Water quality management. Irrigation planning and operation models. (Same course as Biological Sys-
tems Engineering 243.)—I. Marino

252. Hillslope Geomorphology and Sediment Budgets (4)
Lecture—3 hours; fieldwork—3 hours. Prerequisite: course 141 or Geology 35 or Civil and Environ-
mental Engineering 142 or consent of instructor. Explora-
tion of theoretical and empirical foundations of sediment production on hillslopes using computer models and field measurements. Survey of processes and landforms associated with sedi-
ment deposition in the coastal zone. Application of geomorphic principles to coastal management issues. Offered in alternate years.—III. Pasternack

256. Geomorphology of Estuaries and Deltas (4)
Lecture—3 hours; fieldwork—3 hours. Prerequisite: course 141 or Geology 35 or Civil and Environmen-
tal Engineering or consent of instructor. Survey of the processes and landforms associated with sedi-
ment deposition in the coastal zone. Application of geomorphic principles to coastal management issues. Offered in alternate years.—III. Pasternack

Professional

396. Teaching Assistant Training Practicum (1)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—II, III, (I, II, III)

Professional

410. OSHA HAZWOPER Refresher Course (1)
Lecture—1 hour. Updates hazardous materials han-
dling information for purposes of keeping certifica-
tion current. Certification lapses until the refresher course is complete. (P/NP grading only.)—II. Grismer

440. Hazardous Waste Operations Training (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: upper division standing in College of Agricultural and Environmental Sciences. Forty-hour course designed to meet the requirements of Federal OSHA regulations 1910.120. Covers the health, regu-
latory, processing and safe handling issues/pro-
blems associated with working with hazardous materials. (P/NP grading only.)—III. Grismer

Hydrology

[College of Agricultural and Environmental Sciences] Faculty, see under Department of Land, Air and Water Resources, on page 364, Hydrology Section.

The Major Program

Hydrology is the study of the occurrence, distribu-
tion, circulation, and behavior of water and water-
borne materials in the environment of Earth. It includes practical measurement and technical analy-
sis of water phenomena underground, on the Earth’s surface, and in the atmosphere. Contemporary hydrologic problems containing an interdisciplinary nature per year include environmental restoration, sustain-
ability of groundwater and surface water resources, water pollution, and natural disasters such as floods, droughts, landslides, avalanches, and land subsid-
ence. The management of these problems demands hydrologists with the comprehensive, inter-
derdisciplinary education embodied in this program. Beyond its societal utility, hydrology can be an exci-
ting science for the curious-minded. Hydrologists explore natural phenomena such as climate change, waterfalls, health of coral reefs, biogeochemical cycles, and aquifers.

The Program. A hydrologist needs a strong back-
ground across the basic sciences of physics, mathe-
matics, chemistry, and biology. Breadth of understanding comes from exposure to ecology, geology, engineering, policy, and law. Depth of experience is provided by core hydrology courses, internship opportunities, and practical outdoor train-
ing. Students choose electives to match their interests and career goals. Transfer students should have completed as much as possible of the preparatory subject matter listed below.

Internships and Career Alternatives. Job opportunities in hydrology exceed the available sup-
ply of trained hydrologists. Students commonly obtain internships and jobs with state and federal
agencies, private consulting firms, environmental interest groups, irrigation districts, and utility compa-
nies. Federal agencies hiring hydrologists include the U.S. Geological Survey, U.S. Department of
Agriculture (Fish and Wildlife, Agricultural Research, Forest Service, and National Resource Conservation
Service), Environmental Protection Agency, and national research laboratories (Lawrence Livermore
National Laboratory, Oak Ridge National Labora-
tory). State and local agency employers include Cal-
ifornia’s Departments of Water Resources, Regional Water Quality Control Boards. To obtain
higher levels of responsibility and salary, hydrolo-
gists often seek advanced degrees, and the hydro-
logy major is designed to provide students with a
highly competitive education to get into graduate
school.

B.S. Major Requirements:

Preparatory Subject Matter ........................................ 71

- Biological Sciences 2A, 2B ........................................ 10
- Chemistry 2A, 2B, 2C .......................................... 15
- Physics 9A, 9B, 9C ............................................... 15
- Mathematics 21A, 21B, 21C, 21D, 22A, 22B 22
- Geology 50, 50X .................................................. 5

- Engineering 6 or the equivalent ............................... 4

Depth Subject Matter ............................................. 46-55

- Hydrologic Science 103N or Engineering 103 or Water Analysis ............................... 4
- Civil and Environmental Engineering 114 or Statistics 130A and 130B .............................. 4-6
- Hydrologic Science 134, 141, 142, 144, 151, 211, 213
- Soil Science 107 ................................................... 5
- Select one of Hydrologic Science 150, Agricultural and Resource Economics 147, Environmental Science and Policy 161, 166N .................................................. 3-4
- Select three of Hydrologic Science 110, 124, 143, 146, Civil and Environmental Engineering 141, Applied Biological Systems Technology 165 ................................................. 9-13

Restricted Electives ............................................. 16-26

To supplement or expand areas of student interest selected with approval of adviser

Total Units for the Major .................................. 129-148

Major Adviser. Peter Hernes (Land, Air and Water Resources)

Minor Program Requirements:

Hydrology

The Hydrology Section of the Department of Land,
Air and Water Resources offers the minor in Hydro-
logy for environmental or natural science students
who have an interest in water/environmental issues.

The interested student should have completed prepa-

ratory subject matter course work in calculus (Mathematics 16B), chemistry (Chemistry 2A; Chemistry 2B recommended), physics (Physics 7A), and biology (Biological Sciences 2A). Course work in the minor provides fundamental skills and knowledge of the hydrologic sciences. The program is sufficiently flexible for students to pursue particular water issues or problems of interest to them.

UNITs

Hydrology ..................................................... 20-23

- Hydrologic Science 103N or Engineering 103 ............................................ 4
- Hydrologic Science 141 or Environmental Science and Management 100 .................. 4
- Hydrologic Science 144 .......................................... 4
- Soil Science 107 ................................................... 5
- Hydrologic Science 134, Chemistry 100, Soil Science 111, Environmental Science and Policy 151 .................................................. 3-6

Watershed Science

The Hydrology Program of the Department of Land, Air and Water Resources offers the minor in Water-
shed Science. This minor is intended for environmen-
tal, natural, or social science students who have an interest in the interfaces between hydrology, ecol-
omy, policy, and management. The interested student should have completed preparatory course work in calculus (Mathematics 16B; Mathematics 2A; Chemistry 2B recommended), physics (Physics 7A), and biology (Biological Sciences 2A). Course work in the minor provides fundamental skills and knowledge on the management of water basins in the context of current water resources and ecologic problems.

Minor Program Requirements:

UNITs

Watershed Science ........................................ 21-26

Hydrologic Science 141 or Environmental Science and Management 100 .................. 4
- Soil Science 111 .................................................. 4
- Hydrologic Science 144 or Soil Science 107 ............................................. 4-5
- Hydrologic Science 124, or Hydrologic Science 150 .................................. 4
- Hydrologic Science 143, Environmental Science and Management 144, or Environmental Science and Policy 151 .................................................. 3-4
- Hydrologic Science 150, Environmental Science and Management 121, or Environmental Science and Policy 151 .................................................. 3-4

Minor Advisor. Graham Fogg 530-752-6810; gefogg@ucdavis.edu

Advising Center. 1150 PES Building

Courses in Hydrologic Science (HYD)

Questions pertaining to the following courses should be directed to the instructor or to the Resource Sci-
ces Teaching Center in 113 Vehmeyer Hall or in 1150 Plant and Environmental Sciences Building 530-752-1603.

Lower Division

10. Water, Power, Society (3)

Lecture—2 hours; discussion—1 hour. Water resources issues. How water has been used to gain and wield socio-political power. Water resources development in California as related to current and future sustainability and quality. Roles of science and policy in solving water prob-
lems. (Same course as Science and Society 10.) GE credit: SciEng or SocSci, WRT | SE or SS, SL—III. (II.) Foy.

47. Watershed Processes and Water Quality in the Tahoe Basin (2)

Lecture/labatory—21 hours; fieldwork—9 hours; discussion—3 hours; term paper. Prerequisite: basic knowledge of hydrology, soil, or hydrologic sci-
ences. Watershed processes, runoff water-quality management, restoration in Lake Tahoe Basin. Soils, precipitation-runoff, revegetation and adaptive man-
agement relating to erosion control, effective solu-
tions, development of restoration strategies. Students develop field restoration. Course involves 3 days of instruction in Tahoe City. (Same course as Environmental Sciences 217.) Not open to students who have successfully completed Environmental and Resource Sciences 47. [Formerly Envi-
ronmental and Resource Sciences 47.] GE credit: SciEng or Environ, WRT | SE or SS, SL—III. (II.) Potter.

92. Hydrologic Science Internship (1-12)

Internship—3-36 hours. Prerequisite: lower division student, consent of instructor. Work experience off campus in Hydrologic Science. Internship supervised by a member of the faculty. (P/NP grading only.)—I, II, III, (I, II, III)

98. Directed Group Study (1-5)

Prerequisite: consent of instructor. Offered irre-
gradely. (P/NP grading only)

Upper Division

103N. Fluid Mechanics Fundamentals (4)

Lecture—4 hours. Prerequisite: Physics 9B. Fluid mechanics axioms, fluid physics, kinematics, velocity fields for one-dimensional incompressible flow and boundary layers, turbulent flow time averaging, potential flow, dimensional analysis, and macro-
scopic balances to solve geometrical problems. [Same course as Biological Systems Engineering 103.] Offered irregularly. GE credit: SciEng | QL, SE, SL—II. (I.) Wallender

110. Irrigation Principles and Practices (3)

Lecture—2 hours; laboratory—3 hours. Prerequisite: Physics 7A; Soil Science 100 recommended. Gen-
ceral course for agricultural and engineering students dealing with soil and plant aspects of irrigation and drainage. Soil-water principles including soil water movement, plant responses to irrigation regimes, water use by crops; also irrigation systems and water quality. Not open for credit to students who have completed Water Science 101. Offered in alternate years. GE credit: SciEng | SE, SL—III. (II.) Goldhammer, Grattan

124. Plant-Water-Soil Relationships (4)

Lecture—3 hours; discussion—1 hours. Prerequisite: one upper division course in soil science, such as Soil Science 100; and one upper division course in plant science or plant biology, such as Plant Biology 111; or consent of instructor. Principles of plant inter-
actions with soil and atmospheric water environ-
ments and practical applications to crop manage-
ment (e.g., irrigation) and plant eco-physiolog-
y (e.g., drought). Not open for credit to students who have completed Water Science 104. GE credit: SciEng | QL, SE, SL—II. (III.) Shackle

134. Aquatic Geochemistry (6)

Lecture—4 hours; laboratory—3 hours. Prerequisite: Chemistry 2B. Chemistry of natural waters; dielotropic properties of water; thermal and density properties; weathering and reaction relations; metal hydrolysis; acid-base equilibria; metal coordination chemistry; solubility calculations; electron-exchange reactions; sorptive partitioning; ion exchange; and dissolved organic matter. GE credit: SciEng | QL, SE, SL—II. (III.) Hernes, Parikh

141. Physical Hydrology (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: Physics 9B, Mathematics 218, course 100 recom-

mended. Introduction to the processes that constitute the hydrologic cycle. Special emphasis on a quanti-
tative description of the following processes: precipi-
tation, infiltration, evaporation, transpiration, surface runoff, and groundwater movement. GE credit: SciEng | QL, SE, SL—II. (I.) Puente

142. Systems Hydrology (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 141 or Civil and Environmental Engineering 142. General courses considering hydrologic pro-
cesses from a systems or statistical model perspec-
tive. General probability concepts are applied to frequency, time series and spatial data analysis. Lin-
ear systems are also considered in conjunction with Kalman filter techniques. GE credit: SciEng | QL, QL, SE—II. (II.) Puente

143. Hydrological Processes in Ecosystems (3)

Lecture—3 hours. Prerequisite: course 141 or Envi-
ronmental and Resource Science 100. Movement and storage of water are integral parts of landscape and ecosystem functioning. Hydrological processes in individual ecosystems, fluid transfer from and to aboveground water, linking the myriad components of the landscape. Offered in alternate years. GE credit: SciEng | QL, QL, SE, SL—II. (II.) Pasternack

144. Groundwater Hydrology (4)

Lecture—4 hours. Prerequisite: Mathematics 16B or 21A; course 103 or Engineering 103 recom-


146. Hydrogeology and Contaminant Transport (S) Lecture—3 hours; laboratory—2 hours; term paper. Prerequisite: course 144 or Civil and Environmental Engineering 144 or the equivalent. Physical and chemical processes affecting groundwater flow and contaminant transport, with emphasis on realistic hydrogeologic examples. Groundwater geology and chemistry. Fundamentals of groundwater flow and transport analysis. Laboratory includes field pumping test and work with physical and computer models. [Same course as Geology 156.] GE credit: SciEng | SE. —II. (II.) Fogg

147. Runoff, Erosion and Water Quality Management in the Tahoe Basin (S) Lecture/lab—30 hours; fieldwork—15 hours; discussion—10 hours; term paper. Prerequisite: Physics 7B or 9B, Mathematics 16C or 21C, Civil and Environmental Engineering 142 or course 141 or Environmental and Resource Sciences 100. 5 days of instruction in Tahoe City. Practical hydrology and runoff water quality management from Tahoe Basin slopes. Development of hillslope and riparian restoration concepts, modeling and applications from physical science perspectives including precipitation-runoff relationships, sediment transport, and detention ponds. [Same course as Biological Systems Engineering 147.] GE credit: SciEng | QL, SE, SL. —IV. (IV) Grismer

150. Water Law (3) Lecture—3 hours. Prerequisite: Environmental and Resource Sciences 100 or consent of instructor. Principles and issues of California Water Law. Types of water rights, groundwater rights and management, and protection of instream uses. Water projects, role of federal government and federal and state relations. Basic water quality acts, endangered species act, water transfers and current water issues. GE credit: SocSci | ACGH. —II. (II.) Cahill

151. Field Methods in Hydrology (4) Lecture—2 hours; laboratory—3 hours; fieldwork—3 hours. Prerequisite: Environmental and Resource Sciences 100 or course 141. Measurement methods and data analysis for evaluation of water storage, movement, and conservation in the field. Equipment such as data loggers, water and sediment samplers, pressure transducers, weather stations, surveying equipment, and flow meters will be used. Offered in alternate years. GE credit: SciEng | QL, SE, SL. —II. Pasternak

182. Environmental Analysis using GIS (4) Lecture—2 hours; laboratory—4 hours. Prerequisite: Applied Biological Systems Technology 180 or the equivalent GIS experience and skills; general biology and/or ecology courses recommended. Ecosystem and landscape modeling with emphasis on hydrology and solute transport. Spatial analysis of environmental risk assessment including ecological risk assessment, natural resource management. Spatial database structures, scripting, data models, and error analysis in GIS. Offered in alternate years. [Same course as Applied Biological Systems Technology 182.] GE credit: SciEng | QL, SE, SL, VL. —II. (II.) Hijmans

192. Hydrologic Science Internship (1-12) Internship—3-40 hours. Prerequisite: completion of B4 units and consent of instructor. Work experience off and on campus in water science. Internship supervised by a member of the faculty. (P/NP grading only.)—I, II, III. (I, II, III)

198. Directed Group Study (1-5) (P/NP grading only) P/NP grading only. —I, II, III. (I, II, III)

199. Special Study for Advanced Undergraduates (1-5) Prerequisite: senior standing. (P/NP grading only.)—I, II, III. (I, II, III)

Immunology (A Graduate Group)

Charles Bevis, M.D., Ph.D., Chairperson of the Group

Group Office. 5217 Vet Med 3A; 530-754-0103; http://immunology.comped.ucdavis.edu/

Faculty

Iannis Adamopoulos, Ph.D., Assistant Professor (Microbiology, and Immunology)
Paul Ashwood, Ph.D., Associate Professor (Microbiology, and Immunology)
Nicole Baumgardh, D.V.M., Ph.D., Professor (Center for Comparative Medicine and Pathology, Microbiology and Immunology)
Andreas Baumler, Ph.D., Professor (Microbiology, and Immunology)
Charles Bevis, M.D., Ph.D., Professor (Microbiology, and Immunology)
Christopher L. Bowlsus, M.D., Associate Professor (Gastroenterology)
Khoa Cho, Ph.D., Associate Adjunct Professor (Surgery)
Saty a Dandekar, Ph.D., Professor and Chair (Microbiology, and Immunology)
Laurel J. Gerwit (Pharmaceutical V.M., Ph.D., Professor Pathology, Microbiology, and Immunology)
Tizaporn Goldkorn, Ph.D., Professor (Pulmonary and Critical Care Medicine)
Leigh G. Griffiths, Ph.D., Associate Professor (Animal Science, and Immunology)
Richard W. Harper, M.D., Ph.D., Associate Professor (Pulmonary and Critical Care Medicine)
Volkan Heinrich, Ph.D., Associate Professor (Biomedical Engineering)
James E.K. Hildreth, M.D., Ph.D., Professor and Dean (Molecular and Cellular Biology)
Daniel Hwang, Ph.D., Adjunct Professor (Nutrition)
Kirk C. Klaing, Ph.D., Professor (Animal Science)
Kit S. Lam, M.D., Ph.D., Professor and Chief (Hematology and Oncology)
Pam Lein, Ph.D., Professor (Molecular Biosciences)
Patrick S.C. Leung, Associate Adjunct Professor (Rheumatology, Allergy and Clinical Immunology)
Shirley Luckhart, Ph.D., Professor (Microbiology, and Immunology)
Emanuel Maurerakis, M.D., Assistant Professor (Dermatology)
Kimberly A. Allister, Ph.D., Associate Professor (Neurology)
Stephanie J. McSorley, Ph.D., Associate Professor (Center for Comparative Medicine and Anatomy, and Immunology)
Liu A. Miller, Ph.D., Associate Professor (Anatomy, Physiology, and Cell Biology)
William J. Murphy, Ph.D., Professor (Dermatology)
Lori Navarro, Ph.D., Professor (Microbiology and Molecular Genetics)
Robert T. O’Donnell, M.D., Ph.D., Professor (Hematology and Oncology)
John Peters, Ph.D., Associate Professor-in-Residence (Internal Medicine)
Kent E. Pinkerton, Ph.D., Professor and Director (Anatomy, Physiology, and Cell Biology, and Immunology)
Distinguished Teaching Award Graduate/Professional
David Pleasure, M.D., Ph.D., Professor (Neurology, and Pediatrics)
Siba Raychaudhuri, M.D., Clinical Assistant Professor and Chief Rheumatologist (Sacramento VA Medical Center)
Grace L. Rosenquist, Ph.D., Associate Professor (Neurobiology, Physiology, and Behavior)
Barbara Shackleford, Ph.D., Associate Professor (Microbiology, and Immunology)
Scott I. Simon, Ph.D., Professor (Biomedical Engineering)
Jay Solnick, M.D., Ph.D., Professor (Center for Comparative Medicine and Medical Microbiology and Immunology)
Athena Soulika, Ph.D., Assistant Professor (Dermatology)
Charles B. Stephensen, Ph.D., Adjunct Professor (Western Human Nutrition Research Center)
Jeffrey L. Stott, Ph.D., Professor (Pathology, Microbiology, and Immunology)
Yoshikazu S. Takada, M.D., Ph.D., Professor (Dermatology)
Suzanne S. Teuber, M.D., Professor (Rheumatology, Allergy and Clinical Immunology)
Jose V. Torres, Ph.D., Professor (Microbiology, and Immunology)
Allfonso Tramontano, Ph.D., Adjunct Professor (Nephrology)
Renee M. Tsolis, Ph.D., Associate Professor (Microbiology, and Immunology)
Joseph M. Tuscano, M.D., Professor (Flematology and Oncology)
Judy Van de Water, Ph.D., Professor-in-Residence (Rheumatology, Allergy and Clinical Immunology)
Andrew Vaughn, Ph.D., Professor (Radiation Oncology)
Robert H. Weiss, M.D., Associate Professor (Nephrology, and Immunology)
Rene Wu, Ph.D., Professor (Anatomy, Physiology and Cell Biology)
Heike Wulff, Ph.D., Associate Professor (Medical Microbiology, and Immunology)
Susan Zunino, Ph.D., Associate Adjunct Professor (Nutrition)
Huanjuan Zhou, Ph.D., Assistant Professor (Microbiology, and Immunology)

Graduate Study. The Graduate Group in Immunology offers an interdisciplinary program of study in an exciting field of biology and medicine leading to the M.S. and Ph.D. degrees. Participating faculty from various Schools and Departments at UC Davis provide research opportunities in diverse areas of applied immunology. Areas of focus include infection and immunity (including host response regulation to parasites, viruses and bacteria), nutrition and immunity, autoimmunity, immune regulation, neuro-immunology, cancer therapy and immune mediators and their uses for diagnosis and treatment.

Preparation. Applicants for candidacy to these programs should have completed undergraduate preparation in mathematics, physics, chemistry, biochemistry, molecular and cellular biology or related biological and medical sciences.

For work leading to the Ph.D. degree, the requirements include cell biology, chemical immunology, cellular immunology, immunohematology, and advanced immunology. In addition to these general requirements, more specialized preparation in at least one of the following is required: (a) microbiological specialties (bacteriology, virology, parasitology, medical microbiology); (b) zoological specialties (cell biology, endocrinology, embryology, pathology, histology, cytology, physiology); (c) medical specialties (pathology, anatomy, pharmacology, clinical pathology, reproduction, hematology, epidemiology); (d) biochemistry/biophysics specialties (biologically active molecules, control mechanisms); (e) genetic specialties (developmental genetics, population genetics, cyto genetics, molecular genetics).

Graduate Adviser. See the graduate program website at http://immunology.comped.ucdavis.edu/people/

Courses in Immunology (IMM) Additional courses are available and listed under the individual sponsoring departments. Contact the Group office for information.

Graduate

201. Introductory Immunology (4) Lecture—4 hours. Prerequisite: graduate standing. Comprehensive introduction to the principles of immunology. Limited enrollment. —I. (I.) Miller
201L. Advanced Immunology Laboratory Rotations (4)
Laboratory/discussion—12 hours. Laboratory assignment in two research laboratories. Individual research problems with emphasis on methodological/procedural experience and experimental design. May be repeated two times for credit. (S/U grading only)—I. (I.) Ashwood

202L. Advanced Immunology Laboratory Rotations (5)
Laboratory/discussion—15 hours. Laboratory assignment in two research laboratories. One four-week and one six-week assignment in immunology research laboratories. Individual research problems with emphasis on methodological/procedural experience and experimental design. May be repeated two times for credit. (S/U grading only)—II. (I.) Ashwood

203. Cancer Immunology (2)
Lecture—1 hour, term paper. Covers concepts in cancer biology, immunological control and immune effector mechanisms. It will also cover topics such as: immune surveillance, immune effector mechanisms and current concepts in immunotherapy. Offered in alternate years.—II. (I.) Murphy

204. Topics in Innate Immunity (2)
Extensive written or discussion—1 hour, performance instruction—1 hour. Prerequisite: course 201 or equivalent; course 293 preferred. Restricted to first-year GGI and MGG students; others with permission of instructor. Enrollment limited to 18 students. Covers current topics in the field of innate immunity through student seminar presentations and critical evaluation of the literature. Concepts include: pathogen recognition, intercellular communication, specialized cellular function and effector/signaling molecules. Offered in alternate years.—IV. (I.) Bevins

292. Immunotoxicology Seminar (2)
Seminar—2 hours. Prerequisite: graduate standing in Pharmacology/Toxicology, Immunology, Physiology, or Biochemistry. Seminar presentations dealing with principles of xenobiotic effects on immune system functions and specific examples of drugs and environmental chemicals exerting toxic effects on the immune system. Offered in alternate years. (S/U grading only.)—J. Golub

293. Current Concepts in Immunology (4)
Lecture/discussion—4 hours. Prerequisite: Pathology, Microbiology, and Immunology 126 or consent of instructor. Innate and acquired immunity as defense mechanisms against disease. Mechanisms regulating the distinct cell types driving these responses and current concepts in the literature. Offered in alternate years.—II. Baumgart

294. Comparative Clinical Immunology (4)
Lecture/discussion—4 hours. Prerequisite: Pathology, Microbiology, and Immunology 126 or consent of instructor. Clinical immunology in animals and man. Pathogenesis of representative infectious diseases, hypersensitive reactions, and autoimmunity. Emphasis on species differences, and non-immune effector mechanisms to combat infections or mediate pathology. Not open for credit to students who have completed course 294A. Offered in alternate years.—C. Van der Meer

295. Cytokines (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 293 or consent of instructor. Cytokines and their involvement in human and animal physiology, disease, molecular mechanisms and receptor systems. Immune and non-immune actions. Overlapping/redundant functions referred to as the “cytokine network.” Offered in alternate years.—III. Erickson

296L. Advanced Virology in Immunology (2)
Seminar—2 hours. Prerequisite: graduate standing or consent of instructor. Presentation, discussion, and analysis of faculty research topics in immunology. Required for Immunology Graduate Students every year until they have passed their qualifying examination. May be repeated for credit. (S/U grading only)—I. (I.) Maveraikis

297. Mucosal Immunology (2)
Lecture—1 hour; discussion—1 hour; term paper. Prerequisite: course 201 or equivalent. Basic concepts and current research topics in the field of mucosal immunology, with an emphasis on human immunology. Major emphases include innate and adaptive mucosal immunity, the gastrointestinal tract, the lung, lymphocyte trafficking, and mucosal vaccination. Offered in alternate years.—II. Shacklett

Independent Study Program

Information. Chairperson, Committee on Courses of Instruction, 530/752-2231

The Independent Study Program provides an opportunity for upper division students to design and pursue a full quarter (12-15 units) of individual study in an area of special interest. A program qualifying as Independent Study will consist of one or more courses in the 190-199 series. While the theme of such a program may be reasonably broad, a recognizable common thread should unite all the academic work you undertake during an independent study quarter. Regularly offered formal courses will only be acceptable as a part of such a program if they clearly fit its theme and contribute something essential toward the realization of its objectives. The program is not to be considered a way to take more variable-unit courses than normally permitted.

The procedure for enrolling in an Independent Study Program is as follows:
(1) Develop, in general terms, a plan of study;
(2) Locate a faculty sponsor or panel of sponsors and with their help and approval develop a detailed plan;
(3) Complete a project proposal form (obtained from the Academic Senate office) and submit it to the Academic Senate Committee on Courses of Instruction.

The deadline for applications is the tenth day of instruction of the term before; see the Academic Calendar, on page 1, for specific dates.

You must report the completion or termination of the project to the Committee on Courses of Instruction.

Individual Major

(Email: [college@ucdavis.edu](mailto:college@ucdavis.edu)

College of Agricultural and Environmental Sciences, College of Biological Sciences, and College of Letters and Science)

The Major Program

The Individual Major, an integrated program composed of courses from two or more disciplines, is designed by the student and is subject to approval by faculty advisers and appropriate college committees. This major enables a student to pursue a specific interest that cannot be accommodated within the framework of an existing major. It must clearly and specifically meet the student’s educational goals as well as meet university and college academic standards.

College of Agricultural and Environmental Sciences

The Individual Major in this College has been suspended indefinitely.

Program Office. 150 Wark Hall 530/752-0100
http://caes.ucdavis.edu/StudentInfo/Advising/undergraduate-advising

Student Proposal. An Individual Major may be organized by a student having a specific academic interest not represented by an established major. Each student wishing an Individual Major should submit a proposal to the Dean’s Office, prior to reaching 120 units, for review by the Student Actions and Individual Major Subcommittee. This proposal must include an essay describing the special educational aims of the student, including a statement indicating why the educational objectives cannot be met by existing majors; (2) a list of planned courses; and (3) faculty adviser recommendations. It is critical that students contact a college counselor in the Dean’s Office for consultation and development of the proposal.

UNITS

Preparatory Subject Matter........ (variable)
Lower division courses basic to the program or needed to satisfy prerequisites for upper division requirements.

Depth Subject Matter...........45-54
Upper division course work must include:
(a) Interrelated courses of 45 upper division units from two or more areas of study;
(b) At least one of the two or more areas of study must be within the College of Agricultural and Environmental Sciences;
(c) At least 30 of the 45 upper division units that are required in the program must be taken from courses provided by the College of Agricultural and Environmental Sciences.

Unrestricted Electives.............(variable)
Total Units for the Major...........45-54

Master Adviser, Thomas Gordon, Ph.D. (Plant Pathology)

College of Biological Sciences

Program Office, Biology Academic Success Center, 1023 Sciences Laboratory Building, 530/752-0410

Student Proposal. A student who wishes to propose an individual major must submit the proposal to the Committee on Undergraduate Student Petitions prior to reaching 120 units. It is important for the student to make arrangements to speak with an adviser in the Biology Academic Success Center early in the development of his/her major as no individual major will be approved after a student has completed 120 units.

A.B. and B.S. Major Requirements:

UNITS

Preparatory Subject Matter....... (variable)
Lower division courses basic to the program or needed to satisfy prerequisites for upper division requirements as determined by the Committee on Undergraduate Student Petitions.

Depth Subject Matter ....... 45 units minimum
Upper division course work must include:
(a) At least 30 units from courses offered by departments in the College of Biological Sciences;
(b) additional requirements as determined by the Committee on Undergraduate Student Petitions. See the Biology Academic Success Center for details.
(c) for the B.A. degree, a maximum of 80 units toward the major; for the B.S. degree, a maximum of 110 units toward the major.

All University, General Education, and College of Biological Sciences Bachelor’s degree requirements.........................(variable)
Total Units for the Degree............180

Principal Adviser (selected by student). A faculty member in a department or program in the College of Biological Sciences.
Integrative Genetics and Genomics (A Graduate Group)

**Formerly Genetics**
David Neale, Ph.D., Chairperson of the Group


**Faculty**

- **Steffen Abel, Ph.D., Professor Emeritus** (Plant Sciences)
- **Danika Bannasch, Ph.D.** (Evolution and Ecology)
- **Johanna Chiu, Ph.D., Assistant Professor** (Entomology)
- **Gitta L. Cooker, Ph.D., Associate Professor** (Plant Pathology)
- **Lucas Comai, Ph.D., Professor (Plant Biology)**
- **Douglas Cook, Ph.D., Professor (Plant Pathology)**
- **Gino A. Cortopassi, Ph.D., Professor (Molecular Biology)**
- **Michael E. Dahmus, Ph.D., Professor Emeritus** (Molecular and Cell Biology)
- **Abhaya Dandekar, Ph.D., Professor (Plant Sciences)**
- **Satya Dandekar, Ph.D., Professor** (Microbiology and Immunology)
- **Mary Delany, Ph.D., Professor (Animal Science)**
- **Bruce Draper, Ph.D., Assistant Professor** (Molecular and Cell Biology)
- **Jorge Dubcovsky, Ph.D., Professor (Plant Sciences)**
- **Jan Dvorak, Ph.D., Professor (Plant Sciences)**
- **Joanne E. Engebret, Ph.D., Professor (Molecular Biology)**
- **Holly Ernesto D.V.M., Ph.D., Associate Professor** (Population Health and Reproduction)
- **Bryce Fulk, Ph.D., Professor (Plant Pathology)**
- **Thomas R. Fumula, Ph.D., Professor (Animal Science)**
- **Nann A. Fangue Ph.D., Assistant Professor** (Wildlife, Fish and Conservation Biology)
- **Peggy Farnham, Ph.D., Adjunct Professor (Medical Pharmacology)**
- **Charles S. Gasser, Ph.D., Professor** (Molecular and Cellular Biology)
- **Paul Gepts, Ph.D., Professor (Plant Sciences)**
- **Paramita Ghosh, Ph.D., Associate Professor** (Urology)
- **Robert L. Gilbertson, Ph.D., Professor** (Plant Pathology)
- **Dennis G. Gilchrist, Ph.D., Professor Emeritus** (Plant Pathology)
- **Thomas Glazer, Ph.D., Professor** (Cell Biology and Human Anatomy)
- **Thomas Gradziel, Ph.D., Professor (Plant Sciences)**
- **Paul J. Hageman, Ph.D., Professor** (Biochemistry and Molecular Medicine)
- **Nobuko Hagiwara, Ph.D., Assistant Professor** (Cardiovascular Medicine)
- **John H. Harada, Ph.D., Professor (Plant Biology)**
- **Stacey Harmer, Ph.D., Assistant Professor** (Plant Biology)
- **Dennis Hartigan, Ph.D., Assistant Professor** (Microbiology)
- **Wolf-Dietrich Heyer, Ph.D., Professor (Microbiology)**
- **James Hildreth, Ph.D., Professor** (Molecular and Cellular Biology)
- **Russell Hovdey, Ph.D., Associate Professor** (Animal Science)
- **Liping Huang, Ph.D., Assistant Adjunct Professor** (Nutrition)
- **Neil Hunter, Ph.D., Professor (Microbiology)**
- **Clarence I. Kado, Ph.D., Professor Emeritus** (Plant Pathology)
- **Sree Kanta Narsawamy, Ph.D., Associate Adjunct Professor** (Plant Sciences)
- **Daniel Kliebenstein, Ph.D., Associate Professor** (Plant Sciences)
- **Paul Knoepfell, Ph.D., Associate Professor** (Cell Biology and Human Anatomy)
- **Artym Kopp, Ph.D., Associate Professor** (Evolution and Ecology)
- **Ian Kost, Ph.D., Assistant Professor** (Molecular and Cellular Biology)
- **Stephen C. Kowalczykowski, Ph.D., Distinguished Professor (Microbiology)**
- **Dieter Kuelz, Ph.D., Associate Professor** (Animal Science)
- **Hsing-Jieng Kung, Ph.D., Professor** (Biochemistry and Molecular Medicine)
- **Michelle La Merrill, Ph.D., Assistant Professor** (Environmental Toxicology)
- **Kit Lam, Ph.D., Professor** (Hematology and Oncology)
- **Charles Langley, Ph.D., Professor** (Evolution and Ecology)
- **Gregory C. Lanzara, Ph.D., Professor Pathology** (Microbiology & Immunology)
- **Janine LaSalle, Ph.D., Professor** (Microbiology and Immunology)
- **Su-Ju Lin, Ph.D., Associate Professor (Microbiology)**
- **Susan Lott, Ph.D., Assistant Professor** (Evolution & Ecology)
- **William Lucas, Ph.D., Professor (Plant Biology)**
- **Shirley Luckhart, Ph.D., Professor** (Microbiology and Immunology)
- **Leslie A. Lyons, Ph.D., Professor** (Population Health and Reproduction)
- **Philip Mack, Ph.D., Associate Adjunct Professor** (Hematology and Oncology)
- **Julin Maloof, Ph.D., Professor** (Plant Biology)
- **Ben May, Ph.D., Adjunct Professor** (Animal Science)
- **Juan F. Medina, Ph.D., Professor (Animal Science)**
- **Frederick J. Meyers, Ph.D., Professor** (Hematology and Oncology)
- **Richard Michelmore, Ph.D., Professor** (Plant Sciences)
- **Michael Miller, Ph.D., Assistant Professor** (Animal Science)
- **Maria Mudriy, Ph.D., Associate Professor** (Microbiology and Immunology)
- **Jeanette D. Murray, Ph.D., Professor** (Animal Science)
- **Jeanette E. Natzle, Ph.D., Associate Professor** (Microbiology and Immunology)
- **Anita M. Oberbauer, Ph.D., Professor** (Animal Science)
- **Don E. Parikh, Ph.D., Pomologist (Plant Sciences)**
- **Niels Pedersen, Ph.D., D.V.M., Professor** (VM: Medicine and Epidemiology)
- **Martin L. Privalsky, Ph.D., Distinguished Professor** (Microbiology)
Courses in Genetics (GGG)

Graduate

201A. Advanced Genetic Analysis (5)
Lecture-discussion—5 hours. Prerequisite: Biological Sciences 101, Statistics 100 or the equivalent, graduate standing. Fundamentals of genetic analysis and chromosome structure using model organisms including mutation, transmission, complementation, suppression, and enhancement as well as epigenetic phenomena at the whole organism and molecular levels.—II. (II)

201B. Genomics (5)
Lecture—3 hours; discussion—2 hours. Prerequisite: course 201A, 201C or the equivalent. Prokaryotic and eukaryotic genomes. Experimental and analytical approaches to study model organisms, a broad range of native and agricultural species, humans, and complex traits. Introduction to computational genomics and the research and the theory and mechanics of data analysis. Structural, functional, and comparative genomics. Related issues in bioinformatics.—I. (II)

201C. Molecular Genetic Mechanisms in Disease (4)
Lecture-discussion—4 hours. Prerequisite: Biological Sciences 101 or the equivalent. Pass one restricted to graduate students in genetics, microbiology or biochemistry and molecular biology graduate groups. Exploration of how basic mechanisms of molecular biology contribute to health and disease. Diseases related to animals, plants, and microbes will be highlighted focusing on the assembly, function and regulation of DNA, RNA, and protein. —III. (Ill) Segal

201D. Quantitative and Population Genetics (5)
Lecture—5 hours. Prerequisite: course 201A or consent of instructor. Basic concepts of quantitative and population genetics including gene and genotypic frequencies, multiple factor hypothesis, phenotypic and genotypic values, heritability, selection, genetic variation, the detection of quantitative trait loci and evolution in populations. Experimental and analytical methods. —II. (II)

205. Molecular Genetics Laboratory (5)
Laboratory—1.5 hours. Prerequisite: Biological Sciences 101 may be taken concurrently or the equivalent, enrolled in Genetics Graduate Group. Students will conduct experiments in molecular genetics laboratories. Individual research problems will emphasize experimental design, experience with methodologies, and data interpretation. May be repeated up to three times for credit. (S/U grading only)—I, II, III. (I, II, III) Segal

210. Horizontal Gene Transfer (3)
Lecture-discussion—3 hours. Prerequisite: background in basic microbiology and genetics required. Introductory course in molecular biology, biotechnology and microbial genetics recommended. Transfer of genes between unrelated organisms in nature. Dissemination of foreign DNA from genetically engineered organisms, including plants and animals. Mechanisms by which genes are transferred horizontally, and between kingdoms.—II. (II)

211. Concepts in Human Genetics and Genomics (3)
Lecture/discussion—3 hours. Prerequisite: course 201A or the equivalent; course 201B, 201C or the equivalent recommended. Human genomic organization; genetic structure of populations; positional cloning; application of linkage, association, and haplotypes; quantitative trait loci analyses; integrative genetic studies of gene expression; DNA repair mechanisms in genetic disease; mutation analyses; epigenetics; mitochondrial disease; gene manipulation and therapy.—II

220. Genomics and Biotechnology of Plant Improvement (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101 or the equivalent. Integration of modern biotechnology and classical plant breeding including the impact of structural, comparative and functional genomics on gene discovery, characterization and functionalization. Also covers molecular markers, plant transformation, hybrid production, disease resistance, and novel output traits. (Same course as Plant Sciences 220)—II. (II)
Foreign Language Requirement ........... 0-15
Students must complete three sequenced
quarters (15 units) of courses in one foreign
language or its equivalent. Passing a foreign
language proficiency examination, a score of
5, 4, or 3 on a foreign language Advanced
Placement exam (except Latin), or a score of
550 on the SAT II Subject Test will also
satisfy this requirement.

Internship Requirement ..................... 4
Students must complete at least four units of
internship. Internships can be chosen in
consultation with an adviser. Internship
requirement waived for students enrolled in
the UC Education Abroad Program.

Areas of Specialization ......................... 44-45
Agricultural Production Option............... 45
Biological Sciences 2A and 2B ............. 10
Chemistry 2A and 2B ......................... 10
15 units from: Animal Science 118, 124,
136A, 136B, 143, 144, 145, 146, Avian
Sciences 121, Entomology 110, 135,
Environmental Horticulture 100, 133,
Environmental Science and Management
100, Hydrology 124, International
Agricultural Development 142, 160,
Plant Pathology 121, 130A, 130B,
110C, 110L, 112, 113, 130, 150,
170A, 170B, 172, 176, Soil Sciences
109, 118 ........................................... 15
Restricted Electives: Courses selected in
consultation with an adviser ................ 10

Trade and Economic Development
Option .................................................. 44-45
Mathematics 166 ................................ 3
Sociology 1 or Anthropology 2 ............ 4-5
20 units from: Agricultural and Resource
Economics 15, 100A, 100B, 115B, 120,
121, 130, 136A, 136B, 143, 175, 176
Community and Regional Development
141, Economics 160A, 160B, Textiles and
Clothing 174 .................................... 20
Restricted Electives: Courses selected in
consultation with an adviser ............... 17

Environmental Issues Option ............... 45
Biological Sciences 2A and 2B ............ 10
Environmental Science and Policy 1 ....... 4
16 units from: Agricultural and Resource
Economics 147, 175, 176, Environmental
Science and Policy 100, 101, 105, 110,
160, 161, 170, 171, 172, 175, Plant
Sciences 101, 147, 147L, 150,
Environmental Horticulture 150, 160,
160L ............................................... 16

Restricted Electives: Courses selected in
consultation with an adviser ............... 15

Total Units for Major ..................... 116-134
International Agricultural Development
Abroad ............................................. 0-40
Major Adviser, P. Brown in 3041 Wickson Hall
(Plant Sciences)

Advising Center for the major is located in 1220
Plant and Environmental Sciences 5307521715.

Minor Program Requirements:

International Agricultural Development
Enrollment .......................... 21-33
International Agricultural Development 10
and Agricultural Economics 115A ............... 8
Plant Sciences 101, 110A, 110C, 112, 6-7
International Agricultural Development 103,
170, 195A or Community and Regional
Development 142 ................................ 7-8

Minor Adviser, P. Brown

Advising Center for the minor is located in 1220
Plant and Environmental Sciences 5307521715.

Courses in International
Agricultural Development (IAD)
Questions pertaining to the following courses should
be directed to the instructor or to the Department
of Plant Sciences Advising Center in 1220 Plant
and Environmental Sciences 5307521715.

Lower Division

10. Introduction to International
Agricultural Development (4)
Lecture—discussion—4 hours. Prerequisite: intro-
ducatory social science course (Anthropology,
Sociology, Economics, International Agricultural Development). How social and cultural factors influence technologi-
ical change in agriculture, theories of diffusion of
innovations; social impact analysis and technology
assessment. GE credit: SocSci, Div, Wrt | SS, WE, —II. (II.)
Brown

92. Internship (1-12)
Internship—3-36 hours. Prerequisite: consent of
instructor. Supervised internship, off and on campus,
in community and institutional settings. (P/N grading
only.)—I, II, III, (I, II, III)

Upper Division

103. Social Change and Agricultural
Development (4)
Lecture—discussion—4 hours. Prerequisite: intro-
ducatory social science course (Anthropology,
Sociology, Economics, International Agricultural Development). How social and cultural factors influence technologi-
ical change in agriculture, theories of diffusion of
innovations; social impact analysis and technology
assessment. GE credit: SocSci, Div | SS, WE,
142. Equipment and Technology for Small
Farms (2)
Lecture—1 hour, laboratory—3 hours. Types and
characteristics of agricultural equipment and technol-
ogies appropriate for small commercial farming.
Adjustment and calibration of equipment. Selection of
and budgeting for equipment. (Same course as
Applied Biological Systems Technology 142.) GE
credit: SciEng | QL, SE, VL—III. (II) Shafii

160. Agroforestry: Global and Local
Perspectives (3)
Lecture—discussion—3 hours. Prerequisite: Plant
Sciences 2 or Biological Sciences 1C or 2C; Plant
Sciences 142 or 150 or Biological Sciences 2B or a
general ecology course. Traditional and evolving
types of crops in agricultural ecosystems; their multiple
roles in environmental stabilization and production of
food, fuel, and fiber; and socioeconomic barriers to
the adoption and implementation of agroforestry
practices. Not open for credit to students who have
taken previously taken Agricultural Management
and Rangeland Resources 160. [Former course Agri-
cultural Management and Rangeland Resources
160.] (Same course as Plant Sciences 160.) Offered in
alternate years. GE credit: SciEng | SE—I. (II)
Gradziel

170. Program Development for
International Agriculture (4)
Lecture—discussion—4 hours. Prerequisite: course
10. Principles of leadership and management for
international agricultural development. Organiza-
tions and organizational behavior, and the implica-
tions for planning and administering organizations
involved in the global development effort.—I. (I.)

190. Proseminar in International
Agricultural Development (1)
Seminar—1 hour. Presentation and discussion of cur-
cent topics in international agricultural development by
visiting lecturers, staff and students. May be
repeated for credit. (P/N grading only.)
192. Internship (1-12)
Internship—3-36 hours. Prerequisite: consent of instructor. Supervised internships, off and on campus, in community and institutional settings. (P/NP grading only.)—I, II, III (I, II, III)

195A. Field Study in Agricultural Development—California (3)
Lecture—2 hours; seminar—6 hours; fieldwork. Prerequisite: consent of instructor. Students will incur travel expenses. Observation of agricultural development strategies and effects on rural communities. Discussion with farmers, workers and organizational staff members. Analysis of farm commodities, institutions and experiences in dealing with agricultural development problems. International influence on U.S. agriculture. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. Directed group study. (P/NP grading only.)—I, II, III (I, II, III)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. Special study for advanced undergraduates. (P/NP grading only.)—I, II, III (I, II, III)

Graduate

200N. Philosophy and Practice of Agricultural Development (5)
Lecture/discussion—5 hours; term paper. Introduces key elements of philosophy and practice of agricultural development. Themes include: major paradigms of development, historical context within which these paradigms operate, various development techniques and initiatives emerging from agricultural paradigms of development; historical context within agricultural lands, extractive zones (fisheries, forests) and wildlands, with emphases on conservation and sustainability. Comparison of industrial democracies and poor industrial nations. (Same course as Ecology 217.)

220. Food and Nutrition Strategies in Developing Countries (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Agricultural and Resource Economics 100A. Identifies important topical problems in food and nutrition policy, develops theoretical frameworks suitable for their analysis, examines the empirical information relevant to the problems and, using theory data, draws appropriate policy implications. Offered in alternate years.

290. Seminar in International Agricultural Development (1-2)
Seminar—1-2 hours. Prerequisite: consent of instructor. Discussion and critical evaluation of advanced topics and issues in international agricultural development. May be repeated for credit. (S/U grading only.)—I, II, III (I, II, III)

291. Topics in International Agricultural Development (1-3)
Lecture/discussion—1-3 hours. Prerequisite: consent of instructor. Selected topics dealing with current issues in agricultural development in lesser developed nations. Variable content. May be repeated one time for credit.—I, II, III (I, II, III)

292. Graduate Internship (1-12)
Internship—3-36 hours. Prerequisite: participation in H. Humphrey Fellow Program or consent of instructor. Involves student in supervised internship, whether or on campus, in community, business or institutional setting. Developed with advice of faculty mentor and Humphrey Coordinator. (S/U grading only.)—I, II, III (I, II, III)

298. Directed Group Study (1-5)
Prerequisite: consent of instructor. Directed group study. (S/U grading only.)—I, II, III (I, II, III)

299. Research (1-12)
Prerequisite: consent of instructor. Research. (S/U grading only.)—I, II, III (I, II, III)

Professional

396. Teaching Assistant Training Practicum (1-1)
Prerequisite: graduate standing. Teaching assistant training practicum. May be repeated for credit. (S/U grading only.)—I, II, III (I, II, III)

International Agricultural Development (A Graduate Group)

Kate Scow, Ph.D. Professor (Land, Air, and Water Resources) Chairperson of the Group

Group Office, 1220 Plant and Environmental Sciences Building, 530-752-1715; http://iadam.ucdavis.edu

Faculty

Kassim Al-Khatib, Ph.D., Professor (Plant Sciences)
Roger Baldwin, Ph.D., Assistant Cooperative Extension Specialist, Agronomist and Lecturer (Wildlife, Fish, and Conservation Biology)
Diane M. Barrett, Ph.D., Specialist in Cooperative Extension (Food Science and Technology)
Mark Bell, Ph.D., Lecturer (Plant Sciences)
Stephen Boucher, Ph.D., Associate Professor (Agricultural and Resource Economics)
Kenneth H. Brown, Ph.D., Professor (Nutrition)
Patrick H. Brown, Ph.D., Lecturer (Plant Sciences)
Colin A. Carter, Ph.D., Professor (Agricultural and Resource Economics)
Michael R. Carter, Ph.D., Professor (Agricultural and Resource Economics)
Patricia A. Conrad, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Kathryn G. Dewey, Ph.D., Professor (Nutrition)
Serge I. Doroshov, Ph.D., Professor (Animal Science)
Richard Evans, Ph.D., Specialist in Cooperative Extension (Plant Sciences)
James Fadel, Ph.D., Professor (Animal Science)
Steven Fenimore, Ph.D., Cooperative Extension Specialist (Plant Sciences)
Louise Ferguson, Ph.D., Specialist in Cooperative Extension Specialist (Plant Sciences)
Howard Ferris, Ph.D., Professor (Nematology)
Albert Fisher, Ph.D., Professor (Plant Sciences)
Ryan E. Galt, Ph.D., Assistant Professor (Human and Community Development)
Paul L. Gepts, Ph.D., Professor (Plant Sciences)
Robert Gilbertson, Ph.D., Professor (Plant Pathology)
Rachael Goodhue, Ph.D., Associate Professor (Agricultural and Resource Economics)
Thomas Gradowelz, Ph.D., Professor (Plant Sciences)
Richard D. Green, Ph.D., Professor (Agricultural and Resource Economics)
Luis Guarnizo, Ph.D., Professor (Human and Community Development)
Timothy K. Hartz, Ph.D., Specialist in Cooperative Extension and Lecturer (Plant Science)
James Hill, Ph.D., Professor (Agricultural and Resource Economics)
Robert Hijmans, Ph.D., Associate Professor (Environmental Science and Policy)
Frank W. Hirtz, Ph.D., Senior Lecturer (Human and Community Development)
William Horwath, Ph.D., Professor (Land, Air and Water Resources)
Russell C. Howe, Ph.D., Associate Professor (Animal Science)
Theodore Hsiao, Ph.D., Professor (Land, Air and Water Resources)
Silas S. O. Hung, Ph.D., Professor (Animal Science)
Lovel S. Jarvis, Ph.D., Professor (Agricultural and Resource Economics)
Bryan M. Jenkins, Ph.D., Professor (Biological and Agricultural Engineering)
Marion Jenkins, Ph.D., Research Engineer (Civil and Environmental Engineering)
Suad Joseph, Ph.D., Professor (Anthropology, Women and Gender Studies)
Katrina Jessoe, Ph.D., Adjunct Professor (Agricultural and Resource Economics)
Lucia Kaiser, Ph.D., Community Nutrition Specialist in Cooperative Extension (Nutrition)
Ermias Kebed, Ph.D., Professor (Agricultural Engineering)
Kurt Kornbluth, Ph.D., Adjunct Professor (Biological and Agricultural Engineering)
Bruce Lingquist, Ph.D., Professional Researcher (Plant Sciences)
Jay Lund, Ph.D., Professor (Civil and Environmental Engineering)
Travis Lybbert, Ph.D., Associate Professor (Agricultural and Resource Economics)
Miguel A. Marino, Ph.D., Professor (Land, Air and Water Resources; Civil and Environmental Engineering)
Philip E. Martin, Ph.D., Professor (Agricultural and Resource Economics)
Mark A. Matthews, Ph.D., Professor (Viticulture and Enology)
G. David Miller, M.Sci., Lecturer (Plant Sciences)
Elizabeth J. Mitcham, Ph.D., Specialist in Cooperative Extension (Plant Sciences)
Jeffrey P. Mitchell, Ph.D., Professor (Agricultural Extension and Lecturer (Plant Sciences)
Dan Potter, Ph.D., Professor (Plant Sciences)
Daniel Putnam, Ph.D., Cooperative Extension Specialist, Agronomist and Lecturer (Plant Sciences)
Pamela C. Ronald, Ph.D., Professor (Plant Pathology)
Scott Rozelle, Ph.D., Adjunct Professor (Agricultural and Resource Economics)
Roberdo S. Sainz, Ph.D., Professor (Animal Science)
Richard Sexton, Ph.D., Professor (Agricultural and Resource Economics)
Rajender Paul Singh, Ph.D., Professor (Biological and Agricultural Engineering)
Michael P. Smith, Ph.D., Professor (Human and Community Development)
International and Community Nutrition

Kathryn G. Dewey, Ph.D., Program Director

Program Office. 3253 Meyer Hall
530-752-1992; http://pcin.ucdavis.edu/

Faculty
Lindsay H. Allen, Ph.D., R.D., Professor (Nutrition)
Monique Borgerhoff-Mulder, Ph.D., Professor (Anthropology)
Kenneth H. Brown, M.D., Distinguished Professor (Nutrition)
Caroline Chantry, M.D., Professor (Pediatrics)
Kathryn G. Dewey, Ph.D., Professor (Nutrition)
Liz C. H. Fernald, Ph.D., Associate Professor (Public Health Nutrition, Community Health & Human Development, UC Berkeley)
Sonja Y. Hess, Ph.D., Associate Professor (Nutrition)
Lovell S. Jarvis, Ph.D., Professor (Agricultural and Resource Economics)
Bo L. Lønnerdal, Ph.D., Distinguished Professor (Nutrition)
Christine F. Stewart, Ph.D., Assistant Professor (Nutrition)

Emeriti Faculty
Louis E. Grivetti, Ph.D., Professor Emeritus
Charles H. Halsted, M.D., Professor Emeritus
Ernesto Pollitt, Ph.D., Professor Emeritus
Fernando E. Viteri, M.D., Ph.D., Professor Emeritus

Affiliated Faculty
Marjorie Haskell, Ph.D., Associate Researcher (Nutrition)
Sonja Y. Hess, Ph.D., Associate Project Scientist (Nutrition)
Sandra Huffman, Sc.D., Researcher (Nutrition)
Lucia Kaiser, Ph.D., Specialist in Cooperative Extension (Nutrition)
Charles B. Stephens, Ph.D., Adjunct Professor (Nutrition)
Marta V. Loan, Ph.D., Adjunct Professor (Nutrition)
Steven A. Vosti, Ph.D., Associate Adjunct Professor (Agricultural and Resource Economics)

Graduate Study. The Program in International and Community Nutrition, an Organized Research Unit located in the Department of Nutrition, coordinates specialized course work and research leading to the Designated Emphasis in International and Community Nutrition for students in various graduate programs. The program focuses on both theoretical and practical issues concerning the identification, treatment, and prevention of human nutritional problems in low-income countries and in disadvantaged groups in the United States. Students enrolled in the Designated Emphasis are expected to (1) complete the course requirements already established by their respective graduate programs, (2) participate in a weekly advanced seminar in international and community nutrition, (3) complete additional core courses in international nutrition (Nutrition 219A, 219B, 258) and selected courses in the related disciplines of epidemiology, statistics, and social and behavioral sciences, and (4) conduct their dissertation research on a relevant topic under the supervision of a professor who is a member of the Program in International and Community Nutrition. Students accepted into the following doctoral programs are automatically eligible to participate in the Designated Emphasis: Nutrition, Agricultural and Resource Economics, Epidemiology, Anthropology, and Human Development. Students from other programs may also be accepted by special request to the Program Director. Upon graduation, students receive a Ph.D. in their major field, with specific recognition for the Designated Emphasis in International and Community Nutrition.

Graduate Adviser. Contact the Program office.
the American civil trial, and foundational substantive and procedural law such as real property, torts, criminal law and procedure, civil procedure, and contracts.

201B. Advanced Topics in United States Law (3)
Lecture/discussion—20 hours. Prerequisite: Law School education or equivalent. Orientation to advanced topics in U.S. law - Intellectual Property (including copyright and trademarks), Commercial and Consumer Law, Advanced Contracts, Antitrust, Taxation, Remedies in Law, Environmental Dispute Resolution, Remedies and introduction to trial techniques and legal research/writing.

202. Introduction to Contracts (4)
Lecture/discussion—20 hours. Prerequisite: Law school education or the equivalent. Examines formation of the sorts of promises that are enforced and the nature of protection given promissory obligations in both commercial and noncommercial transactions. Inquiry is made into the means by which traditional doctrinal adjustments/changes to social demands.

202A. Introduction to Contracts Formation (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Examines formation of the sorts of promissories that are enforced and the nature of protection given promissory obligations in both commercial and noncommercial transactions. Inquiry is made into the means by which traditional doctrinal adjustments/changes to social demands. Offered irregularly—II, IV, (II, IV)

202B. Contracts Performance (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Examines issues of performing promises that are enforceable and possible breach of promissory obligations in both commercial and noncommercial transactions. Inquiry is made into the means by which traditional doctrinal adjustments/changes to social demands. Offered irregularly—II, IV, (II, IV)

202B. Contracts Performance (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Examines issues of performing promises that are enforceable and possible breach of promissory obligations in both commercial and noncommercial transactions. Inquiry is made into the means by which traditional doctrinal adjustments/changes to social demands.

203. Civil Procedure (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or the equivalent. Study of the fundamental and recurrent problems in civil actions including the methods used by federal and state courts to resolve civil disputes.

204. International Joint Ventures (3)
Lecture/discussion—20 hours. Prerequisite: Law School education or equivalent; course 201. Internaional and U.S. business law and legal transactions. Legal planning, problem solving, decision making and negotiations related to the break-up and dissolution of a major international joint venture. U.S. laws including finance, tax, bankruptcy, labor, antitrust, environmental, corporate structures and intellectual property.

205. Introduction to Constitutional Law (4)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Principles, doctrines and controversies regarding the structure and division of powers in American government. Includes judicial review, jurisdiction, standing to sue, federalism, federal and state powers and immunities, and the separation of powers among branches of the federal government.

205A. Overview of US Constitutional Law (2)
Lecture/discussion—20 hours. Prerequisite: Law School education or equivalent. Principles, doctrines and controversies regarding the structure and division of powers in American government. Includes judicial review, jurisdiction, standing to sue, federalism, federal and state powers and immunities, and the separation of powers among branches of the federal government.

205AS. Overview of US Constitutional Law (2)
Lecture/discussion—20 hours. Prerequisite: Law School education or equivalent. Principles, doctrines and controversies regarding the structure and division of powers in American government. Includes judicial review, jurisdiction, standing to sue, federalism, federal and state powers and immunities, and the separation of powers among branches of the federal government.

205B. Constitutional Law—Protection of Individual Rights (2)
Lecture/discussion—20 hours. Prerequisite: Law School education or equivalent. Principles, doctrines and controversies regarding the U.S. Constitution Bill of Rights, including due process of law, equal protection, freedom of religion, freedom of speech, separation of religion and state action, and congressional legislation in aid of civil rights and liberties.

211. Negotiations and Alternative Dispute Resolution (1)
Lecture/discussion—10 hours. Prerequisite: course 201, law school education or the equivalent. Mechanisms for resolving disputes including the alternatives to litigation such as negotiation, mediation, and arbitration. Advantages and disadvantages of each approach.

212. Introduction to Negotiation (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or the equivalent. Introduction to theoretical and empirical approaches to negotiation for the purposes of making deals and resolving legal disputes.

212. Introduction to Negotiation (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or the equivalent. Introduction to theoretical and empirical approaches to negotiation for the purposes of making deals and resolving legal disputes.

214. Advanced Negotiation (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Principles and empirical approaches to advanced negotiations including negotiation framework, models, styles, multiple party/issue negotiations and settlements.

214S. Advanced Negotiation (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Principles and empirical approaches to advanced negotiations including negotiation framework, models, styles, multiple party/issue negotiations and settlements.

215. Business Associations (4)
Lecture/discussion—20 hours. Prerequisite: course 201, law school education or the equivalent. Legal rules and concepts applicable to business associations including general partnerships, joint ventures, limited partnerships, limited liability entities, and sole proprietorships.

215S. Business Associations (4)
Lecture/discussion—20 hours. Prerequisite: Law School education or equivalent. Legal rules and concepts applicable to business associations including general partnerships, joint ventures, limited partnerships, limited liability entities, and sole proprietorships.

216. International Business Transactions (2)
Lecture/discussion—20 hours. Prerequisite: course 201 and law school education or the equivalent. Legal problems arising from international business transactions. Focus on international sales contracts, choice of law, forum selection clauses, letters of credit, transfers of technology, regulation of bribery, development of joint ventures, repatriation of profits, foreign exchange problems, and national efforts to control imports.

217. Alternative Dispute Resolution (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or the equivalent. Introduces students to a wide variety of alternative dispute resolution procedures, with an in-depth emphasis on negotiation, mediation and arbitration.

219. Advanced Writing Project (4)
Project. Prerequisite: course 201, law school education or the equivalent. The completion of a written research project under the active supervision of a faculty member in satisfaction of the research-writing requirement. (S/U grading only)

220. United States Taxation of Multinational Investments (2)
Lecture/discussion—20 hours. Prerequisite: course 201, law school education or the equivalent. An analysis of the United States taxation of multinational investments including jurisdiction of tax, the U.S. tax system, foreign tax credits, treaties, and transfer pricing.

227. Criminal Procedure (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or equivalent. Federal constitutional limits on government authority to gather evidence and investigate crimes. Includes Fourth Amendment limits on search, seizure, and arrest; Fifth Amendment privilege against self-incrimination; Sixth Amendment right to counsel.

228A. Mergers and Acquisitions Law (2)
Lecture/discussion—20 hours. Prerequisite: Law School education or equivalent. Practical approach to mergers and acquisitions with an in-depth look at the planning, negotiation and completion of mergers and acquisitions.

228AS. Mergers and Acquisitions Law (2)
Lecture/discussion—20 hours. Prerequisite: Law School education or equivalent. Practical approach to mergers and acquisitions with an in-depth look at the planning, negotiation and completion of mergers and acquisitions.

228B. Mergers and Acquisitions Law (2)
Lecture/discussion—20 hours. Prerequisite: course 201, law school education or the equivalent. Structuring and jurisdictional issues associated with securitization practice. Topics include the regulation of public offerings, transactions by corporate insiders, regulation of corporate disclosure and conduct, and the liabilities of corporations and individuals under antifraud provisions.

239. Mediation (2)
Lecture/discussion—20 hours. Prerequisite: Law school education or the equivalent. Introduction to the mediation process. Development of communication skills, the ability to analyze disputes, to understand why mediation succeeds or fails, and understand the advantages and limitations of mediation as a method of resolving disputes.

242. Private International Law (2)
Lecture/discussion—20 hours. Prerequisite: course 201; Law School education or equivalent. Operating law across national borders; emphasis on methods of resolving international disputes. International aspects of jurisdiction, choice of law, judgment enforcement, forum choice, process service, taking of evidence, foreign sovereign immunity, extra-territorial regulation of antitrust, securities, other national laws.

242S. Private International Law (2)
Lecture/discussion—20 hours. Prerequisite: course 201; Law School education or equivalent. Operating law across national borders; emphasis on methods of resolving international disputes. International aspects of jurisdiction, choice of law, judgment enforcement, forum choice, process service, taking of evidence, foreign sovereign immunity, extra-territorial regulation of antitrust, securities, other national laws.
of evidence, foreign sovereign immunity, extraterritorial regulation of antitrust, securities, other national laws.

247. Banking Law (1)
Lecture/discussion—10 hours. Prerequisite: course 201, law school education or the equivalent. Institution features of international banking transactions, the structure of international banking, and the mechanics of overseeing large loans. Emphasis on negotiable instruments such as bills of lading, letters of credit, standby letters of credit, and interbank transactions.

249. Comparative Law (1)
Lecture/discussion—10 hours. Prerequisite: course 201 and law school education or the equivalent. A comparative study of the development of laws of legal traditions. Attention to the historical reasons for their divergence, contemporary approaches to universal problems such as succession, torts, and contracts, the cross-fertilization of laws and difficulties commonly associated with importing foreign law into new territory.

250. International Trade Law (3)
Lecture/discussion—20 hours. Prerequisite: course 201, law school education or the equivalent. An investigation of global trading systems including international trade in goods and services, e-commerce, international intellectual property, international tax systems, and international finance. Emphasis on preparing for a trial in the United States. Includes the study of pretrial motions, jury selection, opening statements, rules of evidence, closing arguments, and the selection of appropriate strategies.

251. United States Litigation Issues (1)
Lecture/discussion—10 hours. Prerequisite: course 201, law school education or the equivalent. Prevention and resolution of disputes in international commerce. Emphasis on preparing for a trial in the United States. Includes the study of pretrial motions, jury selection, opening statements, rules of evidence, closing arguments, and the selection of appropriate strategies.

262. Antitrust (1)
Lecture/discussion—10 hours. Prerequisite: course 201, law school education or the equivalent. Historical and institutional background of antitrust law in the United States. The statutory framework including price fixing, limits on distribution, monopolization and mergers, and reporting requirements. Offered in alternate years.

270. Financing International Transactions (3)
Lecture/discussion—20 hours. Prerequisite: course 201 and law school education or the equivalent. How capital is raised in international markets. Investment strategies for U.S. markets. Taxation of financial investments, international currency regulation, and assessing rates of return on international investments.

274. Intellectual Property (2)
Lecture/discussion—20 hours. Prerequisite: Law School or equivalent; course 201. Intensive study of intellectual property law. Including copyright, trademark and patent law and unfair competition.

274S. Intellectual Property (2)
Lecture/discussion—20 hours. Prerequisite: Law School or equivalent; course 201. Intensive study of intellectual property law. Including copyright, trademark and patent law and unfair competition.

283. Contract Remedies (2)
Lecture/discussion—20 hours. Prerequisite: Law School education or equivalent. Covers a range of remedies for contract breach: remedies under common law and equity, liquidated damages clauses, remedies for mistake and unconscionability as well as breach of contract for the Sale of Goods under UCC Article II.

283S. Contract Remedies (2)
Lecture/discussion—20 hours. Prerequisite: Law School education or equivalent; course 202A, 202B or equivalent. Covers a range of remedies for contract breach: remedies under common law and equity, liquidated damages clauses, remedies for mistake and unconscionability as well as breach of contract for the Sale of Goods under UCC Article II.

285. Environmental Law (2)
Lecture/discussion—20 hours. Prerequisite: Law School education or the equivalent. Introduction to federal and state environmental laws; historical development of environmental law; the role of courts, the legislature and the executive branch in the development and implementation of environmental policy. Review of major statutes.

289. Licensing Agency in Intellectual Property & Technology (4)
Lecture/discussion—20 hours. Prerequisite: course 201. Law School education or equivalent. Intellectual property as it relates to current forms of legal protection and how new innovations fit into these models, including public-private technology transfer, patents, institutional objectives, technology transfer offices, and government policy. (S/U grading only.)

290. American Legal System Research Seminar (1)
Seminar—5 hours. Prerequisite: course 201, law school education or equivalent. Advanced seminar in a current topic in International Commercial Law. May be repeated three times for credit when topic differs.

292. International Commercial Law Seminar (1-4)
Lecture/discussion—20 hours. Prerequisite: Law School education or equivalent. Advanced seminar in a current topic in International Commercial Law. Topic will change each year the course is offered. May be repeated two times for credit when topic differs.

292S. International Commercial Law Seminar (1-4)
Lecture/discussion—20 hours. Prerequisite: Law School education or equivalent. Advanced seminar in a current topic in International Commercial Law. Topic will change each year the course is offered. May be repeated two times for credit when topic differs.

299. Advanced Research in Legal Problems (1-4)
Prerequisite: course 201, law school education or the equivalent. Student individualized research projects under faculty supervision. (S/U grading only.)

International Relations

(Ethran Scheiner, Ph.D., Program Director)
Program Office. 464 Kerr Hall 330-754-8098
Committee in Charge
Kyle Joyce, Ph.D. (Political Science)
Alison Ledgerwood, Ph.D. (Psychology)
Eric Schraeder, Ph.D. (University Writing Program)
Deborah Swenson, Ph.D. (Economics)

The Major Program
Problems of security, development, ethnic conflict, human rights, health, and the environment increasingly confront us at a global rather than a national level. With its theoretical models and real-world application, the study of international relations is an exciting and highly relevant interdisciplinary major.

The Program. Graduation with a major in international relations requires completion of introductory courses in political science, economics, statistics, and history. The major also requires fluency in English and a working knowledge (approximately 24 to 30 units of course credits or equivalent fluency) of one other modern language. Students choose one of four tracks that encompass major topical areas in combination with an area studies emphasis:

1. World Trade and Development;
2. Peace and Security;
3. Global Environment, Health, and Natural Resources;
4. Peoples and Nationalities.

Upper division coursework for Tracks I, II and III is composed of twelve courses. Students choosing Track IV, Peoples and Nationalities, are required to study or work abroad for a minimum of one quarter; upper division coursework is reduced to nine classes in recognition of the experience gained through education abroad.

Programs, Internships, and Career Alternatives.
One program of special interest to international relations majors is the Education Abroad Program, which provides for an alternative to the life and culture of other cultures. At UC Davis, the Internship and Career Center assists students in obtaining legislative, legal, and business internships. In addition, the UC Davis Washington Center arranges internships and runs a full-credit academic program in Washington, D.C. with a full range of opportunities for International Relations majors (see also UC Washington Program (UCDC), on page 534). International relations graduates are prepared for employment in government agencies (such as the Foreign Service), state agencies, international or non-governmental organizations (such as the United Nations), foundations, and companies having interests in international business, trade, or finance. The stringent language requirement of the major program enhances career prospects in jobs which demand knowledge of the language and culture of other countries.

International Relations Abroad. International Relations strongly encourages all students to participate in the UC Education Abroad Program; those who choose to study Track IV, Peoples and Nationalities, must study or work abroad for a minimum of one quarter. A maximum of five courses taken abroad may be applied toward the 12 upper division courses in Tracks I, II, and III of the International Relations major. In Track IV, the Four Area Studies courses may be done abroad. Courses are selected with the approval of an adviser for the International Relations program.

Preparatory Requirements. Before declaring a major in International Relations, students must complete the following courses with a combined GPA of at least 2.500 at the University of California or other four-year school (at least 3.000 for similar courses taken at community college). All courses must be taken for a letter grade.

A.B. Major Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Economics 1A or Anthropology 2</td>
<td>4</td>
</tr>
<tr>
<td>Economics 1B</td>
<td>4</td>
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<tr>
<td>History 4C or 10C</td>
<td>4</td>
</tr>
<tr>
<td>Political Science 3</td>
<td>4</td>
</tr>
<tr>
<td>Statistics 1 or Sociology 468</td>
<td>4</td>
</tr>
</tbody>
</table>

Preparatory Subject Matter: 24-54

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Economics 1A or Anthropology 2</td>
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<tr>
<td>Economics 1B</td>
<td>4</td>
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<tr>
<td>History 4C or 10C</td>
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<tr>
<td>Political Science 3</td>
<td>4</td>
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<tr>
<td>Statistics 1 or Sociology 468</td>
<td>4</td>
</tr>
<tr>
<td>Political Science 51</td>
<td>4</td>
</tr>
</tbody>
</table>
Select five courses spanning two disciplines: treatments of war, peace, alliances, and diplomacy. Focuses on political and security relationships.

Track II: Peace and Security

Emphasizes contemporary economic relations of

Depth Subject Matter ........................................... 36-48

Foreign language ............................................. 0-30

Three additional courses from at least two

Economics 162, History 174B, 174C,

Science 123 ................................................. 20

Track IV: Peoples and Nationalities

Familiarizes students with new sources of global

Area Studies Requirement

Four courses: Courses must incorporate at least two of three groups (History, Social Analysis, Culture and Society); we encourage students to take all four courses from one region, but will accept a minimum of three from one region and one from a different region. Track I, II, and III students who choose to take advantage of an Education Abroad experience may fulfill the Area Studies requirement by completing three courses instead of four; all three courses must be from one region.

Africa and the Middle East


Culture and Literature: African American and African Studies 153, 157, 162, Art History 150, Comparative Literature 147, 166, Dramatic Art 155A, French 124

East and South Asia


Latin America

History: History 159, 162, 163B, 164, 165, 166B, 167, 168


Russian and East/Central Europe

History: History 138B, 138C, 143

Social Analysis: Political Science 144A, 144B

Culture and Literature: Russian 123, 124, 129, 130, 133, 150

Western Europe

History: History 140, 141, 142A, 142B, 145, 146A, 146B, 147B, 147C, 151D


Total units for the major.................................. 60-102

Major Adviser. Daniel Kono (Political Science)
Courses in International Relations (IRE)

Lower Division

1. Global Interdependence (4)
   Lecture—3 hours; discussion—1 hour. Development of the concept of global interdependence along its political, economic, demographic, cultural, technological, and environmental dimensions. Focus on the ways societies and states interact. Course provides the foundation for upper division multidisciplinary work in international relations. GE credit: SocSci | SS, WE—II, III.
   98. Directed Group Study (1-5)
   Prerequisite: consent of instructor. (P/NP grading only.)
   99. Special Study for Undergraduates (1-5)
   Prerequisite: consent of instructor. (P/NP grading only.)
   Upper Division
   104. The Political Economy of International Migration (4)
   Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: upper division standing. Analysis of worldwide migration patterns, and social scientific theories of international and transnational migration. Focus in economical, political, and social impact of immigration and potential for international and regional cooperation. (Same course as Sociology 104.) GE credit: SocSci | OL, SS, SS.
   190. Topics in International Relations (4)
   Lecture/discussion—4 hours. Prerequisite: consent of instructor. Selected topics in international relations. Variable content. May be repeated for credit when topic differs. GE credit: WE.
   192. International Relations Internship (1-12)
   Internship—3-36 hours to be arranged. Prerequisite: upper division standing and consent of instructor. Work experience in international relations, with term paper summarizing the practical experience of the student. (P/NP grading only.) GE credit: SS, WE.
   194HA-194HB. Special Study for Honors Students (4-4)
   Seminar—2 hours; term paper. Prerequisite: open only to majors of senior standing who qualify for honors program. Directed reading, research, and writing on topics selected by students and instructor in preparation of a senior honors thesis under direction of a faculty adviser. (Deferred grading only, pending completion of sequence.) GE credit: SocSci | OL, SS, WE—II, III, III.
   198. Directed Group Study (1-5)
   Prerequisite: upper division standing and consent of instructor. (P/NP grading only.)
   199. Special Study for Advanced Undergraduates (1-5)
   Prerequisite: upper division standing and consent of instructor. (P/NP grading only.)

International Science Studies

This interdisciplinary minor in International Science Studies will introduce College of Agricultural and Environmental Sciences students to global issues, which affect their major disciplines in the current world, and also provide an opportunity to gain first hand experience abroad when appropriate. The goal of this minor is to enable our college students to develop greater international competence and to enhance their employability.

The minor assumes that the student will have a major in the sciences, and that classes taken under one of the three tracks in the minor will contribute depth to the existing major or establish depth in a selected additional field of study. Students will be expected to work closely with an academic advisor in developing an intellectually coherent program of study. A minimum of 18 units at upper division work is required. Only a single course can be counted toward both major and minor and no course can be used to satisfy the requirements of more than one minor.

Minor Program Requirements:

<table>
<thead>
<tr>
<th>International Science Studies</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Global issue course requirement</td>
<td>7-8</td>
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<tr>
<td>Focusing on broad range of global issues and their impacts on ecological and environmental resources and biodiversity, in addition to international policy and economics. Beyond the courses taken under each track, choose two out of the three courses listed below:</td>
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<tr>
<td>(1) Atmospheric Science 116</td>
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<tr>
<td>(2) Plant Sciences 150</td>
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<tr>
<td>(3) Agricultural and Resource Economics 158</td>
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<tr>
<td>Select one of the following tracks ……… 16-17</td>
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</table>

Education Abroad Program courses taught overseas and relevant international internships will count towards the minor requirement with advisor’s approval. For each track, students can take a maximum of three units from EAP courses, with a valid transcript, and three units from relevant international internships. The international internship activities would require a pre-approved study plan with the academic adviser before the maximum of three units can be awarded. Language and culture related courses are encouraged, but not required for the minor.

| (1) Ecological, environmental, and energy sciences study track: | |
| Select 16-17 units from Anthropology 103, Agricultural and Resource Economics 147, Atmospheric Science 116, 133, Environmental Science and Management 100, 121, 131, 144, 120, 30, Environmental Science and Policy 100, 116, 151, Evolution and Ecology 147, Soil Science 109, Hydrology 143 | |
| (2) Policy and management focus track: | |
| Select 16-17 units from Agricultural and Resource Economics 115A/B, Agricultural and Resource Economics 138, International Relations 190, Community and Regional Development 156, 180, International Agricultural Development 160, 162, 170, Environmental Science and Policy 102, 179 | |
| (3) Agriculture, food systems and water systems track: | |

Minor Advisor. Shu-Hua Chen (Land, Air and Water Resources) 530-752-1822, shachen@ucdavis.edu

Internship

See Internship Program, below; and UC Washington Program (UCDC), on page 334.

Internship Program

Subhash H. Risbud, Ph.D., Director
Jeanne B. Shelby, Associate Director and Project Manager
Marcie Kirk Holland, Project Manager
Andrea Hanson, Project Manager
The Internship and Career Center
1st, 2nd and 3rd Floors, South Hall 530-752-2855

Program Areas

Agricultural and Environmental Sciences, Career Recruiting Programs, Engineering and Physical Sciences, Graduate Student and Postdoctoral Career Services, Health and Biological Sciences, International Programs and Liberal Arts and Business

Internship Experience

The Internship and Career Center facilitates a campus-wide internship program. All internships, both credit and non-credit, can be taken for Transcript Notation with completion of required evaluation reports. The notation briefly describes the nature and location of the internships experience. Questions pertaining to academic credit and Transcript Notation may be directed to The Internship and Career Center.

Course Credit. Internship courses (numbered 92 and 192) are available for credit on a variable-unit and Passed/Not Passed grading basis. A maximum of 12 units of 92 and/or 192 courses may be counted toward the 180-unit minimum needed for graduation. To qualify for the 192 course, students must have acquired 84 units of credit. All credited internships require approval and sponsorship by a faculty member from an appropriate discipline. Arrangements may be made through the department of the sponsoring faculty member and facilitated by The Internship and Career Center Staff.

Italian

[College of Letters and Science]
Julia Simon, Ph.D., Chairperson of the Department

Department Office. 213 Sproul Hall
530-752-1219; http://italian.ucdavis.edu

Faculty
Margherita Heyer-Caput, Ph.D., Professor
Juliana Schieszari, Ph.D., Professor
[Comparative Literature, French and Italian]

Emeriti Faculty
JoAnn Cannon, Ph.D., Professor Emerita
Dennis Dutschke, Ph.D., Professor Emeritus
Gustavo Fossacini, M.A., Senior Lecturer Emeritus

Affiliated Faculty
Antonella Bassi, M.A., Lecturer
Jay Grossi, M.A., Lecturer

The Major Program

The major in Italian provides a solid language background which will enable the student to develop an appreciation for the numerous Italian contributions not only to the arts, but also to political theory, science, literature and other expressions of human creativity, which continue to influence our global world. The Program. The Italian program is geared to the specific needs and interests of the students, who enjoy the advantages of a small classroom setting and the individualized mentoring of dedicated professors. While the use of Italian is stressed in language and literature courses, the Italian program is interdisciplinary in nature. Starting at the lower-division level, students collaborate closely with academic advisers in order to design a major or minor curriculum which includes culture, film, art history,
Career Alternatives. The Italian Program provides
a solid foundation for a variety of career paths
by offering training in Italian language and culture
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8A. Italian Conversation (3)
Discussion—3 hours. Prerequisite: course 3 or the equivalent. Course designed to offer practice in speaking Italian. May be repeated one time for credit. (P/NP grading only) GE credit: WC.—I, II, III.

8AS. Italian Conversation (3)
Discussion—3 hours. Prerequisite: course 3 or the equivalent. Practice in the speaking of Italian. Course is taught abroad. May be repeated for up to 6 units of credit. Not open for credit to students who have completed course 8B. (P/NP grading only) GE credit: —I, II, III.

8B. Italian Conversation (3)
Discussion—3 hours. Prerequisite: course 3. Course designed to offer practice in speaking Italian. (P/NP grading only) GE credit: WC.—II, III.

8BS. Italian Conversation (3)
Discussion—3 hours. Practice in the speaking of Italian. Course is taught abroad. May be repeated for up to 6 units of credit. Not open for credit to students who have completed course 8B. (P/NP grading only) —I, II, III.

9. Reading Italian (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 5. Reading and discussion of modern Italian prose, including selections from creative, scientific and juridical writings. Introduction to contemporary Italian literature and culture. Strengthening the student's command of the Italian language. GE credit: WC.—I, II, III, I, II, III.

9S. Reading Italian (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 5 or SS. Reading and discussion of modern Italian prose, including selections from creative, scientific and juridical writings. Introduction to contemporary Italian literature and culture as well as strengthening the student's command of the Italian language. This course is taught abroad. Not open for credit to students who have completed course 9. GE credit: WC.—I, II, III.

50. Studies in Italian Cinema (4)
Lecture—2 hours; discussion—1 hour; term paper. Introduction to Italian cinema through its genres. Focus is on cinema as a reflection of and a comment on modern Italian literature. Film will be studied as an artistic medium and as a form of mass communication. ArtHum, Wrt | AH, WC, WE.—II, III, I, II, III.

90X. Lower Division Seminar (1-2)
Seminar—1.2 hours. Prerequisite: lower division standing and consent of instructor. Examination of a special topic in Italian language or culture (such as Italian culture seen through film, Italian feminism, literature, or politics) through shared readings, discussions, writing assignments, or special activities such as film screening or laboratory work.

98. Directed Group Study (1-5)
Primarily intended for lower division students. (P/NP grading only)

98S. Directed Group Study (1-4)
Prerequisite: consent of instructor. Group study on focused topics in Italian literature and culture. Varies according to instructor. This course is offered abroad. May be repeated for credit when topic differs. (P/NP grading only) —I, II, III.

99S. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. Opportunity for a faculty member to work with an advanced undergraduate student in a focused manner on an aspect of a topic or topics of mutual research/creative interest. This course is offered abroad. May be repeated for credit when topic differs. (P/NP grading only) —I, II, III.

Upper Division

101. Advanced Conversation, Composition, and Grammar (4)
Lecture—3 hours. Prerequisite: course 9 or consent of instructor. GE credit: ArtHum | AH, OL, WC, WE.—I, II. (I.) Heyer-Caput

101S. Advanced Composition, Conversation and Grammar (4)
Lecture—3 hours; extensive writing. Prerequisite: course 9 or consent of instructor. Expository writing in Italian, with emphasis on advanced grammar, organization, and vocabulary building. Course will be taught to students who have completed course 101. GE credit: ArtHum | AH, OL, WC, WE.—III.

104. Italian Translation and Style (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 101 or consent of instructor. Practice in translation from and to English. Italian, using literary and non-literary texts of different styles. Analysis of linguistic problems and elements of style contained in the translation material. GE credit: AH, WC.—III.

104T. Translation and Style (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 101 or consent of instructor. Practice in translation from Italian to English and English to Italian, using literary and non-literary texts of different styles. Analysis of linguistic problems and elements of style contained in the translation material. Course will be taught abroad. Not open for credit to students who have completed course 104. GE credit: ArtHum | AH, WC.—III.

105. Introduction to Italian Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 101 or consent of instructor. Introduction to the study of the classical periods, works, and movements of the Medieval, Renaissance, and Early Modern periods in Italy. GE credit: ArtHum | AH, OL, WC.—II, III, I, II, III. (I.) Heyer-Caput, Schiesari

105T. Introduction to Italian Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 101 or consent of instructor. Introduction to the study of the principal authors, works, and movements of the Medieval, Renaissance, and Early Modern periods in Italy. This course is taught abroad. Not open for credit to students who have completed course 105. GE credit: ArtHum, Div, Wrt | AH, OL, WC.—III.

107. Survey of Italian Culture and Institutions (4)
Lecture—3 hours; term paper. Assessment of the impact of regional autonomy on Italian cultural life from the Middle Ages to the present. Special emphasis will be placed upon achievements in literature, the arts, philosophy, and socio-political institutions. To be taught in English. GE credit: ArtHum or SacSci | AH, OL, SS, VI, WC, WE.—I, II, III.

107S. Survey of Italian Culture and Institutions (4)
Lecture/discussion—3 hours; term paper. An assessment of the impact of regional autonomy on Italian cultural life from the Middle Ages to the present. Special emphasis will be placed upon achievements in literature, the arts, philosophy, and socio-political institutions. To be taught in English. Not open for credit to students who have completed course 107. GE credit: ArtHum or SacSci | AH, OL, SS, VI, WC, WE.—I, II, III.

108. Contemporary Issues in Italian Culture and Society (4)
Lecture/discussion—3 hours; term paper. Analysis of cultural issues in contemporary Italy. Myth and reality of imagined Italies; Italian identities; immigration and race relations; the media and popular culture. Taught in English. GE credit: ArtHum or SacSci, Div, Wrt | AH, OL, SS, VI, WC, WE.—II, III. (I.) Bassi

108S. Contemporary Issues in Italian Culture and Society (4)
Lecture/discussion—3 hours; term paper. Analysis of cultural issues in contemporary Italy, myth and reality of imagined Italies; Italian identities; immigration and race relations; the media and popular culture. Taught in English. This course will be taught abroad. Not open for credit to students who have completed course 108. GE credit: ArtHum or SacSci, Div, Wrt | AH, OL, SS, VI, WC, WE.—II, III.

110. Medieval and Renaissance Poetry: St. Francis to Petrarch (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. Study of the origins of Italian religious and secular poetry of the 13th and 14th centuries. A diversified poetry is illustrated in works of St. Francis, Dante, Petrarch, the Sicilian School, the New Sweet Style Poets, and other authors. Offered in alternate years. GE credit: ArtHum | AH, OL, WC, WE.—II, III.

113. Dante Alighieri, Divina Commedia (Inferno, Purgatorio, Paradiso) (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. Study of Dante Alighieri’s Divina Commedia, and its role in the development of Italian language and literature. Emphasis will be placed on reading the whole poem within the historical context of the Middle Ages. GE credit: ArtHum | AH, OL, WC, WE.—II, III.

114. Boccaccio, Decameron, and the Renaissance Novella (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. Study of the development of the short story in Italy, as exemplified in Giovanni Boccaccio’s Decameron, in his predecessors and Renaissance followers. Offered in alternate years. GE credit: ArtHum | AH, OL, WC, WE.—I, II.

115A. Studies in the Cinquecento (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. Study of the principal authors, works, and movements of the Medieval, Renaissance, and Early Modern periods in Italy. GE credit: ArtHum | AH, OL, WC.—II, III, I, II, III. (I.) Heyer-Caput, Schiesari

115B. Italian Literature of the Renaissance and the Baroque: From Cellini to Marino (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 115A. Continued examination into the loss of an ideal. Emphasis on the conflicts in Michelangelo and Tasso leading to Marino, with an excursion on Galilei’s role in the formation of a modern scientific and journalistic writings. Introduction to literary styles. Analysis of key texts from the high moment of the Italian Renaissance. The political and aesthetic legacy of humanism will be foregrounded in relation to authors such as Ficino, Ariosto, Machiavelli, Aron, Cabezie, and Tasso. Offered in alternate years. GE credit: ArtHum | OL.—III. (III.) Schiesari

115C. Italian Drama from Machiavelli to the Enlightenment (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. Development of comic and tragic forms as critical representations of their societal and historical contexts, i.e. Machia
evelli and the logic of power. Barocco: Transfer in the service of counter-reformation Italy, Goldoni’s comedies and bourgeois social consciousness. Offered in alternate years. GE credit: ArtHum | OL.—I. Schiesari

115D. Early Modern Italian Lyric (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. Examination of the poetic tradition influenced by Petrarch: Consideration of the relation between gender and genre in such poets as Petrarch, Bembo, della Casa, Tasso, Marino, Gasparo Stampa, Veronica Franco, Isabella di Morra. Offered in alternate years. GE credit: ArtHum | OL.—I, II, III. Schiesari

118. Italian Literature of the Eighteenth Century (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. Examination of the poetic tradition influenced by Petrarch: Consideration of the relation between gender and genre in such poets as Petrarch, Bembo, della Casa, Tasso, Marino, Gasparo Stampa, Veronica Franco, Isabella di Morra. Offered in alternate years. GE credit: ArtHum | OL.—I, II, III. Schiesari

119. Italian Literature of the Nineteenth Century (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. Romanticism in Italy, including Manzoni, Verga, and Verismo. GE credit: ArtHum | AH, OL, WC, WE.—II, III. (I.) Heyer-Caput
120A. Italian Literature of the Twentieth Century: The Novel (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. Development of the novel from Svevo to the present. Emphasis on the work of Svevo, Levi, Moravia, Pavese, and Vittorino. GE credit: ArtHum, Div | AH, WC, WE — Cannon, Hoyer-Capit

120B. Italian Literature of the Twentieth Century: Poetry and Drama (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. Italian poetry with emphasis on Hermeticism; the theater of Luigi Pirandello and its role in the development of contemporary Italian drama. GE credit: ArtHum, Div | AH, WC — Hoyer-Capit

121. New Italian Cinema (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 1 and upper-division standing, or consent of instructor. Italian cinema of the 21st century in the context of profound cultural and social changes in Italy since World War II. Productions by representative directors such as Amelio, Giordano, Moretti, Muccino are included. Knowledge of Italian not required. Offered in alternate years. (Same course as Film Studies 121.) GE credit: ArtHum, Div, Wrt | AH, OL, VL, WC, WE — III. Hoyer-Capit

121S. New Italian Cinema (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 1 and upper-division standing, or consent of instructor. Italian cinema of the 21st century in the context of profound cultural and social changes in Italy since World War II. Productions by representative directors such as Amelio, Giordano, Moretti, Muccino are included. Knowledge of Italian not required. [Same course as Film Studies 121S.] GE credit: ArtHum, Div, Wrt | AH, OL, VL, WC, WE — II, III, I, II.

131. Autobiography in Italy (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. The development of representations of selfhood with particular attention to generic conditions, the confessional tradition and the problem of women’s self-representation. Authors studied may include Petrarch, Tasso, Casanova, Alfieri, Zvekov, Sibilla Aleramo and Primi. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, OL, WC, WE — III. Hoyer-Capit, Schiesari

139B. Italian Literature in English: Boccaccio, Petrarch and the Renaissance (4)
Lecture/discussion—3 hours; term paper. Petrarch and Boccaccio and their relations to the Middle Ages and the Renaissance; the Renaissance, with particular attention to the works of Lorenzo de’ Medici, Leonardo da Vinci, Machiavelli, Ariosto, Michelangelo, etc. GE credit: ArtHum, Div | AH, OL, WC, WE — II, III.

140. Italian Literature in English Translation: Dante, Divine Comedy (4)
Lecture/discussion—3 hours; term paper. Prerequisite: any course from the GE Literature Preparation List. Reading of Dante Alighieri’s Divine Comedy, through the other world realms of Inferno, Purgatory, and Paradise. GE credit: ArtHum, Wrt | AH, OL, WC, WE — I, II.

141. Gender and Interpretation in the Renaissance (4)
Lecture/discussion—3 hours; term paper. Prerequisite: completion of Subject A requirement, at least one course in literature, or consent of instructor. Critical analysis of Renaissance texts with primary focus on issues such as human dignity, education and gender politics; “high” and “low” culture and its relation to literary practices. (Same course as Comparative Literature 138.) GE credit: ArtHum, Div, Wrt | AH, OL, WC, WE — I. I. Schiesari

142. Masterpieces of Modern Italian Narrative (4)
Lecture—1.5 hours; discussion—1.5 hours; term paper. Prerequisite: either English 3, Comparative Literature 2, or History 4C. Analysis of major works of Italian narrative fiction from unification of Italy to present. Students will learn to use representative methods and concepts which guide literary scholarship. Consideration of works within European social and cultural context. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC, WE — III.

145. Special Topics in Italian Literature (4)
Lecture/discussion—4 hours. Prerequisite: course 9 or consent of instructor. Study of special topics and themes in Italian literature, such as comic literature, epic poetry, pre-twentieth century theater, fascism, futurism, women and literature, and the image of America, etc. May be repeated for credit when topics differ. GE credit: ArtHum, Wrt | AH, OL, VL, WC, WE — I, II, III, I, II, III.

145S. Special Topics in Italian Literature (4)
Lecture/discussion—4 hours. Prerequisite: course 9 or consent of instructor. Study of special topics and themes in Italian literature, such as comic literature, epic poetry, pre-twentieth century theater, fascism, futurism, women and literature, the image of America, etc. This course is taught abroad. May be repeated for credit. Not open for credit to students who have completed course 145. GE credit: ArtHum, Wrt — III.

145ST. Special Topics in Italian Literature (4)
Lecture/discussion—4 hours. Prerequisite: course 9 or consent of instructor. Study of special topics and themes in Italian literature, such as comic literature, epic poetry, pre-twentieth century theater, fascism, futurism, women and literature, the image of America, etc. This course is taught abroad. May be repeated for credit. Not open for credit to students who have completed course 145. GE credit: ArtHum, Wrt | AH, OL, VL, WC, WE — II, III.

150. Studies in Italian Cinema (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: Humanities 10 or consent of instructor. Introduction to Italian cinema through its genres. Focus on cinema as a reflection or a comment on modern Italian history. Film as an artistic medium and as a form of mass communication. GE credit: ArtHum, Div, Wrt | AH, OL, VL, WC, WE — II, III.

190X. Upper Division Seminar (1-2)
Seminar—1-2 hours. Prerequisite: upper division standing and consent of instructor. Examination of a special topic in Italian language or culture through shared readings, discussions, written assignments or special activities such as film screening or laboratory work. Limited enrollment. May not be repeated for credit. GE credit: ArtHum | AH, WC, WE.

192. Italian Internship (1-12)
Internship—3-36 hours. Prerequisite: upper division standing and consent of instructor. Participation in government and business activities to gain work experience and to develop a better knowledge of Italian language and culture. (P/NP grading only.)—I, II, III (1, II, III)

194H. Special Study Honors Students (3)
Independent study—3 hours. Prerequisite: open only to seniors of major standing who qualify for honors program, or consent of instructor. Study under the direction of a faculty member, leading to a senior honors thesis on a topic in Italian literature, civilization, or language studies. (P/NP grading only.) GE credit: AH, WC.

195H. Honors Thesis (3)
Independent study—3 hours. Prerequisite: course 194H. Writing of the honors thesis on a topic in Italian literature, civilization, or language studies under the direction of a faculty member. (P/NP grading only.) GE credit: AH, WC, WE.

Japanese

See East Asian Languages and Cultures, on page 223.

Jewish Studies

(See College of Letters and Science)

Diane L. Wolf, Ph.D., Program Director

Program Office, 2216 Social Sciences and Humanities Building
http://jewishstudies.ucdavis.edu

Committee in Charge

David Biale, Ph.D. (History)
Zeev Maoz, Ph.D. (Political Science)
Susan Miller, Ph.D. (History)
Sven-Erik Rose, Ph.D. (German)
Diane Wolf, Ph.D. (Sociology)

The Program of Study

The Program in Jewish Studies offers students the opportunity to explore Jewish history, Jewish communities, literature, religion, and culture in a comparative perspective and multicultural framework. Courses include Hebrew language instruction as well as the study of classical and modern Jewish texts in translation. The interdisciplinary minor in Jewish Studies provides an introduction to the study of Jewish culture, thought, history, and literature. Students learn a broad range of methodologies and critical concepts in these areas and gain insight into the relation between Jewish identities, histories, and representations and those of the cultures in which Jews throughout the world have lived.

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer, 2013-2016 offering in parentheses.

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; AGCH—American Cultures; DD—Diverse Domesticity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
Upper Division

10. Introduction to Jewish Cultures (4)
Lecture—3 hours; term paper. Diverse Jewish cultures created over the past 2,000 years using examples from less-familiar communities such as India, China, and Ethiopia. Topics include the tensions between homeland/diaspora and questions of identity (race, nationality, culture, or religion). GE credit: Scit, Div, Wrt | SS—III.

120. Cinema and the American Jewish Experience (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: 120 recommended. Examination of American cinema to reveal how Jewish identity is expressed and submerged, tracing the relations between religion, identity, race, politics, and art. Not open for credit to students who have completed Humanities 122. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, WE—I.

121. Oral History and Jewish Life (4)
Lecture/discussion—3 hours; term paper. Oral history methodologies and application to an in-depth oral history interview about Jewish life. Topics include oral history practices and ethics, immigration, migration, religious practice, ethnic relations, and community organization structures. Not open for credit to students who have completed Humanities 123. GE credit: SocSci, Wrt | SS—III.

Emeriti Faculty

Thomas A. Cahil, Ph.D., Professor Emeritus
John J. Carroll, III, Ph.D., Professor Emeritus
G. Stuart Pettypgrove, Professor Emeritus
Ruth Reck, Ph.D., Professor Emeritus
Roger H. Shaw, Ph.D., Professor Emeritus
Marilyn L. Shetron, Ph.D., Professor Emeritus
Su-Tzai Soong, Ph.D., Professor Emeritus
Bryan C. Weare, Ph.D., Professor Emeritus

Affiliated Faculty

Richard L. Snyder, Ph.D., Lecturer (Atmospheric Science) and Specialist in Cooperative Extension

Faculty—Hydrology

Susen Usin, Chairperson
Office. 1110 Plant and Environmental Sciences Building 330-752-1130

Helen Dahlke, Ph.D., Assistant Professor (Integrated Hydrological Sciences/Hydrologic Modeler)
Graham E. Fogg, Ph.D., Professor (Hydrogeology)
Mark E. Grimes, Ph.D., Professor (Hydrological Science, Biological and Agricultural Engineering)
Peter J. Hennes, Ph.D., Associate Professor (Hydrologic Science)
Jan W. Humpans, Ph.D., Professor (Vadose Zone Hydrology)
Gregory B. Pasternack, Ph.D., Professor (Watershed Hydrology)
Carlos E. Puentes, Ph.D., Professor (Hydrology)
Samuel Sandoval Soils, Ph.D., Assistant Professor (Hydrological Sciences/CE Specialist in Water Management)
Susan Usin, Ph.D., Professor (Environmental and Resource Sciences)

Emeriti Faculty

David A. Goldhamer, Ph.D., Lecturer Emeritus
Donald W. Grimes, Ph.D., Lecturer Emeritus
Theodore C. Hsiao, Ph.D., Professor Emeritus
Allen W. Knight, Ph.D., Professor Emeritus
Miguel A. Mariño, Ph.D., Professor Emeritus
Donald R. Nielsen, Ph.D., Professor Emeritus
Frank E. Robinson, Ph.D., Professor Emeritus
Verne H. Scott, Ph.D., Professor Emeritus

Affiliated Faculty

Stephen Grant, Ph.D., Lecturer (Hydrologic Science) and Specialist in Cooperative Extension
Timothy A. Hallett, Ph.D., Specialist in Cooperative Extension
Doug Mackay, Ph.D. Adjunct Professor (Hydrologic Science)

Faculty—Atmospheric Science

Lawrence J. Schwankl, Ph.D., Lecturer (Atmospheric Science)

Affiliated Faculty

A. Toby O’Gren, Ph.D. Specialist in Cooperative Extension

Faculty—Atmospheric Science

Michael J. Singer, Ph.D. Professor Emeritus
Richard D. Gratohn, Ph.D., Professor (Atmospheric Science)
Terrence R. Nathan, Ph.D., Professor (Atmospheric Science)

Affiliated Faculty

Michael J. Singer, Ph.D. Professor Emeritus
Richard D. Gratohn, Ph.D., Professor (Atmospheric Science)
Land, Air and Water Resources is a multidisciplinary department with faculty who specialize in atmospheric, environmental, soil, hydrology, and water engineering. Teaching and research focus on both agricultural forestry, natural ecosystems, climate change and environmental science.

The faculty contribute to numerous other undergraduate and graduate programs in the Colleges of Letters and Science, Engineering, and Agricultural and Environmental Sciences.

**Major Programs.** Undergraduates in the department major in Atmospheric Science, Environmental and Resources Sciences, Environmental Science and Management, and Hydrology, and Soil and Water Science; see http://lawr.ucdavis.edu/academic_programs.htm.

Undergraduate Advising Center is located in 1150 Plant and Environmental Sciences Building 530-752-1603.

Graduate Study. Graduate work is offered in the area of Atmospheric Science, Hydrologic Sciences, and Soils and Biogeochemistry. For detailed information, contact 530-752-1669 or see http://lawr.ucdavis.edu/academic_programs.htm.

Courses. See courses listed under Atmospheric Science, Hydrologic Sciences, Hydrology, Environmental and Resources Sciences, Environmental Science and Management, and Soil Science. See also the websites listed above.

**Landscape Architecture**

College of Agricultural and Environmental Sciences (Department of Human Ecology)

Paty Ebanks Owens, M.L.A., Chairperson, Human Ecology, Landscape Architecture, and Environmental Design

Department Office. 131 Hunt Hall 530-752-3907; http://larda.ucdavis.edu

Faculty

Elizabeth Boults, M.L.A., Continuing Lecturer

Steven E. Greco, Ph.D., Associate Professor

Eric Larsen, Ph.D., Associate Research Scientist

Jeff Loux, Ph.D., Associate Adjunct Professor

Brett Milligan, M.L.A., Assistant Professor

N. Claire Napawan, M.L.A., Assistant Professor

Lorenzo Oki, Ph.D., Associate Specialist in Cooperative Extension

Paty Ebanks Owens, M.L.A., Professor

David de la Pena, Ph.D., Assistant Professor

Michael Rios, Ph.D., Associate Professor

Sheryl Ann Simpson, Ph.D., Assistant Professor

Stephen Wheeler, Ph.D., Associate Professor

Emeriti Faculty

Mark Francis, M.L.A., Professor Emeritus

Dean MacCannell, Ph.D., Professor Emeritus

Health Massey, M.F.A., Professor Emerita

E. Byron McCulley, B.S.L.A., Continuing Lecturer

Edward S. McNiel, M.L.A., Senior Lecturer, SOE Emeritus

Robert L. Thayer, Jr., M.A., Professor Emeritus

**The Major Program**

Landscape architecture is planning and design of land areas where human use requires adaptation or conservation of the environment. Students who study landscape architecture are concerned about the welfare of the environment and the people who use and shape it. They are capable of solving physical problems and are able to visualize and think in terms of spaces and three-dimensional concepts. The program is fully accredited by the Landscape Architecture Accreditation Board (LAAB) which is the only architectural accreditation in the United States. The program was last reviewed in 2012.

**The Program.** The curriculum balances creativity and visual and spatial skills with technical expertise and a thorough background in physical, natural, and social sciences. Students develop profiency at problem solving relating to design of parks, public spaces, energy-efficient neighborhoods, land reclamation projects, city and regional planning, and landscape planning for wilderness and scenic regions, coastal and riparian environments, and agricultural landscapes. The program stresses a process-oriented approach to design and emphasizes environmental and community values.

**Preparatory Requirements.** Students are admitted to the landscape architecture major only after submitting a portfolio for review by the faculty. Contact the Landscape Architecture Advising Office for further information in 135 Hunt Hall 530-754-8628.

**Career Alternatives.** Graduates may find jobs in private landscape architecture firms or public agencies, non-profit organizations, and corporations employing landscape architects. The landscape architecture major provides the student with excellent preparation for graduate school or career development in a wide range of environmental and design-related fields.

B.S. Major Requirements:

**Preparatory Subject Matter.** 75-78

English Writing ....................... 4

Communication 1 .......................... 4

Biological Sciences 2A, 2B .......... 5

Environmental Horticulture 6 ....... 4

One course from: Mathematics 16A; Statistics 13; Computer Science 10 .......... 4

One course from: Chemistry 2A, 10; Physics 1A, 10; Geology 1; Geology 1 or Soil Science 103 ........................................... 5

Two courses satisfying Social Sciences general education requirement .... 8

Two courses satisfying Arts and Humanities general education requirement .... 8

Landscape Architecture 1, 2, 3, 21, 30, 50, 60, 70 It is strongly recommended that students register for these courses during their junior year and after completing Calculus.

**Depth Subject Matter.** 61

Landscape Architecture 160, 161, 170, 171 ............................................ 24

Three studios from Landscape Architecture 191 ........................................ 18

Honors alternative: Landscape Architecture 191; Landscape Architecture 102, Honors Thesis (landscape Architecture 199) ........ 20

Landscape Architecture 120 or 150 . 4

Landscape Architecture 190 [three quarters] ........................................... 3

Psychology 152 ................................ 4

Environmental Humanities, Science, and Engineering 133, 105 .............. 8

Restricted Electives ..................... 20

Select 20 units of upper division courses in consultation with adviser ........... 20

**Total Units for the Major** 158

**Major Adviser.** Stephen Wheeler

Advising Center is located in 135 Hunt Hall 530-754-8628.

**Graduate Study.** Graduate-level landscape architecture courses are available to students pursuing graduate programs compatible with or directed toward landscape management, planning, and design issues. Department faculty are active members of various professional societies, including Community Development, Geography, Transportation Technology and Policy and Ecology. Faculty members have expertise in many areas, including landscape history, social theory, practice of public space design, historic landscape preservation, city and regional planning, community participation in urban landscape design, landscape ecology, resource management, bioregionalism, and regenerative landscape systems.

Graduate students pursue more focused interests, expanding their professional expertise and/or constructing advanced research in landscape architecture or related disciplines.

**Courses in Landscape Architecture (LDA) Lower Division**

1. **Introduction to Environmental Design (4)**

   Lecture—3 hours; discussion—1 hour; term paper. Introduction to the role of design professionals in contributing to the built environment at a range of scales. Introduction to basic methods used by design professionals to evaluate design, plan, and manage landscapes and the built environment. Not open for credit to students who have taken course 40. GE credit: ArtHum or SciEng or SocSci, Wrt | AH or SE or SS, VL, WC, WE—II. (II) Napawan

2. **Place, Culture and Community (4)**

   Lecture—4 hours. Introduction to recognizing and reading cultural landscapes, and the application of cultural landscape meaning to the creation of contemporary built environments. Topics include patterns and influences relating to agriculture, military, transportation, housing, wilderness, recreation and tourism. GE credit: SocSci, Wrt | AGCH, SS, VL, WE—II. (II) Wheeler

3. **Sustainable Development: Theory and Practice (4)**

   Lecture—2 hours; extensive problem solving—2 hours, discussion—1 hour. Origins, theoretical perspectives, and practical applications of the concept of sustainable development at a range of scales (site, building, neighborhood, city, region, and nation) through lectures, sketch exercises, student projects, walking tours. GE credit: ArtHum, Wrt | AGCH, SS, VL, WE—II. (II) Wheeler

21. **Environmental Design Visualization (5)**

   Lecture—3 hours; laboratory/discussion—3 hours. Prerequisite: course 1. Restricted to Landscape Architecture majors. Introduction to the development of simple computer-aided drafting and expressive techniques. Introduction to computer-aided graphics techniques. GE credit: ArtHum | AH, VL, WE—II. (II)

23. **Computer Graphics for Landscape Architecture (4)**

   Studio—8 hours; two all-day field trips. Prerequisite: course 21. Landscape architectural communications explored through the construction of basic computer-aided drafting, drawing, rendering, desktop publishing, and photorealistic simulation.

30. **History of Environmental Design (4)**

   Lecture—2 hours; discussion—1 hour. Prerequisite: course 1. Pass a one restricted to Pre-Landscape Architecture and Landscape Architecture majors or consent of instructor. History of Environmental Design across disciplines, including landscape architecture, planning, community and urban design. GE credit: ArtHum, Wrt | AGCH, AH, VL, WE—II. (II)

50. **Site Ecology (4)**

   Lecture—2 hours; laboratory—2 hours. Prerequisite: Biological Sciences 1A, 2A or 10 or an introductory course in biology, botany, or plant science; priority given to Landscape Architecture majors. Introduction to ecological concepts, including nutrient dynamics, population regulation, community structure, ecosystem function. Principles will be applied to human activities such as biological conservation, ecological restoration, landscape planning, and management. Weekly laboratory devoted to field exercises in local ecosystems. GE credit: SciEng | SE, VL, WE—III. (III) Greco

60. **Landform and Grading Studio (6)**

   Studio—8 hours; extensive problem solving. Prerequisite: course 1, 21, 30, 70. Restricted to Landscape Architecture major. Introduction of landform and topography as landscape medium and utilization of grading and drainage to design meaningful and functional spaces. Introduction to site analysis, site planning, and the conventions of grading & drain-
Landscape Architecture

Prerequisite: consent of instructor. (P/NP grading)

Landscape Architecture (1-5)

99. Special Study for Undergraduates in Landscape Architecture majors. Introduction to basic principles of design towards the creation of space. Introduction to design methodologies and skills necessary to define, manipulate, and represent the built environment. Workshops in 2D computer graphic techniques and 3D physical modeling making will reinforce design principles. GE credit: ArtHum or SciEng | AH, OL, VL, WE.—II. (III.) Rios

98. Directed Group Study in Landscape Architecture (1-5)

Prerequisite: consent of instructor. Directed group study. (P/NP grading only)

99. Special Study for Undergraduates in Landscape Architecture (1-5)

Prerequisite: consent of instructor. (P/NP grading only)

Upper Division

102. Methods in Design and Landscape Research (4)

Seminar—4 hours; term paper. Prerequisite: course 170, 171, 172, 180. Restricted to Landscape Architecture majors only. Introduction to landscape research. Lectures provide a historical overview of research methodology. GE credit: ArtHum | AH, OL, VL, WE.—II. (II.) Owens

120. Advanced Computer Applications (4)

Studio—8 hours; two-all day field trips. Prerequisite: course 21, 30, 50, 70. Open to Landscape Architecture majors. Application of 3D modeling and rendering skills in landscape architecture. GE credit: ArtHum | AH, OL, VL, WE.—I. (I.) McClure

140. Green Building, Design, and Materials (4)

Lecture—2 hours; laboratory—4 hours. Prerequisite: course 21, 30, 50, 70. Restricted to Landscape Architecture majors only. Sustainable design and construction techniques in site and building scale. Studio work using computer-aided design, geographic information systems, and other advanced computer programs. (III.) McNeil

160. Design and Build Studio (6)

Studio—8 hours; extensive problem solving; fieldwork. Prerequisite: course 1, 2, 3, 21, 30, 50, 70. Restricted to Landscape Architecture majors. Introduction to the spatial design and construction of small-scale projects. Hands-on approach to learning and understanding design (concrete, and stone) and methods in landscape construction, and the application of technical skills (including detailing, cost estimation, and specifications). GE credit: ArtHum or SciEng | AH, OL, VL.—I. (I.) Greco, Upadhyaya

161. Technology 3: Professional Practice and Construction Documents (4)

Studio—8 hours. Prerequisite: courses 21, 23, 60 and 160. Legal documents and applications for various systems by which landscape construction may be developed. Student teams will develop detailed proposals for real-world sites. GE credit: ArtHum or SciEng | AH, OL, VL.—I. (I.) McCuller

170. Site Planning and Design Studio (6)

Studio—8 hours. Prerequisite: course 21, 30, 50, 70. Open to Landscape Architecture majors. Application of place-making and design skills in local landscapes. Site analysis of social and environmental conditions in the field. Lectures link design projects to contemporary theories and practices. Includes workshops in computer-aided drafting. GE credit: ArtHum | AH, OL, VL.—I. (I.) Greco

171. Urban Design and Planning Studio (6)

Studio—8 hours. Prerequisite: course 21, 30, 50, 70. Restricted to Landscape Architecture majors. Studio devoted to designing urban landscapes at regional, sub-regional, and neighborhood scales. Focuses on understanding complex social, economic, and environmental factors, developing sustainability principles and applying them through design and policy. GE credit: ArtHum | ACGH, AH, OL, VL.—II., III. (II., III.)

180. Advanced Design and Planning Studio (6)

Studio—8 hours; fieldwork; extensive problem solving. Prerequisite: course 60, 160, 170, 171, 172. Restricted to Landscape Architecture majors or consent of instructor. Application of advanced theories and methods of design and planning to real-world projects. May be repeated for up to 18 units of credit. GE credit: ArtHum or SciEng | AH, OL, VL.—I, II, III. (I, II, III.)

180A. Special Topics in Landscape Architecture: Urban Design (2)

Lecture—2 hours. Prerequisite: upper division standing. Theories and methods of urban and community design. Offered in alternate years. GE credit: SciEng | ACGH, SS.—I. (I.) Loux

180B. Special Topics in Landscape Architecture: Social Factors in Landscape Architecture (2)

Lecture—2 hours. Prerequisite: upper division standing. Concepts in environmental psychology as they relate to landscape architecture. Discussion of needs of various user groups of a land area. Introduction to past occupancy evaluations. Open to alternate years. GE credit: SciEng | ACGH, SS.—II. (II.) Loux

180C. Special Topics in Landscape Architecture: Art of the Environment (2)

Lecture—2 hours. Prerequisite: courses 1 and 30. Priority given to Landscape Architecture and Design majors. Introduction to environmental art. Encouragement of critical thinking about the interaction of art and landscape and environmental issues. Offered in alternate years. (I.) Greco

180F. Special Topics in Landscape Architecture: Landscape Ecology (2)

Lecture—2 hours. Prerequisite: course 50 or an introductory course in Ecology. Theories, major concepts and research methods of landscape ecology. Spatial structure, function and dynamics of various landscape types. Biological conservation, ecological restoration, and landscape planning, design, and management. Not open for credit to students who have taken Landscape Architecture 183. Offered in alternate years. GE credit: SciEng | SE, WE.—II. (II.) Greco

180G. Special Topics in Landscape Architecture: Landscape and Regional Land Planning (2)

Lecture—2 hours. Prerequisite: upper division standing. Theories, laws, and practices of community planning. Creation of livable and sustainable communities and natural landscapes. Smart growth, new urbanism, neo-traditional town planning, transit-oriented, and sustainable communities. Traditional neighborhood planning vs. participatory planning and design approaches. Offered in alternate years. GE credit: SciEng | ACGH, SS.—II. (II.) Loux, Wheeler

180L. Special Topics in Landscape Architecture: Regenerative Landscape Systems (2)

Lecture—2 hours. Prerequisite: courses 1 and 30. Priority given to Landscape Architecture majors. Theories, basic techniques and applications for various systems by which landscape construction may be developed. Focuses on understanding complex social, economic, and environmental factors, developing sustainability principles and applying them through design and policy. GE credit: SciEng | ACGH, SS.—II. (II.) Loux, Wheeler

180P. Special Topics in Landscape Architecture: Community Participation in Design (2)

Lecture—2 hours. Prerequisite: upper division standing. History and role of community participation in landscape design; methods of community involvement, including workshops techniques. Introduction to design processes, including public participation. Offered in alternate years. GE credit: SciEng | ACGH, SS.—I. (I.) Loux

180Q. Special Topics in Landscape Architecture: Public Space (2)

Lecture—2 hours. Prerequisite: upper division standing. Critical study of public spaces, including parks, plazas, playgrounds, greenways and community gardens. Current issues associated with design and management of the public environment of cities. Offered in alternate years. GE credit: SciEng | ACGH, SS.—II. (II.) Loux

180V. Special Topics in Landscape Architecture: Urban and Community Design (2)

Lecture—2 hours. Prerequisite: upper division standing. Theories and methods of community and neighborhood design. Past and contemporary approaches including new urbanism, planned unit development, mixed use, pedestrian and transit-oriented development. Issues of open space and community form. Offered in alternate years.

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses

Fall 2011 and on Revised General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div-Domestic Diversity; WRW—Writing Experience

ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
180N. Special Topics in Landscape Architecture: Planting Design (2)
Lecture—2 hours. Prerequisite: upper division standing in Environmental Horticulture 6. Develop an understanding of the sensory, visual and functional importance of plants in the landscape. Visualization and design of planting landscapes. Development of planting plans. Offered in alternate years. Not open for credit to students who have taken course 156. 180O. Special Topics in Landscape Architecture: Current Issues in Landscape Architecture (2)
Lecture—2 hours. Prerequisite: course 1 and 30. Priority will be given to Landscape Architecture and Design majors. Study of current issues in landscape architecture with emphasis on design and/or design history. Offered in alternate years.
180P. Special Topics in Landscape Architecture: Water in Community Planning and Design (2)
Lecture—2 hours. Prerequisite: course 50 or equivalent with consent of instructor. Upper division standing or above. Priority given to Landscape Architecture majors. Theories, policies, methods, and resources related to the integration of water resource systems with urban/community planning and landscape design including water use/demand, quality, treatment, conservation, and storm water management. Offered in alternate years.—Loux, M.
180Q. Historic Preservation (2)
Lecture—2 hours. Prerequisite: upper division standing. Priority given to Landscape Architecture majors. Roots and present focus of historic preservation movements, current philosophies and laws governing preservation, restoration, and revitalization as they affect landscape architects. Offered in alternate years.—(I, II, III) McNiel

181A. Postmodern Landscapes Design and Planning Studio (3)
Studio—6 hours; one field trip required. Prerequisite: course 170; course 180A concurrently. Priority given to Landscape Architecture majors. Application of design theory and methods to real-world projects associated with course 180A. Offered in alternate years.
181C. Art of the Environment Design and Planning Studio (3)
Studio—6 hours; one field trip required. Prerequisite: course 170; course 180A concurrently. Priority given to Landscape Architecture majors. Application of design theory and methods to real-world projects associated with course 180C. Offered in alternate years.—Masey, S.
181F. Landscape Ecology Design and Planning Studio (3)
Studio—6 hours. Prerequisite: course 170; 180F must be taken concurrently. Priority to Landscape Architecture majors. Design theory and methods to real-world projects in ecology. Ecological principles and their application in biological conservation, ecological restoration, and landscape planning, design, and management. Field required. Offered in alternate years. GE credit: SciEng | OL, VL, SE.—I, Greco
181G. Special Topics in Landscape Architecture: Landscape and Regional Land Planning Studio (3)
Studio—6 hours. Prerequisite: course 170, course 181G concurrently. Applications of recent models and practices of urban planning and design to create vibrant and sustainable cities, towns, villages, rural, and natural landscapes. Testing of models by creating plans and designs for new communities, and for urban infill, restoration or redevelopment projects. Field trip required. Offered in alternate years. GE credit: VL.—Loux, Wheeler
181H. Bioregional Landscape Design and Planning Studio (3)
Studio—6 hours; one field trip required. Prerequisite: course 170; 180H must be taken concurrently. Priority given to Landscape Architecture majors. Application of design theory and methods to real-world projects associated with course 180H. Offered in alternate years.

181L. Regenerative Landscape Systems Design and Planning Studio (3)
Studio—6 hours; one field trip required. Prerequisite: course 170; course 180L concurrently. Priority given to Landscape Architecture majors. Application of design theory and methods to real-world projects associated with course 180L. Offered in alternate years.

181J. Community Participation in Design: Design and Planning Studio (3)
Studio—6 hours; one field trip required. Prerequisite: course 170; course 180J concurrently. Priority given to Landscape Architecture majors. Application of design theory and methods to real-world projects associated with course 180J. Offered in alternate years.

181M. Urban and Community Design: Design and Planning Studio (3)
Studio—6 hours; one field trip required. Prerequisite: course 170; course 180M concurrently. Priority given to Landscape Architecture majors. Application of design theory and methods to real-world projects associated with course 180M. Offered in alternate years.

181N, 181P. Special Topics in Landscape Architecture: Social Factors in Landscape Architecture (2)
Lecture—2 hours. Prerequisite: Psychology 155 and upper division standing. Concepts in environmental psychology as they relate to landscape architecture. Discussion of needs of various user groups of a land area. Introduction to post occupancy evaluations. Offered in alternate years. GE credit: DD, OL, VL.—Owens

181Q. Current Issues Design and Planning Studio (3)
Studio—6 hours; one field trip required. Prerequisite: course 170; course 180Q concurrently. Priority given to Landscape Architecture majors. Application of design theory and methods to real-world projects associated with course 180Q. Offered in alternate years.

181R. Special Topics in Landscape Architecture: Water in Community Planning and Design Studio (3)
Studio—6 hours. Prerequisite: courses 50 and 61 (or equivalent courses with consent of instructor); course 170; course 180R concurrently. Priority given to Landscape Architecture majors. Application of design theory and methods to real-world projects associated with course 180R. Offered in alternate years.

181S. Special Topics in Landscape Architecture: Historic Preservation Studio (3)
Studio—6 hours. Prerequisite: junior standing in the Landscape Architecture course 180S to be taken concurrently. Methods and tools currently used by professional preservation architects and planners, including inventory and evaluation methods and traditional architectural design approaches. Field trip required. Offered in alternate years.—I, II, III, (I, II, III) McNiel

190. Proseminar in Landscape Architecture (1)
Seminar—1 hour. Lectures and discussion of critical issues in landscape architecture. May be repeated three times for credit. (P/NP grading only)—I, II, III, (I, II, III)

191. Landscape Architecture Planning & Design Studio (2)
Seminar—1 hour; workshop—3 hours. Prerequisite: course 1, 70, and 170 or consent of instructor. Priority to Landscape Architecture majors. Faculty initiated workshops featuring advanced studies and applications of original work in landscape architecture. May be repeated for up to 20 units of credit.—I, II, III, (I, II, III)

192. Internship in Landscape Architecture (1-12)
Internship. Prerequisite: senior standing in Landscape Architecture. Professional field experience in landscape architecture. May be repeated for a total of 12 units. (P/NP grading only.)

193A. Senior Project in Landscape Architecture (3)
Studio—6 hours. Prerequisite: senior standing in Landscape Architecture. Projects will focus on a critical area of landscape architectural design, planning, analysis, communication, or research. Limited enrollment. Required of all Landscape Architecture majors. (P/NP grading only)—I, II, III

193B. Senior Project in Landscape Architecture (4)
Studio—8 hours. Prerequisite: course 193A and senior standing in Landscape Architecture. Projects will focus on a critical area of landscape architectural design, planning, analysis, communication, or research. Limited enrollment. Required of all Landscape Architecture majors. (P/NP grading only)—I, II, III

197T. Tutoring in Landscape Architecture (1-5)
Tutoring—3-15 hours. Prerequisite: consent of instructor. Directed group study. (P/NP grading only)

198. Directed Group Study in Landscape Architecture (1-5)
Prerequisite: consent of instructor. Directed group study. (P/NP grading only)

199. Special Study for Advanced Undergraduates in Landscape Architecture (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Graduate
200. Citizenship, Democracy, & Public Space (4)
Seminar—4 hours. Prerequisite: graduate standing or consent of instructor. Introduction to seminal works in political theory, philosophy, and the social sciences that focus on citizenship and the public sphere; development of critical perspective regarding restructurings of public space in a pluralistic and global culture; discussion of contemporary case studies. (Same course as Geography 230.)—I, II, III

201. Theory and Philosophy of the Designed Environment (4)
Seminar—4 hours. Prerequisite: course 140 or the equivalent, graduate standing or consent of instructor. Examines the major theories of environmental design. Epistemology of design serves as framework to examine modern landscape architecture, architecture, urban design and planning. Normative theories of design are reviewed along with the social and environmental sciences. Offered in alternate years.—II, Rios

202. Methods in Design and Landscape Research (4)
Seminar—4 hours. Prerequisite: Statistics 102 or the equivalent, graduate standing or consent of instructor. Explores methods of the research and advanced design and planning methods employed in landscape architecture. Exercises provide the student...
204. Case Studies in Landscape Design and Research (4)
Seminar—4 hours; field trip required. Prerequisite: graduate standing in Landscape Architecture, Ecologi-
gy, Geography or Community Development or con-
sent of instructor. Real-world designed environment
situations where creative activity and/or basic
research is the primary product. Advanced land-
scape problems will be utilized at the site, urban or
rural scale. Offered in alternate years.

205. Physical Planning and Design (4)
Lecture—2 hours; discussion—2 hours. Limited to
graduate students. Regulation, design, and develop-
ment of urbanized landscape, planning and land-
development processes, zoning and subdivision reg-
ulation, site planning, urban design goals and meth-
ods, public participation strategies, creatively
designing landscapes to meet community and/or
ecological goals. [Same course as Geography 233.]
Offered irregularly.—Wheeler

210. Advanced Landscape Architecture Studio (4)
Laboratory—8 hours. Prerequisite: course 113 or the
equivalent; graduate standing or consent of instruc-
tor. Exposes students to real-world, designed environ-
ment situations where creative activity and/or basic
research is the primary product. Advanced land-
scape problems will be utilized at the site, urban or
rural scale. Offered in alternate years.

220. Public Space and Culture (3)
Seminar—3 hours. Prerequisite: course 182 or the
equivalent; graduate standing or consent of instruc-
tor. Explores the public environment of cities includ-
ing their streets, parks, and squares. Public life and
culture of American cities is examined and design
responses to this culture evaluated. Typology is used
to identify spaces. Offered in alternate years.

230. Landscape and Memory (4)
Seminar—4 hours; term paper. Prerequisite: gradu-
ate standing or consent of instructor. Theories of
memory from other fields (critical theory, psycho-
analysis, history) applied to landscape design, espe-
cially heritage and tourist sites. The relationships
between place, memorial, and event. Offered in
alternate years.

240. Historic, Cultural Landscapes: Concept,
Perception, Preservation (4)
Seminar—4 hours. Prerequisite: graduate standing
or consent of instructor. Historic cultural landscapes,
as defined by the National Register of Historic
Places. Identification and analysis of aerial extent,
structured makeup, integrity, and historical signifi-
cance using common and emerging methods and
tools. Offered in alternate years.—McNiel

250. Life-Place: Bioregional Theory and
Principles (4)
Seminar—3 hours; tutorial—1 hour. Prerequisite:
graduate standing or consent of instructor. The
emerging concept of bioregionalism as a hypothe-
sis for environmental quality, theoretical structures
and practical methods by which individuals and groups
identify with naturally-bounded “life-places” or “biore-
gionales” and strive to live respectfully and recip-
rocally within them. Offered in alternate years.

260. Landscape and Power (4)
Seminar—4 hours. Prerequisite: graduate standing
or consent of instructor. How various representations
of landscapes have been worked as agents of cultural
power. Course framework is interdisciplinary,
including studies of landscape representation in
literature, art, photography, cartography, cinema, and
landscape architecture. [Same course as Geolo-
gy 252.]—I. (J.) Schenker

270. Environment and Behavior (4)
Seminar—3 hours; tutorial—1 hour. Prerequisite:
graduate standing or consent of instructor; Psychol-
ogy 144 recommended. Factors that influence human
interaction with their surroundings and the
mechanisms used for recognizing and addressing
general and specific human needs in community
development and design decisions. Offered in alter-
ate years.

280. Landscape Conservation (3)
Seminar—3 hours. Prerequisite: contact department
for prerequisite courses; graduate standing or con-
sent of instructor. Focus is on land planning, design,
and management techniques to further the goal of
resource preservation. Examines current critical the-
ory in the establishment and management of conser-
vation areas. Offered in alternate years.—II. Greco

290. Graduate Seminar in Landscape Architecture (2)
Seminar—2 hours. Prerequisite: graduate standing
and consent of instructor. Seminar on selected topics
in landscape architecture research, analysis, plan-
ning, design, communication, or education. May
be repeated for credit. (S/U grading only)

297. Practicum in Landscape Architecture (1-10)
Independent study—1-10 hours. Prerequisite: gradu-
ate standing and consent of instructor. Opportunity
for students to work directly in the field with academic-
ists at other institutions or with professionals in an
office setting. Gives experience beyond the confines
of campus and allows direct interaction with the
community. (S/U grading only)

298. Group Study (1-5)
Prerequisite: graduate standing and consent of
instructor. (S/U grading only)

299. Directed Individual Research for
Graduate Students (2)
Requires consent of instructor. May be repeated
for credit. (S/U grading only)

Professional

396. Teaching Assistant Training Practicum
(1-4)
Prerequisite: graduate standing. May be repeated
for credit. (S/U grading only)—I, II, III (I, II, III)

Landscape Restoration

[College of Agricultural and Environmental Sciences]
This minor is of particular interest to students major-
ing in Wild life, Fish, and Conservation Biology, Envi-
ronmental Science and Management, Landscape
Architecture, Biological Sciences, Evolution and
Ecology and Plant Biology, Biological Sciences 1C
or Plant Sciences 2 is a prerequisite to some courses
in the minor. The minor is sponsored by the Depar-
tment of Plant Sciences.

Minor Program Requirements:

UNITS
Landscape Restoration.............................. 19-25
Select one of Environmental Science and
Policy 155, Plant Biology 102, 117, 147,
Plant Sciences 144.......................... 4-5
Select one of Environmental Horticulture 100,
130, 133, Plant Biology 119, Plant
Sciences 124, 176
Soil Science 10 or 100......................... 3-5
Environmental Horticulture 160 and 160L
4
Select one of Environmental Horticulture 150,
Environmental Science and Policy 155,
Landscape Architecture 180F, 180H, 180l,
Plant Sciences 130, Wildlife, Fish, and
Conservation Biology 155.................... 2-4
Plant Sciences 192.......................... 3

Minor Adviser. T.P. Young (Plant Sciences)
Advising Center is located in 1224 Plant and
Environmental Sciences 530-752-7738.

Latin

See Classics, on page 198.

Latin American and Hemispheric Studies

[College of Letters and Science]
Charles F. Walker, Ph.D., Program Director
Program Office, Hemispheric Institute on the
Americas, 1277 Social Sciences and Humanities
Building 530-752-3046

Committee in Charge
Jelmer Eerkens, Ph.D., Professor (Anthropology)
Liza Grandio, Ph.D., Associate Professor
[Native American Studies]
Luis Guarnizo, Ph.D., Professor
(Human and Community Development)
Erin Hamilton, Ph.D., Assistant Professor (Sociology)
Robert Irwin, Ph.D., Professor
(Spanish & Portuguese)
Robert Newcomb, Ph.D., Professor
(Spanish and Portuguese)
Betina Ng’weno, Ph.D., Associate Professor
[African American & African Studies]
Pablo Ortiz, Ph.D., Professor (Music)
Marc Schenker, Ph.D., Professor
[Medicine & Public Health]
Charles Walker, Ph.D., Professor (History)

The minor in Latin American and Hemispheric Stud-
ies offers students the opportunity to explore connec-
tions throughout the Western Hemisphere from an
array of perspectives across multiple academic
fields.

The minor is made up of six courses, arranged in
three tiers: Basic (one lower division course on the
history of Latin America); Core (two introductory
upper division courses chosen from a designated list
of fields other than History); and Elective (three addi-
tional upper division courses from a designated list
of courses that focus primarily on Latin American
and/or Hemispheric issues). Students are strongly
couraged to develop proficiency in Spanish or Portug-
esian, either through coursework (such as comple-
tion of Spanish 24 or 33), or through life experi-
ence such as study abroad.

Minor Program Requirements:

UNITS
Latin American and Hemispheric Studies
.................................................. 24
Basic Courses........................................ 4
One course from: History 7A, 7B, 7C core
courses.................................................. 8
One course each from two of the following
categories:
(a) Anthropology 144;
(b) Native American Studies 115;
(c) Spanish 150 or 151;
(d) Political Science 143
Elective Courses.................................. 12
Three courses selected from the following
list to achieve a total of 24 units: African
and African American Studies 107A, 155,
155, 163, 172, 180; Anthropology 130C, 146,
Art History 151; Chicano/a Studies 130,
160, Comparative Literature 151, 152,
165; Film Studies 185A; Music 127; Native
American Studies 110A, 110B, 110C,
110D, 120, 129, 131, 181A, 181B,
181C, 184; History 160, 162, 163A,
163B, 164, 165, 166A, 166B, 167, 168,
169A, 169B; Spanish 107A, 117, 149,
151, 153, 154, 155, 156, 157, 158,
159, 163, 170, 171, 172, 174, 175,
176, 177; Portuguese 109, 159, 161,
162, 163; Women’s Studies 80, 102

Quarter Offered: I=Fall; II=Winter; III=Spring; IV=Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; ScieEng—Science and Engineering; SocSci—Social Sciences; Div= demás; DemDiv= Demographic Diversity; Wr= Writing Experience
Fall 2011 and on Revised General Education (GE): ArtHum—Arts and Humanities; ScieEng—Science and Engineering; SocSci—Social Sciences; Div= demás; DemDiv= Demographic Diversity; Wr= Writing Experience

ACGH=American Cultures; DD=Domestic Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; VL=Visual; WC=World Cultures; WE=Writing Experience
200. Introduction to Law (1)
Discussion—1 hour. Introduction to basic concepts of the law, the historical roots of common law and equity, the present system in its practical operation, the modes of reasoning used by courts and attorneys, and the ethical standards of statutory interpretation. (S/U grading only.)

200A. Introduction to the Law of the United States (2)
Discussion—2 hours. History and fundamental principles of the United States’s legal system. Important current legal issues, developments and trends. Required for LLM. Students who have not attended a U.S. law school. Fall semester only. (S/U grading only.)

201. Property (4)
Discussion—4 hours. A study of doctrines and concepts of property law with primary emphasis on real property. Course coverage includes: the estates in land system; the landlord-tenant relationship, conveyancing, and private and public land use control.

202. Contracts (5)
Discussion—5 hours. Examine sorts of promises that are enforced and the nature of protection given to parties. Consider possible effects of reliance on broken promises and remedies for harm done to intangible interests.

203. Civil Procedure (5)
Discussion—5 hours. A study of the fundamental and recurrent problems in civil actions including the methods used by federal and state courts to resolve civil disputes.

204. Torts (5)
Discussion—5 hours. Familiarizes students with legal rules, concepts and approaches pertinent to the recovery for personal injuries, property damages and harm done to intangible interests.

205. Constitutional Law I (4)
Discussion—4 hours. The principles, doctrines and controversies regarding the basic structure of government and division of powers in American government. Specific topics include judicial review, jurisdiction, standing to sue, federalism, federal and state powers and immunities, and the separation of powers among the branches of the federal government.

206. Criminal Law (3)
Discussion—3 hours. Study of the bases and limits of criminal liability. Coverage of the constitutional, statutory, and case law rules which define, limit, and provide defenses to individuals liability for the major criminal offenses.

207. Legal Research and Writing I (2)
Discussion/labatory—2 hours. This fall semester course taught by Wylick Program Fellow faculty is an integrated legal research and writing skills course. Basic legal research resources and strategies are introduced and practiced.

207A. Legal Research (LLM) (1)
Discussion—1 hour. A description of the evolution and use of sources of law and secondary authority. LLM students only.

208. Legal Research and Writing II (2)
Discussion—2 hours. Focuses on persuasive writing and oral advocacy. Students will complete integrated research and writing assignments, including a complaint, a strategic defense office memorandum, a motion to dismiss in federal court, and an appellate brief, with oral arguments by all students.

Second and Third Year Courses
(c) Constitutional Law: 216A, 218, 240, 288A
(e) Estate Planning: 214, 223, 221
(g) Family Law: 225, 242, 272, 435
(k) Individual and Group Study: 411A, 418, 416, 417, 418, 419, 498, 499
(o) Legal Theories and Ethics: 220T, 237, 250, 258, 259, 284, 286C, 286D
(u) Clinical Programs: 425, 430, 440, 455, 460, 470
(v) Clinical Programs-InHouse Clinics: 420, 430, 440, 480, 485
210. Criminal Justice Administration Seminar (2)
Seminar—2 hours. This course compares U.S. criminal procedure with that of other countries, particularly the differing roles of the prosecutor, defense counsel, and the judge. Limited enrollment.

210A. Police Seminar (2) 
Seminar—2 hours. Restricted to 10 students. What are the expectations and roles of the police in a democratic society? We need order maintenance and crime control, but to assume these tasks the police must sometimes intrude upon interests considered fundamental to free societies.

210B. Sociology of Criminal Procedure (2) 
Seminar—2 hours. Limited enrollment. What are the expectations and roles of the police in a democratic society? We need order maintenance and crime control, but to assume these tasks the police sometimes intrude upon interests considered fundamental to free societies.

211. Negotiation (2) 
Discussion—2 hours. Limited enrollment. Skills course teaches theoretical and empirical approaches to negotiation strategy for the purposes of making deals and resolving disputes. Students participate in simulations to hone their negotiation skills, and write analytical papers.

211A. Advanced Negotiation Strategy and Client Counseling (3) 
Discussion—3 hours. Prerequisite: consent of instructor. Application Course. Must apply and secure professor’s approval to enroll. Will involve participating in discussions and a series of simulations. Your classmates will be counting on you to actively participate and be well prepared for every simulation. Do not apply to take this course unless you are willing and able to participate fully and can accept constructive feedback. If you anticipate missing more than two class sessions, do not apply to take this course.

211B. Medical Liability Law and Policy (2) 
Discussion—2 hours. This course will consider the many ways in which society seeks to establish and maintain quality in patient care.

213T. Terrorism and International Law (2) 
Seminar—2 hours. Terrorism remains a pressing concern. Developing effective remedies for responding to it within the bounds of the law is critical. Therefore, the new generation of international lawyers needs to be familiar with the relevant law and standards.

214. Estate and Gift Tax (3) 
Discussion—3 hours. Prerequisite: course 220; course 221 recommended. Fundamentals of federal taxation, including the estate tax, the gift tax, and the generation-skipping transfer tax.

215. Business Organizations (4) 
Discussion—4 hours. Legal rules and concepts applicable to business associations, both public and closely held. Corporate form of organization, partnerships, and other associational forms.

215A. The Law of Corporate Governance Seminar (2) 
Seminar—2 hours. Prerequisite: course 215. Advanced issues in the governance of publicly held corporations. Separation of ownership and control and how the law has addressed this issue at the theoretical level and in the context of topics such as the duties of corporate directors, shareholder voting rights, and competition among states to attract corporate charters.

215S. Special Session Business Associations (4) 
Discussion—4 hours. Provides a broad survey of the legal rules and concepts applicable to business associations, both public and closely held.

216A. Law and Religion (2) 
Discussion—2 hours. Restricted to 20 students. Federal constitutional law relating to religion; the interpretation and application of the Free Exercise Clause and the Establishment Clause of the First Amendment.

217. Telecommunications Law (3) 
Discussion—3 hours. Economic and administrative regulation of telephony, radio and television broadcasting, and video technologies such as cable and direct broadcast satellites. Emphasis on the recently enacted Telecommunications Reform Act and the role of the Federal Communications Commission, as well as other sources of regulation such as related antitrust law and state public utility regulation.

218. Constitutional Law II (4) 
Discussion—4 hours. Students who have completed course 218A or course 218B may not take this course. Principles of the First Amendment and the Equal Protection Clause.

218A. Constitutional Law II—Equal Protection (2) 
Discussion—2 hours. Students who have previously taken course 218A or who plan to take course 218 for 4 units in Spring 2011, may not take this course. Students enrolled in this course will be given priority registration spring semester 2011 to enroll in course 218B. Federal and Equal Protection Clause of the Fourteenth Amendment.

218B. Constitutional Law II—First Amendment (2) 
Discussion—2 hours. Students who have previously taken course 218A or who plan to take course 218 for 4 units in Spring 2011 may not take this course. Students not required to take course 218A in order to take this course. Principally covers the free speech clause of the First Amendment.

218T. Selected Topics in Constitutional Law (2) 
Seminar—2 hours. Examines two core themes of Constitutional Law I and Federal Jurisdiction: federalism and separation of powers. Concentrates on habeas corpus and the Eleventh Amendment as vehicles for examining the constitutional themes in greater depth.

218A. Separation of Powers (2) 
Discussion—2 hours. Study of the separation of powers in our federal government by focusing on certain historical events and their impact on constitutional law.

218B. Law of War (3) 
Discussion—3 hours. Surveys the law of armed conflict as it applies to today’s battlefield.

218C. Antidiscrimination Law (4) 
Discussion—4 hours. Course offers an overview of federal constitutional and statutory antidiscrimination law in the United States.

219. Evidence (4) 
Discussion—4 hours. Covers rules regarding the admissibility of testimonial and documentary evidence during the trial of civil and criminal cases, including rules governing relevancy, hearsay, the examination and impeachment of witnesses, expert opinion, and constitutional and statutory privileges.

219A. Advanced Evidence (3) 
Discussion—3 hours. Prerequisite: course 219. Limited to six students; selected by professor. Interested students complete an application form; available in the Law Registrar’s Office. Credit is contingent on attending all classes and participating in all exercises. Participation is crucial to the success of the course, as students will be working in teams of three. Do not take this course unless you are willing and able to participate fully and can accept criticism. Public interest lawyers often spend much time in the courtroom. Prosecution, defendant, and legal aid offices usually don’t have resources to hire lawyers in trial work. Seeks to help remedy this deficiency by helping develop witness interrogation skills. (S/U grading only)

220. Federal Income Taxation (4) 
Discussion—3 hours. Surveys the federal income tax system, with consideration of the nature of income, when and to whom income is taxable, exclusions from the tax base, deductions and credits, and tax consequences of property ownership and disposition.

220A. Federal Income Taxation (3) 
Discussion—3 hours. Surveys the federal income tax system, with consideration of the nature of income, when and to whom income is taxable, exclusions from the tax base, deductions and credits, and tax consequences of property ownership and disposition.

220B. Tax and Distributional Justice (2) 
Discussion—3 hours. Advanced tax course designed to introduce students to issues of tax policy, with particular emphasis on tax distribution (i.e., who or what should pay taxes in society) and tax incidence (i.e., who or what ends up paying taxes in society).

220BT. Law of Banking and Financial Institutions (2) 
Discussion—2 hours. Guides to dual regulatory system, and an understanding of banks and other financial institutions, such as thrifts, credit unions, industrial banks, finance companies, and money transmitters, as well as large versus community banks.

220S. Special Session Federal Income Taxes—Div 2 (2) 
Discussion—2 hours. Introduction to the basic principles of federal income taxation using the American federal tax model. Topics include identification of income subject to taxation, gains and losses from property transactions, the timing of income and deductions and the identity of people subject to tax on particular items of income.

220T. State and Local Taxation (3) 
Discussion—3 hours. Introduction to fundamentals of state and local taxation. Beginning with historical and constitutional aspects, students will analyze recent developments in state and local taxation and their impact on client representation.

221. Trusts, Wills and Decedents’ Estates (3) 
Discussion—3 hours. Study of the law of decedent’s estates, wills, and trusts.

222. Critical Race Theory Seminar (3) 
Discussion—3 hours. Examines race relations and racial discrimination in America through the perspectives of proponents of the Critical Race Theory
222A. Accounting for Lawyers (2)
Discussion—2 hours. Exposes student to basic principles of accounting, from the perspective of the practicing attorney.

222B. Law and Statistics (3)
Discussion—3 hours. Introduction to fundamentals of statistical analysis and how statistical analysis is used in the law and public policy. Course goal is to help students become excellent consumers of statistical information and evidence.

229. Scientific Evidence (3)
Discussion—3 hours. Prerequisite: course 219. In addition to examining the evidence law governing the admission of evidence, this course considers trial advocacy in presenting and attacking such testimony. Limited enrollment.

230. International Environmental Law (3)
Discussion—3 hours. Prerequisite: prior course work in environmental law and/or international law is helpful. Course may be taken for credit only once. Course is offered in the fall and the spring. May satisfy Advanced Writing Requirement with professor’s permission. Provides an introduction to the core principles and basic principles of international environmental law and policy.

231. Sex Based Discrimination (3)
Discussion—3 hours. Issues raised by legal and social distinctions between men and women. Explores potential remedies for discrimination drawn from constitutional law, statutory enactments, and common law developments. Subject matter areas include sex-based discrimination in constitutional law, family law, reproductive rights, educational opportunity, criminal law, and employment.

231A. Sexual Orientation, Gender Identity, and the Law (2)
Discussion—2 hours. Examines the legal and social regulation of sexual orientation and gender identity.

232. Real Estate Finance (2)
Discussion—2 hours. An introduction to fundamentals of real estate, and of lender remedies in the event of debtor default. The practical application of California legal doctrines.

233. Property Law & Race (2)
Seminar—2 hours. Seminar explores the extent to which property law (both federal, state, and local statutes, and administration regulations) historically impacted and currently shapes conceptions of race, racial groups, and racial relations.

234. Administrative Law (3)
Discussion—3 hours. The U.S. Constitution and the federal Administrative Procedure Act constrain and regulate decision making by government agencies and officials.

236. Securities Regulations (3)

236A. Securities Regulation (2)
Discussion—2 hours. Prerequisite: course 215 or consent of instructor. Legal rules and concepts applicable to business associations, both public and closely held. Complex issues of organization, partnership and other associations.

236B. Securities Regulation II (2)
Discussion—2 hours. Prerequisite: course 215 or consent of instructor; course 236A recommended. Securities Exchanges and Regulation of the regulation of securities markets. Topics covered include regulation of securities markets and securities professionals, responsibilities of securities lawyers, continuous reporting, transactional securities fraud, and enforcement of the securities acts.

239. Mediation: Theory and Practice (3)
Discussion—3 hours. Prerequisite: course 211, 297. The basic, practical knowledge necessary to begin a mediation practice. Detailed understanding of the mediation process to counsel clients knowledgeably about the mediation option and represent clients ably in mediation. Comprehensive, development of the ability to analyze disputes to understand why negotiations succeed or fail, and understanding of the advantages and limitations of mediation as a method of resolving disputes. The stages of a mediation: contracting (establishing contact with the parties and explaining the process), developing the issues, working the conflict, resolving the conflict, and closure. Limited enrollment.

240. Elections and Political Campaigns (2)
Discussion—2 hours. Covers selected constitutional and statutory aspects of federal and state elections, including campaign finance, initiatives, and other topical issues. Limited enrollment.

244. Commercial and Bankruptcy Law (4)
Discussion—4 hours. The business debtor who doesn’t have enough money (or is unwilling) to pay his debts. Remedies available to creditors to force payment, along with devices that creditors may use to give themselves priority against limited assets. Examination of the role of bankruptcy. Bankruptcy as both a means for providing funds for creditors, and as a device for maximizing asset value.

245. Corporate and White Collar Crime (3)
Discussion—3 hours. The law of conspiracy, corporate criminal liability, mail and wire fraud, RICO, money laundering, and environmental crimes and associated defenses.
ity, regulatory competition, and so-called Asian
governing; and the Kyoto Protocol's cap-and-trade system
state-based efforts to support global health financ-
a California not-for-profit corporation; private and
the Internet governance regime offered by ICANN,
tive legal standards related to intellectual property;
the Basel Accord on capital adequacy; the World
can we grapple with problems that now take on a
Discussion—3 hours. Globalization of people,
248D. Globalization and the Law (3)
employ to repress their own citizens. Finally, the
of the Former Soviet Union's countries governments
situation in the Former Soviet Union. It then analyzes
Seminar (2) hours. Offers overview of the constitu-
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245B. Death Penalty Seminar (2)
Seminar—2 hours. Offers overview of the constitu-
law governing the death penalty in the United States.
ized disciplines.
246. Federal Jurisdiction (3)
Discussion—3 hours. Prerequisite: course 205. A study of subject-matter jurisdiction of federal courts.
247A. International Aspects of U.S. Taxation (3)
Discussion—3 hours. Prerequisite: course 220. Study of the federal tax treatment of partner-
ship and partnerships, including entities classified as partnerships.
247A. International Aspects of U.S. Taxation (3)
Discussion—3 hours. Prerequisite: course 220. Completion or current enrollment in a course covering the
domestic taxation of corporations is suggested but not required. Corporate tax may be taken concur-
rently. Examine the U.S. income tax laws and poli-
cies related to the taxation of foreign income of U.S.
persons and U.S. income of foreign person.
247B. Corporate Tax (3)
Discussion/laboratory—2 hours. Examination of the federal income tax relationship between corpora-
tions and their owners. Covers the transfer of funds into a corporation on formation and the re-transfer of
money and property from the corporation to its shareholders.
248. Public International Law (3)
Discussion—3 hours. Introductory course covers basic international law concepts and the law-making
process.
248A. Jurisdiction in Cyberspace Seminar (2)
Seminar—2 hours. Review concepts in international law, conflicts of law, cyberlaw, and federal jurisdic-
tion to address the growing multi-jurisdictional con-
flits created by the Internet. Examine European
efforts at crafting intra-European jurisdictional rules, as
well as other international jurisdiction treaty projects
such as those at the Hague. Limited enrollment. GE
credit: Win.
248B. International Human Rights (2)
Discussion—2 hours. Introduces international human
rights legal system through an examination of its his-
torical origins and precursors and a review of its
international legal backdrop, including the character
and sources of international law, the UN Charter
and the UN system.
248BT. Advanced International Law (3)
Discussion—3 hour. Prerequisite: basic course in international law or consent of instructor. Review
books of international law; Hugo Grotius and Judge
Rosalyn Higgins. The careful resolu-
don of disputes, law of war and peace, and interna-
tional legal process. GE credit: WE
248TC. International Economics Law (3)
Discussion—3 hours. This course will examine the architecture of the international economic system,
with a focus on business models and investment.
248TT. Theories of International Law (2)
Discussion—2 hours. International law, once cri-
tiqued as powerless and ineffective, is now chal-
enged as a threat to American democracy. An intro-
duction to competing theories of international law,
including natural law, positivism, realism, liberal-
ism, constructivism, fairness, legal process, and
world public order.
249. Comparative Law (3)
Discussion—3 hours. The uses of comparative
method, principal differences between common law
and civil law and the styles of legal reasoning that
prevail in these two great legal cultures. Topics
include the evolution of the civil law, the phenome-
non of codification, the structure of European civil
codes and the interpretation of their provisions,
the respective roles of counsel, judges and law teachers,
civil law procedure and a survey of selected legal
areas of substantive law. Knowledge of a foreign
language is not required.
249S. Special Session Comparative Law (1)
Discussion—1 hour. This course will provide a com-
parative perspective for students of American law.
After an initial look at the uses of the comparative
method, discussions will be centered around the
main differences between common law and civil law
and the style of legal reasoning that prevails in the
civil law. Topics to be covered will be the evolution of the civil law and the idea of codification,
the structure of European civil codes and the interpretation of their provisions, the
personnel of the law and procedure in civil law
countries, and the analysis of selected problems
of substantive law. Knowledge of a foreign language
will not be required.
250. Jurisprudence Seminar (2)
Seminar—2 hours. Deals principally with the ques-
tion of how judges should decide ‘hard cases,”
test the content of the law is in doubt and compe-
tent arguments have or could be offered for mutually
inconsistent decisions in favor of either party. Limited
enrollment.
250AT. Legal Theory Workshop (2)
Seminar—3 hours. Introduction to cutting edge
research by legal academics and professors in affili-
ated disciplines.
250BT. Writing Requirement Workshop (2)
Seminar—2 hours. Students who have written a
course paper or an independent study paper and
would like to take papers to the next level, producing
a work of publishable quality. (S/U grading only)
GE credit: WE.
250T. Asian American Jurisprudence (3)
Discussion—2 hours. Legal, social, and political dis-
course on Asian relations has traditionally been
framed in Black/White terms. This course disrupts the
traditional view by taking Asian Americans seri-
ously.
251. Labor Law (2)
Discussion—2 hours. Survey of the legislative, adminis-
trative, and judicial regulation of labor rela-
tions under federal law. Historical development of
labor law, the scope of national legislation, union
organization and recognition, the legality of strikes,
picketing, and the negotiation of collective bargain-
ing agreements.
251T. Labor Law I (2)
Discussion—2 hours. Restricted to students who pre-
viously took Labor Law in Fall 2008 may not enroll in
Labor Law I. Survey of the legislative, administra-
tive, and judicial regulation of labor relations under federal law.
251T. Labor Law II (2)
Discussion—2 hours. Prerequisite: course 251T pre-
ferred; not required. Survey of the legislative, admin-
istrative, and judicial regulation of labor relations under federal law.
252. International Litigation and Arbitration (3)
Discussion—3 hours. Current developments in inter-
national law, conflict of laws, civil procedure, arbi-
tration, and comparative law in the context of
transactions and disputes that cut across national
boundaries.
252. International Litigation and Arbitration (3)
Discussion—3 hours. Survey course covers legal and
policy issues related to developing, protecting and
preserving affordable, safe and accessible housing and
sustaining viable, diverse communities.
254A. Law and Rural Livelihoods Seminar (2)
Seminar—2 hours. Provides broad overview of law as
it relates and applies to rural people and places.
254T. Practicum in Rural Community Advocacy (3)
Seminar—3 hours. Provides an opportunity to learn
about Participatory Action Research (PAR) methods
and community-based law practice in the context
of rural community development and advocacy. Using
these skills and knowledge to serve rural California
communities.
255. Pension and Employee Benefit Law (3)
Discussion—3 hours. Prerequisite: course 220. The
federal regulation and taxation of private pensions
and employee benefits. The Employee Retirement
Income Security Act (ERISA), including such topics as
coverage, forfeitures, spousal rights, creditor access,
fiduciary duties, preemption of state law, remedies,
and other litigation issues. Internal Revenue Code
issues such as discrimination in favor of the highly
compensated, limitations on contributions, and related bene-
fits, rollovers, IRAs, early distribution penalties, and
minimum distribution rules.
256. Land Use (2)
Discussion—2 hours. Local agencies, developers,
environmental interest groups, and others who regu-
larly deal with the administrative and legislative
applications of land use planning and development
laws. Topics include zoning, general plans, local
government land use regulations, and related areas
of litigation. The expanding role of the California
Environmental Quality Act.
257. Legislative Process (2)
Discussion—2 hours. Fundamental elements of the
legislative process, including legislative procedure;
the legislature as an institution; lobbying; statutory
interpretation, legislative-executive relations; and the
legislature’s constitutional powers and limitations.

Quarter Offered: FI-Spring, F-Winter, SS-Fall, W-Summer; 2015-2016 offerings in parentheses
Pre-Fall 2011 General Education (GE): AA=Arts and Humanities; SC=Science and Engineering; SS-Social Sciences; Div=Diverse Domesticity; Wrt=Writing Experience
Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; ACH=American Cultures; DD=Domestic Diversity; OL=Oral Skills; GQ=Quantitative; SL=Scientific; V=Visual; WC=World Cultures; WE=Writing Experience
257A. Legislative Intent Seminar (2)
Seminar—2 hours. Theories and principles of statutory and constitutional interpretation. Original intent vs. living constitution; permissible kinds of evidence for determining legislative intent; canons of construction; extent to which initiatives should be interpreted similarly to laws.

257B. Statutory Interpretation (3)

258. Professional Responsibility (2)
Discussion—2 hours. The American Bar Association's Model Rules of Professional Conduct and the Code of Judicial Conduct, which are tested on the Multistate Professional Responsibility Examination, and the California Rules of Professional Conduct, which are tested on the California Bar Examination. Issues affecting the legal profession, including lawyers' ethical duties and responsibilities to clients, the courts, third parties, and the legal system.

258A. Legal Ethics and Corporate Practice (3)
Discussion—3 hours. Focus on corporate practice to explore the ethical responsibilities of lawyers.

258BT. Mindfulness and Professional Identity Seminar—3 hours. Introduction to the practice of meditation and connect it with readings about the legal profession.

259. Feminist Legal Theory (2)
Discussion—2 hours. Provides an overview of feminist legal theory and considers how its various strands inform legislative and judicial law making. Satisfies Advanced Writing Requirement.

259A. Women, Islam and the Law (2)
Seminar—2 hours. This course will study legal and religious reform movements for women's rights within Muslim communities in the context of current scholarly and political debates about fundamentalism, democracy, equality, secularism, universalism, and multiculturalism. This is a limited enrollment seminar.

259P. Women and the Law Practicum (1)
Discussion/lecture. Prerequisite: prior or concurrent enrollment in course 259. Complements the content of the feminist legal theory course by providing students the opportunity to consider how feminist theory may be used to inform law-making.

260. Employment Discrimination (3)
Discussion—3 hours. Examine federal laws prohibiting employment discrimination, including Title VII of the Civil Rights Act of 1964, the Equal Pay Act, the Age Discrimination in Employment Act, the Americans with Disabilities Act, the Rehabilitation Act of 1973, and §1981. The law teacher will discuss cases.

260AT. Employment Law (2)
Discussion—2 hours. Provides an overview of employment law, labor law and employment discrimination law and aims to serve as a foundation for understanding the law and policy (statutory and common law) that surround the employer-employee relationship.

261. Judicial Process (2)
Discussion—2 hours. Examines the role of the court in the legal process, the administration of justice, and the challenge of maintaining trust in the judicial process.

262. Regulated Industries (2)
Discussion—2 hours. Analyzes the role of the government in the regulation of industries, including the ethical responsibilities of lawyers.

263A. Trial Practice I (3)
Discussion—2 hours; laboratory—1 hour. Prerequisite: course 219, may be taken concurrently. Introduction to the preparation and trial of cases, including trial advocacy, legal research, oral and written communication, and the handling of evidence.

264. Water Law (2)
Discussion—2 hours. Property rights in surface waters, including riparian rights, prior appropriation, and public rights use of water bodies; environmental constraints on exercise of water rights; groundwater rights and management; federal allocation and control of water resources; legal aspects of interstate allocation.

264A. Ocean and Coastal Law (2)
Discussion—2 hours. Introduction to the goals and challenges of coastal and ocean policy, the complicated web of conflicting interests in coastal lands and ocean waters; regulation of coastal development; domestic and international fisheries management; and preservation of ocean resources.

265. Natural Resources Law Seminar (2)
Seminar—2 hours. Topics for each year. This year, we will take a close look at the challenges of managing the Sacramento-San Joaquin Delta, which is both the most important estuary on the west coast and the hub of California's water delivery system. Limited enrollment.

266A. Cyberlaw (2)
Discussion—2 hours. Emerging legal issues crucial to the conduct of business in cyberspace. Discussion of the evolving current and future. Topics may include the Internet and the World Wide Web.

267. Civil Rights Law (3)
Discussion—4 hours. Civil remedies for civil rights violations under the primary United States civil rights statute. Special topics may cover actions for constitutional and statutory violations under Title 42 USC §1983, affirmative defenses, and abstention doctrines.

267B. Civil Rights Seminar (2)
Seminar—2 hours. The social, political, legal, and historical factors leading to the creation of the United States Commission on Civil Rights in 1957. The United States Commission on Civil Rights is a bipartisan, independent agency established by the Civil Rights Act of 1964. It is directed to investigate complaints alleging deprivations of the right to vote, voter fraud, and study and collect information relating to discrimination and the denial of equal protection of the laws under the Constitution on the basis of race, color, religion, sex, age, disability, or national origin; and submit reports, findings and recommendations to the President and to Congress. The role that the USCCR has played and continues to play in American politics, legislative enactments and the national dialogue on equality, fairness and justice in the context of civil and human rights. Satisfies Advanced Legal Writing Requirement. Limited enrollment.

269. Basic Finance for Lawyers (2)
Discussion—2 hours. Prerequisite: Business Association course 219 or concurrent enrollment. Focus on how corporations raise money, stocks and bonds, etc.; understanding other business-related law school courses.

269AT. The Financial Crisis: Law & Policy (2)
Discussion—2 hours. Examine the impact of the financial crisis on the economy and the role of the courts, third parties, and the legal system.

269B. Exemptions and Taxation Focus (2)
Discussion—2 hours. The Conceptual basis and substantive law criteria for the determination of charitable contributions, intermediate and non-profit organizations. Focus is on understanding and advising your clients and for understanding other business-related law school courses.

269C. Corporate Finance (3)
Discussion—2 hours. Elective course 219 or concurrent enrollment recommended. Focus on how corporations raise money, stocks and bonds, etc.; how deals are structured and why corporations use a strategy instead of another.

269D. Seminar on Financial Regulation (2)
Seminar—2 hours. Introduction to the legal and regulatory issues presented by contemporary capital markets.

270. International Business Transactions (2)
Discussion—2 hours. Select legal problems arising from international business transactions. Topics may include the international sales contract, letters of credit, transfers of technology, regulation of bribery, development of joint ventures, reparation of profits, and foreign exchange problems.

270S. Special Session International Business Transactions (2)
Discussion—2 hours. A consideration of selected legal problems arising from international business transactions. Topics may include the international sales contract, letters of credit, transfers of technology, regulation of bribery, reparation of profits, and national efforts to control imports.

270T. Life-Cycle Business Transactions (3)
Discussion—3 hours. Prerequisite: Business Association and/or Trusts. Wills & Estates are recommended for enhanced comprehension. Focus is on understanding the drafting process for various types of transactions and the actual transactional documents typically encountered.

271. Nonprofit Organizations and Drafting (3)
Discussion—4 hours. Prerequisite course 215 or consent of instructor. Legal rules and concepts applicable to nonprofit organizations.

271A. Nonprofit Organizations: State and Local Governance Issues (2)
Discussion—2 hours. Prerequisite course 215 may be taken concurrently with instructor. State and local laws applicable to nonprofit organizations, i.e., public interest, cultural, religious, educational, and other not-for-profit entities. Federal tax exemptions of nonprofits and local laws impacting nonprofits with respect to incorporation or charitable trust formation, operation and governance, dissolution, fiduciary obligations of trustees, officers, directors, and management, and investment obligations vis-à-vis trust assets, cy pres rights, rights of members of social clubs, trade associations and labor unions, enforcement of obligations and rights by the attorney general and others, and regulation of charitable solicitation. Topics may include local property tax and other tax exemptions, nonprofit accounting issues, public private partnerships and Federal antitrust and constitutional constraints.

271B. Nonprofit Organizations: Tax Exemptions and Taxation Focus (2)
Discussion—2 hours. Prerequisite: course 215 or consent of instructor. Legal rules and concepts applicable to nonprofit organizations. Conceptual basis and substantive law criteria for the federal and state income tax exemption of nonprofit organizations and other particular circumstances and activities which will and will not result in income taxation or financial sanction, including qualifications for exempt status, the nondistribution constraint, the inurement and private benefit concepts, limitations on campaign activities, permissible lobbying expenditures, and the unrelated business income tax. Focus is on understanding and advising your clients and for understanding other business-related law school courses.

Purpose is to give you background necessary for understanding and advising clients and for understanding other business-related law school courses.
sanctions, the differences between private foundations and public charities, special excise taxes, the exempt organization private letter ruling and reporting requirements. Topics may include non-profit accounting issues, local property tax and other local tax exemptions, and public/private partnerships.

271T. Nonprofit Organizations-Key Legal Topics (2)
Discussion—2 hours. Legal issues raised in operating and governing a nonprofit organization, primarily a public charity.

272. Family Law (3)
Discussion—3 hours. An introduction to the legal regulation of the family.

274. Intellectual Property (3)
Discussion—3 hours. Provides a broad survey of intellectual property law.

274A. International Intellectual Property and Development (2)
Discussion—2 hours. In September 2007, the World Intellectual Property Organization adopted a development agenda that would rewrite that body’s mandate, placing the concerns of the poor at the center of international intellectual property law and policy.

274AS. Summer Session Intellectual Property (2)
Discussion—2 hours. This course provides a broad survey of the field of intellectual property. Areas covered will include trademarks, patents, trade secrets, idea protection, unfair competition, and copyright.

274BT. Law of Trade Secrets and Restrictive Covenants (2)
Discussion—2 hours. Focus is on the law of trade secrets, including the Uniform Trade Secret Act (UTSA), restrictive covenants not to compete, and current case law developments in the areas of employee mobility and raids, and corporate espionage.

274CT. Knowledge Commons, Collaborative Authorship, Open Access (2)
Seminar—2 hours. Focuses on the increasingly global diffusion and success of collaborative forms of cultural and technoscientific production rooted in copyright-based licenses.

274D. Intellectual Property in Historical Context Seminar (2)
Seminar—2 hours. How the legal system has adapted to earlier periods of rapid change by creating, delimiting, and expanding intellectual property rights (IPRs). Required paper satisfies advanced writing requirement. Limited enrollment.

274T. Theory and History of Intellectual Property (2)
Seminar—2 hours. Seminar traces development of intellectual property law in the U.S. and Europe because it is not possible to understand the logic and shape of current Intellectual Property concepts outside of their messy history.

275. Complex Litigation (2)
Discussion—2 hours. Issues that frequently arise in large complex litigation involving multiple parties and multiple claims.

275A. Intellectual Property Agreement Drafting for Biotech & Pharma
Seminar—2 hours. Prerequisite: upper-division Business Law course or Intellectual Property course; priority given to students that have completed course 274. Covers the negotiation and drafting of intellectual property agreements common in the biotechnological and pharmaceutical arena.

276. Juvenile Justice Seminar (2)
Seminar—2 hours. Examines unique historical, political and legal context in which Indian tribes operate casinos, including impacts on tribal sovereignty, relationships between tribes, states, and local governments, and changing relationships among the tribes themselves, members with particular relevance to experience of California.

278. Pretrial Skills (2)
Discussion—2 hours. This course uses role-playing exercises, videotaped simulations, and related projects to introduce students to lawyering skills basic to the practice of law, including client interviewing, witness interviewing and discovery, including deposition. Limited enrollment.

279. Public Sector Labor Law (2)
Seminar—2 hours. Prerequisite: course 251 or consent of instructor. Application of private sector labor law doctrines to the public sector. Emphasis on the four California public sector statutes and the impact of constitutional law on public employees. Class presentation and seminar paper required. Satisfies advanced writing requirement. Limited enrollment.

280. Advanced Legal Writing: Analytical & Persuasive Writing (2)
Seminar—2 hours. Prerequisite: consent of instructor. Develop essay writing skills and performance test drafting typically employed on the bar examination. (S/U grading only.)

280AT. Legal Analysis (2)
Discussion—2 hours. Selected enrollment by permission of professor. 280A’s only. Focuses on skills critical to law school success, and ultimately, bar exam success. (S/U grading only.)

280BT. Problem Solving and Analysis (2)
Discussion—2 hours. Prerequisite: consent of instructor. Restricted to third-year Law students only. Skills focused on the development of legal analytical and organizational methods essential to successful completion of the Performance Test component of the California Bar Exam (and other states), and, by extension, to success in the practice of law. (S/U grading only.)

281. Local Government Law (2)
Discussion—2 hours. Local Government Law explores the structure of state and local government through the lens of the virtues and flaws of the ideas of Madison and DeTocqueville, i.e., centralized federal government vs. decentralized local government.

282. Energy Law Seminar (2)
Seminar—2 hours. The history, law, and public policy of energy regulation in the United States with an emphasis on economic and environmental regulation. Competitive restructuring of the natural gas and electric utility industries emphasized. The basic regulatory scheme for large consumers such as hydroelectric power, coal, oil, and nuclear power explored. Recommended to anyone who has an interest in the energy sector, various models of economic regulation, and regulated industries.

282AT. Renewable Energy Seminar (2)
Seminar—2 hours. Seminar will provide a broad overview of renewable energy law and policy with a particular focus on the California policy and institutional context.

283. Remedies (3)
Discussion—2 hours. Survey of modern American civil remedies law in both private and public law contexts. Topics addressed include equitable remedies, equitable deceit, malpractice, fraud, relief, reformation, and money damages in torts and contracts.

284. Law and Economics (4)
Discussion—4 hours. Prior study of economics is not required. Introduces students to the economic analysis of law.

285. Native American Law (3)
Discussion—3 hours. Seminar focuses on legal relations between Native American tribes and the federal and state governments.

277. Indian Gaming Law Seminar (2)
Seminar—2 hours. Examines unique historical, political and legal context in which Indian tribes operate casinos, including impacts on tribal sovereignty, relations between tribes, states, and local governments, and changing relationships among the tribes themselves, members with particular relevance to experience of California.

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284. Law and Economics (4)
Discussion—4 hours. Prior study of economics is not required. Introduces students to the economic analysis of law.

285. Native American Law (3)
Discussion—3 hours. Seminar focuses on legal relations between Native American tribes and the federal and state governments.

277. Indian Gaming Law Seminar (2)
Seminar—2 hours. Examines unique historical, political and legal context in which Indian tribes operate casinos, including impacts on tribal sovereignty, relations between tribes, states, and local governments, and changing relationships among the tribes themselves, members with particular relevance to experience of California.

278. Pretrial Skills (2)
Discussion—2 hours. This course uses role-playing exercises, videotaped simulations, and related projects to introduce students to lawyering skills basic to the practice of law, including client interviewing, witness interviewing and discovery, including deposition. Limited enrollment.

279. Public Sector Labor Law (2)
Seminar—2 hours. Prerequisite: course 251 or consent of instructor. Application of private sector labor law doctrines to the public sector. Emphasis on the four California public sector statutes and the impact of constitutional law on public employees. Class presentation and seminar paper required. Satisfies advanced writing requirement. Limited enrollment.

280. Advanced Legal Writing: Analytical & Persuasive Writing (2)
Seminar—2 hours. Prerequisite: consent of instructor. Develop essay writing skills and performance test drafting typically employed on the bar examination. (S/U grading only.)

280AT. Legal Analysis (2)
Discussion—2 hours. Selected enrollment by permission of professor. 280A’s only. Focuses on skills critical to law school success, and ultimately, bar exam success. (S/U grading only.)

280BT. Problem Solving and Analysis (2)
Discussion—2 hours. Prerequisite: consent of instructor. Restricted to third-year Law students only. Skills focused on the development of legal analytical and organizational methods essential to successful completion of the Performance Test component of the California Bar Exam (and other states), and, by extension, to success in the practice of law. (S/U grading only.)

281. Local Government Law (2)
Discussion—2 hours. Local Government Law explores the structure of state and local government through the lens of the virtues and flaws of the ideas of Madison and DeTocqueville, i.e., centralized federal government vs. decentralized local government.

282. Energy Law Seminar (2)
Seminar—2 hours. The history, law, and public policy of energy regulation in the United States with an emphasis on economic and environmental regulation. Competitive restructuring of the natural gas and electric utility industries emphasized. The basic regulatory scheme for large consumers such as hydroelectric power, coal, oil, and nuclear power explored. Recommended to anyone who has an interest in the energy sector, various models of economic regulation, and regulated industries.

282AT. Renewable Energy Seminar (2)
Seminar—2 hours. Seminar will provide a broad overview of renewable energy law and policy with a particular focus on the California policy and institutional context.

283. Remedies (3)
Discussion—2 hours. Survey of modern American civil remedies law in both private and public law contexts. Topics addressed include equitable remedies, equitable deceit, malpractice, fraud, relief, reformation, and money damages in torts and contracts.

284. Law and Economics (4)
Discussion—4 hours. Prior study of economics is not required. Introduces students to the economic analysis of law.
286E. Reproductive Rights, Law, and Policy (2) Seminar—2 hours. Addresses a variety of laws and practices that affect reproductive health and proactive decision making. Limited enrollment.

287. Public Land Law (3) Discussion—3 hours. Legal aspects of federal land management, including the history of public land law, the role of federal lands and specialized law dealing with particular natural resources and uses found on federal lands (minerals, timber, range, wildlife, recreation and preservation).

287A. Law (2) Seminar—2 hours. Will explore the theory and practice of law pertaining to the enactment and administration of public benefits programs for poor and other disadvantaged persons in our society. Limited enrollment.

287T. Law and Society Seminar (2) Seminar—2 hours. Study of law and society challenges traditional legal scholarship by exploring multiple ways in which law both shapes and is shaped by societies and social interactions. Seminar will introduce students to important literature and debates in the field. Limited enrollment.

288. Advanced Constitutional Law Seminar (2) Seminar—2 hours. Prerequisite: Prior or concurrent enrollment in course 218 or 218A. Explores in-depth selected topics or problems in constitutional law and theory. Current focus is on the interpretation and application of the federal commerce clauses of the First Amendment. Limited enrollment.

288B. Supreme Court Simulation Seminar (2) Seminar—2 hours. Consideration in depth of approximately nine cases involving constitutional law that will be decided during the present term of the U.S. Supreme Court. Limited enrollment.

289A. Biotechnology Law and Policy (2) Seminar—2 hours. Coverage includes the regulation of biotechnology research, including restrictions on cloning and fetal stem cell research; regulation of the products of biotechnology to protect human health or the environment, including restrictions on use or distribution of genetically modified organisms; the availability and scope of intellectual property protection for biotechnology products, including genes and engineered organisms, and the international law governing access to the natural resources that provide the starting materials for biotechnology and trade in bioengineered organisms or their products. Limited enrollment.

290T. International Trade Law (4) Discussion—4 hours. Review existing landscape of trade regulation from the World Trade Organizations, to regional organizations such as NAFTA, ASEAN, and the European Union.

291A. International Finance (3) Discussion—3 hours. How a framework of national and international laws and institutions regulates and fails to regulate the flow of money around the world.

291B. International Investment Dispute Seminar (2) Seminar—2 hours. This seminar will examine the law of investor-state dispute resolution.


292T. Advanced Topics in Immigration and Citizenship Law (2) Seminar—2 hours. Conducts a closer examination of various topics and subject matters that relate to immigration and citizenship law.

293. Public Interest Law Seminar (2) Seminar—2 hours. This class will examine the issues and problems associated with providing civil legal services to persons and interests in American society that typically have been unable to afford or otherwise obtain representation from the private bar.

293AT. Contemporary Issues in Economic Justice (2) Discussion—2 hours. Provides an introduction to the social justice critique of free markets.

293T. Public Interest Lawyering, Civil Rights and Employment Law (2) Seminar—2 hours. Prerequisite: course 260, 260AT. Advanced course covers employment law issues through the lens of public interest lawyers and their constituencies.

294A. Law and Popular Culture (2) Seminar—2 hours. This course examines works of popular culture, films, and legal texts. Each session will focus on one particular film and cultural icons in terms, particular problem or problems of law, law practice, legal ethics, traditional ethics, or public policy.

295A. Trademark and Unfair Competition Law (2) Discussion—2 hours. Prerequisite: course 274 recommended. We will take an intensive look at selected issues in Trademark Law, including the concepts of trademarks and unfair competition, acquisition and loss of trademark rights, infringement, trademarks as speech, and international aspects of trademark protection.

295T. Brands and Trademarks (2) Seminar—2 hours. Explores the challenges brands pose to traditional trademark law. Taking a close, interdisciplinary look at branding: from the business school’s theories of brand management to semiotic analyses of bromance meaning to art criticism of brand advertisements.

296. Copyright (3) Discussion—3 hours. Thorough examination of the law of copyright, including its application to literature, music, films, television, art, computer programs, and the Internet. Issues addressed include copyright protection, the copyright owner’s rights, the term of protection, copyright ownership and transfer, infringement, and defenses to infringement.

296T. Entertainment Law (2) Discussion—2 hours. Explores the many facets of Entertainment Law.

297. Alternative Dispute Resolution (3) Discussion—3 hours. Introduces students to a wide variety of alternative dispute resolution procedures, with an emphasis on negotiation, mediation and arbitration. Limited enrollment.

297AT. Commercial Arbitration Seminar (2) Seminar—2 hours. Trace the development of commercial arbitration, with a special emphasis on hot-button contemporary issues like consumer and employment arbitration, the separability doctrine, preemption of state law, and the arbitrability of statutory claims.


Professional

400A. Study Abroad—University College Dublin, Ireland (2) Independent study. Students must apply and be accepted into the International Study Abroad Program. Semester away study abroad at the University College Dublin, Ireland. Enhance knowledge of international legal regimes and obtain a global legal educational experience. (S/U grading only)

400B. Study Abroad—University of Copenhagen, Denmark (12) Independent study. Students must apply and be accepted into the International Study Abroad Program. Semester study abroad at the University of Copenhagen, Denmark. Enhance knowledge of international legal regimes and obtain a global legal educational experience. (S/U grading only)

400C. Study Abroad—China University of Political Science and Law (12) Independent study. Students must apply and be accepted into the International Study Abroad Program. Semester-away study abroad at the China University of Political Science and Law. Enhance knowledge of international legal regimes and obtain a global legal educational experience.

400D. Study Abroad—University of Lausanne, Switzerland (12) Independent study. Students must apply and be accepted into the International Study Abroad Program. Semester-away study abroad at the University of Lausanne, Switzerland. Enhance knowledge of international legal regimes and obtain a global legal educational experience. (S/U grading only)

400S. Critical Topics in Environmental Law in a Comparative Perspective (2) Seminar—2 hours. Enrollment by application only. Intensive, two-week program provides an opportunity for U.S. and international law students to study environmental law by examining European Union and U.S. environmental law policies and regulatory regimes. (S/U grading only)

408. Community Education Seminar (3) Seminar/clinic—3 hours. Trains students to educate the community about basic legal rights and responsibilities. Students attend an initial four-hour orientation, followed by weekly seminars that will prepare students to teach in a local high school at least two times per week. Paper or project required, to be determined by instructor. Limited enrollment. (S/U grading only)

408A. Educational Policy and the Law Seminar (2) Seminar—2 hours. Prerequisite: course 235 recommended. Examines the interaction between policy and the law of various educational themes such as the “right” to an education, financial equalization, merit and testing, privatization of education, and educational access. Limited enrollment.

409. Environmental Law Moot Court Competition (1) During the first eight weeks of fall semester, students research and submit briefs as appellants, respondents, or third parties on a problem of environmental law that is prepared by the National Environmental Law Moot Court Board. Students attend four to six classes (including guest lectures) on aspects of appellate advocacy, legal writing, and environmental law. Members of the spring environmental law moot court team will be selected on the basis of performance in class. (S/U grading only)

410A. Appellate Advocacy I (2) Discussion/laboratory. Basic appellate practice and procedure. Beginning instruction in oral advocacy skills and an opportunity to practice these skills in front of a moot court. Limited enrollment. (S/U grading only)

410B. Appellate Advocacy II (Moot Court) (2) Practice—2 hours. Continuation of course 410A. Focuses on the development of effective appellate brief writing skills and the refinement of oral advocacy skills. Limited enrollment. (S/U grading only)

411. Journal of International Law and Policy (1-2) The Journal is a biannual journal produced by King Hall students with an interest in international law. The editor-in-chief of the journal receives two units of credit each semester. The managing editor receives one unit of credit each semester. (S/U grading only)

411A. International Law Journal (1-2) The Editor in Chief of the Journal of International Law and Immigration receives two credits for each semester of service. Only one person may receive this credit in any one semester or cumulative. Managing and executive editors each receive one unit. (S/U grading only)
411B. Journal of Juvenile Law and Policy (1-2)
A biannual publication of the UC Davis School of Law that addresses the unique concerns of children in the American legal system. The editor-in-chief of the journal receives two credits each semester. Managing editors receive two credit each semester. (S/U grading only)

411C. UC Davis Business Law Journal (1-2)
Run by dedicated law students who are committed to providing current and valuable legal and business analysis. The journal addresses a broad spectrum of issues that fall within the intersection of business and the law. May be repeated two times for credit. (S/U grading only)

412. Carr Intraclass Trial Advocacy Competition (2-5)
Competition—1 hour. Named after the late Justice Frances Carr, this competition is open to second- and third-year students. A preliminary round is followed by quarter-finals, semi-finals, and a final round. Students in mock trials presided over by judges and critiqued by experienced litigators. Limited enrollment. (S/U grading only)

413. Interschool Competition (1-3)
Prerequisite: consent of appropriate faculty adviser. Participation in the interschool court and lawyer skills competitions. Enrollment is limited to students actually representing the School in the interschool competitions. Competition must be authorized by the faculty advisers. The faculty adviser may condition the award of academic credit for any particular competition on the performance of such actual work as may be reasonable to justify the credit. May not aid in the legal writing requirement. (S/U grading only)

414. Moot Court Board (1)
Prerequisite: courses 410A-410B. Members of Moot Court Board may receive one credit for each semester of service on the board, up to a maximum of two. Credit awarded only after certification by Moot Court Board and approval of the faculty advisers to Moot Court Board. Limited enrollment. (S/U grading only)

414A. Negotiations Board (1)
Variable—1 hour. Prerequisite: consent of instructor. Members of the King Hall Negotiations Board assist in the administration of the King Hall Negotiation Team by performing a variety of tasks under the supervision of the course instructor. One unit of credit for each semester of service on the board, up to a maximum of two units per academic year. Credit awarded only after approval by the instructor. (P/NP grading only)

415. Trial Practice Honors Board (1)
Members of the Trial Practice Honors Board administer the Frances Carr competition. Members are nominated by their Trial Practice I adjuncts. Students receive one credit for serving on the Board, awarded upon approval of the faculty adviser. (S/U grading only)

416. Law Review Writer (1-3)
The writing of a law review article under the editorial supervision of editors of the UC Davis Law Review. Office hours (including but not limited to Bluebooking and cite-checking) are required. 1 or 2 units, required. In the spring semester, credit is obtained only upon achieving status as a member of the UC Davis Law Review, which requires that the student has made substantial progress towards meeting the selection criteria. Credit is awarded only after certification by the editor in chief and approval of the faculty advisers. One unit of credit is earned the first semester. Two units are earned the second semester. Credit is awarded upon nomination and acceptance of nomination to the Editorial Board. One unit is earned second semester if only a membership draft and office hours are completed. May be repeated for credit. (S/U grading only)

417. Law Review Editor (1-2)
Editors must have completed an editorialship article and must perform editorial duties requiring a substantial time commitment. Credit awarded only after certification by the editor-in-chief of the Law Review and approval of the faculty advisers to the Law Review. Students are credited over two semesters for service as an editor. Deferred grading pending only, pending completion of sequence.

418. Environmental Law and Policy Journal (1-2)
Independent study. Each year nearly 100 King Hall students work together to publish Environments. Getting involved with the journal will provide you with the chance to develop essential skills that will benefit you throughout school and career. (S/U grading only)

419. Advanced Writing Project (1-4)
The completion of a writing requirement project under the active and regular supervision of a faculty member in satisfaction of the legal writing requirement. The writing project must be an individually authored work of rigorous intellectual effort of at least 20 typewritten double-spaced pages, excluding footnotes. The project may take any of several forms, for example, a paper, a brief, a memorandum of law, a proposed statute, a statutory scheme or set of administrative regulations (with explanatory comments), a will or agreement (with explanatory comments). The advanced writing project may also be undertaken in connection with another course or seminar to satisfy the legal writing requirements. The number of units shall be approved by the faculty supervisor and will depend upon the scope of the writing effort. (S/U grading only)

419A. Advanced Writing Project (1-4)
The completion of a writing requirement project under the active and regular supervision of a faculty member in satisfaction of the legal writing requirement. The writing project must be an individually authored work of rigorous intellectual effort of at least 20 typewritten double-spaced pages, excluding footnotes. The project may take any of several forms, for example, a paper, a brief, a memorandum of law, a proposed statute, a statutory scheme or set of administrative regulations (with explanatory comments), a will or agreement (with explanatory comments). The advanced writing project may also be undertaken in connection with another course or seminar to satisfy the legal writing requirements. The number of units shall be approved by the faculty supervisor and will depend upon the scope of the writing effort. (S/U grading only)

419B. Special Session Advanced Writing Project (1-4)
The completion of a writing requirement project under the active and regular supervision of a faculty member in satisfaction of the legal writing requirement. The writing project must be an individually authored work of rigorous intellectual effort of at least 20 typewritten double-spaced pages, excluding footnotes. The project may take any of several forms, for example, a paper, a brief, a memorandum of law, a proposed statute, a statutory scheme or set of administrative regulations (with explanatory comments), a will or agreement (with explanatory comments). The advanced writing project may also be undertaken in connection with another course or seminar to satisfy the legal writing requirements. The number of units shall be approved by the faculty supervisor and will depend upon the scope of the writing effort. (S/U grading only)

420. Civil Rights Clinic (2-6)
Clinical activity. Prerequisite: prior or concurrent enrollment in course 219. Students may work only on individual civil rights matters. (S/U grading only; deferred grading only, pending completion of sequence)

420A. Immigration Law Clinic (4)
Clinical Activity—8 hours. Prerequisite: Prior or concurrent enrollment in course 292. Each student is required to enroll for two semesters, receiving four units each semester for total of eight units. Provides legal representation to indigent non-citizens in removal proceedings before U.S. Immigration Courts, the Board of Immigration Appeals, and federal courts, including the Ninth Circuit Court of Appeals. (S/U grading only; deferred grading only, pending completion of sequence)

420B. Immigration Law Clinic (4)
Clinical Activity—8 hours. Prerequisite: Prior or concurrent enrollment in course 292. Each student is required to enroll for two semesters, receiving four units each semester for total of eight units. Provides legal representation to indigent non-citizens in removal proceedings before U.S. Immigration Courts, the Board of Immigration Appeals, and federal courts, including the Ninth Circuit Court of Appeals. (S/U grading only; deferred grading only, pending completion of sequence)

445. Legislative Process Externship (2-5)
Clinical activity. Prerequisite: course 240 (may be taken concurrently) or consent of instructor. Practical experience in the operation of the office of a legislator or a legislative committee. The major thrust of the program is to enable students to become familiar with the give and take realities of making laws, as contrasted with their interpretation and enforcement. Journals are required. (S/U grading only)

450. Environmental Law and Policy Journal (1-2)
Clinical activity—2.6 hours. Prerequisite: course 262. Directed study. Students observe procedures and practices of a governmental or private agency. Enrolled students are required to write a term paper of approximately 10 pages. Limited enrollment. (S/U grading only)

455. Employment Relations Externship (2-6)
Clinical activity. Prerequisite: course 251 or 260 (may be taken concurrently). Practical experience in employment relations, including employment discrimination and public sector labor law. (S/U grading only)

460. Federal and State Taxation Externship (2-6)
Clinical activity—2.1 hours. Prerequisite: course 220. Students will have the opportunity to work with the Internal Revenue Service or other governmental tax authorities. Journals and attendance at group meetings are required. (S/U grading only)

465. Family Protection Clinic (4)
Clinical activity. Prerequisite: course 219 (may be taken concurrently). Representation of low-income persons in family law matters arising out of situations involving family violence. Students are supervised by the staff attorney at the clinic's office located in Woodland at the Sexual Assault and Domestic Violence Center of Yolo County. (S/U grading only)

470. Civil Rights Clinic (2-6)
Clinical activity. Prerequisite: prior or concurrent enrollment in course 219. Students may work only on individual civil rights matters. (S/U grading only; deferred grading only, pending completion of sequence)

472. Civil Rights Clinic (2-6)
Clinical activity. Prerequisite: prior or concurrent enrollment in course 219. Students may work only on individual civil rights matters. (S/U grading only; deferred grading only, pending completion of sequence)
may be applied toward the practicum requirement for the Public Interest Law Program. (S/U grading only.)

465. Intellectual Property Externship (2-6) Clinical activity. Prerequisite: course 293 and Com- parative Public Services recommended. Opportunity to work for government, academic, and nonprofit entities. (S/U grading only.)

470. Administration of Criminal Justice Externship (2-6 or 12) Clinical activity—2-12 hours. Prerequisite: Com- pletion of, or concurrent enrollment, in courses 219 and 227; course 268.3A recommended. Earn practical experience working full or part-time in a District Attorney’s or Public Defender’s office in one of several surrounding counties or in a federal Public Defender’s office. Students participate in the many activities associated with the office for which they extern: observation, interviewing, research, counseling, motion practice, and trials under State Bar rules. Limited enrollment. (S/U grading only.)

475. Washington UC-DC Law Program (10) Clinical activity—10 hours. Open to 2L and 3L stu- dents. Uniquely collaborative externship program in Washington, D.C., combining weekly seminars with full-time field placement offering students an unparalleled opportunity to learn how federal statutes, regulations, and policies are made, changed, and understood in the nation’s capital. (S/U grading only.)

475A. Law Making and Law Changing in the Nation’s Capital (3) Seminar—3 hours. Companion seminar to the Washington UC-DC Externship. Designed to enhance the externship experience in three principal ways.

480. Clinical Program in Prison Law (2-6) Clinical program. Provides practical experience in providing legal services to real clients who have var- ious claims related to their incarceration in state prison. The services require analysis and application of Constitutional Law, state statutory law, agency regulations, and the rules of professional responsibility. Students will work under the direct supervision of the Prison Law clinical director and will be assigned a portion of the director’s caseload. Students will be required to follow the law office procedure of the clinic and employ skills such as interviewing, research, writing, negotiating, and possibly, the preparation of legal documents to be filed in court. (S/U grading only.)

485. California Supreme Court Clinic (6) Clinical activity—6 hours. Class size limited to 6 stu- dents. California Supreme Court Clinic provides students with an immersive experience in litigating cases before the state’s highest court.

490T. Aoki Federal Public Defender Clinic (4) Clinical activity—4 hours. Students submit applica- tions for the course. Outgrowth of the work of the Aoki Center on Race and Nation. As part of its work, the Aoki Center provides educational opportu- nities to students interested in critical race perspec- tives in practice.

495. Legal Research and Writing I (2) Discussion—2 hours. Integrated legal research and writing skills courses. Basic legal research resources and strategies are introduced and practiced. (S/U grading only.)

498. Group Study (1-4) Prerequisite: consent of instructor. Group of students with common interest in studying a stated legal problem may plan and conduct their own research and seminar program under the direction of faculty. Class size limited to no fewer than 4 or more than 10 students. (S/U grading only.)

498A. Group Study (1-4) Prerequisite: consent of instructor. Group of students with common interest in studying a stated legal problem may plan and conduct their own research and seminar program under the direction of faculty.

499. Independent Research Project (1-4) Students may receive credit for individual projects, subject to the following regulations: (1) the project may extend over no more than two semesters; (2) each project will be under the supervision of a fac- ulty member; (3) an outline of the project must be approved by the supervising faculty member; (4) normally, no faculty member will be permitted to supervise more than five students working on individ- ual programs during any semester; and (5) each stu- dent must submit an individual paper or approved alternative to the supervising faculty member. (S/U grading only.)

499A. Independent Research Project (1-4) Students may receive credit for individual projects, subject to the following regulations: (1) the project may extend over no more than two semesters; (2) each project will be under the supervision of a fac- ulty member; (3) an outline of the project must be approved by the supervising faculty member; (4) normally, no faculty member will be permitted to supervise more than five students working on individ- ual programs during any semester; and (5) each stu- dent must submit an individual paper or approved alternative to the supervising faculty member. Grad- ing is on a Satisfactory/ Unsatisfactory basis unless a request for letter grading has been made in advance.

499B. Law Students Study Away (10) Independent study. Students studying away from UC Davis, School of Law. (S/U grading only.)

499C. Joint Degree Student-GSM (10) Joint degree course for graduate School of Manage- ment students. (S/U grading only.)

499S. Special Session Independent Research Project (1-4) Students may receive credit for individual projects, subject to the following regulations: (1) the project may extend over no more than two semesters; (2) each project will be the supervision of a fac- ulty member; (3) an outline of the project must be approved by the supervising faculty member; (4) normally, no faculty member will be permitted to supervise more than five students working on individ- ual programs during any semester; and (5) each stu- dent must submit an individual paper or approved alternative to the supervising faculty member.

499SA. Special Session Independent Research Project (1-4) Students may receive credit for individual projects, subject to the following regulations: (1) the project may extend over no more than two semesters; (2) each project will be under the supervision of a fac- ulty member; (3) an outline of the project must be approved by the supervising faculty member; (4) normally, no faculty member will be permitted to supervise more than five students working on individ- ual programs during any semester; and (5) each stu- dent must submit an individual paper or approved alternative to the supervising faculty member.

499SB. Special Session Independent Research Project (1-4) Students may receive credit for individual projects, subject to the following regulations: (1) the project may extend over no more than two semesters; (2) each project will be under the supervision of a fac- ulty member; (3) an outline of the project must be approved by the supervising faculty member; (4) normally, no faculty member will be permitted to supervise more than five students working on individ- ual programs during any semester; and (5) each stu- dent must submit an individual paper or approved alternative to the supervising faculty member.
Linguistics


Total Units for the Major……………48-68

Students interested in teaching foreign languages. Teaching Area of emphasis; it is also of relevance to communication. Cultural, historical, and political dimensions of language contact. GE credit: ArtHum | AH—II, III.

Major Adviser. R.Bayley

Minor Program Requirements:

(1) General Linguistics, which provides the student with basic knowledge of language structure and linguistic analysis.

(2) Linguistics for Language Teachers, which especially complements the major in English with the Teaching Area of emphasis; it is also of relevance to students interested in teaching foreign languages.

UNITS

General Linguistics…………………24
Linguistics 1, 103A, 103B, 106, 108, 109, 110, 120, 121, 131, 141, 151, 152………………4

Additional units selected from upper division Linguistics courses and other upper division courses listed in the major requirements in consultation with an advisor………………..8

Linguistics for Language Teachers……24
Linguistics 1, 106, 165…………………12
Linguistics 160 or 163…………………4
Linguistics 173 or Education 151…………………4

Minor Adviser. Same as Major adviser

Graduation Recommendation. Though not required, it is recommended that all courses offered in satisfaction of the Linguistics major be taken for a letter grade.

Honors and Honors Programs. The honors program consists of six units of 194H credit normally taken in the fall and winter quarters of the senior year. Completion of the program is a prerequisite for High or Highest Honors at graduation. Specific eligibility criteria may be obtained from the major adviser. For general information regarding graduation with honors and Dean’s Honors Lists, please see Academic Information, on page 73.

Graduate Study. The Linguistics Graduate Group offers study and research leading to the M.A. and Ph.D. degrees. Please see Linguistics [A Graduate Group], on page 380; more detailed information may be obtained from the Graduate Adviser or from the Chairperson of the Linguistics Group.

Graduate Adviser. R.Aronovich, J. Menard-Warwick

Courses in Linguistics (LIN)

Lower Division

1. Introduction to Linguistics (Linguistics 1)
Lecture—3 hours; discussion—1 hour. Introduction to the study of language, its nature, diversity, and structure. GE credit: ArtHum or SoSci, Wrt | AH, SS—II, III, IV, V, VI.

1Y. Introduction to Linguistics (Web Virtual Lecture—3 hours; discussion—1 hour. Introduction to the study of language, its nature, diversity, and structure. GE credit: ArtHum or SoSci, Wrt | AH or II, III, IV.

5. Global English and Communication (4)
Lecture—2 hours; discussion—2 hours. English as a global language and its uses in intercultural communication. Cultural, historical, and political dimensions of varieties of English spoken around the world. Experiential grounding in strategies for increasing interpretive and verbal communicative competence for a globalized world. (Same course as Communication 3) GE credit: ArtHum or SoSci, Div.

6. Language and Society (4)
Lecture—3 hours; discussion—1 hour. Language as a social phenomenon. Topics include linguistic diversity, language and identity, language and social structure, speech communities and social networks, the effect of social factors on language variation, linguistic consequences of language contact. GE credit: SoSci, Div, Wrt | ACGH.

20. Oral English for Undergraduate ESL Students (3)
Lecture/discussion—3 hours. Prerequisite: consent of instructor; limited primarily to students who have fulfilled their Subject A requirement or have completed course 23. Practice in oral English for undergraduate ESL students. Students will learn to identify and modify features of their pronunciation which limit their ability to communicate clearly. Students will also learn and practice strategies for effective participation in academic tasks. May be repeated one time per credit with consent of coordinator. (P/NP grading only.)

24. English Structures and Strategies in Academic Writing (4)
Lecture/discussion—4 hours. Prerequisite: course 23. Practice in academic writing designed to prepare undergraduate students from language backgrounds other than English for successful academic work. Development of essay writing, critical thinking, and reading skills. Development of clear, accurate language for presenting an effective argument. Open to students from language backgrounds other than English. (Same as English 24.)

25. English for International/ESL Graduate Students (4)
Lecture/discussion—4 hours. Prerequisite: admission by placement examination or consent of instructor. Open to international and ESL graduate students and limited status international undergraduates (Education Abroad Program participants). A multi-skills ESL course designed to help international/ESL students improve their English language skills for successful academic study. Emphasis on writing, speaking, listening, reading, and academic culture. (P/NP grading only.)—I.

26. Writing for International Graduate Students (3)
Lecture—3 hours. Prerequisite: satisfactory completion of course 25 if held for it, or consent of instructor. Admission limited to international graduate students. Focuses on writing needed for academic work, including summaries, critiques, research and grant proposals, memos, resumes, and research papers. Includes a review of grammar needed for writing and some focus on reading skills and American vocabulary and idioms. (P/NP grading only.)

27. Academic Writing for ESL Students (4)
Lecture/discussion—4 hours. Writing skills necessary for upper division courses, including skills crucial to writing lab and project reports, summaries, critiques, abstracts, and responses to exam questions. Includes practice with the syntax, grammar, and vocabulary characteristic of academic writing. Offered irregularly.

28. Reading in Scientific and Technical Subjects for ESL Students (4)
Lecture/discussion—4 hours. Instruction and practice in reading scientific and technical texts. Techniques for comprehension, language and idioms, and use of note-taking and summarizing, vocabulary enrichment. (P/NP grading only.)

96. Directed Group Study in English as a Second Language (1-5)
Variable—1-5 hours. Prerequisite: consent of instructor. Directed group study of topic in English as a Second Language (ESL). May be repeated for credit by consent of the ESL coordinator. (P/NP grading only.)—I, II.

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. Offered for lower division students. (P/NP grading only.)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. Offered for lower division students. (P/NP grading only.)

Upper Division

103A. Linguistic Analysis I: Phonetics, Phonology, Morphology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Introduction to fundamental methods and concepts used in linguistic analysis, focusing on phonetic, phonological, and morphological phenomena. Emphasizes development of analytical skills and appreciation of structural regularities and differences among languages. Not open for credit to students who have completed course 139. GE credit: ArtHum | AH—II, III.

103B. Linguistic Analysis II: Morphology, Syntax, Semantics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Introduction to fundamental methods and concepts used in linguistic analysis, focusing on morphological, syntactic, and semantic phenomena. Emphasizes development of analytical skills and appreciation of structural regularities and differences among languages. Not open for credit to students who have completed course 140. 103B GE credit: ArtHum | AH—II, III.

105. Topics in Language and Linguistics (4)
Lecture—3 hours; term paper. Prerequisite: course 1 and consent of instructor. Detailed examination of a major contemporary linguistic theory, a major contemporary issue or related set of issues in linguistics, or the structure of a particular language or language family. May be repeated for credit when topic differs. Offered irregularly.

106. English Grammar (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or English 3 or University Writing Program 1 or consent of instructor. Survey of present-day English grammar as informed by contemporary linguistic theories. The major syntactic structures of English, their variation across dialects, styles, and registers; their development, and their usefulness in describing the conventions of English. (Same course as English 106 and University Writing Program 106) GE credit: ArtHum | AH.

111. Introduction to Phonological Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 103A. Contemporary phonological theory with emphasis on syllable structure, metrical structure, phonology-morphology interaction, and typological variation in these areas, from the perspective of optimality-theoretic approaches. GE credit: ArtHum | AH—II, III.

112. Phonetics (4)
Lecture—3 hours; term paper. Prerequisite: course 1. Detailed examination of articulatory and acoustic phonetics. GE credit: SciEng | SE—I, II, III, IV.

121. Morphology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 103A, 103B. Introduction to the analysis of word structure and the relation of word structure to the lexicon and other grammatical components. GE credit: ArtHum | AH—II, III.

127. Text Processing and Corpus Linguistics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 1, course 5, course 6, or Anthropology 4. Investigation of the lexical organization of human languages through corpus linguistics. Application of principles of linguistic analysis, automatic text pro-
166. The Spanish Language in the United States (4)
Lecture—3 hours; term paper. Prerequisite: course 1 or Spanish 111N; and Spanish 23 or the equivalent. Linguistic features of the varieties of the Spanish language spoken throughout the United States; phonology, morphology, syntax, vocabulary. Focus on the relationship between United States Spanish and other world varieties of Spanish, within a historical framework. GE credit: SocSci, Div, Wrt | SS.

171. Introduction to Psycholinguistics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or courses 103A, 103B recommended. Introduction to psychological issues relating to the implementation of language and linguistic structure during speech production and comprehension and to the implications of research in psychology and related fields for linguistic theory. Offered in alternate years. GE credit: SS.—Corina

173. Language Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 103B. The study of development of language and language-based abilities. Relationships between human cognition and computer representations of cognitive processing. Not open for credit to students who have completed course 7. GE credit: SciEng or SocSci | SE or SS.—II. Ojeda

180. Second Language Learning and Teaching (4)
Lecture/discussion—4 hours. Prerequisite: course 1 or equivalent. Psycholinguistic and sociolinguistic theories of second language learning. Connections between theoretical perspectives and pedagogical practices in formal and informal second language settings, with focus on tutoring. (P/NP grading only.) GE credit: ArtHr or SocSci, Div, Wrt | SS, WE.—III. Ward

183. Language, Gender, and Society (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or Anthropology 4. Investigation of real and putative (stereotyped) gender-linked differences in language structure and usage, with a consideration of some social and psychological consequences of such differences. Focus is on English, but other languages are also discussed. GE credit: SocSci, Div, Wrt | ACGH, DD, SS, WE.—II. Timm, Mernd-Warwick

165. Introduction to Applied Linguistics (4)
Lecture—3 hours; discussion—1 hour. Applications of linguistic principles and the analysis of language-related issues in the world. Exploration of a range of language-related problems including issues related to language learning, teaching to issues concerning language and gender, race, class and the media. GE credit: SocSci | SS, WE.—III. Ramana

177. Computational Linguistics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or consent of instructor. Understanding the nature of language through computer modeling of linguistic abilities. Relationships between human cognition and computer representations of cognitive processing. Not open for credit to students who have completed course 7. GE credit: SciEng or SocSci | SE or SS.—II. Ojeda

182. Multilingualism (4)
Lecture/discussion—4 hours. Issues in multilingualism from a global perspective: e.g., multilingual communities; multilingualism and identity (gender, ethnicity, nationality); language ideologies and educational and sociopolitical policies surrounding multilingualism; acquisition of multilingualism; discursive practices of multilinguals. Limited enrollment. GE credit: SciEng or SocSci, Div, Wrt | SS, WE.—II. Menang-Warwick

192. Internship in Linguistics (1-12)
Internship—3-36 hours; two written reports. Prerequisite: courses 103A, 103B recommended. Not open for credit to students who have completed course 7. GE credit: SciEng or SocSci, Div, Wrt | SS, WE.—III. Ramangan, Timm

199. Special Study for Honors Students (1-5)
Independent study—1-5 hours. Prerequisite: open to upper division students. May be repeated for credit. (P/NP grading only.)

205A-205B-205C-205D. Topics in Linguistic Theory and Methods (4)
Seminar—3 hours; term paper. Prerequisite: consent of instructor. Survey of fundamental issues raised by contemporary linguistic theories lying outside the generative grammar orthodoxy, with emphasis on issues crucial to applications of linguistics. GE credit: ArtsHum or SocSci | AH, Div, SE, WE.—II. Ojeda

211. Advanced Phonological Theory and Analysis (4)
Lecture—3 hours; term paper. Prerequisite: course 111. Critical examination of current phonological theories. (P/NP grading only.)

212. Advanced Phonetics (4)
Lecture—3 hours; term paper. Prerequisite: course 112. Advanced investigation of the physiological basis of speech articulation and acoustic phonetics. GE credit: SciEng | SE and WE.—II. Ojeda

231. Advanced Syntactic Theory and Analysis (4)
Lecture—3 hours; term paper. Prerequisite: course 131. Critical survey of current theories of syntax. Offered in alternate years. GE credit: SciEng | SE and WE.—II. Ojeda

241. Advanced Semantic Theory and Analysis (4)
Lecture—3 hours; term paper. Prerequisite: course 141 or consent of instructor. Advanced critical exploration of contemporary theories of linguistic semantics. Offered in alternate years.—II. Ojeda

251. Principles of Historical Linguistics (4)
Lecture—3 hours; term paper. Prerequisite: course 151. Advanced analysis of the theory and methods of historical linguistics. GE credit: SciEng | SE and WE.—II. Ojeda

252. Romance Linguistics (4)
Lecture—3 hours; term paper. Prerequisite: course 151. Examination of the development of the Romance languages from 500 to the modern era. Application and critical examination of methods of historical and comparative linguistics in particular areas of structural change in Romance. GE credit: SciEng | SE and WE.—II. Ojeda

260. Variation in Speech Communities (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 281 or consent of instructor. Linguistic variability in time, space, and society. Theoretical issues related to social and linguistic constraints in variation, issues and methods in the quantitative study of language variation, and applications of variation theory to sociolinguistic research. Not open for credit to students who have completed course 7. GE credit: SciEng or SocSci | SE and WE.—II. Ojeda

297. Tutoring in Linguistics (1-4)
Lecture—3 hours; term paper. Prerequisite: upper division standing, consent of instructor, and consent of department chairperson. Leading of small voluntary discussion groups affiliated with one of the department's regular courses. May be repeated for credit. (P/NP grading only.)

298. Directed Group Study (1-5)
Independent study—1-5 hours. Prerequisite: consent of instructor. (P/NP grading only.)

299. Special Study for Advanced Undergraduates (1-5)
Independent study—1-5 hours. Prerequisite: open to undergraduate students. (P/NP grading only.)

Graduate

200A. Foundations of Linguistics I (4)
Lecture/discussion—3 hours; term paper. Prerequisite: graduate standing. Survey of fundamental issues raised by pre-generative linguistics in the twentieth century, with emphasis on issues crucial to applications of linguistics. GE credit: ArtsHum or SocSci, Div, Wrt | AH.—II. Ojeda

200B. Foundations of Linguistics II (4)
Lecture/discussion—3 hours; term paper. Prerequisite: graduate standing. Survey of fundamental issues raised by contemporary linguistic theories lying outside the generative grammar orthodoxy, with emphasis on issues crucial to applications of linguistics. GE credit: ArtsHum or SocSci, Div, Wrt | AH.—II. Ojeda

205A-205B-205C-205D. Topics in Linguistic Theory and Methods (4)
Seminar—3 hours; term paper. Prerequisite: consent of instructor. Survey of current linguistic theories and methodologies. May be repeated for credit when topic differs.

211. Advanced Phonological Theory and Analysis (4)
Lecture—3 hours; term paper. Prerequisite: course 111. Critical examination of current phonological theories. (P/NP grading only.)

212. Advanced Phonetics (4)
Lecture—3 hours; term paper. Prerequisite: course 112. Advanced investigation of the physiological basis of speech articulation and acoustic phonetics. GE credit: SciEng | SE and WE.—II. Ojeda

231. Advanced Syntactic Theory and Analysis (4)
Lecture—3 hours; term paper. Prerequisite: course 131. Critical survey of current theories of syntax. Offered in alternate years. GE credit: SciEng | SE and WE.—II. Ojeda

241. Advanced Semantic Theory and Analysis (4)
Lecture—3 hours; term paper. Prerequisite: course 141 or consent of instructor. Advanced critical exploration of contemporary theories of linguistic semantics. Offered in alternate years.—II. Ojeda

251. Principles of Historical Linguistics (4)
Lecture—3 hours; term paper. Prerequisite: course 151. Advanced analysis of the theory and methods of historical linguistics. GE credit: SciEng | SE and WE.—II. Ojeda

252. Romance Linguistics (4)
Lecture—3 hours; term paper. Prerequisite: course 151. Examination of the development of the Romance languages from 500 to the modern era. Application and critical examination of methods of historical and comparative linguistics in particular areas of structural change in Romance. GE credit: SciEng | SE and WE.—II. Ojeda

260. Variation in Speech Communities (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 281 or consent of instructor. Linguistic variability in time, space, and society. Theoretical issues related to social and linguistic constraints in variation, issues and methods in the quantitative study of language variation, and applications of variation theory to sociolinguistic research. Not open for credit to students who have completed course 7. GE credit: SciEng or SocSci | SE and WE.—II. Ojeda
264. Current Issues in Language and Gender (4)
Seminar—3 hours; term paper. Graduate standing; prerequisite: 2, or equivalent. Focus on gender, language, and the construction of gender through language. Does not fulfill requirement toward the M.A. degree. May be repeated for credit with permission of the instructor. —Menard-Warwick

265. Language, Performance, and Power (4)
Seminar—3 hours; term paper. Graduate standing or consent of instructor. Exploration of the intersection between linguistic and social theories in the language-state relation and the performance of identity. Ideological sources of language difference and the two-way nation-building and linguistic difference. Political, economic, sociolinguistic, and ethnographic approaches to understanding linguistic inequality. (Same course as Anthropology 265.) (Offered in alternate years.—Shibamoto Smith

280. Theories of Second Language Acquisition (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 2, or equivalent. Discussion of current research in second language acquisition; evaluation of research designs and methods of analyses, formulation of research questions and hypotheses and design of study with thought to various methods of data collection. —I. Menard-Warwick

281. Research Methods in TESOL/SLD (4)
Lecture—3 hours; term paper. Prerequisite: course 280. Research methods in second language research; evaluation of research designs and methods of analyses, formulation of research questions and hypotheses and design of study with thought to various methods of data collection. —I. Menard-Warwick

282. Individual and Social Aspects of Bilingualism (4)
Lecture—3 hours; term paper. Broad overview of bi- and multilingualism, with focus on theoretical and descriptive research. Topics covered range from language processing in bilinguals to codeswitching to language as political issue in multilingual states. —III. Timm

283. Politics of Bi and Multilingual Literacy (3)
Lecture/discussion—3 hours; term paper. Anthropological, psycho-social, political, and educational perspectives on bi- and multilingualism. Power, colonialism, speakers, and varieties and the unequal distribution of social goods. Analysis of how competing factors keep peoples disenfranchised. —Ramanathan

289. Pedagogical Applications of Second Language Acquisition (4)
Seminar—3 hours; term paper. Prerequisite: course 280. Pedagogical implications of various theories of second language acquisition, facilitation of language acquisition in classroom settings, and techniques for conducting classroom-based research in language learning. —Bayley

297. English as a Second Language Tutoring/Tutoring (1-4)
Tutoring—1-4 hours. Prerequisite: course 300, 301, or 302 (may be taken concurrently). Teaching classes for ESL graduate students. Aiding the ESL undergraduate composition classes; tutoring foreign graduate student Teaching Assistants in pronunciation. Does not fulfill requirement toward the M.A. degree. May be repeated for credit. (S/U grading only.)

298. Directed Group Study (1-5)
Directed Group Study—1-5 hours. Prerequisite: admission to Ph.D. program in Linguistics. The Ph.D. program offers a program of study leading to the M.A. and the Ph.D. degrees. The M.A. program offers research in linguistic theories and methods. Second language acquisition; facilitation of language learning. —Bayley

299. Research (1-12)
Research—1-12 hours. Prerequisite: admission to Ph.D. program in Linguistics. May be repeated for credit with consent of coordinator. Does not fulfill requirement toward a major. —I. Menard-Warwick

300. Language Pedagogy (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing in Linguistics or consent of instructor; concurrent enrollment in course 297T recommended. Methods of teaching second languages to non-native speakers, street/alternate current linguistic theories, and strategies. (Same course as Anthropology 265.) Offered in alternate years.—Shibamoto Smith

301. Teaching Academic Literacy (4)
Seminar—1.5 hours; tutorial—14 hours; project: practice. Prerequisite: graduate standing; course 300 or consent of instructor. Methods of teaching advanced academic literacy in a second language, with a focus on ESL composition. Lesson development, teaching and tutoring in the UC Davis ESL program. —II. Ramanathan

302. Recent Research and Special Projects in TESOL (4)
Lecture—4 hours. Prerequisite: courses 300 and 301. Review of recent research in second language acquisition and the teaching of English to speakers of other languages. Continued teaching and tutoring in the UC Davis ESL clinic. Each student also designs and reports on a classroom research project.

305. Second Language Literacy and Technology (4)
Lecture/discussion—1.5 hours; web electronic discussion—1.5 hours. Prerequisite: course 2, or equivalent coursework experience in second language pedagogy; consent of instructor; graduate students only. Exploration of literacy theory and critical pedagogy in relation to new instructional and communication technologies. Practice experience in teaching second language literacy; reflection on connections between theory and practice. Limited enrollment. —Menard-Warwick

310. Language Pedagogy for Teacher Educators (4)
Seminar—3 hours; tutorial; project: fieldwork. Prerequisite: admission to Ph.D. program in Linguistics or consent of instructor; significant language teaching experience. Current issues in second language pedagogy, with a focus on communicative methodology, participatory curricula design, and classroom literacy practice. Emphasis on reflective teaching and action research. May be repeated up to 12 units for credit. —I. Menard-Warwick, Ramanathan

391. Oral English for ESL Students (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: open only to non-native speakers of English with prior enrollment to international student teaching assistants; completion of any required ESL courses or consent of instructor. Course gives non-native English-speaking students, particularly international student teaching assistants, intensive work in oral English to increase fluency, accuracy, and use of appropriate English language. (East Asian Languages and Cultures)

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.) —I, II, III.
Literature in Translation

The following courses are open to students throughout the campus. The readings can be in English. See departmental listing for the course description.

Chinese
10. Chinese American Literature [in English]
11. Great Books of China [in English]
50. Introduction to the Literature of China and Japan [in English]
100A. Daoist Traditions
101. Chinese Film
102. Chinese American Film
103. Modern Chinese Drama
104. Twentieth-Century Chinese Fiction [in English]
105. Western Influences on Twentieth-Century Chinese Literature [in English]
106. Chinese Poetry [in English]
107. Traditional Chinese Fiction [in English]
108. Poetry of China and Japan [in English]
109A-I. Topics in Chinese Literature [in English]
110. Great Writers of China: Texts and Context [in English]

Classics
10. Greek, Roman, and Near Eastern Mythology
140. Homer and Ancient Epic
141. Greek and Roman Comedy
142. Greek and Roman Novel
143. Greek Tragedy

Comparative Literature
1. Great Books of Western Culture: The Ancient World
2. Great Books of Western Culture: From the Middle Ages to the Enlightenment
3. Great Books of Western Culture: The Modern Crisis
4. Major Books of the Contemporary World
5. Fairy Tales, Fables and Parables
6. Myths and Legends
7. Literature of Fantasy and the Supernatural
8. Utopias and their Transformations
9. The Short Story and Novel
10A-N. Master Authors of World Literature
12. Introduction to Women Writers
13. Dramatic Literature
14. Introduction to Poetry
20. Humans and the Natural World
25. Ethnic Minority Writers in World Literature
53A. Literature of China and Japan
53B. Literature of India and Southeast Asia
53C. Literatures of the Islamic World
100. World Cinema
120. Writing Nature: 1750 to the Present
135. Writing Nature: 1750 to the Present
139A. Shakespeare and the Classical World
140. Thematic and Structural Study of Literature
141. Introduction to Critical Theoretical Approaches to Literature and Culture
142. Critical Reading and Analysis
144. The Grotesque
145. Representations of the City
146. Myth in Literature
147. Modern Jewish Writers
151. Colonial and Postcolonial Experience in Literature
152. Literature of the Americas
153. The Forms of Asian Literature
154. African Literature
155. Classical Literature of the Islamic World
157. War and Peace in Literature
158. The Detective Story as Literature
159. Women in Literature
160A. The Modern Novel
160B. The Modern Drama
161A. Tragedy
161B. Comedy
163. Biography and Autobiography
164A. The Middle Ages
164B. The Renaissance
164C. Baroque and Neoclassicism
164D. The Enlightenment
165. Caribbean Literature
166. Literature of the Modern Middle East
166A. The Epic
166B. The Novel
167. Comparative Study of Major Authors
168A. Romanticism
168B. Realism and Naturalism
169. The Avant-Garde
170. The Contemporary Novel
180. Selected Topics in Comparative Literature
194H. Special Study for Honors Students
195. Seminar in Comparative Literature

Dramatic Art
20. Introduction to Dramatic Art
154. Asian Theatre and Drama: Contexts and Forms
156AN. Performance Analysis
156BN. Theatre in History and Place: Local, National and Global Conditions for Production
156CN. Modern Aesthetic Movements in Performance
159. Contemporary Experimental Theatre and Drama

French
50. French Film
51. Major Works of French
52. France and the French-Speaking World

German
48. Myth and Saga in the Germanic Cultures
49. Freshman Colloquium
112. Topics in German Literature
113. Goethe's Faust
115. German literature since 1945
118A. Fin-de-siècle Vienna (The Swan Song of the Habsburg Empire)
118B. Weimar Culture: Deaf, the Roaring Twenties, the Rise of Nazism
118C. Germany under the Third Reich
119. From German Fiction to German Film
141. The Holocaust and its Literary Representation
142. New German Cinema: From Oberhausen to the Present

Italian
50. Studies in Italian Cinema
107. Survey of Italian Culture and Institutions
108. Contemporary Issues in Italian Culture and Society
139B. Boccaccio, Petrarch and the Renaissance
140. Italian literature in English Translation: Dante, Divine Comedy
141. Culture, Gender and the Italian Renaissance
142. Masterpieces of Modern Italian Narrative
150. Studies in Italian Cinema

Japanese
10. Masterworks of Japanese Literature (in English)
15. Introduction to Traditional Japanese Culture
50. Introduction to the Literature of China and Japan
101. Japanese Literature in Translation: The

Literature in Translation

Early Period
102. Japanese Literature in Translation: The Middle Period
104. Modern Japanese Literature: War and Revolution
105. Modern Japanese Literature: Hero and Anti-Hero
106. Japanese Culture through Films
107. Modern Japanese Autobiographies [in English]
108. Poetry of China and Japan
109. Japanese Popular Culture
152. Traditional Japanese Drama
156. Japanese Literature on Film

Native American Studies
181A. Native American Literature [the novel and fiction]
181B. Native American Literature [non-fiction works by Native authors]
181C. Native American Literature (traditional and contemporary poetry)
184. Contemporary Indigenous Literature of Mexico
188. Special Topics in Native American Literary Studies

Russian
45. Russian Fantasy
121. Nineteenth-Century Russian Prose
123. Twentieth-Century Russian Prose
126. The Russian Theater
130. Contemporary Soviet Culture
140. Dostoevsky
141. Tolstoy

Spanish
149. Latin-American Literature in Translation

Luso-Brazilian Studies

(College of Letters and Science)

The Department of Spanish and Portuguese sponsors the minor in Luso-Brazilian Studies, which offers students the opportunity to engage with the Portuguese-speaking world as a global space, as well as gain in-depth knowledge of Brazilian literature, culture and society. The minor is structured to facilitate engagement with Latin American, peninsular, and transatlantic topics, while ensuring that students master the essential skills of linguistic competence, and literary and cultural knowledge.

Minor Program Requirements:

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<th>Minor Program Requirements</th>
<th>UNITS</th>
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<tr>
<td>Luso-Brazilian Studies ................. 23-24</td>
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<tr>
<td>Portuguese 100, 161, 163 ............... 8</td>
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<td>Select one course in each of the following categories:</td>
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<td>Spanish 111N, 115, or 116 ............... 3-4</td>
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<td>Portuguese 162 or 163 ................. 4</td>
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<td>Select one elective course in each of the following categories:</td>
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<td>Portuguese 159, 162, or 163 .......... 4</td>
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<tr>
<td>History 159, 163A, or 163B .......... 4</td>
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<td>Note: Consult a departmental adviser if any of these courses are to be taken abroad.</td>
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<td>Note: Additional courses may count toward the minor with prior approval by a departmental adviser.</td>
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Minor Advisers: L. Bernucci, R. Newcomb

Education Abroad Program Options. We highly recommend that students participate in study abroad in Salvador, Brazil; see http://studyabroad.ucsd.edu. Courses taken abroad may count toward the Luso-Brazilian Studies minor.
Students must take these courses for a letter grade of C- or better.

UNITs

Management 11A................................. 4
Mathematics 16A-16B, 17A-17B or 23A-23B 6-8

Minor Program Requirements:

UNITs

Technology Management .................... 20
Choose five courses from: Management 120, 140, 150, 160, 170, 180.................... 20

Courses in Management

(MGT/MGB/MGP)

Lower Division

11A. Elementary Accounting (4)

11B. Elementary Accounting (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A. Theory of product costing; analyzing the role and impact of accounting information in decision making; planning and performance evaluation. GE credit: SocSci | SS.—III. (III.

Upper Division

100. Introduction to Financial Accounting (3)
Lecture—3 hours. Course is open to all upper division undergraduate and graduate students, except those in the Graduate School of Management. Introduction to financial accounting, including balance sheet and statements of income and cash flow, as well as their analysis by investors and managers.

120. Managing and Using Information Technology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A, Mathematics 16B, 17B, or 21B, Statistics 100, 102, 103, or 108. Introduction to computer hardware, systems software, and information systems. Management of information technology and the impact of information systems on modern management. —III.

140. Marketing for the Technology-Based Enterprise (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A, Mathematics 16B, 17B, or 21B, Statistics 100, 102, 103, or 108. Marketing in technology-based companies, with emphasis on how scientists, engineers, and business people interact to develop and market products and services.—II.

150. Technology Management (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A, Mathematics 16B, 17B, or 21B, Statistics 100, 102, 103, or 108. Management of firms in high technology industries such as software development and biotechnology research. Motivating and managing workers, organizing for innovation, and making decisions.—I.

160. Financing New Business Ventures (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A, Mathematics 16B, 17B, or 21B, Statistics 100, 102, 103, or 108. Concepts and methods used to structure and finance new business ventures. Topics include the evaluation of new investment projects, raising venture capital, the role of the venture capitalist, and the choice of organizational structure in new ventures.—II.

170. Managing Costs and Quality (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A, Mathematics 16B, 17B, or 21B, Statistics 100, 102, 103, or 108. Designing cost systems in high technology organizations and managing operations to maximize quality and minimize costs. Topics include activity based costing and management, quality control and process design, cost allocation, and differential costing for decision making.—I.

180. Supply Chain Planning and Management (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A, Mathematics 16B, 17B, or 21B, Statistics 100, 102, 103, or 108. Quantitative techniques for analysis and management of modern supply chains for the production and delivery of goods and services.—I. Woodruff

Graduate—Core Courses

200A. Financial Accounting (3)
Lecture—3 hours. Prerequisite: graduate student in the Graduate School of Management. Introduction to the concepts and objectives underlying the preparation of financial statements. Topics include understanding the accounting cycle, measurement of valuation and cost, recognition of events, and analysis of financial statements and the nature of transactions associated with financial position of a firm.—I. (I.) Vermal

200B. Managerial Accounting (3)
Lecture—3 hours. Prerequisite: graduate student in the Graduate School of Management. Information managers should know to be effective, including: product costing, motivating people, and differential analysis for decision making. Includes team projects and written and oral presentations.—II, IV (II, IV.) Ramanan

201A. The Individual and Group Dynamics (3)
Lecture—3 hours. Prerequisite: graduate student in the Graduate School of Management. Examines basic psychological and social psychological processes shaping human behavior and applies knowledge of these processes to the following organizational problems: motivation, job design, commitment, socialization, culture, individual and group decision making, and team building.—I. (I.) Elsbach

201B. Organizational Structure and Strategy (3)
Lecture—3 hours. Prerequisite: graduate student in the Graduate School of Management. Analysis of structural properties of organization including differentiation and vertical and horizontal integration. Alternative structural arrangements including functional, divisionalized, matrix, and hybrid structures. Relationship between environment, structure, and strategic objectives. Organization life cycle and changes.—II, III, IV, V. (II, IV.) Ramanan

202A. Markets and the Firm (3)
Lecture—3 hours. Prerequisite: course 201A. Examines the interaction of consumers, firms and government, and the effect this interaction has on the use of resources and the firm profitability. Fundamentals of demand concepts such as marginal analysis, opportunity cost, pricing, and externalities are introduced and applied.—II. (II.)

202B. Business, Government, and the International Economy (3)
Lecture—3 hours. Prerequisite: course 202A. Examines the influence of government and international factors on business. Topics include distribution of income, business cycles, inflation and interest rates, the federal debt, monetary policy and international trade and finance.—II. (II.)

203A. Data Analysis for Managers (3)
Lecture—3 hours. Prerequisite: graduate student in the Graduate School of Management MBA program or consent of instructor. Introduction to and use of statistics and data analysis for managerial decision making. Descriptive statistics, principles of data collection, analysis, sampling, quality control, regression, and forecasting. Applications of data analytic methods to problems in marketing, finance, accounting, production, operations, and public policy.—II. (II.)

203B. Forecasting and Managerial Research Methods (3)
Lecture—3 hours. Prerequisite: course 203A. Practical statistical methods for managerial decision making covers regression analysis, time series analysis and forecasting, design and analysis of experiments
223. Power and Influence in Management (3)
Seminar—3 hours. Prerequisite: consent of instructor. Investigation of the bases of power in organizations and the tactics used to translate power into influence. Topics include the control of resources (including information), social psychological processes (including compliance and the construction of meaning, and ethics.—I. (I.) Palmer

224. Managing Human Resources (3)
Lecture/discussion—3 hours. Restricted to students in the MBA program. Explore choices firms make in managing working conditions as to wages, benefits, working conditions, and other management policies and practices. Analyze employment systems fit with firms’ environments and strategies, and consequences of choices managers make regarding policies and practices. Not open to students who have taken MGT/B 224.—II. (II.) Hsu

239. Digital Marketing (3)
Lecture/discussion—3 hours. Prerequisite: course 204. Course equips students for a career in digital marketing and social media. Topics include online advertising, search engine optimization, interactive mktg, online privacy issues, e-commerce, social influence, social networking, and social influence, integrating social and traditional media.—III. (III.) Yoganarasimhan

240. Management Policy and Strategy (3)
Lecture—3 hours. Prerequisite: first-year core courses of M.B.A. program for chance of missteps, objectives strategies, policies, structures, measures and incentives which bear on the management of an organization. Real client organizations, in the private and public sectors, are assigned to student teams as the subjects of study.—II. (II.) Suran

241. New Product Development (3)
Lecture/discussion—3 hours. Prerequisite: course 249 or consent of instructor; restricted to graduate students in the School of Management. Disseminates state-of-the-art concepts and methods to enhance the effectiveness of new product development activities. Focuses on the understanding of managerial issues and how acquiring the ability to solve problems.—III. (III.) Naik

242. Marketing Communications (3)
Lecture—3 hours. Issues in designing a marketing communications strategy. Topics include mass and direct communications, institutional aspects of advertising, consumer behavior, evaluating ad effectiveness, determining ad budget, creative strategy, and use and abuse of promotions.—III. (III.) Naik

244. New Venture / Small Business Venturing (3)
Lecture—3 hours. Emphasizes starting a new business venture or managing a small, ongoing business during its formative stages. The business plan. Legal forms, financial considerations, the management team. The entrepreneurial student develops a detailed business plan.—IV. (IV.)

246. Negotiation and Team Building (3)
Lecture—3 hours. Prerequisite: courses 202, 205. Teaches basic theory of negotiation; applies theory to process of building teams to achieve business purposes. Covers integrative and distributive strategies of claiming value, how to recognize bargaining tricks, uncovering hidden agendas, brainstorming to extend Pareto frontier.—II. (II.) (III.) Elsbach

247. Customer Service as a Marketing Tool (3)
Lecture—3 hours. Understanding the distinct features of services, how to create value through service, methods of building strong relationships with customers, methods of measuring and building customer satisfaction, and measuring the financial impact of service improvement.—I. (I.)

248. Marketing Strategies (3)
Lecture—3 hours. Examines marketing process by which organizations develop strategic marketing plans. Includes definition of activities and products, marketing audits, appraising market opportunities, design of new activities and products, and organizing marketing planning function. Applications to problems in private and public sectors.—I. (I.) Rubel

249. Marketing Research (3)
Lecture—3 hours. Course addresses the managerial issues and problems of systematically gathering and analyzing information for making private and public marketing decisions. Covers the cost and value of information, research design, information collection, measuring instruments, data analysis, and marketing research applications.—III. (III.) Bunch

250. Technology, Competition and Strategy (3)
Lecture—3 hours. Prerequisite: completion of first-year core courses at the Graduate School of Management or the equivalent. Restricted to students in the MBA program. Why is software typically so defective? Why do many firms in the IT industry give away their best products free? This course helps you analyze questions like these by modeling competition and strategy in the network, technology and information industries.—II. (II.) Bhargava

251. Management of Innovation (3)
Lecture—3 hours. Managing innovative enterprise in changing and uncertain environments. Covers technology forecasting and assessment, program selection and control, financial management, regulation, and ethics.—I. (I.) Biggert

252. Managing for Operational Excellence (3)
Lecture—3 hours. Open to students in the Graduate School of Management. Explores the management of operations as applied to manufacturing as well as services provided both inside and outside the organization. Develop an understanding of how uncertainty affects planning and delivery by looking at fundamental models of operations.—IV. (IV.) Woodruff

260. Corporate Finance (3)
Lecture—3 hours. Focuses on planning, acquiring, and managing a company’s financial resources. Includes discussion of financial aspects of mergers and other forms of reorganization; analysis of investment, financial, and dividend policy; and theories of optimal capital structure.—III. (III.) Scherbina

261. Investment Analysis (3)
Lecture—3 hours. Examines asset pricing theories and relevant evidence, including the investment performance of stocks and bonds. Topics include the efficiency of markets, dollar denomination, portfolio diversification, factors influencing the value of stocks and other investments, and portfolio management and performance.—IV. (IV.) Chen

263. Derivative Securities (3)
Lecture/discussion—3 hours. The behavior of options, futures, and other derivative securities markets and how public agencies, business and others use those markets. Trading strategies involving options, swaps, and financial futures contracts. Pricing of derivative securities, primarily by arbitrage methods. Open to students enrolled in the MBA program.—III. (III.)

265. Business Taxation (3)
Lecture—3 hours. Analysis of the impact of business taxation on investment, production, and finance decisions. Discussion of the relationship between business organization and tax liability. Course is not intended for tax specialists.—II. (II.) Yetman

266. International Finance (3)
Lecture—3 hours. Prerequisite: course 207 or the equivalent. Open economy macroeconomics, balance of payments theory, and financial decision making in multinational firms.—II. (II.)

267. Teams and Technology (3)
Lecture/discussion—3 hours. Restricted to working professional MBA students or consent of instructor. Theory and practice of managing teams with primary goals of: providing conceptual guidelines for analyzing and diagnosing group dynamics and determining strategic options as a manager; impart-
ing interpersonal skills for implementing effective strategies; understanding how technological change affects business processes—III.  

268. Articulation and Critical Thinking (3)  
Laboratory/discussion—3 hours. With commitment to this course, students will become competent public speakers, write well at a level expected in business, think critically and analytically about business challenges and have a useful personal code of ethics to shape their actions and decisions. No student may repeat course for credit.—I (II).  

269. Business Intelligence Technologies—Data Mining (3)  
Lecture/discussion—3 hours. Prerequisite: completion of core courses at the Graduate School of Management or the equivalent. Restricted to students in the MBA program. May be repeated for credit.—III. (III.) Y. Yang  

270. Corporate Financial Reporting (3)  
Lecture/discussion—3 hours. Prerequisite: completion of core courses at the Graduate School of Management or the equivalent. For MBA students and others who use accounting and other information in making rational investment, lending decisions. Emphasis is placed on the analysis of financial information in a variety of contexts. Where applicable, recent research in finance and economics is discussed.—III. (II.) Griffin  

271. Strategic Cost Management (3)  
Laboratory/discussion—3 hours. Theoretical frameworks and associated techniques for using organizational design and cost management to achieve a sustainable, profitable cost structure. Topics include: targeting; strategies for low cost, total cost of ownership, cost of customers, implementing structural change, and incentives.—III. (III) Anderson  

272. Evaluation of Financial Information (3)  
Lecture—3 hours. Studies how investors, creditors, others use accounting and other information in making rational investment, lending decisions. Emphasis is placed on the analysis of financial information in a variety of contexts. Where applicable, recent research in finance and economics is discussed.—III. (III.) Griffin  

273. Accounting and Reporting for Government Nonprofit Entities (3)  
Lecture—3 hours. Concepts, methods, and uses of accounting and financial reporting by governmental and nonprofit entities. In addition to budgeting and performance evaluation, and accounting for entities such as hospitals, universities, and welfare agencies.  

274. Corporate Governance (3)  
Lecture—3 hours. Prerequisite: restricted to full-time MBA students or consent of instructor. Discusses how corporations can better operate in the interests of shareholders and public. Directly relevant to managers, consultants in compensation and incentives, staff working on mergers and acquisitions, corporate regulators, shareholder rights activists, and board members. II, III, (III. I.)  

275. Real Estate, Finance and Development (3)  
Lecture—3 hours. Prerequisite: courses 201A and 207. Focus on single family, attached, detached, multi-family, and light commercial development. Students will study examples which make up successful real estate developments. Course will consider financial aspects involved in land acquisition, land development, construction, and project lending.—III.  

281. Systems Analysis and Design (3)  
Lecture—3 hours. Design and specification of computer-based information systems. Applications systems development life cycle, use requirements and feasibility assessment, logical and physical design, program development and testing, conversion and implementation.  

282. Supply Chain Management (3)  
Lecture/discussion—3 hours. Prerequisite: completion of first-year core courses at the Graduate School of Management or the equivalent, knowledge of Microsoft Excel. Restricted to students in the MBA program. Matching supply with demand is a primary challenge in any firm: excess supply is too costly, inadequate supply irritates customers. Matching supply to demand is easiest when a firm has a flexible supply process, but flexibility is generally expensive.—II. (II.)  

284. Applied Linear Models for Management (3)  
Lecture—3 hours. Covers regression, analysis of variance, and multivariate analysis. Topics will focus on applications to management and policy problems.—Tsai  

285. Time Series Analysis and Forecasting (3)  
Lecture—3 hours. Considers application of time series methods to evaluation and forecasting of problems. Covers univariate and multivariate ARIMA models and transfer function models. Applications will be in such areas as economics, finance, budgeting, program evaluation, and industrial process control.—Tsai  

286. Telecommunications and Computer Networks (3)  
Lecture—3 hours. Prerequisite: course 280. Communication systems components; common carrier services; design and control of communications networks; network management and distributed environment; local area networks; data security in computer networks.—Tsai  

287. Database Systems (3)  
Lecture—3 hours. Prerequisite: course 280. Hierarchical, network, and relational models for database systems. Design and implementation of models. Performance evaluation and forecasting. Query languages; database structures and languages. Data security and integrity. Application to managerial decision making and decision support systems.—II. (II.) Yang  

288. Special Topics in Management of Information Systems (3)  
Lecture—3 hours. Managerial aspects of information systems. Topics stressing applications in organizations chosen from: economics of computers and information systems, support systems, management of computer-based information systems, office automation.—Topics  

290. Topics in General Management (3)  
Seminar—3 hours. Prerequisite: completion of all first-year graduate courses at the Graduate School of Management or the equivalent. Advanced topics in general management. May be repeated for credit.—I, II, III, (II, III.) Woodruff  

291. Topics in Organizational Behavior (3)  
Seminar—3 hours. Prerequisite: completion of all first-year graduate courses at the Graduate School of Management or the equivalent. Advanced topics in social psychology and sociology of organizations. Varied topics to cover more extensively issues discussed in courses 201A and 201B, or current interest topics in fields of business writing, business communications, development, or workplace processes. May be repeated for credit.—I, II, III, (I, II, III.) Woodruff  

292. Topics in Finance (3)  
Seminar—3 hours. Prerequisite: completion of all first-year graduate courses at the Graduate School of Management or the equivalent. Contemporary and emerging issues in finance. Application of modern techniques of finance to business problems. Use of appropriate electronic database and research techniques. May be repeated for credit.—I (I.)  

293. Topics in Marketing (3)  
Seminar—3 hours. Prerequisite: completion of all first-year graduate courses at the Graduate School of Management or the equivalent. Advanced topics in marketing, which may include marketing research, new product development, brand management, pricing, distribution management, service marketing, hitech marketing, advertising, sales promotions, marketing through the Web. May be repeated for credit.—I (I.)  

294. Topics in Accounting (3)  
Seminar—3 hours. Prerequisite: completion of all first-year graduate courses at the Graduate School of Management or the equivalent. Contemporary and emerging issues in financial management accounting. Application of modern techniques of evaluation and analysis of financial information. Use of appropriate electronic database and research techniques. May be repeated for credit.—I (I.)  

295. Topics in Information Technology (3)  
Seminar—3 hours. Prerequisite: completion of all first-year graduate courses at the Graduate School of Management or the equivalent. Applications of information technology to management and management of information technology. Adaptation to the dynamic nature of the field. May be repeated for credit.—I (I.)  

296. Topics in Technology Management (3)  
Seminar—3 hours. Prerequisite: completion of all first-year graduate courses at the Graduate School of Management or the equivalent. Cyclical nature of innovation and technological change, features of innovative firms and industries, national innovation systems, and impact of information technologies on innovation processes. May be repeated for credit.—III. (III.) Bhargava  

297. Topics in International Management (3)  
Seminar—3 hours. Prerequisite: completion of all first-year graduate courses at the Graduate School of Management or the equivalent. Broader environmental issues which U.S. firms and their foreign competitors operate. Integration of material from other topics (marketing, strategy, finance, accounting, information technology, technology management) into the international setting. May be repeated for credit.—IV. (IV.)  

298. Directed Group Study (1-5)  
Prerequisite: consent of instructor. (S/U grading only.)  

299. Individual Study (1-12)  
Prerequisite: consent of instructor. (S/U grading only.)  

Professional  

401. Crisis Management (1)  
Laboratory/discussion—1 hour. Establishes and explores the defining characteristics of crises. Will learn to anchor crisis management firmly within overall strategic management and also acquire a set of useful tools and techniques for both and handling actual crises.—(S/U grading only).—I (I.) Biggs  

402. Crisis Communications and Reputation Management (1)  
Laboratory/discussion—1 hour. Intended to provide you with an understanding of the framework and tools necessary to successfully address communications and reputation management tasks in a variety of crisis situations. (S/U grading only).—I (I.) Friedman  

403. Business Statistics Practicum (1)  
Project—1 hour. Prerequisite: MGT, MGB, or MGB 203A is a prerequisite. In addition, students must be concurrently enrolled in (or completed) MGT, MGB, or MGB 203B. Restricted to students in the MBA program. Applies techniques and concepts in business statistics to real case studies.—II (II.)  

404. Organizational Change Management (1)  
Laboratory/discussion—1 hour. Challenges in getting significant changes made in organizations. Learn Organization Change Management (OCM) techniques and discuss case situations where OCM techniques play a role. (S/U grading only).—II (II.) Mathur  

405. Business Literature (1)  
Laboratory/discussion—1 hour. Will examine Business history – historical trends that might influence contemporary business. Some argue that the recent
collapse of our financial system might have been averted if business leaders had a better sense of history. (S/U grading only)—II. (II.) Biggar

406. Ethical Issues in Management (1)
Lecture/discussion—1 hour. Explores the philosophical foundation of ethical theory and its recent applications to business situations. Professional codes of ethics, as promulgated by educational, managerial, engineering, scientific, medical and legal professional societies, are presented. (S/U grading only)—II. (II.)

407. Storytelling for Leadership (1)
Lecture/discussion—1 hour. Internals the fundamental principles behind stories that educate, influence, motivate, inspire, persuade and connect. (S/U grading only)—III. (III.)

408. The Business of the Media (1)
Lecture/discussion—1 hour. Focuses on the media industries and how emerging digital technologies are disrupting the way media consumption, distribution and business models work. Will highlight the economics of several media—the news and entertainment. (S/U grading only)—II. (II.),IV. (IV.)

409. Managing Multi-Asset Class Investment Portfolios (1)
Lecture/discussion—1 hour. Prerequisite: course 202. 203A, discussing a wide variety of investment principles, both theoretical and pragmatic. Helps prepare students to more thoughtfully approach investment decision-making. Topics include: Endowments, pension funds, family offices, sovereign wealth funds, and insurance companies. —III. (III.)

410. Corporate Governance (1)
Lecture/discussion—1 hour. Covers recent and not-so-recent accounting scandals, discussing how corporations can better operate in the interests of shareholders and the public, and learn from people who rely on corporate governance in making investment decisions. (S/U grading only)—I. (I.),II. (II.),III. (III.),IV. (IV.)

411. Turnaround Management (1)
Lecture/discussion—1 hour. Evaluate the financial performance of a company, identify opportunities for improvement, propose real solutions to enhance performance, and gain inspiration to action in staff. (S/U grading only)—I. (I.),II. (II.),III. (III.),IV. (IV.)

412. International Marketing (1)
Lecture/discussion—1 hour. Understanding basic concepts of international marketing. Understanding and analyzing the economic, political, social and cultural forces impacting businesses operating internationally, and the interdependent environments across countries. How to develop and implement an international marketing strategy; where and how to compete, how to adapt to your marketing mix. —II. (II.)

413. Sustainable Business Ventures: Business and Energy (1)
Lecture/discussion—1 hour. Introduction to sustainable goals, indicators, values, measurement techniques, and practice how it applies to large and small enterprise. —II. (II.)

414. Multi-Channel Marketing (1)
Lecture/discussion—1 hour. Multi-channel marketing strategies empower managers to create value for different customer segments. Covers the necessary concepts to evaluate and select go-to-market strategies in order to capitalize on the ubiquity of modern customers. (S/U grading only)—I. (I.),II. (II.),III. (III.),IV. (IV.)

415. Climate Change and Corporate Strategy (1)
Lecture—1 hour. Prerequisite: course 205. Restricted to students in the MBA program. Focuses on the finance principles related to the risk and return of the private equity (PE) industry, valuation of PE target companies, the structuring of leveraged buyouts (LBOs), and the management of portfolio companies. (S/U grading only)—II. (II.)

417. Incentives and Controls (1)
Lecture/discussion—1 hour. Understand how organizations use financial and nonfinancial performance management systems to motivate people and manage resources. (S/U grading only)—I. (I.),II. (II.),III. (III.),IV. (IV.)

418. Scientific Discovery and Business Innovation: The Food and Agriculture Sector (1)
Lecture—3 hours. Restricted to students in the MBA program. Scientific discovery and business innovation within the food and agriculture sector profoundly influences the sustainability of society and enterprise competitiveness. Students will learn how business innovation models co-exist antagonistically or synergistically with scientific discovery and its influence on enterprise competitiveness. (S/U grading only)—II. (II.),III. (III.),IV. (IV.)

424. Practicum for Managing People in Modern Organizations (1)
Project—1 hour. Prerequisite: course 224. Restricted to students in the MBA program. Provides solid grounding in the management of work and the employment relationship. Examines firms’ interrelated policies and practices for managing people. —II. (II.)

434. Practicum for Pricing (1)
Project—1 hour. Prerequisite: course 234. Restricted to students in the MBA program. Enhance understanding of the principles and concepts learned in Pricing by: (1) performing statistical and mathematical skills, and (2) requiring a report for a Real Pricing case. —II. (II.),Iang

440. Integrated Management Project (3)
Project—3 hours. Prerequisite: first-year core courses of M.S.A. and application learning. Solve complex business challenges for real world clients. Student teams learn practical consulting skills while their clients benefit from the student’s experience, insights, and work product. (Deferred grading only, pending completion of sequence.) —I. (I.)

440A. Integrated Management Project (3)
Lecture/discussion—3 hours. Prerequisite: first-year core courses of MBA program. Restricted to full-time (day) MBA students. Applies classroom learning to solve complex business challenges for real world clients. Student teams learn practical consulting skills while their clients benefit from the student’s experience, insights, and work product. (Deferred grading only, pending completion of sequence.) —I. (I.)

442. Practicum for Marketing Communication (1)
Project—1 hour. Prerequisite: course 242. Restricted to students in the MBA program. Provides experience applying concepts learned in Marketing Communications to a realistic advertising or communication problem faced by firms. —III. (III.)

443. Practicum for Customer Relationship Management (1)
Project—1 hour. Prerequisite: course 243. Restricted to students in the MBA program. Hands-on training in applying Customer Relationship Management concepts and metrics to secondary data. Enhances ability to interpret results and decide the right type of marketing actions by requiring an executive report at the end of the quarter. —I. (I.)

448. Practicum for Strategy (1)
Project—1 hour. Prerequisite: course 248. Restricted to students in the MBA program. Provides opportunities to apply the concepts covered in the Marketing Strategies class through a project group involving the analysis of strategic marketing decisions based on business-related issues, simulation and modeling. —I. (I.)

449. Marketing Research Practicum (1)
Project—1 hour. Prerequisite: course 249. Restricted to students in the MBA program, or in some cases with permission of instructor. Provides opportunities to apply the concepts and methods covered in the Marketing Research class. Hands-on and project-based, work could be either individual or in groups depending on enrollments and/or interests of students. —III. (III.)

450. Practicum for Technology Strategy and Competition (1)
Project—1 hour. Prerequisite: course 250. Restricted to students in the MBA program. In-depth practicum project course. Apply the concepts and methods learned in course 250 to a real-world business problem, through data collection, data analysis, simulation, modeling and post-model interpretation. —II. (II.)

460. Practicum for Corporate Finance and Real Estate (1)
Project—1 hour. Prerequisite: course 260. Restricted to students in the MBA program. Work in groups to select a value and a financial entity; could be a firm, a sports player, a building, a project, or a patent. Grade based on an in-class presentation and a write-up. —III. (III.)

461. Practicum for Investment Analysis (1)
Project—1 hour. Prerequisite: course 261. Restricted to students in the MBA program. Provides practical experience applying concepts learned in Investment Analysis to a realistic portfolio management setting via a hypothetical exercise or a realistic executive summary and presentation of an investment proposal for a hypothetical client. —I. (I.)

464. Practicum for Taxes and Business Strategy (1)
Project—1 hour. Prerequisite: course 264. Restricted to students in the MBA program. Practical application project drawing from the tax planning theory contained in course 264. Project consists of a business formation and operating, change in organizational (incorporation), and movement into multinational and multi-jurisdictional tax. —I. (I.)

465. Practicum for Venture Capital (1)
Project—1 hour. Prerequisite: course 265. Restricted to students in the MBA program. Provides an opportunity to apply concepts learned in a realistic setting. Complete project analyzing a potential investment in a hypothetical venture and prepare a deal term sheet/investment agreement. —III. (III.)

467. Practicum for Teams and Technology (1)
Project—1 hour. Prerequisite: course 267. Restricted to students in the MBA program. Groups are allocated a business or technology problem and are required to investigate the performance, creativity, conflict, information sharing, and leadership behaviors of a real world team. Provide consulting advice to the team, which not only gives analytic skills, but also builds presentation skills. —III. (III.)

469. Practicum for Business Intelligence Technologies (1)
Project—1 hour. Prerequisite: course 269. Restricted to students in the MBA program. Provides experience applying concepts learned in Business Intelligence Technologies to real business problems. —III. (III.)

482. Practicum for Supply Chain Management (1)
Project—1 hour. Prerequisite: MGT, MGB, or MGB 282 is a prerequisite or co-requisite. Restricted to students in the MBA program. Provides experience applying concepts learned in Supply Chain Management to a realistic management setting via a project. —I. (I.)

490. Directed Group Study Management Practicum (3)
Lecture/discussion—3 hours. Prerequisite: consent of instructor; sponsorship of a GSM Academic Senate faculty member; approval of graduate advisor. Projects:

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer, 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): ArtH—Arts; Div—Division; H—Humanities; SciE—Science; SocSci—Social Sciences; Div—Division; Wrt—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SciE—Science and Engineering; SocSci—Social Sciences; ACGH—American Cultures; DD—Dominant Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
Managerial Economics

(College of Agricultural and Environmental Sciences)

http://manecon.ucdavis.edu

Faculty. See Agricultural and Resource Economics, on page 143.

Major Advisers. Contact Department office.

Undergraduate Advising Center for the major, minor, and course offerings (including peer advising) is located in 1176 Social Sciences and Humanities Building, 530-754-9536, http://manecon.ucdavis.edu.

The Major Program

The Managerial Economics major at UC Davis is a disciplinary program combining strong preparation in microeconomic theory and quantitative methods. It prepares students for the analysis of management and policy issues in business, finance, marketing, production, agriculture, food distribution, natural resources, the environment, resource allocation, and international trade and development. Students specialize in one of three options: (1) Managerial Economics focuses on the economic aspects of managerial decision-making. (2) Environmental and Resource Economics focuses on issues related to the use of resources and environmental quality. (3) Agricultural Economics focuses on the economic and policy aspects of production and marketing of foods and fibers. Students in the Managerial Economics program develop valuable skills and strengths that lead to careers in business and government.

Internships and Career Alternatives. Students in managerial economics have opportunities to gain additional career information and preparation through internships in a variety of private business and governmental agencies. Graduates qualify for supervisory and management training positions in banking, finance, commodity and stock brokerages in the private sector, farm and ranch production, food and agricultural processing, agricultural sales and service, and a variety of agency career positions in local, state, and federal government. Graduates are well qualified to seek advanced degrees in agricultural and resource economics, economics, business administration, public policy, or law. For more information, see http://iccweb.ucdavis.edu.

Study Abroad. The Agricultural and Resource Economics department wishes to accommodate students who would like to complement their Managerial Economics degree with a study abroad experience. Up to eight units of upper division credit (excluding core courses) from international campuses may be used towards the completion of the degree or the prerequisite courses. These courses will apply towards the Managerial Economics degree or minor, students need to select courses from the pre-approved list at UC Davis Study Abroad or pre-approve in the Agricultural and Resource Economics department for the courses they wish to complete.

B.S. Major Requirements:

UNITs

Major English Requirement 4

Choose one course from: English 3, University Writing Program 1, 18, 19, 101, 102A-G, 104A-F. (May not duplicate courses taken to meet the English Composition requirement for the College of Agricultural and Environmental Sciences.) NOTE: University Writing Program 104A is highly recommended.

Preparatory Subject Matter 35-37

One course from: Plant Sciences 21, Engineering Computer Science 10, 15 or 30 3-4

Economics 1A-1B 8

Management 11A-11B 8

Mathematics 16A-16B, 17A-17B, or 21A-21B 8

Statistics 13, 103 8

Major Breadth Social Science, Natural Science, Natural Resources, 37 and Agricultural Sciences.

Managerial Economics emphasis

Agricultural and Resource Economics 100A, 100B, 106, 155 and Economics 101 20

Restricted Electives 32

Choose at least one of the options below:

Managerial Economics option

Agricultural and Resource Economics 18, 4

Choose at least 12 units from: Agricultural and Resource Economics 112, 118, 119, 136, 157, 171A, 171B.


Environmental and Resource Economics option

Agricultural and Resource Economics 175, 176 8


Select the remaining 15 units from the aforementioned courses or upper division courses in Agricultural and Resource Economics and/or, Economics, Environmental Change and Policy 160, 161, 163, 165, 166, 167, 171, 172, 173, Environmental Toxicology 138.

Agricultural Economics option

Choose at least 15 units from Agricultural and Resource Economics 120, 121, 130, 132, 138, 139, 140, 145, 150.

Select the remaining 17 units from the aforementioned courses or upper division courses in Agricultural and Resource Economics and/or, Economics, Environmental Science and Policy 168A, 168B, 178.

Select additional upper division Agricultural and Resource Economics courses to complete the 18-unit total for the minor.

Environmental and Natural Resource Economics emphasis

Agricultural and Resource Economics 100A or the equivalent 4

Additional upper division courses in Agricultural and Resource Economics 14

Managerial Economics emphasis

Agricultural and Resource Economics 100A or the equivalent 4

Additional upper division courses in Agricultural and Resource Economics 14

Select 9 or more units from Agricultural and Resource Economics 112, 118, 136, 157, 171A, 171B.

Select additional upper division Agricultural and Resource Economics courses to complete the 18-unit total for the minor.

Agricultural Economics emphasis

Agricultural and Resource Economics 100A or the equivalent 4

Additional upper division courses in Agricultural and Resource Economics 14

Select 9 or more units from Agricultural and Resource Economics 120, 130, 132, 138, 139, 140, 145, 150.

Select additional upper division Agricultural and Resource Economics courses to complete the 18-unit total for the minor.

Graduate Study. Students who meet the admission requirements of Graduate Studies and the Department of Agricultural and Resource Economics may pursue studies leading to the M.S. and Ph.D. degrees. For information on admission to graduate study, degree requirements, consult the Graduate Program Coordinator in the Department of Agricultural and Resource Economics; also see http://agecon.ucdavis.edu.

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2010-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): A=Arts, P=Project, H=Humanities, S=Science, E=Engineering, S=Social Sciences, D=Domestic Diversity, W=Writing Experience

Fall 2011 and on Revised General Education (GE): A=Arts and Humanities, S=Science and Engineering, SS=Social Sciences, ACQ=Cultural Awareness, DD=Domestic Diversity, OL=Oral Skills, QL=Quantitative, SL=Scientific, VL=Visual, WC=World Cultures, WE=Writing Experience
Marine and Coastal Science

The major in Marine and Coastal Science focuses on the interdisciplinary nature of marine sciences by exposing students to core, breadth, and focus area courses in the discipline, in addition to a strong foundation of science preparatory material. The major builds upon existing strengths at UC Davis in marine and coastal sciences as well as field-based courses offered at Bodega Marine Laboratory to provide students with a unique, interdisciplinary, "hands on" education. Initial advising is provided by the Department of Earth and Planetary Sciences for interested students.

The Program. The major begins with introductory courses in mathematics, chemistry, physics, biology, and earth sciences. These are followed by core courses in Marine Science. The major requirements provide focus and breadth, so that each student gains mastery in one area and broad exposure to many facets of Marine and Coastal Science. Focus and Breadth areas include: Coastal Environmental Processes, Marine Ecology and Organismal Biology, Marine Environmental Chemistry, and Oceans and the Earth System.

In this major, students will be exposed to the foundation disciplines within marine science (biology, chemistry, geology, physics) as well as modern issues facing marine and coastal environments; e.g., climate change, pollution, carbon cycling, conservation. The major requires field experience, independent research, and a capstone course. The major program includes both research and internship experiences to help prepare students for career paths.

Advising. Students majoring in Marine and Coastal Science are encouraged to meet with their faculty advisor (assigned, based upon Focus Area choice) once per year to review their coursework plans. Advising is available through the Department of Earth and Planetary Sciences, and student peer advisors are available. Faculty advisors include: Tessa Hill (College of Letters and Science), Gary Cherr (College of Agricultural and Environmental Sciences), and Brian Gaylord (College of Agricultural and Environmental Sciences).

The student's chosen Focus Area will determine the college into which the student is admitted, the college where the degree is awarded, and the associate department:
- Coastal Environmental Processes, College of Agricultural and Environmental Sciences; Environmental Science & Policy
- Marine Ecology & Organismal Biology, College of Biological Sciences; Evolution & Ecology
- Marine Environmental Chemistry, College of Agricultural and Environmental Sciences; Environmental Toxicology
- Oceans and the Earth System, College of Letters and Science; Earth and Planetary Sciences

B.S. Major Requirements:
† denotes courses only offered at Bodega Marine Laboratory.

Marine Environmental Chemistry. Emphasis on major themes in marine chemistry, geochemistry, the carbon cycle, and contaminant fate and transport.

The focus area requirement can be fulfilled using:

* Some courses may require additional prerequisites, such as: Chemistry 88, Geology 50, 60, Hydrology 145, Engineering: Civil and Environmental 144.

Oceans and the Earth System. A study of our changing oceans in the context of earth system history, including climate change, paleoceanography, ecological shifts, conservation, and marine policy.

The focus area requirement can be fulfilled using:

* Some courses may require additional prerequisites, such as: Atmospheric Sciences 60, Chemistry 8A, B, Geology 1, Economics 1A, Hydrology 145, Environmental Resource Sciences 100, Inter- national Relations

Breadth Requirement equal or greater than 8

Complete one course from each category below that is not the student's chosen Focus Area, totaling equal or greater than 8 units.

Coastal Environmental Processes. The breadth requirement can be fulfilled using the following courses: Atmospheric Sciences 116, Environmental Science & Policy 152, *155, Geology 182, Wildlife, Fish & Conservation Biology *157

Marine Ecology and Organismal Biology. The breadth requirement can be fulfilled using the following courses: Atmospheric Sciences 120, Environmental Science & Policy *110, *114, 115, Environmental Toxicology *127, Neurobiology, Physiology, and Behavior 114+114P

Marine Environmental Chemistry. The breadth requirement can be fulfilled using the following courses: Environmental Toxicology *120, Chemistry 100, Geology 182, Hydrology 134, 141

Oceans and the Earth System. The breadth requirement can be fulfilled using the following courses: Atmospheric Sciences 116, Environmental Science & Policy 166N, Evolution & Ecology *120, Geology 107, 108, Wildlife, Fish and Conservation Biology 154

* Some courses may require additional prerequisites; see above.

Field Requirement

Quarter Offered:
- Fall, Winter, Spring, Summer

Pre-Fall 2011 General Education (GE): AH = Arts and Humanities; S = Science and Engineering; SS = Social Sciences;
- AGHC = American Cultures; DD = Domestic Diversity; OL = Oral Skills; QQ = Quantitative; SL = Scientific; VL = Visual; WC = World Cultures; WE = Writing Experience

Fall 2011 and on Revised General Education (GE): AH = Arts and Humanities; S = Science and Engineering; SS = Social Sciences;
- AGHC = American Cultures; DD = Domestic Diversity; OL = Oral Skills; QQ = Quantitative; SL = Scientific; VL = Visual; WC = World Cultures; WE = Writing Experience

Quarterly Offered:

Fall, Winter, Spring, Summer
Master of Education (M.Ed.) (A Graduate Group)

The Master of Education (M.Ed.) program is no longer admitting students; admissions are suspended.

Master of Professional Accountancy (A Graduate Group)

Robert Yetman, Ph.D., Chairperson of the Group
Group Office, Gallagher Hall 530752.7658; fax 530.754.9355; http://gsm.ucdavis.edu/mastere-professional-accountancy

Faculty
Shannon W. Anderson, Ph.D., Professor (Graduate School of Management)
Roger Edelen, Ph.D., Associate Professor (Graduate School of Management)
Paul A. Griffin, Ph.D., Professor (Graduate School of Management)
Donald A. Palmer, Ph.D., Professor (Graduate School of Management)
N.V. Ramanan, Ph.D., Assistant Professor (Graduate School of Management)
Hollis A. Skalle, Ph.D., Professor (Graduate School of Management)
Michelle Yetman, Ph.D., Associate Professor (Graduate School of Management)
Robert Yetman, Ph.D., Professor (Graduate School of Management)

Affiliated Faculty
Will Snyder, M.B.A, C.P.A., Professor (Executive Director)

Graduate Adviser. Contact the Group office.

Courses in Master of Professional Accountancy (ACC)

201. Financial Reporting (4)
Lecture—4 hours. Restricted to Master of Professional Accountancy graduate students. Coverage includes the fundamentals of accounting and reporting of financial events and transactions. Emphasizes the preparation of balance sheets, income statements, cash flow statements, of cash flow, and statements of stockholders’ equity.—II. (II.)

Lecture—4 hours. Prerequisite: course 201 or Management 200A. Restricted to graduate students in the Graduate School of Management. Focuses on the Preparation of financial statements. Topics include accounting recognition, measurement, and disclosure, as well as the theoretical foundations of and motivations for financial reporting choices.—II. (II.)

205. Advanced Financial Reporting (4)
Lecture—4 hours. Prerequisite: course 203. Restricted to graduate students in the Graduate School of Management. Advanced treatment of recognition, measurement, and disclosure of items including depreciation, accounting for income taxes, mergers and acquisitions, consolidations, special-purpose entities, and foreign subsidiaries. Includes accounting for financial instruments and financial reporting entities, as well as advanced treatment of international accounting standards.—III. (III.)

211. Tax Reporting and Analysis (4)
Lecture—4 hours. Restricted to Master of Professional Accountancy graduate students. Introduction to the taxation of business entities and their related transactions, with an emphasis on the details of tax law and tax reporting requirements. Topics include individual, partnership, and corporate taxation, as well as tax theory. Not open for credit to students who have completed Management 264.—I. (I.)

213. Intermediate Tax Reporting and Analysis (4)
Lecture—4 hours. Prerequisite: course 211 or Management 264. Restricted to graduate students in the Graduate School of Management. Detailed analysis of federal taxation of individuals. Topics include the timing of income recognition, deductions, and credits for tax purposes, as well as the basics of property transactions.—II. (II.)

215. Advanced Tax Reporting and Analysis (4)
Lecture—4 hours. Prerequisite: course 213. Restricted to graduate students in the Graduate School of Management. Advanced treatment of complex tax transactions and entities. Topics include aspects of federal taxation of pass through entities and the applicable impact upon individual taxpayers. Coverage includes basis analysis as applicable to pass through entities and an introduction to professional responsibilities.—III. (III.)

217. Taxation of Individuals, Property, and Estates (4)
Lecture—4 hours. Prerequisite: course 213. Restricted to graduate students in the Graduate School of Management. In-depth analysis of individual income tax issues and property transactions including non-taxable exchanges, compensation, gifts, and transfers taxes. Expanded analysis of multiple tax issues is on the interaction of the taxation of complex individual transactions as well as planning techniques.—III. (III.)

219. Taxation of Business Entities (4)
Lecture—4 hours. Prerequisite: course 213. Restricted to graduate students in the Graduate School of Management. Analysis of detailed business entity tax issues including basis calculations, alternative minimum tax, multistate and multinational taxation, stock options, and mergers and acquisitions. Tax planning for entities and relationships between business entities and their owners. Offered irregularly.—III. (III.)

231. Analysis and Use of Accounting Reports (4)
Lecture—4 hours. Prerequisite: course 203. Restricted to graduate students in the Graduate School of Management. Evaluation of financial statements by managers and persons outside the firm, such as investors, creditors, and financial analysts. Topics include cash flow vs. income measurement, ratio and valuation analysis, and the effects of international accounting standards. Not open for credit to students who have completed Management 272.—II. (II.)

241. Auditing and the Accounting Profession (4)
Lecture—4 hours. Prerequisite: course 201 or Management 200A. Restricted to Graduate School of Management students. Introduction to the audit environment, professional standards, the accounting profession, and the professional responsibilities of accountants. Integrate audit topics across the areas of financial, tax, and tax systems accounting. (S/U grading only).—I. (I.)

243. Auditing and Attestation Services (4)
Lecture—4 hours. Prerequisite: course 241. Restricted to graduate students in the Graduate School of Management. Advanced treatment of the audit process and environment. Topics include audit planning and performance, evidence, internal controls, professional standards, and audit reports. Reviews, compilations and attestations services are examined, as are governmental agency audits.—III. (III.)

251. Managerial Accounting and Controls (4)
Lecture—4 hours. Prerequisite: course 201 or Management 200A. Restricted to graduate students in the Graduate School of Management. Analysis of management accounting systems including cost accounting, performance measurement, and compensation and reward systems. Focuses on the production of information useful for managerial decision-making, as well as the design of these systems. Not open for credit to students who have completed Management 271.—II. (II.)

253. Accounting Information and Control Systems (4)
Lecture—4 hours. Prerequisite: course 201 or Management 200A. Restricted to graduate students in the Graduate School of Management. Analysis of information systems used for accounting, record-keeping, and control. Topics include the regulatory requirements of accounting control systems as well as their implementation and auditing considerations.—III. (III.)

261. Communications for Professional Accountants (4)
Lecture—4 hours. Prerequisite: course 201 or Management 200A. Restricted to graduate students in the Graduate School of Management. Overview of written and oral professional communications with an emphasis on structuring and documenting audits and reports, understanding audiences (investors, creditors, regulators, and other stakeholders), and consideration of ethical and regulatory responsibilities.—II. (II.)

271. Accounting Ethics (4)
Lecture—4 hours. Prerequisite: course 201 or Management 200A. Restricted to graduate students in the Graduate School of Management. Analysis of accountants’ professional responsibilities and ethics. Topics include the behavioral foundations of ethics in a business environment, how those elements affect accountants’ integrity, objectivity, and independence. Professional standards related to accountants’ conduct are also covered.—I. (I.)

Master of Preventive Veterinary Medicine (A Graduate Group)

Ashley Hill, D.V.M., M.P.V.M., Ph.D., Chairperson of the Group

Faculty
John Adaska, D.V.M., M.P.V.M., Ph.D., Associate Professor of Clinical (Pathology, Microbiology & Immunology)
Sharif Aly, BVSc, M.P.V.M., Ph.D., Assistant Professor (Population Health and Reproduction)
Robert Atwill, D.V.M., M.P.V.M., Ph.D., Professor (Population Health and Reproduction)
Chris Barker, MS, Ph.D., Assistant Adjunct Professor (Pathology, Microbiology & Immunology)
Courses in Preventive Veterinary Medicine (MPM)

Professional

402. Medical Statistics I (5)
Lecture—37 sessions; laboratory—13 sessions. Prerequisite: MPMV standing in the School of Veterinary Medicine or consent of instructor. Statistics in clinical, laboratory, and population medicine: graphic, tabular, and tabular presentation of data; probability, binomial; Poisson, normal, t-, F-, and Chi-square distributions; elementary nonparametric methods; simple linear regression, multiple regression, logit models; computer applications of statistical procedures in population medicine.—I. (I.) Farver

403. Medical Statistics II (3)
Lecture—20 sessions; laboratory—10 sessions. Prerequisite: Medical Statistics I. MPMV standing in the School of Veterinary Medicine and/or successful completion of course 402 (or equivalent) or consent of instructor. Analysis of variance in biomedical sciences; nonparametric statistical methods; multiple regression; biomedical applications of statistical methods. Microcomputer applications to reinforce principles that are taught in lecture. Continuation of course 402.—II. (II.) Farver

404. Medical Statistics III (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: Medical Statistics II. MPMV standing in the School of Veterinary Medicine and/or successful completion of course 403 (or equivalent) or consent of instructor. Continuation of course 403. Analysis of time dependent variation and trends, analysis of multivariate frequency tables; logistic regression; survival analysis selecting the best regression equation; biomedical applications.—III. (III.) Farver

405. Principles of Epidemiology (4)
Lecture—4 hours. Prerequisite: Medical Statistics II. MPMV standing in the School of Veterinarian Medicine or consent of instructor. Basic epidemiologic concepts and approaches to epidemiologic research, with examples from veterinary and human medicine, including outbreak investigation, infectious disease epidemiology, properties of tests, and an introduction to epidemiologic study design and surveillance. (Same course as Epidemiology 205A.)—I. (I.) Gold, Miller

405L. Epidemiology Laboratory (1)
Lecture—1 session; laboratory—1 session. Prerequisite: Medical Statistics II. MPMV standing in the School of Veterinary Medicine or consent of instructor. Practical application of epidemiological methods using the microcomputer as a tool to solve problems. Utilizes spreadsheets and databases as tools to organize and analyze data. Emphasizes epidemiological methods introduced in course 405. Data sets provided.—I. (I.) Lehnenbauer

406A. Epidemiologic Study Design (3)
Lecture—20 sessions, discussion—6 sessions, laboratory—4 sessions. Prerequisite: Medical Statistics III. MPMV standing in the School of Veterinary Medicine or consent of instructor. Builds on concepts presented in course 405. Concepts of epidemiologic study design—clinical trials, observational cohort studies, case control studies, stratified studies—introduced in course 405 and covered in more depth, using a problem-based format. Discussion of published epidemiologic studies. (Same course as Epidemiology 206.)—II. (II.) Miller

408A. Veterinary Research: Planning and Reporting (1)
Lecture—20 sessions. Prerequisite: Medical Statistics II and consent of instructor. Planning, critical analysis, ethics, and written and oral communication of veterinary research.—Foley

408B. Veterinary Research: Planning and Reporting (1)
Lecture—10 sessions. Prerequisite: Medical Statistics II and consent of instructor. Planning, critical analysis, ethics, and written and oral communication of veterinary research.—Foley
### Mathematical and Physical Sciences

**[College of Letters and Science]**

Louise H. Kellogg, Ph.D., Program Director

**Program Office.** 118 Everson Hall

**Committee in Charge**

Andreas J. Albrecht, Ph.D. (Physics)
Sheila David, Ph.D. (Chemistry)
Joel Hass, Ph.D. (Mathematics)
Isabel P. Montañez, Ph.D. (Earth and Planetary Sciences)

Motohico Mulase, Ph.D. (Mathematics)
Academic Senate Distinguished Teaching Award

Wolfgang Polonik, Ph.D. (Statistics)
Francisco J. Samaniego, Ph.D. (Statistics)

Academic Senate Distinguished Teaching Award

Howard J. Spero, Ph.D. (Earth and Planetary Sciences)

Xiangdong Zhu, Ph.D. (Physics)

**The Program of Study**

The Division of Mathematical and Physical Sciences teaches the concrete mathematics behind the experimental studies and theoretical analyses to find solutions to real world problems. Students learn to address issues such as cleaning up the environment, preserving natural resources and creating innovative materials for the future. From the study of atoms to the examination of distant galaxies, from abstract number theory to the development of new chemical compounds, the division provides students with the skills to build the world of tomorrow.

The program in Mathematical and Physical Sciences provides an organizational structure within the College of Letters and Science for facilitating the development of innovative curricular initiatives across the mathematical and physical sciences, including offering broadly conceived, integrative undergraduate- and graduate-level courses. The program also may house resident faculty pursuing interdepartmental research and teaching in this area of inquiry.

**Courses in Mathematical and Physical Sciences (MPS)**

#### Lower Division

1. **General Science: Science in the News** (4)
   - Lecture—3 hours; laboratory/discussion—1 hour. Prerequisite: lower division standing. Basic principles in science include numeracy, scale, energy, and time; the scientific method; good and bad science. Emphasis on science topics recently in the news. GE credit: SciEng—III.
   - 11A-11B. Mathematical and Physical Sciences Seminar (2–2)
   - Lecture—2 hours. Prerequisite: mentorship for undergraduate research participants in the physical and mathematical sciences. Research and writing in the mathematical and physical sciences. Presentations by various science faculty members.—II. (III.)

**Mathematics**

See Mathematics; and Applied Mathematics (A Graduate Group), on page 165.

**Mathematics**

[College of Letters and Science]

Joel Hass, Ph.D., Chairperson

**Department Office.** 1130 Mathematical Sciences Bldg. 530-752-0827; studentervices@math.ucdavis.edu; http://www.math.ucdavis.edu

**Faculty**

Eric Babson, Ph.D. Professor
Zhaojun Bai, Ph.D., Professor (Computer Science)
Craig Berghem, Ph.D., Professor
Joseph Biello, Ph.D., Associate Professor
James Bremer, Ph.D., Associate Professor
Angela Y. Cheer, Ph.D., Professor
Jesus De Loera, Ph.D., Professor
C. Albert Fannjiang, Ph.D., Professor
Roland Freund, Ph.D., Professor
Dmitry B. Fuchs, Ph.D., Professor
Janko Gravner, Ph.D., Professor
Robert Guy, Ph.D., Associate Professor
Joel Hass, Ph.D., Professor
John K. Hunter, Ph.D., Professor
Michael Kapovich, Ph.D., Professor
Matthias Koepe, Ph.D., Professor
Gregory J. Kuperberg, Ph.D., Professor
Timothy Lewis, Ph.D., Associate Professor
Fu Liu, Ph.D., Professor
Kevin Luli, Ph.D., Assistant Professor
Alexander I. Mogilner, Ph.D., Professor
Ben Morris, Ph.D., Professor
Motohico Mulase, Ph.D., Associate Professor
Academic Senate Distinguished Teaching Award
Bruno I. Nachtergaele, Ph.D., Professor
Brian Osnessman, Ph.D., Associate Professor
Alessandra Pizzaro, Ph.D., Associate Professor
E. Gerry Puckett, Ph.D., Professor
Dan Romik, Ph.D., Associate Professor
Naoki Saito, Ph.D., Professor
Anne Schilling, Ph.D., Professor
Jennifer Schluens, Ph.D., Professor
Albert Schwarz, Ph.D., Professor
Steve Shkoller, Ph.D., Professor
Alexander Soshnikov, Ph.D., Professor
Thomas Strohmer, Ph.D., Professor
J. Blake Temple, Ph.D., Professor
UC Davis Distinguished Professor 2012
Becca Thomasos, Ph.D., Assistant Associate Professor
Abigail Thompson, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Craig A. Tracy, Ph.D. Professor
Monica Vazirani, Ph.D., Professor
Samuel Walcott, Ph.D., Assistant Professor
Andrew Waldron, Ph.D., Professor
Qinglan Xia, Ph.D., Assistant Associate Professor

**Emeriti Faculty**

David Bohnette, Ph.D., Professor Emeritus
Donald C. Benson, Ph.D., Professor Emeritus
Carlos R. Borges, Ph.D., Professor Emeritus
Robert J. Bux, Professor Emeritus
Guilbank D. Chakaroen, Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award
Doyle O. Cutler, Ph.D., Professor Emeritus
James R. Diederich, Ph.D., Professor Emeritus
Allan L. Edelson, Ph.D., Professor Emeritus
Robert D. Giroux, Ph.D., Professor Emeritus
Kurt Kreith, Ph.D., Professor Emeritus
Arthur J. Krener, Ph.D., Professor
Melven R. Krom, Ph.D., Professor
Gary J. Krupsky, Ph.D., Professor Emeritus
Arthur D. Mead, Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award
E. O. Miltion, Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award
Donald A. Norton, Ph.D., Professor Emeritus
Washe F. Mfeffer, Ph.D., Professor Emeritus
G. Thomas Sallee, Ph.D., Professor
Academic Senate Distinguished Teaching Award

Sherman K. Stein, Litt.D. (hon.), Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award
Howard J. Wein, Ph.D., Professor Emeritus
Roger Wets, Ph.D., Professor Emeritus

**Affiliated Faculty**

John Chuchi, Ph.D., Lecturer
Ali Dad-del, Ph.D., Lecturer
Academic Federation Excellence in Teaching Award
Duane Koub, Ph.D., Lecturer
Lawrence Marx, Ph.D., Lecturer

**The Major Programs**

Mathematics is the study of abstract structures, space, change, and the interrelations of these concepts. It also is the language of the exact sciences.

**The Program.** Students majoring in mathematics may follow a program leading to either the Bachelor of Arts or the Bachelor of Science degree. After completing basic introductory courses such as calculus and linear algebra, students plan an upper division program in consultation with a faculty adviser. The upper division course offering is grouped into entry level, core, and enrichment courses. Entry level courses are designed to serve as a bridge between the core mathematics of the lower division and the more abstract concepts taught in upper division courses. The core courses are intended to provide basic mathematical techniques, whereas the enrichment choices allow students to further mathematical knowledge and skills that feature their research or career interests. This individualized program can lead to graduate study in pure or applied mathematic, elementary or secondary level teaching, or to other professional goals. It can also reflect a special interest such as computational and applied mathematics, computer science, or statistics, or may be combined with a major in same subject.

**Career Alternatives.** A degree in mathematics provides entry to many careers in addition to teaching. For instance, operations research, systems analysis, computing, actuarial work, insurance, and financial services are a few of many careers. Mathematics is also a sound basis for graduate work in a variety of fields, such as law, teaching, and economics.

**A.B. Major Requirements:**

**UNITS**

Preparatory Subject Matter........................43-50
Mathematics 12 (or high school equivalent)..............0.3
One of the following two options: (a) Mathematics 24A-24B and 108 OR (b) Mathematics 67-68 .................................47
Computer Science 30 or Engineering 6 .... 4 Mathematics 22AL or equivalent MATLAB knowledge.................................0.1
Additional Non-Mathematics courses chosen from natural sciences............................12
NOTE: Basic knowledge of MATLAB is required for both Mathematics 67 and 22A. Students can learn it on their own, enroll in Engineering 6, Mechanical Engineering 5 or in the one unit course Mathematics 22AL (can be taken concurrently).

**Depth Subject Matter**...............................37-42
A. Entry Level (Optional)..............................0.4
Suggested choice; one course from:
Mathematics 108, 114, 115A, 141, 145
B. Core..................................................16
Mathematics 125A ......................................
Mathematics 125B ....................................
Mathematics 135A ....................................
Mathematics 150A ...................................
C. Choose one Plan from the following two; up to 4 of these 16 units may be approved upper division courses outside of the Department of Mathematics with extensive use of mathematics........................................18

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): A=American Arts and Humanities; S=Science and Engineering; SS=Social Sciences; DD=Dominic Diversity; WE=Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; AC=American Culture; DE=Dominic Diversity; WE=Writing Experience
Plan 1: General Mathematics
Additional upper division mathematics units selected in consultation with and subject to approval of an adviser. .......................... 18
Plan 2: Secondary Teaching
Mathematics 111 .................................. 4
Mathematics 115A ..................................... 4
Mathematics 141 ...................................... 4
Additional upper division mathematics units selected in consultation with and subject to approval of an adviser.
NOTE: Students who wish to satisfy the single subject matter waiver for the teaching credential should see an adviser as early as possible.
D. Capstone Course: Mathematics 189 or 192 (Internship in Applied Mathematics or 194 (Undergraduate Thesis) or 180 (Special Topics) can be taken in consultation with the Undergraduate Vice Chair .............................................. 3-4
Total Units for the Major ..................... 80-92
Applied Mathematics
B.S. Major Requirements:
UNITS
Preparatory Subject Matter .................. 42-52
Mathematics 12 (or high school equivalent) .......................... 0-3
One of the following two options: (a) Mathematics 22A and 108 OR (b) Mathematics 67 .......................... 4-7
Computer Science 30 or Engineering 6 .................................. 5
Physics 9A (Plans 1 and 2) or one course from: Physics 7A, Statistics 13, 32, 100 (Plan 2) .......................... 5-8
NOTE: Basic knowledge of MATLAB is required in both Mathematics 67 and 22A. Students can learn it on their own, enroll in Engineering 6, Mechanical Engineering 5 or in the one unit course Mathematics 22AL (can be taken concurrently).
Depth Subject Matter ......................... 51-56
Choose one plan from the following two:
Plan 1: General Mathematics
A. Entry Level (Optional) .......................... 0-4
Suggested choices: one course from: Mathematics 108, 114, 115A, 141, 145
B. Core ............................................. 28
Mathematics 150A ..................................... 4
Mathematics 150B ..................................... 4
Mathematics 150C ..................................... 4
Mathematics 135A ..................................... 4
Mathematics 125B ..................................... 4
Mathematics 128 ..................................... 4
Mathematics 135A ..................................... 4
C. Enrichment ....................................... 20
1. One of four courses from: Mathematics 111, 114, 115A, 115B, 133, 135B, 141, 145, 147, 148, 156, 158, 158B .......................... 16
2. One of four courses from: Mathematics 119A, 124, 128A, 128B, 129, 133, 167, 168 or one approved upper division course outside the Department of Mathematics with extensive use of mathematics .......................... 4
D. Capstone Course: Mathematics 189 or 192 (Internship in Applied Mathematics or 194 (Undergraduate Thesis) or 180 (Special Topics) or an approved substitute in consultation with the Undergraduate Vice Chair .............................................. 3-4
Plan 2: Mathematics for Secondary Teaching
A. Entry Level (Optional) .......................... 0-4
Suggested choices: one course from: Mathematics 108, 114, 145
B. Core ............................................. 28
Mathematics 150A ..................................... 4
Mathematics 150B ..................................... 4
Mathematics 150C ..................................... 4
Mathematics 135A ..................................... 4
Mathematics 125B ..................................... 4
Mathematics 128 ..................................... 4
Mathematics 135A ..................................... 4
C. Enrichment ....................................... 20
1. One of four courses from: Mathematics 111, 114, 115A, 115B, 133, 135B, 141, 145, 147, 148, 156, 158, 158B .......................... 16
2. One of four courses from: Mathematics 119A, 124, 128A, 128B, 129, 133, 167, 168 or one approved upper division course outside the Department of Mathematics with extensive use of mathematics .......................... 4
D. Capstone Course: Mathematics 189 or 192 (Internship in Applied Mathematics or 194 (Undergraduate Thesis) or 180 (Special Topics) or an approved substitute in consultation with the Undergraduate Vice Chair .............................................. 3-4
Total Units for the Major ..................... 85-98
Mathematics
B.S. Major Requirements:
UNITS
Preparatory Subject Matter ................. 34-42
Mathematics 12 (or high school equivalent) .......................... 0-3
One of the following two options: (a) Mathematics 22A and 108 OR (b) Mathematics 67 .......................... 4-7
Computer Science 30 or Engineering 6 .................................. 5
Physics 9A (Plans 1 and 2) or one course from: Physics 7A, Statistics 13, 32, 100 (Plan 2) .......................... 5-8
NOTE: Basic knowledge of MATLAB is required in both Mathematics 67 and 22A. Students can learn it on their own, enroll in Engineering 6, Mechanical Engineering 5 or in the one unit course Mathematics 22AL (can be taken concurrently).
Depth Subject Matter ......................... 51-56
Choose one plan from the following two:
A. Entry Level (Optional) .......................... 0-4
Suggested choice: one course from: Mathematics 108, 114, 115A, 141, 145
B. Core ............................................. 28
Mathematics 150A ..................................... 4
Mathematics 150B ..................................... 4
Mathematics 150C ..................................... 4
Mathematics 135A ..................................... 4
Mathematics 125B ..................................... 4
Mathematics 128 ..................................... 4
Mathematics 135A ..................................... 4
C. Enrichment ....................................... 20
1. One of four courses from: Mathematics 111, 114, 115A, 115B, 133, 135B, 141, 145, 147, 148, 156, 158, 158B .......................... 16
2. One of four courses from: Mathematics 119A, 124, 128A, 128B, 129, 133, 167, 168 or one approved upper division course outside the Department of Mathematics with extensive use of mathematics .......................... 4
D. Capstone Course: Mathematics 189 or 192 (Internship in Applied Mathematics or 194 (Undergraduate Thesis) or 180 (Special Topics) or an approved substitute in consultation with the Undergraduate Vice Chair .............................................. 3-4
Total Units for the Major ..................... 85-98
Mathematical and Scientific Computation
B.S. Major Requirements:
UNITS
Preparatory Subject Matter ................. 35-42
Mathematics 12 (or high school equivalent) .......................... 0-3
One of the following two options: (a) Mathematics 22A and 108 OR (b) Mathematics 67 .......................... 4-7
Mathematics 22AL or equivalent basic knowledge of MATLAB .................................. 0-1
Computer Science 30, 40 .................................. 8
NOTE: Basic knowledge of MATLAB is required in both Mathematics 67 and 22A. Students can learn it on their own, enroll in Engineering 6, Mechanical Engineering 5 or in the one unit course Mathematics 22AL (can be taken concurrently).
Depth Subject Matter ......................... 51-56
A. Entry Level (Optional) .......................... 0-4
Suggested choice: one course from: Mathematics 108, 114, 115A, 141, 145
B. Core ............................................. 28
Mathematics 150A ..................................... 4
Mathematics 150B ..................................... 4
Mathematics 150C ..................................... 4
Mathematics 135A ..................................... 4
Mathematics 125B ..................................... 4
Mathematics 128 ..................................... 4
Mathematics 135A ..................................... 4
C. Enrichment ....................................... 20
1. One of four courses from: Mathematics 111, 114, 115A, 115B, 133, 135B, 141, 145, 147, 148, 156, 158, 158B .......................... 16
2. One of four courses from: Mathematics 119A, 124, 128A, 128B, 129, 133, 167, 168 or one approved upper division course outside the Department of Mathematics with extensive use of mathematics .......................... 4
D. Capstone Course: Mathematics 189 or 192 (Internship in Applied Mathematics or 194 (Undergraduate Thesis) or 180 (Special Topics) or an approved substitute in consultation with the Undergraduate Vice Chair .............................................. 3-4
Total Units for the Major ..................... 86-98
Recommended Language Preparation, Bachelor of Science degree candidates are advised, but not required, to satisfy the same language requirement as that for a Bachelor of Arts degree candidate, and to fulfill it in French, German, or Russian.
Major Advisers. For a current list of faculty and staff advisers, contact the Student Services office at studentservices@math.ucdavis.edu, or our website: https://www.math.ucdavis.edu/undergrad/advising/advisers/.
Depth Subject Matter Requirements. Certain mathematically oriented courses given by other departments are admissible in partial satisfaction of the depth subject matter requirements with prior departmental approval. Up to three units of Mathematics 194 may be counted toward the depth subject matter requirements. Additionally, up to three units of Mathematics 198 or Mathematics 199, can be counted.
Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses.
Pre-Fall 2011 General Education (GE): AA/AS-Domain, CSU-General, CSU-Transfer, UC-A, B, C, D, E, F, G; UC-Upper Division; WRT-Writing Experience
Fall 2011 and on Revised General Education (GE): AH-Arts and Humanities; SCI-Science and Engineering; SS-Social Sciences; DIV-Div-Domestic Diversity; WR-Writing Experience
ACGH-American Cultures, DD-Domestic Diversity, OL-Oral Skills, SL-Quantitative, SL-Scientific, VU-Visual, WC-World Cultures, WE-Writing Experience
Mathematics 391
12. Precalculus (3) Lecture—3 hours. Prerequisite: two years of high school algebra, plane geometry, plane trigonometry, and satisfying the Mathematics Placement Requirement. Limits; differentiation of algebraic functions; analytic geometry; applications, in particular to maxima and minima problems. Not open for credit to students who have completed course 17A, 17B, 17C, 21A, 21B, or 21C with a C or better. GE credit: SciEng | QL, SE, SL—I, II, III, (II, III). 17B. Short Calculus (3) Lecture—3 hours. Prerequisite: two years of high school algebra, plane geometry, plane trigonometry, and satisfying the Mathematics Placement Requirement. Limits; differentiation of algebraic functions; analytic geometry; applications, in particular to maxima and minima problems. Not open for credit to students who have completed course 17A, 17B, 17C, 21A, 21B, or 21C. Only 2 units of credit to students who have previously completed course 17A. GE credit: SciEng | QL, SE, SL—I, II, III, (II, III). 16A. Short Calculus (3) Lecture—3 hours. Prerequisite: course 16A, 17A, or 21A. Integration; calculus for trigonometric, exponential, and logarithmic functions; applications. Not open for credit to students who have completed courses 17C, 21A, or 21B. Only 2 units of credit to students who have completed course 17A. GE credit: SciEng | QL, SE, SL—I, II, III, (II, III). 16C. Short Calculus (3) Lecture—3 hours. Prerequisite: course 16B, 17B, or 21B. Differential equations; partial derivatives; double integrals; applications; series. Not open for credit to students who have completed course 17C. GE credit: SciEng | QL, SE, SL—I, II, III, (II, III). Note: Mathematics 16A, 16B, and 16C are for students who will take no more Mathematics courses. Mathematics 17A, 17B, and 17C have the same level of rigor as 16A, 16B, and 16C, yet are much more broadly mathematically (containing algebra, differential equations and probability, besides traditional calculus), and are intended for biology students who do not wish to take more rigorous Mathematics courses. 17A. Calculus for Biology and Medicine (4) Lecture—3 hours; discussion—I hour. Prerequisite: two years of high school algebra, plane geometry, plane trigonometry, and analytical geometry, and satisfying the Mathematics Placement Requirement. Introduction to differential calculus via applications in biology and medicine. Limits, derivatives of polynomials, trigonometric, and exponential functions, graphing, applications of the derivative to biology and medicine. Not open for credit to students who have completed course 16B, 16C, 21A, 21B, or 21C; only 2 units of credit to students who have completed course 16A. GE credit: SciEng | QL, SE, SL—I, II, III, (II, III). 17B. Calculus for Biology and Medicine (4) Lecture—3 hours; discussion—I hour. Prerequisite: course 16A, 17A, or 21A. Introduction to integral calculus and elementary differential equations via applications to biology and medicine. Fundamental theorem of calculus, techniques of integration including integral tables and numerical methods, improper integrals, elementary first order differential equations, applications in biology and medicine. Not open for credit to students who have completed course 16C, 21B, or 21C. Only 2 units of credit for students who have completed course 16B. GE credit: SciEng | QL, SE, SL—I, II, III, (II, III). 17C. Calculus for Biology and Medicine (4) Lecture—3 hours; discussion—I hour. Prerequisite: course 16B, 17B, or 21B. Matrix algebra, functions of several variables, partial derivatives, systems of differential equations, and applications to biology and medicine. Not open for credit to students who have completed course 21C; only 2 units of credit to students who have completed course 16C. GE credit: SciEng | QL, SE, SL—I, II, III, (II, III). 21A. Calculus (4) Lecture—3 hours; discussion—I hour. Prerequisite: two years of high school algebra, plane geometry, plane trigonometry, and analytic geometry, and satisfying the Mathematics Placement Requirement. Functions, limits, continuity. Slope and derivative. Differentiation of algebraic and transcendental functions. Applications to motion, natural growth, graphing, extrema of a function. Differentials. L'Hospital's rule. Not open for credit to students who have completed course 16B, 16C, 17B, or 17C. Only 2 units of credit to students who have completed course 16A or 17A. GE credit: SciEng | QL, SE, SL—I, II, III, (II, III). 21AH. Honors Calculus (4) Lecture/discussion—4 hours. Prerequisite: a Precalculus Diagnostic Examination score significantly higher than the minimum for course 21A is required. More intensive treatment of material covered in course 21A. Offered irregularly. GE credit: SciEng | QL, SE. 21AL. Emerging Scholars Program Calculus Workshop (2) Workshop—6 hours. Prerequisite: concurrent enrollment in course 21A. Functions, limits, continuity. Slope and derivative. Same course content as course 21A. Enrollment for students in the Emerging Schol- ars Program by instructor's invitation only. Offered irregularly. (P/NP grading only) GE credit: SE. 21B. Calculus (4) Lecture—3 hours; discussion—I hour. Prerequisite: course 21A or 21AH. Continuation of course 21A. Definition of definite integral, fundamental theorem of calculus, techniques of integration. Application to area, volume, arc length, average of a function, improper integral, surface area, arc length. Only 2 units of credit to students who have completed course 16B, 16C, 17B, or 17C. GE credit: SciEng | QL, SE, SL—I, II, III, (II, III). 21BH. Honors Calculus Lecture/discussion—4 hours. Prerequisite: a grade of B or better in course 21A or 21AH. More intensive treatment of material covered in course 21B. Students completing 21BH can continue with course 21CH or the regular 21C. Offered irregularly. GE credit: SciEng | SE. 21BL. Emerging Scholars Program Calculus Workshop (2) Workshop—6 hours. Prerequisite: course 21A or 21AL; concurrent enrollment in 21B. Continuation of course 21A. Same course content as 21B. Enrollment for students in the Emerging Scholars Program by instructor's invitation only. Offered irregularly. (P/NP grading only) GE credit: SE. 21C. Calculus (4) Lecture—3 hours; discussion—I hour. Prerequisite: course 16C, 17C, 21B, or 21BH. Continuation of course 21B. Sequences, series, tests for convergence, Taylor expansions. Vector-valued functions, calculus, scalar and vector fields. Partial derivatives, total differentials. Applications to maximum and min- imum problems in two or more variables. Applications to physical systems. GE credit: SciEng | QL, SE, SL—I, II, III, (II, III).
21CH. Honors Calculus (4)
Lecture/discussion—4 hours. Prerequisite: a grade of B or better in course 21B or 21BH. More intensive treatment of material covered in course 21C. Offered infrequently. GE credit: SciEng | SE.

21CL. Emerging Scholars Program Calculus Workshop (2)
Workshop—6 hours. Prerequisite: course 21B or 21BH; concurrent enrollment in 21C. Continuation of course 21B. Same course content as course 21C. Enrollment for students in the Emerging Scholars Program by instructor’s invitation only. [P/NP grading only.] Offered irregularly. GE credit: SciEng | SE.

21D. Vector Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 21C or 21CH. Continuation of course 21C. Definite integrals over plane and solid regions in various coordinate systems. Line and surface integrals. Green’s theorem, Stoke’s theorem, divergence theorem. GE credit: SciEng | QL, SE.—I, II, III. (I, II, III.)

21M. Accelerated Calculus (5)
Lecture/discussion—4 hours; discussion/lab—1 hour. Prerequisite: grade of B or higher in both semesters of high school calculus or a score of 4 or higher on the Advanced Placement Calculus AB exam, and obtaining the required score on the Precalculus Diagnostic Examination and its trigonometric component. Accelerated treatment of material from courses 21A and 21B, with detailed presentation of theory, definitions, and proofs, and treatment of concepts requiring augmentation of calculus at a condensed but sophisticated level. Not open for credit to students who have completed course 21A or 21B. only 3 units of credit will be allowed to students who have completed course 1A and only 2 units of credit will be allowed to students who have completed course 1B. Offered irregularly. GE credit: SciEng | SE.

22A. Linear Algebra (3)
Lecture—3 hours. Prerequisite: nine units of college mathematics and Engineering 6 or Knowledge of Matlab or course 22AL [to be taken concurrently]. Matrices and linear transformations, determinants, eigenvalues, eigenvectors, diagonalization, factorization. Not open for credit to students who have completed course 67. GE credit: SciEng | QL, SE.—I, II, III. (I, II, III.)

22AL. Linear Algebra Computer Laboratory (1)
Laboratory—2.3 hours. Prerequisite: nine units of college mathematics. Introduction to Matlab and its use in linear algebra. (P/NP grading only.) GE credit: SciEng | QL, SE.—I, II, III. (I, II, III.)

22B. Linear Algebra (3)
Lecture—3 hours; discussion—2 hours. Prerequisite: courses 21C; 22A or 67. Solutions of elementary differential equations. GE credit: SciEng | QL, SE.—I, II, III. (I, II, III.)

25. Fundamentals of Mathematics (3)
Lecture—3 hours. Prerequisite: satisfaction of the Mathematics Placement Requirement. Introduction to fundamental mathematical ideas selected from the principal areas of modern mathematics. Properties of the primes, the fundamental theorems of arithmetic, properties of the rationals and irrationals, binary and other number systems. GE credit: SciEng | QL, SE.—I, II, III. (I, II, III.)

28. Modern Linear Algebra (4)
Lecture/discussion—4 hours. Prerequisite: course 21B. Introduction to the rigorous treatment of abstract mathematical analysis. Proofs in mathematics, induction, sets, cardinality; real number system, theory of convergence of sequences. Not open for credit to students who have completed former course 127A. GE credit: SciEng | SE.—I, II, III. (I, II, III.)

36. Fundamentals of Mathematics (3)
Lecture—3 hours. Prerequisite: satisfaction of the Mathematics Placement Requirement. Introduction to fundamental mathematical ideas selected from the principal areas of modern mathematics. Properties of the primes, the fundamental theorems of arithmetic, properties of the rationals and irrationals, binary and other number systems. GE credit: SciEng | QL, SE.—I, II, III. (I, II, III.)

67. Modern Linear Algebra (4)
Lecture/discussion—4 hours. Prerequisite: course 21A or consent of instructor. Rigorous treatment of linear algebra; topics include vector spaces, bases and dimensions, orthogonal projections, eigenvalues and eigenvectors, similarity transformations, singular value decomposition and positive definiteness, nonhomogeneous problems and the method of eigenvector expansions, Poisson’s Equations. GE credit: SciEng | QL, SE.—I, II. (I, II.)

71A-71B. Explorations in Elementary Mathematics (3-3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: two years of high school mathematics. Weekly explorations of mathematical ideas related to the elementary school curriculum will be carried out by cooperative learning groups. Lectures will provide background and synthesize the results of group exploration. (Expanded to pending completion of sequence.) Offered irregularly.

89. Elementary Problem Solving (1)
Lecture—1 hour. Prerequisite: high school mathematicians through precalculus. Solve and present solutions to challenging problems in elementary mathematics. May be repeated one time for credit. (P/NP grading only.) Offered irregularly.

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)—I, II, III. (I, II, III.)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)—I, II, III. (I, II, III.)

Upper Division

108. Introduction to Abstract Mathematics (4)
Lecture/discussion—4 hours. Prerequisite: course 21B. A rigorous treatment of mathematical concepts with emphasis on the ideas underlying the development of abstract mathematical ideas, to read and write mathematical concepts, and to prove theorems. Designed to serve as preparation for the more rigorous upper division courses. GE credit: SciEng, Wrt | SE.—I, II, III. (I, II, III.)

111. History of Mathematics (4)
Lecture—3 hours; term paper or discussion. Prerequisite: eight units of upper division Mathematics; one of the following courses: 11A, 21B, 115A, 116, 119A, 141, or 145. History of mathematics from ancient times through the development of calculus. Mathematics from Arab, Hindu, Chinese and other cultures. Selected topics in the history of modern mathematics. GE credit: SciEng | SE.—I, II, III. (I, II, III.)

114. Convex Geometry (4)
Lecture/discussion—4 hours. Prerequisite: courses 21C, 22A or 67. Topics selected from the theory of convex bodies, convex functions, geometric inequalities, combinatorial geometry, and integral geometry. Designed to serve as preparation for the more rigorous upper division courses. Offered in alternate years. GE credit: SciEng | SE.—I, II, III. (I, II, III.)

115B. Number Theory (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 22A or 67 (or equivalent) and 115A (or equivalent). Euler function, Moebius function, congruences, primitive roots, quadratic reciprocity law. Offered in alternate years. GE credit: SciEng | QL, SE.—II. (II.)

116. Differential Geometry (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 125A. Vector analysis, curves, and surfaces in three dimensions. Offered in alternate years. GE credit: SciEng | SE.—II. (II.)

118A. Partial Differential Equations: Elementary Methods (4)
Lecture—3 hours; project. Prerequisite: courses 22A; 22B or 67. Derivation of partial differential equations; separation of variables; equilibrium solutions and Laplace’s equation; Fourier series; method of characteristics for the one dimensional wave equation. Solution of nonlinear homogeneous equations. GE credit: SciEng | QL, SE.—I. (I.)

118B. Partial Differential Equations: Eigenfunction Expansions (4)
Lecture—3 hours; project. Eigenfunction expansions. GE credit: SciEng | QL, SE.—II. (II.)

121A. Partial Differential Equations: Green’s Functions and Transforms (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 118B. Green’s functions for one-dimensional problems and Poisson’s equation. Separation of variables; transforms; Green’s functions for time dependent problems; Laplace transform and solution of partial differential equations. Offered irregularly. GE credit: SciEng | QL, SE.—II. (II.)

121B. Ordinary Differential Equations (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 21D; 22A or 67. Scalar and planar autonomous systems; nonlinear systems and linearization; existence and uniqueness of solutions; matrix solution of linear systems; phase plane analysis; stability analysis; bifurcation theory; Liapunov’s method; limit cycles; Poincare Bendixon theory. GE credit: SciEng | QL, SE.—I, II, III. (I, II, III.)

121C. Mathematical Biology (4)
Lecture—3 hours; project. Prerequisite: courses 22A or 67. Methods of mathematical modeling of biological systems including difference equations, ordinary differential equations, stochastic and dynamic programming models. MATLAB programming required. Offered in alternate years. GE credit: SciEng | QL, SE.—I, II, III. (I, II, III.)

125A. Real Analysis (4)
Lecture—discussion—4 hours. Prerequisite: course 25. Functions, limits of functions, continuity and uniform continuity, sequences of functions, series of real numbers, series of functions, power series. Not open for credit to students who have completed former course 127B. GE credit: SciEng | SE.—I, II, III. (I, II, III.)

125B. Real Analysis (4)
Lecture/discussion—4 hours. Prerequisite: course 67 and 125A. Theory of the derivative, Taylor series, integration, partial derivatives, Implicit Function Theorem. Not open for credit to students who have completed former course 127C. GE credit: SciEng | QL, SE.—I, II, III. (I, II, III.)

128A. Numerical Analysis (4)
Lecture—3 hours; project. Prerequisite: Computer Science: Engineering 30 or equivalent; course 21C. Error analysis, approximation, interpolation, numerical differientation and integration. Programming in language such as Pascal. Familiarity with BASIC required. GE credit: SciEng | QL, SE.—I. (I.)

128B. Numerical Analysis in Solution of Equations (4)
Lecture—3 hours; project. Prerequisite: Computer Science: Engineering 30 or equivalent; courses 21C; 22A or 67. Solution of nonlinear equations and nonlinear systems. Minimization of functions of several variables. Simultaneous linear equations. Eigenvalue problems. Linear programming. Programming in language such as FORTRAN or BASIC required. GE credit: SciEng | QL, SE.—I. (I.)
124C. Numerical Analysis in Differential Equations (4)
Lecture—3 hours; project. Prerequisite: Computer Science: Engineering 130 or equivalent; courses 22A or 67, 22B. Difference equations, operators, numerical solutions of ordinary and partial differential equations. Programming in language such as Pascal, Fortran, or BASIC required. GE credit: SciEng | QI, SE. —III. (III.)

129. Fourier Analysis (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 21D, 22A or 67, 22B, or consent of instructor. Fourier series and integrals, orthogonal sets of functions. Topics selected from trigonometric approximation, orthogonal polynomials, applications to signal and image processing, numerical analysis, and different equations. GE credit: SciEng | QI, SE. —III. (III.)

133. Mathematical Finance (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 67, 135A. Analysis and evaluation of deterministic and random cash flow streams, and pricing of basic financial instruments, interest rate theory, meanvariance portfolio theory, capital asset pricing models, utility functions and general principles. MATLAB programming required. Offered in alternate years. GE credit: SciEng | QI, SE. SL. —III.

135A. Probability (4)
Lecture/discussion—4 hours. Prerequisite: course 125A. Probability spaces, discrete probability, combinatorial analysis; independence, conditional probability; random variables, discrete and continuous distributions, probability mass function, joint and marginal distributions, expectation, moments, variance, Chebyshev inequality; sums of random variables, random walk, large number law, central limit theorem. Not open for credit to students who have completed course 132A. GE credit: SciEng | QI, SE. —I, II, III. (II, III.)

135B. Stochastic Processes (4)
Laboratory/discussion—4 hours. Prerequisite: courses 135A, 22A or 67. Generating functions, branching processes, characteristic function, Markov chains; convergence of random variables, law of iterated logarithm; random processes, Brownian motion, stationary processes, renewal processes, queueing theory, martingales. Not open for credit to students who have completed course 132A. GE credit: SciEng | QI, SE. —I, II, III. (II, III.)

145. Combinatorics (4)
Lecture/discussion—4 hours. Prerequisite: course 218. Combinatorial methods using basic graph theory, counting methods, generating functions, and recurrence relations. Designed to serve as preparation for the more rigorous upper division courses. GE credit: SciEng | QI, SE. VL. —I, II, III. (I, II, III.)

146. Algebraic Combinatorics (4)
Lecture/discussion—4 hours. Prerequisite: courses 218, 22A or 67, 135A. Basic notions of point set and combinatorial topology. GE credit: SciEng | QI, SE. —I, II. (II.)

147. Topology (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 22A or 67, 135A. Basic notions of point set and combinatorial topology. GE credit: SciEng | QI, SE. —II. (II.)

148. Discrete Mathematics (4)
Lecture/discussion—4 hours. Prerequisite: course 67, or courses 22A and 25. Coding theory, error correcting codes, finite fields and the algebraic concepts needed in their development. Not open for credit to students who have completed former course 149B. GE credit: SciEng | QI, SE. —II, III. (II, III.)

150A. Modern Algebra (4)
Lecture/discussion—4 hours. Prerequisite: course 67. Basic concepts of groups, symmetries of the plane. Emphasis on the techniques used in the proof of the ideas (lemmas, etc.) developing these concepts. Precise thinking, proof writing, and the ability to deal with abstraction. GE credit: SciEng | QI, SE. —I, II. (II.)

150B. Modern Algebra (4)
Lecture/discussion—4 hours. Prerequisite: course 150B. Linear forms, rings, factorization, modules. GE credit: SciEng | SE. —II. (II.)

150C. Modern Algebra (4)
Lecture/discussion—4 hours. Prerequisite: course 150B. Group representations, fields, Galois theory. GE credit: SciEng | SE. —III. (III.)

160. Mathematical Foundations of Database Theory, Design and Performance (4)
Lecture—3 hours; project. Prerequisite: course 22A or 67, one of the following courses: 25, 108, 114, 115A, 141, or 145. Relational model, relational algebra, relational calculus, normal forms, functional and multivalued dependencies. Separability. Cost-benefit analysis of physical database design and reorganization. Performance via analytical modeling, simulation, and queueing theory. Block accesses; locking; operating system contention; CPU intensive applications. Offered irregularly. GE credit: SciEng | QI, SE. —III.

165. Mathematics and Computers (4)
Lecture—3 hours; project. Prerequisite: Computer Science: Engineering 30 or equivalent; course 22B and one of the following courses: 25, 67, 108, 114, 115A, 141 or 145. Introduction to computational mathematics, symbolic computation, and computer generated/verified proofs in algebra, analysis and geometry. Investigation of rigorous new mathematics developed in conjunction with modern computational questions and the role that computers play in mathematics and experimentation. GE credit: SciEng | QI, SE. —I, II. (I, II.)

167. Applied Linear Algebra (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 22A or 67, knowledge of a programming language. Applications of linear algebra, LU and QR matrix factorizations, eigenvalue and singular value matrix decompositions. GE credit: SciEng | QI, SE. —I, II. (I, II.)

168. Optimization (4)
Lecture—3 hours; extensive problem solving. Prerequisite: Computer Science: Engineering 30 or equivalent; courses 21C or 25, 22A or 67. Linear programming, simplex method. Basic properties of unconstrained nonlinear problems, descent methods, conjugate direction method. Constrained minimization. Programming language required. GE credit: SciEng | QI, SE. —III. (III.)

180. Special Topics (3)
Lecture—3 hours. Prerequisite: courses 25 and 67, or consent of instructor. Special topics from various fields of modern, pure, and applied mathematics. Some recent topics include Knot Theory, General Relativity, and Fuzzy Sets. May be repeated for credit when topic differs. GE credit: SciEng | SE. —I, II. (I, II.)

185A. Complex Analysis (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 67, 125A. Complex number system, analyticity and the Cauchy-Riemann equations, elementary functions, complex integration, power and Laurent series expansions, residue theory. GE credit: SciEng | SE. —II. (II.)

185B. Complex Analysis (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 185A. Analytical functions, elementary functions and their mapping properties, applications of Cauchy’s integral theorem, conformal mapping and applications to heat flow and fluid mechanics. Offered in alternate years. GE credit: SciEng | SE. —II. (II.)

189. Advanced Problem Solving (3)
Lecture—3 hours. Prerequisite: courses 21D; 22A or 67, 25. Solution and presentation of advanced problem solving techniques. Solve and present interesting challenges across all areas of mathematics. Offered irregularly. GE credit: SciEng, Wrt | OL, QL, SE. WE. —III. (III.)

192. Internship in Applied Mathematics (1-3)
Internship, final report. Prerequisite: upper division standing; project approval by faculty sponsor prior to enrollment. Supervised work experience in applied mathematics. May be repeated for credit for a total of 10 units. (P/NP grading only.)—I, II, III. (I, II, III.)

194. Undergraduate Thesis (3)
Prerequisite: consent of instructor. Independent research under supervision of a faculty member. Student will submit written report in thesis form. May be repeated with consent of Vice Chairperson. (P/NP grading only.) GE credit: SE. —I, II, III. (I, II, III.)

197TC. Tutoring Mathematics in the Community (1-5)
Seminar—1-2 hours; laboratory—2-6 hours. Prerequisite: upper division standing and consent of instructor. Special projects in mathematics education developing techniques for mathematics instruction and tutoring on an individual or small group basis. May be repeated one time for credit. (P/NP grading only.)—I, II, III. (I, II, III.)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.) GE credit: SE. —I, II, III. (I, II, III.)

Graduate

200A-200B. Problem-Solving in Analysis (1-1)
Lecture—1 hour; extensive problem solving. Prerequisite: courses 201ABC. Problem-solving in graduate analysis: continuous functions, metric spaces, Banach and Hilbert spaces, bounded linear operators, the spectral theorem, distributions, Fourier series and transforms, Lp spaces, Sobolev spaces. May be repeated two times for credit. (Deferred grading only, pending completion of sequence.)—I, II, III. (I, II, III.)

201A-201B. Analysis (4-4-4)

202. Functional Analysis (4)

205. Complex Analysis (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 185 or the equivalent, or consent of instructor. Analytic continuation, Riemann surfaces, conformal mappings, Riemann mapping theorem, entire functions, special functions, elliptic functions.—III. (III.)
and vector spaces over fields. Field extensions. Commutative rings. Representation theory and its applications. —III. (III.)

258A. Numerical Optimization (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: courses 25, 167. Numerical methods for infinite dimensional optimization problems. Newton and Quasi-Newton methods, linear and sequential quadratic programming, barrier methods, large-scale optimization, theory of approximations, infinite and semi-infinite programming; applications to optimal control, stochastic optimization and distributed systems. Offered in alternate years. —II.

258B. Variational Analysis (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: courses 25 and 167, or consent of the instructor. Foundations of optimization theory. The design of solution procedures for optimization problems. Modeling issues, and stability analysis. Offered in alternate years. —II.

261A. Lie Groups and Their Representations (4)

261B. Lie Groups and Their Representations (4)

265. Mathematical Quantum Mechanics (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: courses 215A, 240A, 250A-250B or the equivalent or consent of instructor. Mathematical foundations of quantum mechanics: the Hilbert space and Operator Algebra formulations; the Schrödinger and Heisenberg equations, symmetry in quantum mechanics, basics of spectral theory and perturbation theory. Applications to atoms and molecules. The Dirac equation. Offered in alternate years. —II.

266. Mathematical Statistical Mechanics and Quantum Field Theory (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 265 or consent of instructor. Mathematical principles of statistical mechanics and quantum field theory. Topics include classical and quantum lattice systems, variational principles, spontaneous symmetry breaking and phase transitions, second quantization and Fock space, and fundamental of quantum field theory. May be repeated one time for credit. Offered in alternate years. —II.

271. Applied and Computational Harmonic Analysis (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 1229 or 201C, and 1288 or 167, or 129 and or equivalent, or consent of instructor. Introduction to mathematical basic building blocks (wavelets, local Fourier basis, and their relatives) useful for diverse fields (signal and image processing, numerical analysis, and statistics). Emphasis on the connection between the continuum and the discrete worlds. Offered in alternate years. —II.

280. Topics in Pure and Applied Mathematics (3)
Lecture—3 hours. Prerequisite: graduate standing. Special topics in various fields of pure and applied mathematics. Topics selected based on the mutual interests of students and faculty. May be repeated for credit when topic differs. —I, II, III. (I, II, III.)

290. Seminar (1-6)
Seminar—1-6 hours. Advanced study in various fields of mathematics, including analysis, applied mathematics, discrete mathematics, geometry, mathematical biology, mathematical physics, optimization, partial differential equations, probability, and topology. May be repeated for credit. (S/U grading only). —I, II, III. (I, II, III.)

298. Group Study (1-5)
299. Individual Study (1-12)

299D. Dissertation Research (1-12)

Professional
301A-301B-301C. Mathematics Teaching Practicum (3-3-3)
Fieldwork—5 hours, discussion—1 hour. Prerequisite: course 202A-202B and 202C and 303A-303B-303C concurrently or consent of instructor. Specialist training in mathematics teaching. Teaching, training, and cross observing classes taught using large group Socratic techniques, small group guided inquiry experiences, and/or other approaches to teaching at various grade levels. Required for advanced degrees in mathematics education. May be repeated one time for credit. Offered irregularly.

302A-302B-302C. Curriculum Development in Mathematics (1-1-1)
Lecture/discussion—1 hour. Prerequisite: course 303A-303B-303C concurrently or consent of instructor. Mathematics curriculum development for all grade levels. Required for advanced degrees in mathematics education. May be repeated one time for credit. Offered irregularly.

303A-303B-303C. Mathematics Pedagogy (1-1-1)
Lecture/discussion—1 hour. Prerequisite: course 302A-302B-302C or 210L concurrently or consent of instructor. An investigation of the interplay of mathematical pedagogy and mathematical content, including a historical survey of past and present methods in view of some of the influences that shaped their development. May be repeated one time for credit. Offered irregularly.

390. Teaching Assistantship Training (3)

Medical Pharmacology and Toxicology

See Medicine, School of, on page 396.

Medical Microbiology

See Medicine, School of, on page 396.

Medical, School of

Julie Ann Freischlag, M.D.
Vice Chancellor of Human Health Sciences Dean, School of Medicine

Fred Meyers, M.D., M.A.C.P.
Vice Dean, School of Medicine

Brent Sayre, M.D.
Senior Associate Dean for Clinical Research

Edward Callahan, Ph.D.
Associate Dean for Finance

Lars Berglund, M.D., Ph.D.
Senior Associate Dean for Clinical Research

David Acosta, M.D.
Associate Vice Chancellor for Equity, Diversity and Inclusion

Andreea Seritan, M.D.
Assistant Dean for Student and Resident Diversity

James Goodnight, Jr., M.D.
Associate Dean for Cancer Center

Jeffrey Zucker, M.D.
Associate Dean for Cancer Center

Mark Henderson, M.D.
Associate Dean for Admissions and Outreach

Darin Latimore, M.D.
Associate Dean for Student and Resident Diversity

James Nuovo, M.D., M.P.H.
Associate Dean for Graduate Medical Education

Andrea Seritan, M.D.
Associate Dean for Student Wellness

Mark Servis, M.D.
Senior Associate Dean for Curriculum and Competency Development

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http://www.ucdmc.ucdavis.edu/medschool/

Faculty

To search for current faculty, see http://www.ucdmc.ucdavis.edu/search/faculty/searchdetails.asp?searchtype=3
Admission Requirements and Professional Curriculum
Detailed information can be obtained from the School of Medicine, see School of Medicine, on page 127.

Courses in the School of Medicine Curriculum for the School of Medicine
The curriculum for the M.D. degree at the UC Davis School of Medicine is a four-year program providing comprehensive preparation for graduate medical training (residencies) and the practice of medicine. It offers a blend of basic science training and clinical experience with opportunities for research.

The first year curriculum begins in August and extends through May and is organized into two blocks. The basic science portion of the first block includes courses in Molecular Biology, Cell and Tissue Biology, Gross Anatomy/Embryology/Radiology, and Human Physiology. The major organizing theme is structure-function along the continuum of hierarchical biologic structure from molecule to cell, tissue and major organ systems. The three year Doctoring curriculum begins in January, and is presented concurrently with the other courses. The focus of Doctoring 1 is physical examination training using standardized patients and models, correlated with correlated gross anatomy and physiology by organ system. Behavioral medicine, epidemiology, biostatistics, cross-cultural medicine, and ethics are woven into the cases and didactic presentations and team-based learning modules. Students are required to attend preceptorships in the community and participate in home visits. Periodic quizzes and review sessions with basic science courses throughout the block for formative assessment, and all courses administer comprehensive summative final examinations in December.

The second block of the first year curriculum begins in January and extends through April, with final exams in early May. There are two major threads, each of which is composed of several integrated courses. The Doctoring 1 course is offered concurrently. The Immunology/Microbiology/Pharmacology/Pathology/Pharmacy thread presents an introduction to host defense, infection, basic pharmacologic principles, and general pathologic processes. The Endocrinology/Nutrition/Reproduction/Genetics (ENRG) thread covers embryology, cell concepts, genetics, basic and clinical nutrition, reproductive medicine, and clinical endocrinology. The General Pathology course includes female GU and endocrine pathology, and the pharmacology course covers antibiotics and endocrine pharmacology, with the goal of integration with concurrent courses. Periodic quizzes and review sessions provide formative feedback, and final examinations are used for summative assessment. The Doctoring 1 course continues with an emphasis on interviewing skills and clinical assessment. Cases are used in the problem-based learning approach for basic-science-clinical correlation, and for the exploration of psychosocial issues. Preceptorships and home visits continue. The Doctoring 1 course concludes with a comprehensive final examination, and also includes an observed complete history and physical examination.

The first year curriculum ends with a six week unscheduled block that may be used for vacation, remediation, electives, research, and international experiences.

The second year curriculum is composed of three blocks (Blocks 3-5). Block 3 begins in late June and extends through August with a neurosciences block composed of integrated neuroanatomy-clinical neurosciences. The latter emphasizes the pathophysiologic basis of common neurological disorders. The systemic pathology curriculum continues with a focus on neuropathology, and the pharmacology course covers neur谛armacology. A clinical psychiatry course is also presented during this period. The Doctoring 2 course begins, focusing on advanced clinical skills and clinical reasoning using a combination of standardized patient assessments, problem-based learning, sub specialty physical examination sessions, preceptorships, and didactics in clinical epidemiology, medical economics, and socio-behavioral medicine. The remainder of the second year is devoted to a composed of pathophysiology courses with tight integration of the systemic pathology and pharmacology courses. The courses are organized according to organ system (cardiovascular, pulmonary, renal, musculoskeletal system, hematolgy, gastroenterology, oncology, and dermatology). The Doctoring 2 curriculum continues concurrently with its focus on advanced clinical skills, epidemiology, ethics, and problem based assessment. History taking and physical diagnosis skills are correlated with the ongoing pathophysiology courses. Like the first year, all of the second year courses utilize periodic quizzes and review sessions and a comprehensive final examination. The Doctoring 2 course includes an objective structured clinical examination (OSCE) using standardized patients at the end of the course series.

The second year curriculum ends in February and is followed by a six week, unscheduled block for preparation for USMLE Step 1, remediation, elective, and vacation.

The third-year program begins in April and includes six required clerkship rotations in the clinical specialties: eight weeks each of surgery, medicine, obstetrics/gynecology, pediatrics, primary care (jointly administered by Family and Community Medicine and Internal Medicine) and psychiatry. Students may elect to defer one of the required clerkships to the fourth year. The third year Doctoring program consists of longitudinal small groups led by faculty members who remain with their group throughout the year as the students rotate through their clerkships. Doctoring 3 themes include advanced interviewing techniques, clinical reasoning, clinical epidemiology, evidenced based medicine, and ethics/jurisprudence. Students must take a comprehensive clinical skills examination at the end of the third year which features self-assessment and faculty feedback.

The fourth year curriculum features built-in flexibility to allow students with their medical careers. The early start to the fourth year in May allows students to pursue electives for early exposure to clinical specialties or to complete clerkships which may have been deferred. All students are required to select a minimum of 32 weeks of clinical electives in addition to a single 4-week special study module or scholarly project. The Special Study modules are designed to integrate basic sciences with clinical sciences, provide opportunities for students to practice and refine fundamental skills in critical appraisal and analysis of emerging scientific developments, and to allow students to focus indepth on a multidisciplinary topic of special interest to the student. The Scholarly Project requires independent inquiry with faculty mentorship and leads to a publishable manuscript and a presentation of the project at a research forum held in the winter.

Individual student programs are designed under the guidance of college directors, mentors and faculty advisors, with the support of the Career Advising Office. Each student’s fourth year program must be approved by the Fourth Year Oversight Committee to ensure appropriate breadth, depth, and vigor. There are strict guidelines for the choices and time allowed away from the home institution. To satisfy the fourth-year clerkship requirements, the student must successfully complete the required course work, clerkships, and fourth year requirements. Students must pass USMLE Step 1, USMLE Step 2, CS and CK, and complete the fourth year clinical performance examination. In addition to the fourth-year elective program available, there is the opportunity for students to select from a variety of electives during the first two years. Examples include electives in history of ethics and medicine, medical Spanish and insights in clinical research. Most students also participate in one of several student-run, community clinics for elective credit during their first and second years.

Coordination with other Advanced Degree Programs
The curriculum for the M.D. degree provides flexibility and encourages coordination with other advanced degree programs (Ph.D., M.S., M.A., and M.P.H.). The programs offer a wide breadth of study areas and draw upon the considerable expertise of the entire campus faculty. The Department of Public Health Sciences offers an M.P.H. program in conjunction with the M.D. program. This program is designed for students interested in disease prevention and community health, health professionals and State Health Department employees.

School of Medicine administrators enthusiastically support students interested in pursuing advanced degree programs. The dual-degree program for the M.D./Ph.D. is designed to train physicians to meet, respond to, and solve the broad diversity of problems and dilemmas facing current and future health care. Students are encouraged to seek degrees in any of the campus wide Ph.D. programs, including those in social sciences and humanities. The UC Davis School of Medicine awards competitive fellowships each year to students enrolled in the M.D./Ph.D. program.

Required Curriculum for the M.D. Degree
The following listing is the typical sequencing of all courses required for completion of the M.D. degree. Course descriptions are given under the individual departmental course offerings.

First-Year Required Courses
Year 1, Block 1
- Molecular Medicine, BCM 410A
- Gross/Radiologic-Developmental Anatomy, CHA 400
- Human Physiology, HPH 400
- Human Microscopic Anatomy, CHA 402
- Doctoring 1, MDS 411A

Year 1, Block 2
- Medical Immunology, MMW 480A
- Medical Microbiology, MMW 480B
- General and Endocrine Pathology, PMD 410A
- Pharmacology, PHA 400A
- Endocrine-Nutrition-Reproduction-Genetics, "ENRG", MDS 406
- Doctoring 1, MDS 411B

Second-Year Required Courses
Year 2, Block 3
- Neuroanatomy, CHA 403
- Systemic Pathology, PMD 410B
- Pharmacology, PHA 400C
- Clinical Neurosciences, NEU 420
- Fundamentals of Clinical Psychiatry, PSY 403
- Doctoring 2, MDS 421A

Year 2, Block 4
- Inpatient Medicine, DER 420
- Musculoskeletal System, OSU 421
- Doctoring 2, MDS 421B

Year 2, Block 5
- Cardiovascular System, IMD 420D
- Pulmonary and Critical Care, IMD 420C
- Nephrology, IMD 420E
- Hematology, IMD 420A
- Systemic Pathology, PMD 410C/D
- Pharmacology, PHA 400C/D
- Doctoring 2, MDS 421C
- Oncology, HON 420
- GI System, IMD 4208
- Doctoring 2, MDS 421C

Third- and Fourth-Year Required Courses
Third-Year Clerkships
- Internal Medicine
- Clerkship—IMD 430 .......... 8 weeks
- Surgery
- Clerkship—SUR 430 .......... 8 weeks
- Pediatrics
- Clerkship—PED 430 .......... 8 weeks

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): Art/Hum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; DivDom—Domestic Diversity; Wrt—Writing Experience
Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; AGCM—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

Medicine, School of
Primary Care Clerkship—FAP 430, POP 438 .................. 8 weeks
Obstetrics and Gynecology Clerkship—OBG 430 .................. 8 weeks
Psychiatry—PSY 430, POP 438 ................................. 8 weeks

Quarter Offered:
Fall—II, III, IV
Winter—II, III, IV
Spring—III, IV
Summer—II, III, IV

Pre-Fall 2011 General Education (GE):
AH=Arts and Humanities; SC=Science and Engineering; SS=Social Sciences; DD=Dominant Diversity; WR=Writing Experience

Fall 2011 and on Revised General Education (GE):
AH=Arts and Humanities; SC=Science and Engineering; SS=Social Sciences; AC=American Cultures; DD=Dominant Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; VL=Visual; WC=Worls Cultures; WE=Writing Experience

Medical Sciences (MDS)

Lower Division

99. Special Study in Medicine for Undergraduates (1-5)
Independent study—3-15 hours. Prerequisite: consent of instructor. Participate in research projects related to medicine, with faculty in the School of Medicine. (S/U grading only.)—I, II, III, IV (I, II, III, IV)

Upper Division

192. Medical Education Internship for Advanced Undergraduates (1-12)
Internship—3-36 hours. Prerequisite: competency with computers. Enrollment dependent on availability of intern positions. Participate in projects related to curriculum development in support of curriculum for M.D. degree. Gain work experience and appreciation for innovative approaches to learning in basic and clinical sciences of medical education. May be repeated for credit for up to 12 units. (P/NP grading only.)—I, II, III, IV (I, II, III, IV)

Professional

401. Applications of Computers to Medical Practice (2)
Autotutorial—2 hours. Prerequisite: enrollment in medical school. Practicum in computer applications relative to practice of medicine, with emphasis on email, literature searching, file transfer, and hospital information services. Course given online, at home or in lab, time and place determined by preceptor. (P/F grading only.)—I, II, III, IV (I, II, III, IV)

405. Metabolism, Endocrinology, Reproduction and Nutrition (9.5)
Lecture—3.8 hours; discussion/lab—2.8 hours. Prerequisite: consent of instructor. Restricted to Medical school students. Basic and pathophysiologic processes involved in the human metabolic and endocrine system. (P/F grading only; pending completion of sequence.)—II, III, IV (I, II, III, IV)

411A. Doctoring 1 (4)
Discussion—1 hour; clinical activity—1 hour; lecture/discussion—1 hour. Prerequisite: approval of committee on student progress. Medical students only. Small, case-based learning groups with training in patient communication and interviewing techniques, clinical identification and problem solving, applications of social, psychological, cultural, bio-ethical, and basic science concepts to patient case scenarios, outpatient clinical experiences and didactic presentations. (P/F grading only; deferred grading only, pending completion of sequence.)—II, III, IV (I, II, III, IV; Eidson-Ton, Onate)

411B. Doctoring 1 (5)
Discussion—1.5 hours; clinical activity—1.5 hours; lecture/discussion—1.8 hours. Medical students only. Small, case-based learning groups with training in patient communication and interviewing techniques, clinical identification and problem solving, applications of social, psychological, cultural, bio-ethical, and basic science concepts to patient case scenarios, outpatient clinical experiences and didactic presentations. (P/F grading only; deferred grading only, pending completion of sequence.)—I, II, III, IV (I, II, III, IV; Eidson-Ton, Onate)

420. Multisystem Clinical Presentations (0.5)
Extensive problem solving—15 hours; independent study—6 hours. Prerequisite: completion of Pathophysiology Block; consent of instructor. Case-based approach to clinical medicine. (P/F grading only.)—I, II, III, IV (I, II, III, IV)

421A. Doctoring 2 (6)
Discussion—1 hour; discussion/laboratory—1 hour; internship—0.5 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress; medical students only. Application of multidisciplinary basic, social and clinical science concepts to cases in small groups. History, physical examination, and assessment of the student in the context of the patient. (P/F grading only; deferred grading only, pending completion of sequence.)—II, III, IV (I, II, III, IV; Venugopal)

421B. Doctoring 2 (6)
Discussion—1 hour; discussion/laboratory—1 hour; internship—0.5 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress; medical students only. Application of multidisciplinary basic, social and clinical science concepts to clinical cases in small groups. History, physical examination and assessment of the student in the context of the patient. (P/F grading only; deferred grading only, pending completion of sequence.)—IV (I, II, III, IV; Molla, Scolla)

421C. Doctoring 2 (6)
Discussion—1 hour; discussion/laboratory—1 hour; internship—0.5 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress; medical students only. Application of multidisciplinary basic, social and clinical science concepts to cases in small groups. History, physical examination and assessment of the student in the context of the patient. (P/F grading only; deferred grading only, pending completion of sequence.)—I, II, III, IV (I, II, III, IV; Molla, Scolla)

430A. Doctoring 3 (2)
Discussion—3 hours. Prerequisite: approval by SOM Committee on Student Progress. Restricted to Medical students only. Application of multidisciplinary basic, social and clinical science concepts to clinical cases in small group discussions facilitated by medical school faculty. Evaluation of professional competencies, attitudes and skills needed in the practice of clinical medicine. (Deferred grading only; pending completion of sequence. H/P/F grading only.)—IV (I, II, III, IV; Wilkes)

430B. Doctoring 3 (2)
Discussion—2 hours. Prerequisite: approval by SOM Committee on Student Progress. Restricted to Medical students only. Application of multidisciplinary basic, social and clinical science concepts to clinical cases in small group discussions facilitated by medical school faculty. Evaluation of professional competencies, attitudes and skills needed in the practice of clinical medicine. (Deferred grading only; pending completion of sequence. H/P/F grading only.)—I, II, III, IV (I, II, III, IV; Wilkes)

430C. Doctoring 3 (2)
Discussion—2 hours. Prerequisite: approval by SOM Committee on Student Progress. Restricted to Medical students only. Application of multidisciplinary basic, social and clinical science concepts to clinical cases in small group discussions facilitated by medical school faculty. Evaluation of professional competencies, attitudes and skills needed in the practice of clinical medicine. (Deferred grading only; pending completion of sequence. H/P/F grading only.)—I, II, III, IV (I, II, III, IV; Wilkes)

440A. Doctoring 4 Teaching Fellowship (1)
Discussion—0.5 hours; seminar—0.25 hours. Prerequisite: courses 430A/B/C/D and approval by Instructor of Record. Restricted to Medical students only. Instruction on teaching methodology and pedagogy. Mentored teaching of junior medical students in seminar, lecture, and bedside. (Deferred grading only; pending completion of sequence. H/P/F grading only.)—IV (I, II, III, IV; Wilkes)

440B. Doctoring 4 Teaching Fellowship (1)
Discussion—0.5 hours; seminar—0.25 hours. Prerequisite: courses 430A/B/C/D and approval by Instructor of Record. Restricted to Medical students only. Instruction on teaching methodology and pedagogy. Mentored teaching of junior medical students in seminar, lecture, and bedside. (Deferred grading only; pending completion of sequence. H/P/F grading only.)—IV (I, II, III, IV; Wilkes)

440C. Doctoring 4 Teaching Fellowship (1)
Discussion—0.5 hours; seminar—0.25 hours. Prerequisite: courses 430A/B/C/D and approval by Instructor of Record. Restricted to Medical students only. Instruction on teaching methodology and pedagogy. Mentored teaching of junior medical students in seminar, lecture, and bedside. (Deferred grading only; pending completion of sequence. H/P/F grading only.)—IV (I, II, III, IV; Wilkes)

441. Combined Ophthalmology and Otolaryngology Clerkship (6)
Clinical activity—4 weeks. Prerequisite: approval by Committee on Student Promotion and Evaluation. Fundamental knowledge of ophthalmology and otolaryngology for the treatment of eye, ear, nose and throat problems at a level of training of general phy-
400 Medicine, School of

493. Independent Special Study Module (3-12)
Prerequisite: consent of instructor. FYOC approval required. Award education experience that meets Special Study Module requirements. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV)

493A. International and Comparative Health Care—Sciences (3-9)
Discussion—20 hours; lecture—10 hours. Prerequisite: consent on instructor. Restricted to UC Davis School of Medicine students only. Through a series of lectures, seminars and clinical experiences, all occurring in other nations, students will research how health care systems address critical health issues. In 2007, Chronic Disease is the local issue. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Wilkes

493B. International and Comparative Health Care—Clinical (3-9)
Clinical activity—30 hours. Prerequisite: consent of instructor. Restricted to UC Davis School of Medicine students only. Through a series of lectures, seminars and clinical experiences, all occurring in other nations, students will research how health care systems address critical health issues. In 2007, Chronic Disease is the local issue. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Wilkes

493QA. Improving Quality in Health Care (3)
Lecture—8 hours; discussion/laboratory—10 hours; project—10 hours. Prerequisite: consent on instructor. Working in interdisciplinary teams, will explore the theory and practical methods being employed to make improvement in health care systems while providing an opportunity for interprofessional educational experience. (Same course as Nursing 493A.) (H/P/F grading only; deferred grading only, pending completion of sequence.)—I. (I) Bakerjian, Shaikh

493QB. Improving Quality in Health Care (3)
Lecture—8 hours; discussion/laboratory—10 hours; project—10 hours. Prerequisite: consent on instructor. Working in interdisciplinary teams, will explore the theory and practical methods being employed to make improvement in health care systems while providing an opportunity for interprofessional educational experience. (Same course as Nursing 493B.) (H/P/F grading only; deferred grading only, pending completion of sequence.)—II. (II) Bakerjian, Shaikh

493QC. Enhancing Patient Safety in Health Care (6)
Seminar—6 hours; clinical activity—8 hours; discussion—6 hours. Prerequisite: fourth-year Medical student; consent of instructor. Interprofessional module is designed to expose the theory and practical methods being employed to improve patient safety in health care while providing an opportunity for interprofessional educational experience. (Same course as Nursing 493C). (P/F grading only)—I, II, III, IV. (II, II, III, IV) Bakerjian, Natale

495. Medicine Literature Review (1-9)
Discussion—3-27 hours. Prerequisite: medical student in good academic standing and permission of the Associate Dean of Curricular Affairs. Independent study: topics for selection include, but are not restricted to, medical ethics, economics and jurisprudence, culture and medicine, and medical anthropology. (P/F grading only.)

497A. Scholarly Project (2)
Seminar—0.25 hours; independent study—0.5 hours. Prerequisite: project proposal must be accepted by the Scholarly Project Executive Committee (SPEC). Restricted to fourth year medical school students only. Develop a research project on a focused topic area, implements the research, writes a publishable paper, and presents an oral summary of the project. (Deferred grading only, pending completion of sequence. H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Schaefer

497B. Scholarly Project (2)
Seminar—0.25 hours; independent study—0.5 hours. Prerequisite: Project proposal must be accepted by the Scholarly Project Executive Committee (SPEC). Restricted to fourth year medical school students only. Develop a research project on a focused topic area, implements the research, writes a publishable paper, and presents an oral summary of the project. (Deferred grading only, pending completion of sequence. H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Schaefer

497C. Scholarly Project (2)
Seminar—0.25 hours; independent study—0.5 hours. Prerequisite: Project proposal must be accepted by the Scholarly Project Executive Committee (SPEC). Restricted to fourth year medical school students only. Develop a research project on a focused topic area, implements the research, writes a publishable paper, and presents an oral summary of the project. (Deferred grading only, pending completion of sequence. H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Schaefer

499. Research in Medical Education and Curriculum Development (4-9)
Independent study—10-36 hours. Prerequisite: medical student in good standing and competency with computers. Research and development of an independent project related to expanding computer-assisted resources in support of the MD curriculum at UC Davis. (H/P/F grading only)—I, II, III, IV. (II, II, III, IV)

Departmental Courses:

Anesthesiology and Pain Medicine (ANE)

Upper Division

192. Internship in Anesthesiology (1-6)
Internship—3-18 hours. Prerequisite: upper division standing; approval of project prior to period of internship by preceptor. Supervised work experience in anesthesia and pain medicine (P/F grading only)—I, II, III, IV. (I, II, III, IV)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/F grading only)

Professional

461. Anesthesiology Clinical Clerkship (3-18)
Prerequisite: medical student. In-depth exposure to anesthesiology through informal lectures and mentoring by anesthesiologists. Emphasis on understanding of anesthetic principles in managing administration of general, regional, and specialized anesthetic procedures. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Yao

461. Perioperative Medicine (3-12)
Clinical activity—30 hours. Prerequisite: successful completion of third-year clerkship; consent of IOR. Two week rotation provides a broad exposure to various patient care services within the Department of Anesthesiology and Pain Medicine to apply medical knowledge to safely care for patients. (H/P/F grading only)—I, II, III, IV. (II, II, III, IV) Pins

463. Multidisciplinary Pain Management (6)
Clinical activity—30 hours; lecture/discussion—10 hours. Prerequisite: senior medical student in good standing. Senior clerkship to expose students to all facets of treating pain in all aspects of clinical care: outpatient and inpatient settings, acute and chronic pain, end of life issues, pediatrics, rehabilitation, etc. Daily clinics, rounds, and lectures. (H/P/F grading only)—I, II, III, IV. (II, II, III, IV) Singh

465. Away Acting Internship in Anesthesiology (3-18)
Clinical activity—40 hours. Prerequisite: satisfactory completion of Anesthesiology Clerkship; consent of instructor. Work at the level of a sub intern in inpatient and/or outpatient settings. Expectation is to provide direct patient management. May be repeated for credit. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Yao

480. Brief Introduction to Clinical Anesthesiology and Chronic Pain Management (3)
Clinical activity—25-30 hours (two weeks). Prerequisite: second-year medical student. Daily experience in clinical anesthesiology at the preoperative screening unit, operating room, post anesthetic care unit, chronic pain management clinic with daily clinical correlation case discussions, and one-on-one interac-
tion with faculty anesthesiologists. (H/P/F grading only)—I, II. (II) Fraulini

493B. Interdisciplinary Medicine in Pain Care (6)
Lecture—5 hours; lecture/laboratory—10 hours; laboratory—16 hours; clinical activity—4 hours. Prerequisite: consent of instructor; UC Davis School of Medicine students only. This course will review and demonstrate the application of basic physiology and pharmacology to patient care. There will be an in-depth analysis of the physiology and pharmacology of the cardiovascular, pulmonary, nervous, renal and endocrine systems. Limited enrollment. (H/P/F grading only)—I, II. (II) Fleming

499. Anesthesiology Research (4-18)
Laboratory—12-54 hours. Prerequisite: third- or fourth-year medical students, advanced standing undergraduate and veterinary medicine students; or consent of instructor. Problems in clinical and/or laboratory research. May be repeated for credit. (H/P/F grading only for medical students.)—I, II, III, IV. (II, II, III, IV)

Biological Chemistry (BCM)

Lower Division

92. Internship in Biological Chemistry (1-12)
Internship—3-36 hours; final report. Prerequisite: consent of instructor. Supervised work experience in biological chemistry and related fields. (P/F grading only)

Upper Division

192. Internship in Biological Chemistry (1-12)
Internship—3-36 hours; final report. Prerequisite: upper division standing; approval of project prior to internship by preceptor. Supervised work experience in Biological Chemistry and related fields. (P/F grading only)

198. Group Study (1-5)
Prerequisite: consent of instructor. For undergraduate students desiring to explore particular topics in depth. Lectures and conferences may be involved. (P/F grading only)

Quarter Offered: Fall, II—Winter, III—Spring, IV—Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): AH—Arts and Humanities; SC—Science and Engineering; SS—Social Sciences; DD—Domestic Diversity; WRW—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SC—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WRW—Writing Experience
199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

Graduate

209. Prostaglandins/Leukotrienes and Related Lipids (2)

217. Molecular Genetics of Fungi (3)
Lecture—3 hours. Prerequisite: graduate standing in a biological science. Biochemistry 101B; Genetics 100, 102A; Botany 119; Plant Pathology 130, 215X. Microbiology 215 recommended. Advanced treatment of molecular biology and genetics of filamentous fungi and yeasts, including gene structure, organization and regulation; secretion; control of reproduction; molecular evolution; transformation; and gene manipulation. Offered in alternate years. [Same course as Plant Pathology 217. — II. Holland, Tyler]

222. Mechanisms of Translational Control (2)
Lecture—1 hour; discussion—1 hour. Prerequisite: Biochemistry 201C or consent of instructor. Molecular mechanisms of protein synthesis and translational control in eukaryotic cells, with emphasis on mammalian cells and their viruses. An advanced graduate level treatment of topics of current interest, with readings and discussion of primary papers from the literature. Offered in alternate years. — II. HERSHEY

230. Practical NMR Spectroscopy and Imaging (1)
Lecture—1 hour. Prerequisite: Chemistry 107A-107B, Physics 5A-5B-5C or 9A-9B-9C, or consent of instructor. Basic theory, experimental methods, and instrumentation of NMR. Enables students to understand NMR spectroscopy and imaging experiments. (S/U grading only). — I. I.

231. Biological Nuclear Magnetic Resonance (3)
Lecture—3 hours. Prerequisite: Molecular and Cellular Biology 221A or equivalent or consent of instructor. Principles and applications of magnetic resonance in biomedicine. Fundamental concepts and the biophysical basis for magnetic resonance applications in areas of tissue characterization, imaging, metabolic regulation, and cellular bioenergetics. (Same course as Biophysics 231). — III. Jue

291. Seminar in Genetic Approaches to Pathogenesis of Human Disease (1)
Seminar—1 hour. Prerequisite: student in Genetics Graduate Group of consent of instructor. Current genetic approaches to understanding the pathogenesis of disease and mammalian development presented and critically discussed by faculty, fellows and students. Topics include Mendelian and non-Mendelian diseases, imprinting, homologous recombination, statistical methods, genetic epidemiology and cell cycle dependent expression. (Same course as course 491.) [S/U grading only]. — I, II, III, IV, I, II, III, IV

299. Group Study (1-5)
Prerequisite: consent of instructor. For graduate students desiring to explore particular topics in depth. Lectures and conferences may be involved.

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only.)

Professional

410A. Genetics and Molecular Medicine (4)
Lecture—3 hours; discussion—3 hours; web virtual lecture—1 hour. Prerequisite: consent of instructor. Medical Students Only. Based on the clinical and genetic consequences of disease. Molecular aspects of human disease are highlighted throughout the course. (Same course as Pediatrics 420.) (P/F grading only; deferred grading only, pending completion of sequence.) — I, IV, I, IV. G. SAWYER

491. Seminar in Genetic Approaches to Pathogenesis of Human Disease (1)
Seminar—1 hour. Prerequisite: student in Genetics Graduate Group of consent of instructor. Current genetic approaches to understanding the pathogenesis of disease and mammalian development presented and critically discussed by faculty, fellows and students. Topics include Mendelian and non-Mendelian diseases, imprinting, homologous recombination, statistical methods, genetic epidemiology and cell cycle dependent expression. (Same course as course 491.) [P/F grading only]. — I, II, III, IV, I, II, III, IV

493. Medical Genomics (6)
Clinical activity—4 hours; lecture—4 hours; laboratory—12 hours. Prerequisite: consent of instructor. Four-week module covering the clinical applications and applications of medical genomics. Topics will include an introduction to the human genome and human genomics, genetic and epigenetic variation and the ethics of genetic testing. (P/F grading only). — I, II, III, IV, I, II, III, IV. H. HERMAN, S. G. SAWYER

497T. Tutoring in Biological Chemistry (1-5)
Tutoring—3-15 hours. Prerequisite: advanced standing or consent of instructor. Assist instructor by tutoring medical students in preparation for one of the departmental courses that is a component of the required curriculum of the School of Medicine. (H/P/F grading only.)

498. Group Study (1-5)
Prerequisite: medical students with consent of instructor. (P/F grading only.)

499. Research (1-12)
Prerequisite: medical students with consent of instructor. (H/P/F grading only.)

Courses in Cell Biology and Human Anatomy (CHA)

Upper Division

101. Human Gross Anatomy (4)
Lecture—4 hours. Prerequisite: Biological Sciences 2A, concurrent enrollment in Exercise Biology 106L or course 101L strongly recommended. Upper division students only. Pass one open to upper division Exercise Biology or Anthropology majors only; Pass 2 open to Seniors in any major; Open enrollment at the start of the quarter for upper division students in any major. Detailed study of the gross anatomical structure of the human body, with emphasis on function and clinical relevance to students entering health care professions. (Same course as Exercise Biology 106.) GE credit: SciEng | SE—II. [S/U grading only].

101L. Human Gross Anatomy Laboratory (3)
Laboratory—9 hours. Prerequisite: Biological Sciences 2A, must take Exercise Biology 106 or course 101L concurrently (or have already completed). Upper division students only, Pass one open to upper division Exercise Biology or Anthropology majors only; Pass 2 open to Seniors in any major; Open enrollment at the start of the quarter for upper division students in any major; mandatory attendance on first day of lab. Detailed study of protected human cadavers in small group format with extensive hands-on experience. (Same course as Exercise Biology 106L.) GE credit: SciEng | SE. — II. I. Gross

192. Internship in Morphology (1-12)
Internship—3-36 hours; final report. Prerequisite: upper division standing; laboratory science experience including some chemistry; approval of project by preceptor prior to period of internship. Experience of supervised internship in research laboratories of members of the department. (P/NP grading only.)

197T. Tutoring in Cell Biology and Human Anatomy (1-5)
Discussion—1 hour; laboratory—6-9 hours. Prerequisite: completion of course 101 with a grade of B or better and consent of instructor. Provides laboratory instruction in gross and microscopic human anatomy, with small groups of undergraduates under the supervision of the instructor. (S/U grading only)

200. Graduate Human Gross Anatomy (6)
Lecture—4 hours; laboratory—6 hours. Prerequisite: consent of instructor. Lectures on human gross anatomy and cadaver dissection laboratory. Topics arranged by region; emphasis on osteology, neuromuscular anatomy, cardiovascular anatomy, gastrointestinal anatomy and anatomy of reproductive systems. Only two under 200 level students will have completed course 101. Open only to full-time graduate students. — II. I. BLANKENSHIP, G. TUCKER

202. Human Microscopic Anatomy (5)
Lecture—3 hours; laboratory—6 hours. Examines the normal microscopic structure of the basic cells, tissues, and organs of the body. Lectures emphasize morphology and structure-function relationships. Accompanying laboratory exercises involve analysis and identification of sectional material at the light microscopic and ultrastructural levels. — II. S. BECK

203. Neurobiology (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: two upper division or one graduate course in Neurobiology, consent of instructor. Physiology and anatomy of the normal human nervous system in an integrated format. — III. [S/U grading only].

290. Seminar (1)
Seminar—1 hour. Prerequisite: consent of instructor. (S/U grading only). — I, III, I, III

290C. Research Group Conference (1)
Discussion—1 hour. Prerequisite: graduate student with research experience (may be taken concurrently); consent of instructor. Discussion of problems, progress and literature relevant to current research undertaken by laboratory groups in Human Anatomy. (S/U grading only). — I, II, III, I, II, III

298. Advanced Group Study (1-5)
Prerequisite: consent of instructor.

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only.)

Professional

400. Developmental, Gross, and Radiologic Anatomy (7.5)
Lecture—2 hours; laboratory—5 hours. Prerequisite: consent of Committee on Educational Progress. Medical Students only. An integrated presentation of developmental, gross and radiologic anatomy. Embryology and radiology correlated with the dissection of the entire body. Embryology from implantation to birth. (Deferred grading only, pending completion of sequence.) (P/F grading only). — I, IV, I, IV. TUCKER
402. Cell and Tissue Biology (4.5) Lecture—2 hours; laboratory—4 hours. Prerequisite: approval of Student Director. Only Medical Students only. Microscopic structure of the basic cells, tissues and organs of the body with an emphasis on how structure explains function. Analysis and discussion of sections of both light microscopic and ultrastructural levels. (Deferred grading only, pending completion of sequence) (P/F grading only)—I, II, IV Beck

403. Medical Neuroanatomy (5) Lecture—3 hours; discussion/laboratory—10 hours; laboratory—16 hours; clinical activity—4 hours. Prerequisite: consent of instructor. Restricted to School of Medicine students only. Anatomy of the human nervous system. Focus on gross external and internal morphology of brain and spinal cord, and function, neuroanatomy of motor, sensory and cognitive systems. Incorporates application of neuroanatomy to clinical problem solving. (Same course as Surgery 493.) (P/F grading only)—I, IV Blankenship, Gross

493. Clinically-Oriented Anatomy Special Study Module (6) Seminar—10 hours; laboratory activity—14 hours; autobiography—10 hours; independent study—10 hours. Prerequisite: consent of instructor; UC Davis School of Medicine students only. All attend the following laboratory and laboratory modules for courses 400 and 402 during the four-week section (approximately seven anatomy labs and three to four histology labs); tutor last-year students during the laboratory sessions; prepare and present a clinical correlate session. (H/P/F grading only)—I, II, III, IV. (II, III, IV) Beck, Gross, Fitzgerald, Tucker

497T. Tutoring in Human Anatomy (1-5) Tutoring—3-15 hours. Prerequisite: advanced standing or consent of instructor. Assist instructor by tutoring medical students in preparation for one of the Department of Anatomy’s required curriculum for the School of Medicine. (H/P grading only)

498. Advanced Group Study (1-12) Lecture—2 hours; laboratory study—10 hours. Prerequisite: successfully complete course 400, block 1; restricted to medical students only. Anatomical study of the heart, thoracic cavity, abdomen, pelvis, extremities, vascular system, peripheral nervous system and central nervous system. Focus on the understanding of anatomy related to common surgical interventions. (Same course as Surgery 492.) (H/P grading only)—I, II, III, IV. (I, II, III, IV) Blankenship, Khatri

493B. Anatomy Medical Education Special Study Module (6) Lecture—25 hours; discussion—10 hours. Prerequisite: completed one of the following courses: MD, DDS, DMD, OD, ND, DO, PharmD, DVM, PhD or DNS in nursing; application and acceptance into the Clinical Research Graduate Group, K30 program or other SOM/CTSC training programs; consent of instructor. Anatomy and physiology of conducting clinical epidemiologic research. Familiarity with three basic study designs (cross-sectional, case-control, and cohort). Discussion of principles of measurements in clinical epidemiological studies, basic methods for analyzing data, and ethical issues involved in conducting research. (Formerly Medical Sciences 462CR.) (S/U grading only)—IV. (IV) McCurdy, Romano

202. Introduction to Clinical Epidemiology and Study Design (3) Lecture—25 hours; discussion—10 hours. Prerequisite: completed one of the following degrees: MD, DDS, DMD, OD, ND, DO, PharmD, DVM, PhD or DNS in nursing; application and acceptance into the Clinical Research Graduate Group, K30 program or other SOM/CTSC training programs; consent of instructor. Anatomy and physiology of conducting clinical epidemiologic research. Familiarity with three basic study designs (cross-sectional, case-control, and cohort). Discussion of principles of measurements in clinical epidemiological studies, basic methods for analyzing data, and ethical issues involved in conducting research. (Formerly Medical Sciences 462CR.) (S/U grading only)—IV. (IV) Magruder, Romano

203. Methods in Clinical Research (5) Lecture—3 hours; discussion—2 hours. Prerequisite: completed one of the following degrees: MD, DDS, DMD, OD, ND, DO, PharmD, DVM, PhD or DNS in nursing; application and acceptance into the Clinical Research Graduate Group, K30 program or other SOM training programs; consent of instructor. Overview of major approaches to clinical research, including health services research, research techniques, informatics, GCRIC, and preclinical methodologies to enhance clinical projects. Overview of UCD clinical research support infrastructure. Methodologies applicable to clinical research and interdisciplinary perspectives. (Formerly Medical Sciences 463CR.) (S/U grading only)—IV. (IV) Berglund, Kravitz, Murphy

204. Responsible Conduct of Research (3) Lecture—3 hours. Prerequisite: consent of instructor; completed one of the following degrees: MD, DDS, DMD, OD, ND, DO, PharmD, DVM, PhD or DNS in nursing. Application and acceptance into the Clinical Research Graduate Group, K30 program or other SOM training programs. The nine NIH-man- dated modules: Data Acquisition and Reporting, Mentor Training, Publication Practices and Authorship, Peer Review, Collaborative Science, Human Subjects, Research with Animals, Conflict of Interest, Research Misconduct, and Entrepreneurship/Industry Collaborations/Intellectual Property/Technology Transfer. (Former course Medical Sciences 464CR.) (S/U grading only)—IV. (IV) Kon, Wun

205. Introduction to Medical Statistics (4) Lecture—3 hours; laboratory—2 hours. Prerequisite: completed one of the following degrees: MD, DDS, DMD, OD, ND, DO, PharmD, DVM, PhD or DNS in nursing; application and acceptance into the Clinical Research Graduate Group, K30 program or other SOM training programs of instructor. Biomedical applications of statistical methods in clinical, laboratory, population medicine. Graphical/tabular data presentation, probability, binomial, Poisson, normal, t, variance distributions, elementary nonparametric methods, simple linear regression/correlation, life tables. Microcomputer applications of statistical procedures in population medicine. (Former course Medical Sciences 465CR.) (S/U grading only)—IV. (IV) Yang

220. Basics of Stem and Progenitor Cells (1) Lecture—1 hour. Prerequisite: Molecular, Cellular, and Integrative Physiology 200, 200L; consent of instructor; graduate standing. This is a lecture course designed for graduate students who have experience in cell culture techniques. It is designed to give a broad overview of the field and current cells of interest to the greater research community. (S/U grading only)—I, II, III, IV. (III) Tanouye

222. Ethical Issues in Stem Cell Biology (1) Lecture/discussion—1 hour. Prerequisite: consent of instructor; graduate standing. Critical presentation and analysis of recent articles in stem cell biology and small group discussions of the ethical issues surrounding this area of research. (S/U grading only)—II. (II) Kemoto, Rich

230. Congestive Heart Failure, Mechanism of Disease (3) Lecture/discussion—2 hours; project—3 hours. Prerequisite: consent of instructor and graduate standing; completion of course 250. Cutting edge techniques used in clinical research such as electrophysiology, cardiovascular surgery, cardiac catheterization and echocardiography, team science, and patient management. Lectures are presented by experts on each technique, with an emphasis on use in translational research. (S/U grading only)—I, II, III, IV, (I, II, III, IV)

233. Molecular Mechanisms of Disease: Cancer (3) Lecture/discussion—2 hours; project—3 hours. Prerequisite: consent of instructor. Restricted to students pursuing the designated emphasis in Translational Research; graduate standing; cutting edge research on underlying mechanisms of cancer development, progression and prevention - clinical trials/ drug development, signaling pathways and molecular mechanisms of cancer development, recent basic research on cancer stem cells, genetics and epigenetic events and animal models used. (II) Goldkorn

250. Predoctoral Clinical Research Training Program Research Project Research Integration (1) Seminar—0.5 hours; discussion—0.5 hours. Prerequisite: consent of instructor and enrollment in the Predoctoral Clinical Research Training Program in the College of Medicine. Students register for this course; are assigned a journal club, seminar/discussion, and research integration sessions. May be repeated three times for credit (S/U grading only)—I, II, III, (II, III)

250. Integrating Medicine Into Basic Science (1) Lecture—3.75 hours; discussion—6 hours; seminar—2.5 hours; clinical—8 hours. Prerequisite: consent of instructor; graduate standing; acceptance into HHMI Integrating Medicine into Basic Science program. Four-week summer institute consisting of didactic lectures, reading assignments, group discussions, and clinical rotations to acculturate students to the medical environment. Cutting edge techniques used in clinical research such as electrophysiology, cardiovascular surgery, cardiac catheterization and echocardiography, team science, and patient management. Lectures are presented by experts on each technique, with an emphasis on use in translational research. (S/U grading only)—I, II, III, IV. (I, II, III, IV) Kenyon

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer. 2015-2016 offering in parentheses.
290C. Literature in Translational Research (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Critical presentation and analysis of recent journal articles in translational research by students. May be repeated for credit. (S/U grading only.)—I, II, III, IV. (I, II, III, IV) Knowlton

290D. Literature in Translational Research (1)
Discussion—1 hour. Prerequisite: consent of instructor; graduate standing. Critical presentation and analysis of recent journal articles in translational research by students. May be repeated for credit. (S/U grading only.)—I. (I) Knowlton

298. Group Study in Clinical Research (1-5)
Prerequisite: consent of instructor. Special topics in Clinical Research appropriate for group study at the graduate level. Restricted to students enrolled in the Mentored Clinical Research Training Program. (S/U grading only.)

299. Clinical Research (1-5)
Prerequisite: consent of instructor. Independent research and special topics in clinical research appropriate for graduate level. Restricted to students enrolled in the Mentored Clinical Research Training Program. (S/U grading only.)

Dermatology (DER)

Upper Division

192. Internship in Cutaneous Biology (1-4)
Internship—8-20 hours; final report. Prerequisite: upper division standing or consent of instructor. Approval of project prior to internship by preceptor. Supervised work experience involving research on the skin. (P/NP grading only.)—Isserof, Izumiya, Liu, Murphy, Takada

199. Special Study in Cutaneous Biology (1-12)
Prerequisite: advanced undergraduate standing and/or consent of instructor. Special study by individual arrangement of specialized topics in biology of skin. May be repeated for credit. (P/NP grading only.)—Isserof, Izumiya, Liu, Murphy, Takada

Graduate

299. Research in Cutaneous Biology (1-12)
Laboratory—3.6 hours. Prerequisite: consent of instructor. Independent research in cellular and biochemical mechanisms of cutaneous biology and pathology. (S/U grading only.)—Isserof, Izumiya, Liu, Murphy, Takada

Professional

420. Integumentary System (2)
Lecture/discussion—3 hours; clinical activity—0.25 hours. Prerequisite: approval of School of Medicine Committee on Student Promotions. Restricted to Medical students only; student must have passed all SOM Year 1 courses. Cell biology, pathology, and physical diagnosis of the skin. Recognition of normal variations and common or important dermatoses. Patient demonstrations of select conditions. (P/F grading only.)—I, II, Espan, Isserof

466. Away Acting Internship in Dermatology (3-18)
Clinical Activity—70 hours; lecture—6 hours. Prerequisite: consent of instructor. Work at the level of a sub intern in inpatient and/or Outpatient settings. Expectation is to provide direct patient management. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Fazel

470. Introduction to Dermatopathology (6)
Clinical—20 hours; independent study—20 hours; lecture/discussion—6 hours. Prerequisite: previous rotation in a Dermatology Clerkship, consent of instructor. Restricted to fourth-year medical student. Integrated, multi-specialty approach to the microscopic diagnosis of inflammatory and neoplastic skin disorders. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Bar, Fung, Komorowski

480. Insights in Dermatology (1-3)
Clinical activity—3-9 hours. Prerequisite: first- and second-year medical students in good academic standing; consent of instructor. Clinical experience limited to observation of delivery of dermatologic care and attendance at some conferences. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV)

495. Wound Healing: From Bench to Bedside (6)
Clinical activity—12 hours; laboratory—8 hours; autotutorial—15 hours; term paper. Prerequisite: medical students only. An integrated, multi-specialty approach to clinical soft tissue wound healing. —I, II, III, IV. (I, II, III, IV) Armstrong

498. Special Topics in Clinical Dermatology (1-6)
Independent study—3-18 hours. Prerequisite: medical students with consent of instructor. Individually arranged study of special topics in clinical dermatology determined by student and instructor. Assigned readings and/or clinical examination of selected patients. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Armstrong

499. Research in Cutaneous Biology (1-12)
Laboratory—3.36 hours. Prerequisite: consent of instructor. Research, either laboratory or clinical, on ongoing projects within the department under supervision of faculty. (P/F grading only.)—Armstrong Emergency Medicine (EMR)

Lower Division

92. Emergency Medicine Clinical Research Internship (1-4)
Prerequisite: undergraduate student in good academic standing at UC Davis; consent of instructor. This course is intended to give the undergraduate student an opportunity to conduct “hands-on” clinical research in the Emergency Department. Through the lecture/discussion, students will learn the basics of conducting and developing clinical research studies, using examples from ongoing studies. May be repeated for credit up to four units. Units awarded will depend on hours worked. —I, II, III, IV. (I, II, III, IV) Panacek

902. Emergency Medicine Survey (1-6)
Lecture—4 hours; discussion—16 hours; independent study—10 hours. Prerequisite: consent of instructor. Current health policy issues affecting emergency medicine. Participation in policy discussions, attend meetings with California Medicine, School of 403

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer. 2015-2016 offerings in parentheses:

Pre-Fall 2011 General Education (GE): AH=Arts and Humanities; SC=Science and Engineering; SE=Social Sciences; ACH=Dominant Cultures; ASC=Dominant Diversity; WRT=Writing Experience
Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SC=Science and Engineering; SE=Social Sciences; ACH=Dominant Cultures; ASC=Dominant Diversity; VL=Oral Skills; QT=Quantitative; SC=Scientific; VI=Visual; WC=World Cultures; WRT=Writing Experience
403FC. SJVP Longitudinal Primary Care Clerkship at UCSF (C) (2)

Clinical activity—45 hours; lecture—2 hours—workshop; 2 hours.
Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. (H/P/F grading only; deferred grading only, pending completion of sequence.)—I. (III.) Eidson-Ton, Vierra

430TA. TeachMS Longitudinal Primary Care Clerkship (A) (4)

Clinical activity—45 hours; lecture—2 hours—workshop—2 hours.
Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Internal Medicine and Psychiatry for 24 weeks.

430TB. TeachMS Longitudinal Primary Care Clerkship (B) (6)

Clinical activity—45 hours; lecture—2 hours; workshop—2 hours.
Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Internal Medicine and Psychiatry for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. (H/P/F grading only; deferred grading only, pending completion of sequence.)—I. (II, III) Nesbit

Professional

401. Introductory Preceptorship in Family Practice (3-9)

Clinical activity—20-40 hours. Prerequisite: completion of first year of medical training. Preceptorship in family practice offers an introduction to clinical medicine. 20 hours or 40 hours per week in a family physician’s office, doing patient interviews, history-taking, and performing physical exams. (H/P/F grading only.)—I. (II, III) Eidson-Ton

405. The Healer’s Art (1)

Lecture—0.6 hours; workshop—3 hours. Prerequisite: consent of instructor. Limited to first-year medical students. Learning to strengthen your humanity and remain openhearted to awake the difference between professional burnout and a fulfilling life. Opportunity to learn tools for self care, healing loss, finding meaning, strengthening commitment and becoming a true healer. (P/F grading only.)—II. (I) Eidson-Ton, Neyhart

411. Selected Studies of Systems for Chronic Illness Care (3)

Clinical activity—4 hours; discussion—4 hours. Prerequisite: course 405A, 405B, 406C, medical students with consent of instructor. Understanding of chronic illness, particularly diabetes, participation in patient care, alternative techniques. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Fong

430. Primary Care Clerkship (12)

Clinical activity—45 hours; lecture—2 hours; workshop—2 hours. Prerequisite: approval by School of Medicine Committee on Student Progress.

430FA. SJVP Longitudinal Primary Care Clerkship at UCSF (A) (4)

Clinical activity—45 hours; lecture—2 hours; workshop—2 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructors. Longitudinal Clerkship runs concurrently, with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. (H/P/F grading only; deferred grading only, pending completion of sequence.)—I. (I) Eidson-Ton, Vierra

430FB. SJVP Longitudinal Primary Care Clerkship at UCSF (B) (6)

Clinical activity—45 hours; lecture—2 hours; workshop—2 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently, with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. (H/P/F grading only; deferred grading only, pending completion of sequence.)—II. (I) Eidson-Ton, Vierra

430TC. TeachMS Longitudinal Primary Care Clerkship (C) (2)

Clinical activity—45 hours; lecture—2 hours; workshop—2 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Internal Medicine and Psychiatry for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. On-going patient write-ups, rounds, conferences are required. (H/P/F grading only; deferred grading only, pending completion of sequence.)—III, IV. (I, II) Eidson-Ton, Henderson, Holt, Vierra

434. Primary Care Clinics-Clinica Tepati (3-12)

Clinical activity—32-36 hours; seminar—0-2 hours; lecture—1-2 hours. Open to medical students in all four years of medical school. Medical students will learn counseling, diagnosis and treatment of patients with chronic and acute disease under supervision of physician. Provides exposure to special health care needs of various ethnic and poverty-level populations. May be repeated for credit. (P/F grading only.)—I, II, III, IV. (I, II, III, IV) Fong

435. Primary Care Clinics-Imani Clinic (3-12)

Clinical activity—32-36 hours; seminar—0-2 hours; lecture—1-2 hours. Open to medical students in all four years of medical school. Medical students will learn counseling, diagnosis and treatment of patients with chronic and acute disease under supervision of physician. Provides exposure to special health care needs of various ethnic and poverty-level populations. May be repeated for credit. (P/F grading only.)—I, II, III, IV. (I, II, III, IV) Fong

436. Continuity Clinic in Primary Care—Shifa Clinic (3-12)

Clinical activity—32-36 hours; seminar—0-2 hours; lecture—1-2 hours. Open to medical students in all four years of medical school. Learning counseling, diagnosis and treatment of patients with chronic and acute disease under supervision of physician. Provides exposure to special health care needs of vari-
ous ethnic and poverty-level populations. May be repeated for credit. (P/F grading only.)—I, II, III, IV. (I, II, III, IV) Yaman-Ton

437. Primary Care Clinics-Knights Landing (3-12)
Clinical activity—2-3 hours; lecture—1 hour. Must complete an application and interview prior to registration. Experiences in diagnosis and treatment of patients with chronic and acute disease under supervision of physician. Provides exposure to special health care needs of various ethnic and poverty-level populations. Observations of the community of Knights Landing. May be repeated for credit. (P/F grading only.)—I, II, III, IV. (I, II, III, IV) Eidson-Ton

439D. Directed Clinical Studies in Family Medicine (1-12)
Clinical activity—40 hours. Prerequisite: consent of instructor. Individual directed studies in extended preparation for modified curriculum or to complete a clinical rotation following a leave of absence. May be repeated for credit. (P/F grading only.)—I, II, III, IV. (I, II, III, IV) Eidson-Ton

439R. Directed Studies in Family Medicine (1-12)
Clinical activity—40 hours. Prerequisite: completion of third-year primary care plus clerkship or consent of instructor. Individual directed studies in extended preparation for remediation of all or part of clinical rotation. Clinical studies to accommodate and satisfy remedial work as directed by the Community on Student Progress and approved by the course IOR. May be repeated for credit. (P/F grading only.)—I, II, III, IV. (I, II, III, IV) Eidson-Ton

449. Advanced Preceptorship in Family Medicine (3-18)
Clinical activity—40 hours. Prerequisite: completion of third-year primary care plus clerkship or consent of instructor. Individual directed studies in extended preparation for patients with common medical problems seen by primary care physicians in an outpatient setting. May be repeated up to 18 units of credit. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Eidson-Ton

450. CAM in Family & Community Health (3-18)
Variable—20-40 hours. Intended to grant units for away rotations; not offered at the UC Davis Medical Center. Complementary and alternative medicine courses at away institutions that cover various aspects of integrative medicine, including but not limited to: botanicals, homeopathy, mind/body, naturopathy, massage, traditional Chinese medicine, osteopathy, and energy medicine. Offered irregularly. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Eidson-Ton

460. Geriatrics in Community Health (3-6)
Fieldwork—24 hours; clinical activity—12 hours; lecture—4 hours. Prerequisite: course 430. Visits to community agencies including mental health teams, adult day health centers, a diagnostic and research center, and care management specialists. Observation and participation in MMSE’s, patient-family conferences, interdisciplinary team meetings, neuropsychiatric testing and home visit evaluations. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Eidson-Ton

468. International Preceptorship (3-12)
Clinical activity—40 hours. Prerequisite: medical student with consent of instructor. Preceptorship with a family practitioner in a foreign country (arranged by study center or with assistance of the Family and Community Medicine Department.) Participate in clinical activities, analyze and report characteristics of the practice. May be repeated up to 12 units of credit. Prerequisite: consent only.—I, II, III, IV. (I, II, III, IV) Eidson-Ton

469. Inpatient Acting Internship in Family Medicine (3-12)
Clinical activity—40 hours. Prerequisite: completion of third-year of medical school or consent of instructor. Opportunity to work with only. Comprehensive primary medical care of inpatients on a family medicine hospital service and in a family medicine outpatient clinic. May be repeated up to 12 units of credit. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Eidson-Ton

470. Inpatient Clinical Elective in Family Medicine (3-12)
Clinical activity—40 hours. Prerequisite: completion of third-year of medical school or consent of instructor. Open to medical students only. Comprehensive primary medical care of patients on a family medicine hospital service. Usually includes inpatient and outpatient experience. May be repeated up to 12 units of credit. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Eidson-Ton

475. Combined Inpatient/Outpatient Clinical Elective in Family Medicine (3-12)
Clinical activity—40 hours. Prerequisite: completion of third-year of medical school or consent of instructor. Open to medical students only. Combined inpatient and outpatient elective. Consists of comprehensive primary medical care of patients on a family medicine hospital service and in a family medicine outpatient clinic. May be repeated up to 12 units of credit. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Eidson-Ton

488. Selected Studies in Family Practice (1-9)
Prerequisite: medical students with consent of instructor. Assigned readings in family practice to increase understanding on selected topics relating to family medicine. May be repeated for credit. (P/F grading only.)—I, II, III, IV. (I, II, III, IV) Eidson-Ton

490. Health Care to Underserved Populations (1)
Lecture—1 hours. Prerequisite: Sociology, Political Science, or Applied Behavioral Science background recommended, or registration in medical school. Discusses sociocultural perspectives of underserved populations impacting health; roles of family/interpersonal relationships in making health care decisions; the nature of ethnic/racial/socioeconomic health care disparities; and clinicians’ perspectives in treating people of cultures which are unfamiliar and/or uncomfortable with Western medicine. May be repeated for credit. (P/F grading only.)—I, II, III, IV. (I, II, III, IV) Nesbit

493. Aging and Health (6)
Seminar—12 hours. Prerequisite: consent of instructor. Is disease specific to the inevitable consequence of aging? We will spend four weeks exploring this question by reviewing the biology of aging, physiologic changes seen in aged individuals and disease processes commonly found in elderly persons. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Lin, Neyhart

495. LGBTIQA Healthcare Lecture Series (1)
Lecture—6 sessions. Increase the awareness of medical issues surrounding the LGBTIQA community and arm students with knowledge of the health disparities the community faces. Provide better quality care to the LGBTIQA patients cared for by all physicians. May be repeated for credit. (P/F grading only.)—I, II, III, IV. (I, II, III, IV) Eidson-Ton

499. Research (1-12)
Directed reading, discussion and/or laboratory project. Prerequisite: senior standing in biology, chemistry, physics, psychology, or engineering. (P/NP grading only.)

Graduate

210A. Advanced Physiology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Physiology Ph.D. program, or consent of instructor. Advanced course in general concepts of physiology, surveying homeostasis, cellular and selected topics, and neurophysiology. (Same course as Physiology 210A.)—I. (I) Cale, Payne

298. Group Study (1-5)
Prerequisite: consent of instructor. For graduate students desiring to explore particular topics in depth. Lectures and conferences may be involved.

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only)

Professional

400. Human Physiology (6)
Lecture—3 hours; laboratory—2 hours. Medical student only. General and cellular physiology of neurons, muscle, and epithelial cells and systemic physiology of cardiovascular, respiratory, gastrointestinal, and renal systems. Deferred grading only, pending completion of sequence. (P/F grading only.)—I, IV. (I, IV) Payne, Widdicombe

403. Medical Neuroanatomy (5)
Lecture—3 hours; laboratory—1 hour; discussion/lab—1 hour. Prerequisite: Successful completion of course 400, block 1; restricted to medical students only. Anatomy of the normal human nervous system, to include gross external and internal morphology of brain and spinal cord, and function neuroanatomy of motor, sensory and cognitive systems. Incorporates application of neuroanatomy to clinical problem solving. (Same course as Cell Biology and Human Anatomy 403F.) (P/F grading only.)—I, IV. (I, IV) Blankenship, Gross

493. Physiological Principles in SICU SSM (6)
Lecture—5 hours; lecture/laboratory—10 hours; laboratory—16 hours; clinical rounds—4 hours. Prereq: consent of instructor; restricted to UC Davis School of Medicine students only. Special Study Module, a four week course on the topic: Care of the Critically Ill Surgical Patient: U.S. Physiological Principles to Guide Treatment of Patients with Common Surgical Problems. (Same course as Surgery 493SC) (P/F grading only.)—I, II, III, IV. (I, II, III, IV) Cota, Holcroft

497T. Tutoring in Human Physiology (1-5)
Tutoring—3-15 hours. Prerequisite: advanced standing or consent of instructor. Assist instructor by tutoring medical students in preparation for one of the required curriculum of the School of Medicine. (P/NP grading only.)—Cala
Internal Medicine (IMD)

Lower Division

92. Internship (1-4)

Internship—3-12 hours. Prerequisite: lower division standing and consent of instructor. Supervised internship in internal medicine and related fields. (P/NP grading only)—Last

98. Directed Group Study (1-2)

Seminar—1-2 hours. Prerequisite: lower division standing and consent of instructor. Directed group study in medicine and related fields. (P/NP grading only)—Last

99. Undergraduate Research in Medicine: Molecular and Cell Biology (1-3)

Prerequisite: consent of instructor. (P/NP grading only)—Last

Upper Division

164. Practicum in Community Health Clinic: Bayanihan Clinic (1-2)

Clinical activity—5 hours. Through active participation in the medical aspects of community health clinics, the undergraduate student gains knowledge of the organization, administration, and problem-solving capabilities. May be repeated for credit. (P/NP grading only)—I, II, III, IV (I, II, III, IV) Guerrero

192. Internship in Internal Medicine (1-12)

Internship—3-36 hours, final report. Prerequisite: upper division standing. Supervised work experience in internal medicine and related fields. (P/NP grading only)

194. Practicum in Community Health Clinics (1-3)

Clinical activity—5-15 hours on Saturday mornings and during the week as necessary, excluding holidays. Prerequisite: consent of instructor. The undergraduate student, through active participation in the medical aspects of community health clinics, gains knowledge of the organization, administration, and problem-solving capabilities of these primary care facilities. May be repeated for credit. (P/NP grading only)—I, II, III, IV (I, II, III, IV) Kumanogoda

198. Directed Group Study (1-2)

Seminar—1-2 hours. Prerequisite: consent of instructor. Directed group study in medicine and related fields. (P/NP grading only)—Last

199. Special Study for Advanced Undergraduates (1-3)

Prerequisite: upper division standing; consent of instructor. (P/NP grading only)

Graduate

214. Topics in Medical Ethics (1)

Seminar—1 hour. The complex moral, legal, and ethical dilemmas that patients, families, and health care providers face today’s clinic. May be repeated one time for credit. (S/U grading only)—I

220D. Cardiovascular System (2.5)

Lecture/discussion—5.5 hours. Prerequisite: Human Physiology 200, graduate student status and consent of instructor. Principles of etiology, mechanisms, diagnosis and management of the major diseases of the cardiovascular system. Included are ischemic, valvular, hypertensive, cardiomyopathic, pericardial, and conductive disorders. (I, II) Laslett

250. Medicine and the Law (3)

Lecture/discussion—2 hours; project—2 hours. Legal and bioethical principles and concepts in medicine. Topics include standard of care, informed consent, reproductive medicine, and end-of-life issues. (S/U grading only)—II Rich

290C. Controversies in Clinical Research (1)

Seminar—3 hours. Clinical Research Study design and data analysis related to controversial research areas. Presentations assigned to and given by faculty/student teams. May be repeated for credit. (S/U grading only)—II, III (III) Lane, Meyers

Professional

414. One Health: A Course on Global Health (1)

Conference—8 hours. Global health problems are complex and require culturally-sensitive, socially-acceptable, and action-oriented approaches to create practical and cost-effective solutions. Will examine major health problems created by the convergence of human, animal and environmental influences. May be repeated for credit. (P/F grading only)—I, II, III, IV, (I, II, III, IV) Wilkes

416. Summer Institute on Race and Health (6)

Independent study—30 hours. Prerequisite: consent of instructor. Limited enrollment. Using field trips, media, readings, and clinical experiences, 8-10 first year medical students will explore issues of race, health disparities and related issues in a 4 week institute during the summer break. (P/F grading only)—II, III Fancher, Fernandez, Garcia, Murray-Garcia

420A. Hematology (2)

Lecture/discussion—1 hour, discussion—1 hour. Prerequisite: consent of instructor. Restricted to Medical students only. Malignant disorders of blood cells and transfusion therapy. Covers acute leukemia, myelodysplasia, myeloproliferative disorders, lymphoma, and myeloma. (P/F grading only)—I, II O’Donnell

420B. Gastrointestinal System (2.5)

Lecture—2 hours; discussion—2 hours. Prerequisite: approval of Committee on Student Progress; medical student only. Basic pathophysiological principles of digestive diseases on which clinical concepts and judgments can be developed. Emphasis on pathophysiological basis of gastroenterological and hepatic disorders with discussion of major disorders and their diagnosis and management. (P/F grading only)—II, III, (II, III) Terrado

420C. Pulmonary & Critical Care Medicine (2.5)

Laboratory/discussion—5.5 hours. Prerequisite: approval of SOM’s Committee on Student Promotions. Restricted to Medical students only; student must pass all SOM Year 1 courses. Clinical aspects of respiratory and cardiac physiology, and pathology. Diagnostic procedures and a description of the major pulmonary diseases & disorders, and critical care medicine. (P/F grading only)—I, II Stollwerck

420D. Cardiovascular System (2.5)

Lecture/discussion—5.5 hours. Prerequisite: Approval of the School of Medicine Committee on Student Promotions. Restricted to Medical students only: student must pass all SOM Year 2 courses. Principles of etiology, mechanisms, diagnosis and management of the major diseases of the cardiovascular system. Included are ischemic, valvular, hypertensive, cardiomyopathic, pericardial, and conductive disorders. (H/P/F grading only)—I, II Venugopal

420E. Nephrology (2)

Lecture—2 hours; discussion—2 hours; laboratory—2 hours. Prerequisite: approval of Student Progress Committee. Fundamentals of disorders of body water, electrolytes and acid/base balance; major categories and mechanisms of parenchymal renal diseases; urinary tract infections. (P/F grading only)—II, IV Yeun

430. Medicine Clerkship (12)

Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress. Clerkship is divided into two, four-week blocks, one each at UCSF and Kaiser Hospitals. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence)—II, III (II, III) Aronowitz

430A. SJVP Longitudinal Medicine Clerkship at UCSF (A) (4)

Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence)—I, II Aronowitz, Johl

430B. SJVP Longitudinal Medicine Clerkship at UCSF (B) (6)

Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence)—III, (III) Aronowitz, Johl

430C. SJVP Longitudinal Medicine Clerkship at UCSF (C) (2)

Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence)—I, II Aronowitz, Johl

430T. TeachMS Longitudinal Medicine Clerkship (A) (4)

Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence)—I, II Aronowitz, Johl

430B. TeachMS Longitudinal Medicine Clerkship (B) (4)

Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence)—II, III Aronowitz, Johl

430C. TeachMS Longitudinal Medicine Clerkship (C) (2)

Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only; deferred grading only, pending completion of sequence)—II, III Aronowitz, Johl

439D. Directed Clinical Studies in Internal Medicine (1-12)

Clinical activity—40 hours. Prerequisite: consent of instructor. Individual directed studies in extended preparation for modified curriculums to complete a clinical rotation following a leave of absence. May be repeated for credit. (P/F grading only)—I, II, III, (I, II, III) Prescott

Quarter Offered: T-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; Div=Domestic Diversity; Wre=Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; AGCH=American Cultures; DD=Domestic Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; VL=Visual; WC=World Cultures; WE=Writing Experience
439R. Directed Studies in Internal Medicine (1-12)
Clinical activity—30 hours; independent study—10 hours. Prerequisite: consent of instructor. Individual directed studies in extended preparation for remediation of all or part of clinical rotation. Clinical studies are individualized to meet the needs of the student as directed by the Committee on Student Progress and approved by the course IOR. May be repeated for credit. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV)

450A. Medicine and the Law (1.5)
Seminar—2 hours; discussion—2 hours. Prerequisite: consent of instructor. Restricted to Medical students only. Legal and ethical principles and concepts in medicine. Topics include standard of care, informed consent, reproductive medicine, and end-of-life issues. Offered irregularly. (Deferred grading only, pending completion of sequence. H/P/F grading only.)—II. (II) Rich

450B. Medicine and the Law (1.5)
Seminar—2 hours; discussion—2 hours. Prerequisite: consent of instructor. Restricted to Medical students only. Legal and ethical principles and concepts in medicine. Topics include standard of care, informed consent, reproductive medicine, and end-of-life issues. Offered irregularly. (Deferred grading only, pending completion of sequence. H/P/F grading only.)—III. (III) Rich

459. Oncology: Research and Treatment of Cancer (2)
Lecture/discussion—2 hours. Prerequisite: second-, third-, or fourth-year medical student and/or consent of instructor. Comprehensive review of current treatment practices of cancer and state-of-the-art second-impact on the family and prevention of cancer. Emphasis on epidemiology, molecular biology, and pharmacology. (H/P/F grading only)—I. (II) DeCirigno

460. Correctional Health Care Clerkship (1-4)
Clinical activity—full time. Prerequisite: fourth-year medical student in good academic standing. Covers Correctional Health delivery and the effects of detention and incarceration on health status. Special emphasis on problems unique to health care delivery in a prison setting. Student will spend time in clinical settings at three prison facilities. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Silva

462. Medicine Wards AI (6)
Clinical activity—40 hours. Prerequisite: Medicinal Sciences 431; consent of instructor; demonstrated ability to accept responsibility. Limited enrollment. Assessment of active intern and all primary physician on medical ward under direction of medical resident and staff. Teams rotation every fifth night. Emphasis on evidence-based inpatient care. May be repeated for credit. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Johl

463. Acting Internship in Medicine Intensive Care Unit (MICU) (6)
Clinical activity—40 hours. Prerequisite: completion of third-year of medical school; consent of Director of MICU. Limited enrollment. At UCSDMC, student functions as acting intern on MICU service under direction of medical resident and staff. Responsibility for patients admitted to MICU. On call in hospital every fourth night. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Sandrock

464. Bayanihan Primary Care Clinic (3)
Clinical activity—6 hours. Prerequisite: consent of instructor. Restricted to medical students in all four years of medical school. Under the guidance and supervision of a physician, medical students will learn patient history taking, medical documentation, counseling, and diagnosis and treatment of patients with chronic and acute disease. Provides exposure to the special needs of various ethnic and socioeconomic groups. May be repeated for credit. (P/F grading only)—I, II, III, IV. (I, II, III, IV) Guerrero

465. Medicos-Global Health Sciences (9)
Lecture—5 hours; clinical activity—25 hours; fieldwork—5 hours; project—5 hours. Prerequisite: consent of instructor; medical students only. Travel to foreign country for four weeks to collaborate with faculty from local universities and work in urban and rural environments. Experiences are divided among visiting faculty and medical students. (P/F grading only.)—IV. (IV) Wilkes

468. Ambulatory Internal Medicine Elective (8)
Clinical activity—40 hours. Prerequisite: course 430; consent of instructor; demonstrated ability to accept responsibility. Limited enrollment. Hands-on primary care ethics and ambulatory setting supervised by a general internist. Emphasis on evidence-based outpatient care. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Henderson

470. Landmark Clinical Trials and Evidence-Based Medicine (3)
Lecture/discussion—10 hours; clinical activity—8 hours. Prerequisite: fourth-year medical student. Ten landmark clinical trials from a historical, clinical, and epidemiological point of view. Prerequisites of evidence-based medicine. (H/P/F grading only)—III. Kravitz, Amsterdam

480. Person Centered Assessment (1)
Lecture—1 hour. Prerequisite: open to all medical students. Person-centered assessment modalities and diagnostic approaches with regards to Internal Medicine and its different subspecialties. (P/F grading only)—I. Fitzgerald

494. Practicum in Community Health Clinics (1-3)
Clinical activity—15-40 hours. Prerequisite: medical student with consent of instructor. Students are assigned to clinical settings that demonstrate ethnic, urban/rural differences of community health. Through active participation in health care delivery, students are able to relate conceptual with practical aspects of primary health care. May be repeated for credit. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Kumagai

497. Medicine, Bioethics and the Holocaust (3)
Lecture/discussion—10 hours. Prerequisite: medical students only, consent of instructor. The concept of “evil” and the role of collaborators, bystanders and participants exemplified by the holocaust and compared to problems physicians face in practice today. Demonstration that evil emerges incrementally until taken for granted. (P/F grading only.) Offered irregularly—II, III.

498. Group Study in Internal Medicine (1-18)
Prerequisite: consent of instructor. Special study for medical students which may involve laboratory or library research, ambulatory or inpatient care. Consent required. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Meyers

499. General Medicine Research (1-18)
Independent study—20 hours. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Meyer

500. Internal Medicine—Cardiology (CAR)
Upper Division
192. Internship in Cardiology (1-18)
Internship—336 hours; final report. Prerequisite: upper division standing; approval of project by preceptor prior to internship. Supervised work experience in cardiology. May be repeated for credit up to 12 units. (P/NP grading only.)

199. Cardiology Research (1-5)
Prerequisite: consent of instructor. Special study by individual arrangement in cardiovascular medicine. Work will include directed readings, laboratory and discussions. (P/NP grading only.)

220. Basic Science in Cardiology (1)
Lecture—1 hour. Prerequisite: graduate or medical student status. Fundamentals underlying cardiovascular medicine. Including hemodynamics, neural control of the circulation, biochemistry and some experimental design and statistics. Experts in each of these fields will give current experience in these areas. Offered in alternate years. (S/U grading only.)—III. Kaufman

Professional
401. Clinical Cardiology Clerkship: Kaiser (3-18)
Clinical activity (4-weeks)—8-12 hours (hospital); 1-5 hours (clinics). Prerequisite: third-year medical students with advance approval by Division of Cardiology. Emphasis placed on history taking and physical examination of pediatric and adult patients with congenital and acquired cardiovascular disease. Hospital rounds in CUCU and elsewhere. The roles of ECG, PCG, and cardiac fluoroscopy, etc., in office cardiology will be evaluated. May be repeated for credit. Limited enrollment. (H/P/F grading only)—I, II, III, IV.

460. Cardiology Clinical Clerkship (3-18)
Clinical activity—full time (2-12 weeks). Prerequisite: Internal Medicine 430, third and fourth-year medical students in good academic standing with consent of instructor. Participation with members of subspecialty consultation service in initial clinical evaluation, work-up, management, and follow-up of patients with cardiac disorders. Twice weekly rotation in patient clinics per week. May be repeated for credit. Limited enrollment. (H/P/F grading only)—I, II, III, IV.

461. Management of Coronary Artery Disease: Coronary Care Unit (3-18)
Clinical activity (inpatient service)—full time (4 weeks). Prerequisite: completion of second year of medical school and advanced approval by Division of Cardiology. Research in laboratory and exercise testing to be determined by instructor. Current methods of clinical research involving certain aspects of diagnosis and treatment. Includes acute coronary care, hemodynamic monitoring, stress testing, cardiac catheterization, pathologic correlations and the modern approach to therapy, both medical and surgical, based on pathophysiological mechanisms. May be repeated for credit. Limited enrollment. (H/P/F grading only)—I, II, III, IV.

464. Preventive Cardiology (3-6)
Seminar—2 hours (for 2-4 weeks); clinical activity—full time (2-4 weeks). Prerequisite: completion of third year of medical school. Clinical experience, weekly seminar and reading on primary and secondary prevention of cardiovascular disease. Will be carried out in Lipid and Hypertension Clinics, Exercise Laboratory, Cardiac Care Unit, Cardiac Catheterization, and Cardiac Surgery Unit. Consent required. (H/P/F grading only)—II, III, IV. (II, III, IV) Amsterdam

480. Insights in Cardiology (1-3)
Clinical activity—3-9 hours. Prerequisite: medical student in good academic standing and approval by Division of Cardiology. Students attend one or more cardiovascular medicine clinics: general, hypertension, arrhythmia. Introduction to the diagnosis/treatment of common cardiovascular problems. (H/P/F grading only)—I, II, III, IV.

493. Gender Specific Medicine (SSM) (6)
Lecture—5 hours; lecture/laboratory—10 hours; laboratory—16 hours; clinical activity—4 hours. Prerequisite: consent of instructor; restricted to UC Davis School of Medicine students only. Special Studies Module, a four week course on the topic: Basic Science Principles Relating to Gender Specific Medicine. (Same course as Obstetrics & Gynecology 493.) (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Sweet, Villablanca

498. Special Group Study: EKG Unit (1-12)
Special study—2-week sessions. Prerequisite: medical students with advance approval by monthly attending faculty. Special group study in cardiology for medical students in EKG unit. May include lectures, directed readings, laboratory and discussions. May be repeated for credit. Limited enrollment. (H/P/F grading only)
409. Research (1-12)  
Prerequisite: approval by Division of Cardiology.  
(H/P/F grading only.)

Internal Medicine—Endocrinology, Diabetes and Metabolism (EMN)  

Upper Division  
192. Internship in Endocrinology (1-12)  
Internship—3-36 hours; final report. Prerequisite: upper division standing; approval of project by preceptor prior to internship. Supervised work experience in endocrinology. May be repeated for credit up to 12 units. (P/NP grading only.)

Graduate  
299. Research (1-12)  
Prerequisite: consent of instructor. Endocrinology research. (S/U grading only)

Professional  
460. Endocrinology Clinical Clerkship (3-18)  
Clinical activity (inpatient-outpatient service)—full time (3 days per week). Prerequisite: Internal Medicine 430 and/or consent of instructor. Participation with members of subspecialty service in the initial evaluation, work-up, management and follow-up of patients with endocrinologic disorders. Limited enrollment. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV)

485. Introduction to Health Care Ethics (1-3)  
Clinical activity—3-9 hours; oral presentation. Prerequisite: student in good academic standing and consent of instructor. First- or second-year students observed in morning Endocrine and Diabetes clinics and attend bi-weekly noon and afternoon endocrine conferences. They also give brief endocrine physiology oral presentation to the endocrine group. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV)

499. Research (1-12)  
Prerequisite: consent of instructor. (H/P/F grading only)

Internal Medicine—  
Gastroenterology (GAS)  

Upper Division  
192. Internship in Gastroenterology (1-12)  
Internship—3-36 hours; final report. Prerequisite: upper division standing; approval of project by preceptor prior to internship. Supervised work experience in gastroenterology. May be repeated for credit up to 12 units. (P/NP grading only.)

Graduate  
299. Research (1-12)  
Research in gastroenterology. (S/U grading only)

Professional  
460. Gastroenterology Clinical Clerkship (3-18)  
Clinical activity—30 hours. Prerequisite: completion of third year of medical school. Work-up, manage, and follow-up new patients on active inpatient consultation service. Gastroenterology/Hepatology patients. Daily rounds with attending physician. May be repeated for credit. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Terrado

480. Insights in Gastroenterology (1-3)  
Clinical activity—3-9 hours; oral presentation. Prerequisite: student in good academic standing and consent of instructor. First- or second-year medical student in good academic standing. May be repeated for credit. (S/U grading only)—I, II, III, IV. (I, II, III, IV)

499. Research (1-12)  
Prerequisite: consent of instructor. (H/P/F grading only)

Internal Medicine—  
Hematology-Oncology (HON)  

Upper Division  
192. Internship in General Medicine (1-12)  
Internship—3-36 hours; final report. Prerequisite: upper division standing; approval of project by preceptor prior to internship. Supervised work experience in general medicine. May be repeated for credit up to 12 units. (P/NP grading only.)

Graduate  
291. Seminars in Human Health Services Research and Clinical Epidemiology (1)  
Seminar—1 hour. Critical review, evaluation, and discussion of research in human health services and clinical epidemiology. Presentation of statistical, epidemiologic, and econometric methods. Students present their own research and critique the work of others. May be repeated for credit. (Same course as Epidemiology 291.) (S/U grading only)—I, II, III, IV. (I, II, III, IV)

Professional  
460. General Medicine Consults (1-18)  
Clinical activity (inpatient-outpatient service)—40 hours. Prerequisite: fourth-year medical students with consent of instructor, a general medicine clerkship. Supervised opportunity to see entire spectrum of medical problems encountered by a general internist.Student spends time in General Medicine Clinic and on the General Medicine Consult Service. Consult Service is particularly concerned with medical evaluation of surgical patients. Limited enrollment. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Keenan

470. Health Care Ethics (3-9)  
Lecture/discussion—2 hours; laboratory/discussion—1 hour. Prerequisite: consent of instructor. Guided independent study of issues in biomedical ethics, with discussion of readings that are based on student interests and needs. Participation in ethics rounds. (Same course as Nursing 470.) (S/U grading only)—II, III, IV. (III, IV) Loewy

485. Introduction to Health Care Ethics (1)  
Lecture—10 weeks. Prerequisite: medical student in good standing. Introduction to concepts and methods of healthcare ethics. Emphasis on principles and methods. (H/P/F grading only)—I. (I) Loewy

493A. Teaching the Basics Sciences SSM (6)  
Lecture—6 hours; lecture/laboratory—8 hours; laboratory—30 hours; tutorial—10 hours. Prerequisite: consent on instructor; concurrent registration in Medical Sciences 440. Restricted to UC Davis School of Medicine students only. Special Studies Module, a yearlong in program that includes small group discussion and discussion education technique and theory. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV)

499. General Medicine Research (1-18)  
Discussion—3-9 hours; clinical research—6-40 hours. Prerequisite: consent of instructor. Student will be involved in a clinical research problem within the General Medicine Consult Service. May be repeated for credit. (H/P/F grading only)

Internally—  
Hematology-Oncology (HON)  

Upper Division  
199. Research in Hematology-Oncology (1-5)  
Laboratory—hours variable. Prerequisite: upper division standing and consent of instructor. Experience in laboratory research. (P/NP grading only)—I, II, III, IV. (I, II, III, IV)

Graduate  
298. Topics in Hematology (1-4)  
Prerequisite: one year of graduate work and/or consent of instructor. Basic concepts of the physiology of the hematopoietic organ, the pathophysiology of hematopoietic disease, and concepts of therapeutics will be offered for study. The specific topics will be dictated by the interest and background of the students.

299. Research (1-12)  
Prerequisite: consent of instructor. Laboratory investigation contributing to the dissertation for a graduate degree. (S/U grading only)

Professional  
420. Oncology (4)  
Lecture/discussion—2 hours. Prerequisite: approval by the SOM Committee on Student Promotions. Restricted to Medical student only; students must pass all Year 1 SOM courses. Covers the principles of oncology and the pathophysiologic aspects of specific, common cancers correlated with organ systems pathophysiology and systemic pathology courses. (H/P/F grading only; deferred grading only; pending completion of set sequence).—I, II, III, IV. (II, III)

420A. Oncology (4)  
Lecture—2 hours. Prerequisite: consent of instructor. Restricted to Medical student only. Covers the principles of oncology and the pathophysiologic aspects of specific, common cancers correlated with organ systems pathophysiology and systemic pathology courses. (H/P/F grading only).—II. (II)

460. Hematology—Oncology Acting Internship (1-18)  
Clinical activity—full time (4-12 weeks). Prerequisite: fourth-year medical student in good academic standing. Acting intern on inpatient hematology/oncology ward service. May be repeated for credit. Limited enrollment. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV)

461. Hematology—Oncology Consult Clerkship (6-12)  
Clinical activity—full time (4-8 weeks). Prerequisite: fourth-year medical student in good academic standing. Student is an integral member of the inpatient hematology and oncology consult service, the bone marrow service, and will attend all conferences sponsored by the Division. May be repeated for credit. Limited enrollment. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV)

462. Hematology—Oncology Ambulatory Clerkship (3-18)  
Clinical activity—30 hours. Prerequisite: fourth-year medical student in good academic standing, consent of instructor. Limited enrollment. Outpatient rotations in related clinics. Participation with members of the subspecialty service in the initial clinical evaluation, work-up, management and follow-up of the patient with hematologic or oncologic disorders. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV)

493. Cancer as an Educational Process (1-6)  
Seminar—10 hours; clinical activity—14 hours; autotutorial—6 hours; independent study—10 hours. Prerequisite: consent on instructor. Restricted to UC Davis School of Medicine students only. Covers cancer as a process, beginning with risks and prevention, neoplasia, microinvasion, treatment options, metastases and systemic therapy, pain medicine and palliative care, and cancer communication. Format includes traditional lectures, student-led case discussions, and problem-based learning. (H/P/F grading only)—I, II, III, IV. (II, III, IV) Meyer, van Erichs Fitzwater
499. Research (1-12)  
Prerequisite: consent of instructor. (H/P/F grading only.)

Internal Medicine—Infectious Diseases (IDI)  
Upper Division

141. Infectious Diseases of Humans (1)  
Lecture—1 hour. Prerequisite: introductory knowl-
edge in biology and chemistry recommended. Course integrates information on biological and molecular nature of the causative organism, modern diagnostics, treatment and prevention strategies, and the role of infectious diseases in contemporary society and throughout human history. (P/NF grading only.)—I. (I.) Danekar

192. Research Internship in Internal Medicine (1-12)  
Internship—3-36 hours; final report. Supervised work experience in the division of Infectious Diseases. Undergraduates will have an opportunity to acquire research experience in clinical settings. May be repeated for credit up to 12 units. (P/NP grading only.)

199. Infectious Diseases Research (1-5)  
Prerequisite: chemistry through organic chemistry (in addition, microbiology and immunology preferred), consent of instructor. Discrete problem requiring reading and actual manual effort in solution will be assigned to each student. Progress and results will be reviewed at intervals with instructor and via seminar presenta-
tion. (P/NP grading only.)

Graduate

211. Epidemiology and Prevention of Infectious Diseases (3)  
Lecture—2 hours; discussion—1 hour. Prerequisite: Epidemiology 205B, 207 or Internal Medicine 421. Infectious disease epidemiology and prevention, with equal emphasis on human and veterinary diseases. Major categories of infectious diseases by mode of transmission. (I.) DeFierme, Sandrock

299. Research in Infectious Diseases (1-12)  
Prerequisite: consent of instructor. Laboratory investiga-
tion contributing to the dissertation for a graduate degree. (S/U grading only.)

Professional

440. Introduction to AIDS and Related Disorders (1.5-6)  
Clinical Activity—30 hours; discussion—10 hours. Prerequisite: first and second year medical students must be in good academic standing and have con-
sent from the instructor. Familiarizes students with the diagnosis and treatment of individuals infected with the human immunodeficiency virus. Students will interview patients, observe patient care and partici-
pate in ongoing clinic research as well as examine alternative lifestyles. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV. (IV.) Levenswork

450. Clinical and Social Care of the Injection Drug User (1-4)  
Lecture—1 hour; clinical activity—3 hours. Prerequi-
site: first and second year medical students in good academic standing. Lecture and guided clinical practice in a supervised clinical setting, focusing on the social and medical aspects of health care for injection drug users. May be repeated for credit up to 24 units. (H/P/F grading only.)—I, II, III, IV. (II, III, IV.)

460. Infectious Diseases Clinical Clerkship (3-6)  
Clinical activity: Prerequisite: successful completion of years of study at School of Medicine. Limited enrollment with priority to fourth-year medical students. Patients ill with infectious diseases, including AIDS, will be evaluated and presented at rounds and case conferences. Patients are also seen in the Infectious Diseases Clinic. Instruction in clinical microbiology and the proper use of the laboratory will be provided. (H/P/F grading only.)—I, II, III, IV. (II, III, IV.) Cohen

499. Research Topics in Infectious Disease (2-12)  
Prerequisite: successful completion of the first year of study in School of Medicine, graduate students (approved for graduate credit), and/or consent of instructor. Discrete problem requiring reading and actual manual effort in solution will be assigned to each student. Progress and results to be reviewed at intervals with instructor and via seminar presenta-
tion. (H/P/F grading only.)

Internal Medicine—Nephrology (NEP)  
Upper Division

192. Internship in Nephrology (1-12)  
Internship—3-36 hours; final report. Prerequisite: upper division standing; approval of project by pre-
ceptor prior to internship. Supervised work experi-
nce in nephrology. May be repeated for credit up to 12 units. (P/NF grading only.)—I, II, III, IV. (II, III, IV.)

Graduate

299. Nephrology Research (1-12)  
Prerequisite: consent of instructor. (S/U grading only.)

Professional

444. Curriculum Design for Doctoring (1)  
Project—2 hours; seminar—1 hour. Prerequisite: consent of instructor; second year standing in medi-
cal school. Design of Doctoring curriculum for medi-
cal students in focused topic areas to be announced annually. Students will design sessions, consider resource needs, and work with IOs to initiate the curriculum. (P/F grading only.)—IV. (IV.)

460. Nephrology and Fluid Balance (3-6)  
Clinical activity—4 completion of 3rd year medical school. Completion of Medicine Care Clerkship; consent of the instructor. Active participation in all inpatient/outpatient clinical activities, attendance at specific lectures and conferences at UC Davis Medi-
cal Center covering the field of nephrology and fluid-electrolyte disorders. Limited enrollment. (H/P/F grading only.)—I, II, III, IV. (II, III, IV.) Feun

499. Research in Nephrology (3-18)  
Prerequisite: individual arrangement and consent of instructor. Independent laboratory research on a spec-
cific problem related to biochemical or immunologic causes of renal disease and/or uremic disorders in humans or animals. (H/P/F grading only.)

Internal Medicine—Pulmonary Medicine (PUL)  
Upper Division

192. Internship in Pulmonary Medicine (1-12)  
Internship—3-36 hours; final report. Prerequisite: upper division standing; approval of project by pre-
ceptor prior to internship. Supervised work experi-
nce in pulmonary medicine. May be repeated for credit up to 12 units. (P/NP grading only.)

Graduate

299. Pulmonary Disease Research (1-12)  
Laboratory. Prerequisite: by arrangement only. Pul-
monary disease research activity with focus in inhala-
tion toxicity, oxidants or lung biochemistry, and cell and molecular biology. (S/U grading only.)—Cross

Professional

460. Comprehensive Pulmonary Medicine Clerkship (3-6)  
Clinical activity—40 hours. Prerequisite: completion of second year of medical school and/or consent of instructor; completion of Internal Medicine Clerkship. Rotation intended to provide a comprehensive intro-
duction to diagnosis and treatment of common pulmonary disorders. (H/P/F grading only.)—I, II, III, IV. (II, III, IV.) Stollwerk

461. Critical Care Clinical Clerkship (3-6)  
Clinical activity—40 hours. Prerequisite: completion of second year of medical school and/or consent of instructor; completion of Internal Medicine and Sur-
gical Clerkships. Rotation intended to provide stu-
dent education in the Critical Care Management of surgical/critical patients. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV. (II, III, IV.) Stol-
werk

462. Pulmonary Clinical Clerkship (3-6)  
Clinical activity—35 hours. Prerequisite: completion of second year of medical school and/or consent of instructor; completion of Internal Medicine Clerkship. Similar to course 460. Rotation designed for students interested in learning pulmonary medicine, but who do not desire the comprehensive experience offered by a four-week pulmonary rotation. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV. (II, III, IV.)

475. Encounters in Ethics in the ICU (3-6)  
Clinical Activity—12 hours; lecture/discussion—6 hours; independent study—6 hours. Prerequisite: 4th year Medical Student. Care for critically ill adults with complex medical disease carries with it unique ethical roles and duties for the physician. (H/P/F grading only.)—I, II, III, IV. (II, III, IV. Black

480. Pulmonary—Critical Care Medicine Insights (1-3)  
Clinical activity—3-9 hours. Prerequisite: student in good academic standing and consent of instructor. Student will attend respiratory outpatient clinics and inpatient pulmonary consultation rounds and medi-
cal intensive care rounds. Introduction to diagnosis and treatment of common pulmonary disorders. (H/P/F grading only.)—I, II, III, IV. (II, III, IV.) Albertson

499. Research (1-12)  
Prerequisite: consent of instructor. (H/P/F grading only.)

Internal Medicine—Rheumatology-Allergy (RAL)  
Lower Division

99. Directed Research in Immunology (1-5)  
Laboratory. Prerequisite: consent of instructor. Inde-
pendent research will be encouraged in basic immu-
nology, including the role of the cellular immune system in oncogenesis. (P/NP grading only.)—I, II, III, IV. (II, III, IV.)

Upper Division

192. Internship in Rheumatology-Allergy (1-12)  
Internship—3-36 hours; final report. Prerequisite: upper division standing; approval of project by pre-
ceptor prior to internship. Supervised work experi-
nce in rheumatology-allergy. May be repeated for credit up to 12 units. (P/NP grading only.)

99. Directed Research in Immunology (1-5)  
Laboratory. Prerequisite: consent of instructor. Inde-
pendent research will be encouraged in basic immu-
nology, including the role of the cellular immune system in oncogenesis. (P/NP grading only.)

Graduate

209. Current Topics in Immunology: From Presentations to Grants (3)  
Lecture—1 hour; term paper or discussion—1 hour; project—1 hour. Prerequisite: Immunology 201. Cur-
rent developments in various aspects of immunology and their interrelationships. Focus on areas of immu-
nology not currently covered in the basic and advanced immunology courses. Oral presentation, written review and grant preparation. (I.) Van de Water

Quarter Offered:
I=Fall; II=Winter; III=Spring; IV=Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): AH—Arts and Humanities; SC—Science and Engineering; SS—Social Sciences; ACH—American Cultures; DD—Domestic Diversity; WRT—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SC—Science and Engineering; SS—Social Sciences; ACH—American Cultures; DD—Domestic Diversity; OR—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

Medicine, School of
299. Research in Autoimmune Disease (1-12)
Laboratory. Prerequisite: consent of instructor. Independent research will be encouraged in both animal models of human disease (including congenitally athymic [nude], asplenic, and New Zealand mice) and the cellular immune system of patients with systemic lupus erythematosus, polymyositis and drug hypersensitivity. (S/U grading only.)

Professional

460. Rheumatology Clinical Clerkship (1-18)
Clinical activity—240 hours. Prerequisite: Medical Sciences 431 and consent of instructor. Participation with members of the subspecialty service in the diagnosis and therapeutic management of patients with rheumatologic diseases. May be repeated for credit. (H/P/F grading only)—I, II, III, IV, (I, II, III, IV)

461. Allergy Clinical Clerkship (3-18)
Clinical activity (inpatient-outpatient service)—full time (2 to 12 weeks). Prerequisite: completion of second year of medical school and consent of instructor. Student will work with practicing allergist in daily work with patients and participate in weekly allergy clinic and teaching conferences. Study of the literature. Will see patients with problems in clinical immunology, in vitro and in vivo, asthma, allergic rhinitis. (H/P/F grading only)—I, II, III, IV, (I, II, III, IV)

470. Practicum in Care of the Terminally Ill (3-6)
Clinical activity—35 hours; seminar—5 hours. Prerequisite: consent of instructor. Restricted to fourth year medical students in good standing. Work with hospice interdisciplinary team. Direct experience in the care of patients with illnesses where no cure is possible. Emphasis on symptom relief, end of life issues, physician assisted suicide. (H/P/F grading only)—I, II, III, IV, (I, II, III, IV) McMillian

480. Insights in Rheumatology (1-3)
Clinical activity—3-9 hours. Prerequisite: student in good academic standing and consent of instructor. Participation in rheumatology consultation rounds, rheumatic disease clinics and conferences with supervised readmissions in rheumatology. (H/P/F grading only)—I, II, III, IV, (I, II, III, IV)

499. Research (1-12)
Prerequisite: medical student with consent of instructor. Part-time participation in active clinical and basic research projects which can involve both patient care and relevant laboratory procedures. Students can gain experience in clinical medicine and clinical investigation. May be repeated for credit. (H/P/F grading only)—I, II, III, IV, (I, II, III, IV)

Medical Microbiology (MMI)

Upper Division

130. Medical Mycology (2)
Lecture—2 hours. Prerequisite: a course in pathogenic microorganisms of course. This is a course for students who have completed Medical Microbiology as a component of the required curriculum of the School of Medicine. (H/P/F grading only)

280. The Endogenous Microbiota in Lifespan Health and Disease (3)
Lecture—3 hours. Prerequisite: graduate standing. Recent research into host-associated microbial communities has yielded important insights into the microbial composition of mucosal surfaces, and how the composition of these communities contributes to normal development, metabolism, education of the immune system, and disease susceptibility. Not open for credit to students who have completed Internal Medicine. Infectious Diseases 280. (I, II, III) Dandekar, Tsolis

299. Research in Autoimmune Disease (1-12)
Prerequisite: consent of instructor. Independent research will be encouraged in both animal models of human disease (including congenitally athymic [nude], asplenic, and New Zealand mice) and the cellular immune system of patients with systemic lupus erythematosus, polymyositis and drug hypersensitivity. (S/U grading only.)

Professional

410. Physician Scientist Molecular Medicine Journal Club (1)
Lecture—1 hour. Weekly seminars by students on research articles in current literature. Topics/articles to be selected by instructors to include a broad range of frontiers in biomedical literature. May be repeated for credit. (H/P/F grading only)—(I, I) Bevins

430. Medical Mycology (2)
Lecture—2 hours. Prerequisite: a course in pathogenic microbiology and consent of instructor. Various aspects of pathogenic fungi, particularly affecting humans, will be discussed including epidemiology, pathogenesis and pathology, diagnosis and therapy. Offered in alternate years. (Same course as 130.) (H/P/F grading only)—I, II, III, IV, (I, II, III, IV) Shackleford, Torres

480. Medical Microbiology (5.5)
Lecture—2.75 hours; laboratory/discussion—1 hour. Medical students only. Discussion of the diseases caused by infectious agents includes their pathogenesis, clinical manifestations, diagnosis, treatment and epidemiology and pathogenesis. Covers the general properties of and diagnostic techniques for bacteria, fungi and viruses. (P/F grading only; deferred grading only, pending completion of sequence).—II, III, (II, III) Luckhart, Mudri

497. Tutoring in Medical Microbiology (1-5)
Tutoring—3-15 hours. Prerequisite: appropriate preparation in subject matter and consent of instructor. Assist instructor by tutoring medical students in one of the departmental courses that is a component of the required curriculum of the School of Medicine. (H/P/F grading only)

498. Group Study in Medical Microbiology and Immunology (1-5)
Prerequisite: medical students with consent of instructor. Directed reading and discussion and/or laboratory investigation on selected topics. (Sections 1, 2, 4, 5; S/U grading only)

299. Research (1-12)
Prerequisite: consent of instructor; open to graduate students. Laboratory investigation contributing to the dissertation for a graduate degree. (S/U grading only)
Course descriptions are given under the individual course offerings. For Public Health Sciences courses, see the Public Health Sciences (SPH), on page 417.

**Units Required for Master of Public Health**

Core courses ....................................... 40
Add-on-course selective ....................... 6
Elective units ...................................... 10
Total units required for the degree ........ 56

**Core Coursework**

**Biostatistics**
Preventive Veterinary Medicine 402........... 5
Preventive Veterinary Medicine 403........... 3
Public Health Sciences 210..................... 2

**Epidemiology**
Epidemiology 205A............................... 4

**Environmental Health Science**
Public Health Sciences 262..................... 3

**Health Services Administration**
Public Health Sciences 273..................... 3

**Social and Behavioral Influences on Health**
Public Health Sciences 222..................... 3

**General Public Health**
Public Health Sciences 201..................... 3
Public Health Sciences 290
1 unit/quarter.................................. 4
Public Health Sciences 297..................... 10

For more information about the Master of Public Health, see http://mph.ucdavis.edu/.

**Medical Pharmacology and Toxicology (PHA)**

**Lower Division**

92. Internship in Pharmacology (1-12)
Internship—3-36 hours; final report. Prerequisite: lower division student with good academic standing; approval of project prior to period of internship. Supervised work experience in pharmacology and related fields. (P/NP grading only.)

99. Special Study for Undergraduates (1-5)
Prerequisite: lower division standing. (P/NP grading only.)

**Upper Division**

192. Internship in Pharmacology (1-12)
Internship—3-36 hours; final report. Prerequisite: upper division standing; approval of project prior to period of internship. Supervised work experience in pharmacology and related fields. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)—I, II, III, IV, (II, III, IV) Despa

**Graduate**

205. Problem Solving in Pharmacology (1)
Lecture/discussion—1 hour. Restricted to Graduate Students in Pharmacology and Toxicology, Chemistry and Clinical Research Graduate Groups; other students may be accepted upon consultation with instructor. May be repeated 12 times for credit. Course changes subjects every quarter; each course is unique and can be taken as often as desirable; certain students (Trainees of the Training Program in Pharmacological Sciences) must take course for at least three years. —I, II, III, (II, III, III) Hell

207. Drug Discovery and Development (3)
Lecture/discussion—2 hours; extensive writing—1 hour. Prerequisite: course 201, an equivalent course in general pharmacology, or knowledge of basic pharmacology. Intended for graduate students in Pharmacology and Toxicology, Chemistry and Clinical Research Graduate Groups; other students, including undergraduates, may be accepted with consent of instructors. Survey of the process by which a drug is discovered, developed and made available to the public. Topics include drug discovery, design and optimization, safety testing, clinical evaluation, regulatory issues, intellectual property, formulation, and the global pharmaceutical industry. May be repeated for credit. —II. (II.) Horuk, Rogawski, Wulff

208. Advanced Cardiac Physiology and Pharmacology (3)
Lecture—2 hours; lecture/discussion—1 hour. Prerequisite: Pharmacology and Toxicology 201, Pharmacology and Toxicology 202, an equivalent course in general pharmacology or physiology (example, Biomedical Engineering 204), or knowledge of basic pharmacology/physiology. Open to graduate students from the Pharmacology and Toxicology, Molecular, Cellular and Integrated Physiology, Biomedical Engineering and Clinical Research Graduate Groups; other students (including undergraduates) may be accepted upon consultation with the instructors. Detailed characterization of the mechanisms involved in cardiac excitation–contraction coupling, altered in heart disease and pharmacological interventions. Topics include cardiac contractile apparatus, action potential, Ca cycling, excitation–transcription coupling, cardiac inotropy, heart failure and arrhythmias. —III. (III.) Bassuyn, Despa, Ripplinger

225. Gene Therapy (3)
Lecture/discussion—3 hours. Prerequisite: Genetics 201C/Molecular and Cellular Biology 221C or equivalent. Gene therapy from basic concepts to clinical applications. Topics include the human genome and genetic variation, genetic diseases, methods to manipulate gene expression, viral and nonviral delivery vectors, history and progress of gene therapy, case studies, and ethical issues. Offered in alternate years. —II. Anderson, Bauer, Nolita, Segal

250. Functional Genomics: From Bench to Bedside (3)
Lecture/discussion—3 hours. Prerequisite: Genetics 201C/Molecular and Cellular Biology 221C or equivalent. Functional genomics (how genetic variation and epigenomics affect gene expression), with an emphasis on clinical relevance and applications. Topics include genetic variation and human disease, cancer therapeutics, and biomarker discovery. —III. (III.) Diaz, Lozza, Segal

291. Pharmacology Research Seminar Series (1)
Seminar—1 hour; discussion—1 hour. Prerequisite: consent of instructor; upper division or graduate standing. Research seminars on current topics in Pharmacology. May be repeated for credit when topic differs. (S/U grading only.)—I, II, III, (II, III, III) Wulf

298. Group Study (1-5)
Prerequisite: consent of instructor.

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only.)

**Professional**

400A. Pharmacology (2)
Lecture—1 hour; discussion/lab—0.3 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; medical students only. Principles in pharmacology, including pharmacokinetics, drug metabolism and the actions, uses and toxicities of the major classes of drugs. (Deferred grading only, pending completion of sequence. P/F grading only.)—II, III, (II, III) Gelli, Wulf

**400B. Pharmacology (1.5)**
Lecture—1 hour; discussion—0.25 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress; medical students only. Principles in pharmacology, including autonomic pharmacology, general anesthetics, neuropharmacology and sedative/hypnotics. (P/F grading only.)—IV. (IV) Diaz

**400C. Pharmacology (1.5)**
Lecture—1 hour; discussion—0.25 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress; medical students only. Topics taught include the treatment of respiratory and cardiovascular disease. Specific topics include: asthma, chronic obstructive pulmonary disease, hypertension, congestive heart failure, and the treatment of arrhythmias. (P/F grading only.)—I, II, (I) Segal

**400D. Pharmacology (2)**
Lecture—3 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress; medical student only. Pharmacology topics covered include central nervous system drugs, drugs, toxicology/poisoning and cancer chemotherapy. Specific topics are: cancer chemotherapy, pain management, the treatment of depression and psychosis, cardiac re flux disease, irritable bowel syndrome, and general toxicology. (P/F grading only.)—II. (II) Segal

445. Introduction to Integrative Medicine (1)
Lecture/discussion—1 hour. Prerequisite: medical student in good standing. Basic principles of alternative medical systems [e.g., traditional Chinese, Ayurvedic, Tibetan], alternative practices (e.g., chiropractic, osteopathy, naturopathy, homeopathy, herbalism, guided imagery/meditation, massage therapy), and mind/body connection are presented as introduction to integrating alternative treatments into traditional medical practice. (H/P/F grading only.)—I, II, III, (II, III, IV)

**490. Seminar in Pharmacology for Medical Students (1)**
Seminar—1 hour. Prerequisite: consent of instructor. Seminar in pharmacology for medical students. [H/P/F grading only.]—I, II, III, IV, (I, II, III, IV)

**497T. Tutoring in Pharmacology (1-5)**
Tutoring—3-15 hours. Prerequisite: advanced standing or consent of instructor. Assist instructor by tutoring medical students in preparation for one of the departmental courses that is a component of the required curriculum of the School of Medicine. (H/P/F grading only.)

**498. Special Study for Medical Students (1)**
Lecture, directed reading, and/or discussion groups—3-15 hours. Prerequisite: consent of instructor. Special study in pharmacology for medical students. (H/P/F grading only.)

**499. Directed Research for Medical Students (1-12)**
Laboratory—3-36 hours. Prerequisite: consent of instructor. Directed research in pharmacology for medical students. (H/P/F grading only.)

**Neurology (NEU)**

**Upper Division**

199. Individual Special Study and Research (1-4)
Prerequisite: consent of instructor. Individual special study in neurophysiology and biomedical engineering is offered to qualified students. Studies on psychophysics, single-unit electrophysiology and instrumentation are offered in Davis. (P/NP grading only.)

298. Group Study (1-5)
Prerequisite: consent of instructor. For graduate students desiring to explore particular topics in depth. Lectures and conferences may be involved. (S/U grading only.)
Professional

451. Neurosurgical Critical Care Clerkship (3)
Clinical activity—full time (2 weeks). Prerequisite: third- or fourth-year medical student who has satisfactorily completed course 460; consent of instructor. Students participate in the care of neurosurgical patients admitted through the Neurosurgery Emergency Room. (H/P/F grading only.)—I, II, III, IV.

455. Child Neurology (6)
Clinical activity—full time (4 weeks). Prerequisite: satisfactory completion of Internal Medicine 430, Obstetrics and Gynecology 430, Pediatrics 430 and consent of instructor. Student exposed to children with disorders of the nervous system, both in outpatient and inpatient services. Cases presented to a member of the full-time faculty who will discuss clinical findings, differential diagnosis, management and therapy. This course satisfies the fourth year neurosurgery requirement. (H/P/F grading only.)—I, II, III, IV, I, II, III, IV.

460. Clinical Neurosurgery (6-18)
Clinical activity—full time (4-12 weeks). Prerequisite: fourth-year medical student having completed a neurosurgical clerkship. Clerkship in neurosurgery to be arranged at another institution with accredited residency program in neurosurgery under proper supervision. (H/P/F grading only.)—I, II, III, IV, I, II, III, IV.

464. Externship (4-12)
Clinical activity—full time (4-12 weeks). Prerequisite: fourth-year medical student having completed a neurosurgical clerkship. Clerkship in a variety of chronic and acute neurological diseases. Students will function as acting intern on neurosurgical service. Admission and follow-up of patients. Neurological history, examination, and diagnostic procedures are emphasized. Students will participate in surgical procedures and are required to attend all pediatric neurosurgery conferences. (H/P/F grading only.)—I, II, III, IV, I, II, III, IV. Pang

465. Child Neurosurgery (6-12)
Clinical activity—full time (4 weeks). Prerequisite: consent of instructor. (P/NP grading only.)—I, II, III, IV, I, II, III, IV.

499NE. Group Study in Neurology (1-6)
Clinical activity—full time (4 weeks). Prerequisite: completion of four-week Neurology selective and consent of instructor. Extension of basic Neurology clerkship. Designed for students with special interest in medical disorders of nervous system. By arrangement with department, student may serve as an acting intern. Principles of neurological differential diagnosis and therapeutics emphasized. (H/P/F grading only.)—I, II, III, IV, I, II, III, IV.

499. Research (1-12)
Prerequisite: consent of instructor. (P/NP grading only.)—I, II, III, IV, I, II, III, IV.

Graduate

200. Genetics of Reproduction (3)
Lecture/discussion—3 hours. Introduction to genetics of mammalian reproduction for domestic species, species used in research, and the human. Mendelian and non-Mendelian modes of inheritance. Research paper. Offered in alternate years.—II. (II.)

290. Current Topics in Research (1)
Seminar—1 hour. Prerequisite: graduate standing and consent of instructor. Selected topics in reproductive biology. (S/U grading only.)—I, II, III, IV, I, II, III, IV. (II., IV.)

298. Group Study (1-5)
Prerequisite: consent of instructor; consent of instructor. (P/NP grading only.)

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only.)

Professional

410. Obstetrics and Gynecology Clerkship (12)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress. Obstetrics, gyneocolgic and gynecological oncology experience in the delivery room, operating room, and clinics and wards at UCSF Fresno. Rounds, conferences, interactive student presentations and seminars ongoing. (H/P/F grading only.)—I, II, III, IV, I, II, III, IV.

430. SJVP OBGYN Clerkship at UCSF (12)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress. Obstetrics, gynecologic and gynecologic oncology experience in the delivery room, operating room, clinics and wards at UCSF Fresno. Rounds, conferences, interactive student presentations and seminars ongoing. (H/P/F grading only.)—I, II, III, IV, I, II, III, IV.

439D. Directed Clinical Studies in OB/GYN (1-12)
Clinical activity—40 hours. Prerequisite: consent of instructor. Individual directed studies in extended preparation for modified curriculum or to complete a clinical rotation following a leave of absence. May be repeated for credit. (P/F grading only.)—I, II, III, IV, I, II, III, IV.

439R. Directed Studies in OB/GYN (1-12)
Clinical activity—30 hours; independent study—10 hours. Prerequisite: consent of instructor. Individual directed studies in extended preparation for remediation of all or part of clinical rotation. Clinical studies to accommodate and soil remediation. Students directed by the Committee on Student Progress and approved by the course IOR. May be repeated for credit. (P/F grading only.)—I, II, III, IV, I, II, III, IV.

460. Away Clinical Elective in OB/GYN (1-12)
Clinical activity—30 hours. Prerequisite: third- or fourth-year medical student; course 430 or the equivalent; consent of instructor. Active participation in inpatient and/or outpatient care. Special topics and specified conferences; student-faculty member infor- mal conferences. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV, I, II, III, IV.
465. Away Acting Internship in OB/GYN (3-18)
Clinical activity—40 hours. Prerequisite: satisfactory completion of course 430 and other third-year core clerkships; consent of instructor. Work at the level of a sub intern in Inpatient and/or Outpatient settings. Students are expected to provide direct patient management. (H/P/F grading only.)—I, II, III, IV (I, II, III, IV)

470. Gynecologic Oncology Acting Internship (3-18)
Clinical activity—40 hours. Prerequisite: satisfactory completion of course 430 and the third-year core clerkships; consent of instructor. Four week elective primarily involves direct inpatient management of patients on the UC Davis Oncology service. Students will be acting at the level of a sub-intern and will work under the supervision of house staff, fellows, and attendings. May be repeated up to 99 units for credit. (H/P/F grading only.)—I, II, IV, (I, II, III, IV)

471. Ambulatory Gynecology and Obstetrics Elective (3-18)
Clinical activity—35 hours. Prerequisite: third or fourth-year Medical Student who has successfully completed course 430; consent of instructor. Conduct examinations, present patients and discuss treatment regimens at the following ambulatory clinics: General Gynecology & Gynecologic New and Return Obstetrics (including Post-Partum), High Risk Obstetrics, Pre-Operative Clinic, and other sub-specialty clinics as assigned. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

472. Family Planning and Reproductive Health (1-6)
Clinical activity—30 hours; seminar—5 hours. Prerequisite: course 430; consent of instructor. Elective that will focus on the Gynecologic Subspeciality of Family Planning. Counseling and provision of contraceptive methods, experience with pelvic ultrasounds, management of spontaneous, inevitable and induced abortion and postabortion care by both surgical and medical techniques are included. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

475. Labor & Delivery Acting Internship (3-18)
Clinical activity—40 hours. Prerequisite: satisfactory completion of course 430 and the third-year core clerkships; consent of instructor. Four week elective primarily involves direct inpatient management of women on the UCD MAC Unit. Students will be acting at the level of a sub-intern and will work under the supervision of house staff, fellows, and attendings. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

493. Gender Specific Medicine SSM (6)
Lecture—5 hours; laboratory/rotation—10 hours; laboratory—16 hours; clinical activity—4 hours. Prerequisite: consent of instructor; restricted to UC Davis School of Medicine students only. Specialized Studies Module, a four week course on the topic. Basic Science Principles Related to Gender Specific Medicine. (Same course as Cardiology 493.) (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

494. Shifa Clinic (6)
Clinical activity—8 hours. Prerequisite: medical student in good standing; restricted to medical student only. Interaction with patients from multiple ethnic and cultural backgrounds under the direct supervision of a physician/preceptor. Women’s health issues and primary care issues in a culturally diverse mixed population. May be repeated up to three times for credit. (P/N grading only.)—I, II, III, IV, (I, II, III, IV)

494A. Shifa Clinic (1)
Clinical activity—8 hours. Prerequisite: Medical student in good standing; consent of instructor. Interaction with patients from multiple ethnic and cultural backgrounds under the direct supervision of a physician/preceptor. Women’s health issues and primary care issues in a culturally diverse mixed population. (H/P/F grading only; deferred grading only, pending completion of sequence.)—II, IV (Yasmeen)

494C. Shifa Clinic (1)
Clinical activity—8 hours. Prerequisite: Medical student in good standing; consent of instructor. Interaction with patients from multiple ethnic and cultural backgrounds under the direct supervision of a physician/preceptor. Women’s health issues and primary care issues in a culturally diverse mixed population. (H/P/F grading only; deferred grading only, pending completion of sequence.)—II, III, IV (Yasmeen)

498. Group Study (1-5)
Prerequisite: consent of instructor. Explore particular topics in-depth in Obstetrics and Gynecology. Extensive contact with and oversight by instructor. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

499. Research in Obstetrics and Gynecology (2-12)
Clinical activity. Prerequisite: consent of instructor; fourth-year medical student. Research in Obstetrics and Gynecology arranged with instructor. May be repeated eight times for credit. (H/P/F grading only.)

Ophthalmology (OPT)
Upper Division

192. Research Internship (1-12)
Internship—3-36 hours. Prerequisite: upper division approval of project prior to period of internship by respective Supervised work experience in ophthalmology research. Research staff in Ophthalmology have programs in cell biology, electron microscopy, biochemistry, immunology and visual psychophysics. (H/P/F grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/N grading only.)

Graduate

299. Basic Research in Visual Science (1-12)
Prerequisite: consent of instructor. (S/U grading only.)

Professional

442. Introduction to Ophthalmology (3)
Clinical activity—40 hours. Prerequisite: third- or fourth-year Medical Student and consent of instructor; consent of advisor; completion of third-year clerkships in Medicine and Surgery; consult Course Coordinator. Ocular disease diagnosis and management relevant to the clinical practice of future primary care physicians and others. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

465. Advanced Subspeciality Ophthalmology (3-6)
Clinical activity—40 hours. Prerequisite: Medical students who have completed Internal Medicine 430 in third or fourth year; consent of instructor. Participation in disciplines of neuro-ophthalmology/pediatric ophthalmology, diseases of the cornea and external eye, glaucoma and retina. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

498. Group Study (1-3)
Prerequisite: medical students with consent of instructor. Directed reading and discussion. (H/P/F grading only.)

499. Research in Ophthalmology (1-12)
To be arranged—3-36 hours. Prerequisite: medical students with consent of instructor. Individual research on selected topics in optics and visual physiology, cornea and external disease. (H/P/F grading only.)

Orthopaedic Surgery (OSU)
Lower Division

99. Special Studies for Undergraduates (1-4)
Prerequisite: lower division standing and consent of instructor. (P/N grading only.)

Upper Division

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: upper division standing; consent of instructor. (P/N grading only.)

Professional

421. The Musculoskeletal System (2.5)
Lecture/discussion—4 hours; discussion—2 hours. Prerequisite: consent of committee on student progress. Medical student only. Basic and clinical science of orthopaedic surgery and rheumatology. (P/N grading only.)—I, II, III, IV, (I, II, III, IV)

428. Ambulatory and Emergency Room Orthopaedics (3-6)
Clinical activity—full time [2-4 weeks]. Prerequisite: 4th-year medical student in good academic standing and consent of instructor. Introduction to general orthopaedic problems and trauma and their management in an outpatient environment, including the emergency room. Student will conduct orthopaedic examinations, present patients to staff rotations through trauma, hand, pediatrics, adult and foot clinics. Orthopaedic physical examination and interpretation of x-rays. Limited enrollment. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

462. Community Preceptorship (3-6)
Clinical activity—full time [2-4 weeks]. Prerequisite: fourth-year medical student in good academic standing with consent of instructor. Acquaints student with private practice of orthopaedics in the community setting. Opportunity to observe and assist private practitioners in office, emergency room, operating room and inpatient environment. Student must provide own transportation. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

Bovill, Yoo

464. Acting Internship (6)
Clinical activity—full time [4 weeks]. Prerequisite: fourth-year medical student in good academic standing and consent of instructor. Advanced Orthopedic rotation on an approved institution. Topics may include Trauma, Sports, Spine, Pediatrics, Joint and/or Foot/Ankle. Students are expected to perform at the level of an intern. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

466. Externship in Advanced Orthopaedics (3-6)
Clinical activity—40 hours. Prerequisite: fourth-year medical student in good academic standing and consent of instructor. Advanced Orthopaedic rotation on an approved institution. Topics may include Trauma, Sports, Spine, Pediatrics, Joint and/or Foot/Ankle. Students are expected to perform at the level of an intern. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

480. Insights in Orthopaedic Surgery (1-3)
Clinical activity—3-9 hours. Prerequisite: first- and second-year medical students in good academic standing; consent of instructor. Exposure to aims, methods and procedures in orthopaedic surgery via attendance at grand rounds, patient care conferences, and group discussions. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

481. History of Medicine for Medical Students (1.5)
Lecture/discussion—2.5 hours (for six weeks). Prerequisite: third or fourth-year students in the School of Medicine or second-year students with consent of instructor. Overview of the history of medicine throughout the world to introduce medical students to landmark accomplishments and key figures in the development of health care and to provide an
409. Orthopedics Research (1-12)

Clinical activity—3 hours to full time (to be arranged with individual faculty). Prerequisite: third- or fourth-year medical student in good academic standing; consent of instructor. Laboratory or clinical investigation on selected topics. May be repeated for credit. (H/P/F grading only.)

Otolaryngology (OTO)

Lower Division

192. Internship in Otolaryngology (1-12)

Internship—3 to 36 hours. Prerequisite: upper division standing; approval of project prior to period of internship by preceptor. Supervised work experience in otolaryngology and related fields. Final project report. (P/NP grading only.)

199. Special Study in Otolaryngology for Advanced Undergraduates (1-5)

Prerequisite: advanced undergraduate with consent of instructor. (P/NP grading only.)—I, II, III, IV.

Graduate

290C. Research Conference in Otolaryngology (1-3)

Lecture—1 hour. Prerequisite: graduate students; medical students; advanced undergraduates with consent of instructor. Presentation and discussion of faculty and student research in otolaryngology and related fields. (P/NP grading only.)—I, II, III, IV.

291. Principles of Speech, Hearing and Equilibrium (3)

Lecture/discussion—3 hours. Prerequisite: graduate students; medical students; advanced undergraduates with consent of instructor. Presentations by faculty and guest lecturers on anatomy, physiology, and behaviors involved in speech production, hearing, and equilibrium. Each student will be expected to make one class presentation.—(I, II, III, IV.)

299. Individual Study in Otolaryngology for Advanced Graduate Students (1-12)

Prerequisite: advanced graduate student with consent of instructor. (S/U grading only.)

Professional

403. Basic Principles of Reconstructive Surgery (1-5)

Clinical activity—30 hours. Prerequisite: consent by Committee on Student Evaluation and Promotion. Provide fundamental knowledge of otolaryngologic diagnosis and principles; develop facility with basic ENT instruments, provide an understanding of treatment for ear, nose and throat problems and provide knowledge of what patients should be referred for otolaryngologic care. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV) Diaz

404. Otolaryngology Required Clerkship (1-5)

Clinical activity—full time. Prerequisite: third- and fourth-year medical students with consent of instructor; open to graduate students. Approved for graduate degree credit. Total involvement in clinical activities of the department. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV) Div.

409. Journal Seminar (1)

Lecture/discussion—10 hours total (course given three times per quarter). Prerequisite: fourth-year medical students with consent of instructor; open to graduate students. Approved for graduate degree credit. Monthly review of current otolaryngologic and related literature and recent advances. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

403A. Special Study in Otolaryngology (1-3)

Lecture/discussion—1-2 hours; laboratory—1-4 hours. Prerequisite: consent of instructor. Introduction to basic research in Otolaryngology. Lectures, discussion and laboratory study of sensory and motor systems. (H/P/F grading only.)

409. Research (1-12)

Prerequisite: medical students with consent of instructor; open to graduate students. Approved for graduate degree credit. Participation in ongoing projects. (H/P/F grading only.)

Pathology (PMD)

Upper Division

192. Internship in Human Pathology (1-12)

Internship—3-36 hours; final project report. Prerequisite: upper division standing; approval of project prior to period of internship by preceptor. Supervised work experience in pathology and related fields. (P/NP grading only.)

199. Special Study in Pathology for Advanced Undergraduates (1-5)

Prerequisite: advanced undergraduates and consent of instructor. (P/NP grading only.)

Graduate

290C. Research Group Conferences (1)

Lecture—1 hour. Prerequisite: graduate level standing. Seminar. Topics on animal models of human disease and infectious diseases. May be repeated for credit. (S/U grading only.)—I, II, III, IV, (I, II, III, IV)

298. Advanced Group Study (1-5)

Prerequisite: consent of instructor.

299. Research (1-12)

Prerequisite: consent of instructor. (S/U grading only.)

Professional

405. Brain Cutting Conference (1-4)

Lecture—1 hour; discussion—2 hours. Prerequisite: third and fourth-year medical student and consent of instructor. Restricted to Medical students only. Anatomic pathology with an emphasis on autopsy and surgical pathology with application to clinical practice. Specimen grossing, frozen sections, microscopic sign-out and conferences. Exposure to cytopathology, hemopathology, and clinical pathology is available. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV) Bish

475. Anatomical Pathology Acting Internship (1-3)

Clinical activity—40 hours. Prerequisite: fourth-year Medical Students with consent of instructor. Restricted to Medical Students only. Anatomical pathology with the activities of both anatomic (first two weeks) and clinical pathology (second two weeks). May be repeated for credit. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV) Bish
493. Interdisciplinary Study of Gastrointestinal Cancer (6)
Lecture—3 hours; clinical activity—12 hours; laboratory—20 hours.
Prerequisite: consent of instructor. In-depth study of gastrointestinal, hepatic and pancreatic cancer.
Emphasis on an integration of basic science and clinical medicine. Participating departments include pathology, surgical oncology, medical oncology, gastrointestinal, radiology and radiotherapy.
[Socsci course 493D.] (H/P/F grading only)—I, II, III, IV.
494F. SJVP Pediatric Clerkship at UCSF (12)
Clinical activity—45 hours. Prerequisite: approval by SOM Committee on Student Progress. Restricted to medical students during clinical clerkship providing students with the opportunity to learn fundamentals of caring for the pediatric patient by participating in nursery, ambulatory and inpatient services at UCSF. Round, conferences, student presentations ongoing. (H/P/F grading only)—I, II, III, IV.
430F. SJVP Pediatric Clerkship at UCSF (12)
Clinical activity—45 hours. Prerequisite: approval by SOM Committee on Student Progress. Restricted to medical students during clinical clerkship providing students with the opportunity to learn fundamentals of caring for the pediatric patient. Inpatient and outpatient experience in diagnosis and management of pediatric patients. Laboratory experience and participation in clinical investigation may be arranged. (H/P/F grading only)—I, II, III, IV. Consultation.
430D. SJVP Pediatric Clerkship at UCSF (12)
Clinical activity—45 hours. Prerequisite: approval by SOM Committee on Student Progress. Restricted to medical students in their first year during clinical clerkship providing students with the opportunity to learn fundamentals of caring for the pediatric patient. Inpatient and outpatient experience in diagnosis and management of pediatric patients. Laboratory experience and participation in clinical investigation may be arranged. (H/P/F grading only)—I, II, III, IV. Consultation.
430C. SJVP Pediatric Clerkship at UCSF (12)
Clinical activity—45 hours. Prerequisite: approval by SOM Committee on Student Progress. Restricted to medical students during clinical clerkship providing students with the opportunity to learn fundamentals of caring for the pediatric patient. Inpatient and outpatient experience in diagnosis and management of pediatric patients. Laboratory experience and participation in clinical investigation may be arranged. (H/P/F grading only)—I, II, III, IV. Consultation.
430B. SJVP Pediatric Clerkship at UCSF (12)
Clinical activity—45 hours. Prerequisite: approval by SOM Committee on Student Progress. Restricted to medical students during clinical clerkship providing students with the opportunity to learn fundamentals of caring for the pediatric patient. Inpatient and outpatient experience in diagnosis and management of pediatric patients. Laboratory experience and participation in clinical investigation may be arranged. (H/P/F grading only)—I, II, III, IV. Consultation.
430A. SJVP Pediatric Clerkship at UCSF (12)
Clinical activity—45 hours. Prerequisite: approval by SOM Committee on Student Progress. Restricted to medical students during clinical clerkship providing students with the opportunity to learn fundamentals of caring for the pediatric patient. Inpatient and outpatient experience in diagnosis and management of pediatric patients. Laboratory experience and participation in clinical investigation may be arranged. (H/P/F grading only)—I, II, III, IV. Consultation.

439F. Pediatrics (6-18)
Clinical activity—full time (2 to 12 weeks). Prerequisite: satisfactory completion of course 430; consent of instructor. Inpatient and outpatient experience in diagnosis and management of pediatric patients with pulmonary diseases. These will include but will not be limited to cystic fibrosis, asthma, and other common pulmonary diseases as well as congenital abnormalities. (P/F grading only)—I, II, III, IV.
460A. Acting Internship: General Inpatient Pediatric Clerkship (6-18)
Clinical activity—full time (2 to 12 weeks). Prerequisite: completion of course 430 with grade of B or better; letter of recommendation from Pediatrics faculty member. The Ward Acting Intern functions in a manner similar to that of a pediatric intern. The Acting Intern takes the regular sequence and is expected to take night call. The Acting Intern can expect to manage between six and ten patients at a time. Limited enrollment. (H/P/F grading only)—I, II, III, IV.
460B. Acting Internship: Outpatient Pediatrics (3-18)
Clinical activity—full time (2 to 12 weeks). Prerequisite: completion of course 430 with grade of B or better; letter of recommendation from Pediatrics faculty member. Supervised experience in pediatric care on outpatient service at UCSD. Student functions as “Acting Intern” with appropriate supervision by residents and attending faculty. Limited enrollment. (H/P/F grading only)—I, II, III, IV.
461. Pediatric Inpatient AI in Hematology/Oncology (3-18)
Clinical activity—37.5 hours; lecture—7.5 hours. Prerequisite: satisfactory completion of course 430; consent of instructor. Inpatient and outpatient experience in diagnosis and management of oncologic and hematologic disorders in children. Limited enrollment. (H/P/F grading only)—I, II, III, IV.
462. Elective in Pediatric Endocrinology (3-18)
Clinical activity—full time (2 to 12 weeks). Prerequisite: completion of second-year study or the equivalent; consent of instructor. Inpatient and outpatient experience in diagnosis and management of endocrine disorders in children. Laboratory experience and participation in clinical investigation may be arranged. Limited enrollment. (H/P/F grading only)—I, II, III, IV.
463. Medical and Mental Health Evaluation of Children at Risk for Malnutrition (3-9)
Clinical activity—30 hours; discussion—4 hours. Elective for fourth-year medical students covers basic areas of knowledge needed for child abuse prevention and consultation. Rotation includes legal cases, abuse exams, child and parent interactive therapy and visits to community organizations. May be repeated for credit. (P/F grading only)—I, II, III, IV.
464. Acting Internship in Neonatology (6-18)
Clinical activity—full time (4 to 12 weeks). Prerequisite: completion of course 430 with grade of B or better; letter of recommendation from Pediatrics faculty member. Diagnostic and therapeutic aspect of the medical management of neonates. Student is expected to take night call. Limited enrollment. (H/P/F grading only)—I, II, III, IV.
465. Pediatric Specialty Clinic Elective (3-18)
Clinical activity—full time (2 to 12 weeks). Prerequisite: satisfactory completion of course 430; consent of instructor. Inpatient and outpatient experience in diagnosis and management of neurologic disorders in children. Laboratory experience and participation in clinical investigation may be arranged. (H/P/F grading only)—I, II, III, IV. Limited enrollment. (H/P/F grading only)—I, II, III, IV.

466. Elective in Pediatric Oncology (3-18)
Clinical activity—full time (2 to 12 weeks). Prerequisite: satisfactory completion of course 430; consent of instructor. Inpatient and outpatient experience in diagnosis and management of pediatric patients with pulmonary diseases. These will include but will not be limited to cystic fibrosis, asthma, and other common pulmonary diseases as well as congenital abnormalities. (H/P/F grading only)—I, II, III, IV.
467. Elective in Pediatric Nephrology (3-18)
Clinical activity—full time (2 to 12 weeks). Prerequisite: satisfactory completion of course 430; consent of instructor. Inpatient and outpatient experience in diagnosis and management of renal disorders in children. Laboratory experience and participation in clinical investigation may be arranged. Limited enrollment. (H/P/F grading only)—I, II, III, IV.
468. Elective in Pediatric Infectious Disease (3-18)
Clinical activity—full time (2 to 12 weeks). Prerequisite: satisfactory completion of course 430; consent of instructor. Inpatient and outpatient experience in diagnosis and treatment of infectious disease of infants and children. Laboratory and clinical investigation may be arranged. Limited enrollment. (H/P/F grading only)—I, II, III, IV.
470. Elective in Pediatric Gastroenterology (3-18)
Clinical activity—full time (2 to 12 weeks). Prerequisite: satisfactory completion of course 430, Internal Medicine 430, Obstetrics and Gynecology 430, and Pediatrics 430 and consent of instructor. Inpatient and outpatient experience in diagnosis and management of neurological disorders in children. Students will also participate in other pediatric subspecialty clinics which serve children with neurologic disorders. This course does not satisfy the fourth year neurology requirement. Limited enrollment. (H/P/F grading only)—I, II, III, IV.
471. Elective in Pediatric Gastroenterology (3-18)
Clinical activity—full time (2 to 12 weeks). Prerequisite: satisfactory completion of course 430; consent of instructor. Inpatient and outpatient experience in diagnosis and management of pediatric patients with pulmonary diseases. These will include but will not be limited to cystic fibrosis, asthma, and other common pulmonary diseases as well as congenital abnormalities. (P/F grading only)—I, II, III, IV.
472. Clinical Rotation in Adolescent Medicine (3-9)
Clinical activity—39 hours; lecture—1 hour. Prerequisite: fourth year Medical Student; consent of instructor. Under supervision, students will care for patients in the UCD clinic and at a number of community-based sites. Emphasis on the socially-mediated problems that face adolescents, including
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substance abuse, STD’s, pregnancy, depression and suicide. One hour of lecture each week. (H/P/F grading only.) I, II, III, IV. Wilkins

473. Away Acting Internship in Pediatrics (6-18)
Clinical activity—40 hours; lecture—6 hours. Prerequisite: satisfactory completion of Pediatrics Clerkship; must work at the level of a sub intern in Inpatient and/or Outpatient settings. Expectation is to provide direct patient management. (H/P/F grading only.) I, II, III, IV. Butani

476. Acting Internship in Pediatric Intensive Care (6-18)
Clinical activity—full time (4 to 12 weeks). Prerequisite: completion of course 430 with grade of A or consent of instructor of record; letter of recommendation from Pediatrics faculty member. Evaluation and support of critically ill infants and children. In general, student expected to take night call every third night during rotation. Limited enrollment. (H/P/F grading only.) I, II, III, IV. Davis

493. Ethical, Legal and Social Issues in Clinical Genetics (6)
Seminar—12 hours; clinical activity—18 hours; tutorial/—8 hours; independent study—2 hours. Prerequisite: consent of instructor. Restricted to UC Davis School of Medicine students only. Develop advanced knowledge, communication skills and attitudes necessary to provide compassionate, knowledgeable and patient care to patients who may be at increased risk for illness. Seminar covers ethical and legal principles, epidemiology, and genetics. (H/P/F grading only.)—II. (II) Rich, Wilkes

493B. Living with Intellectual & Developmental Disability in the Community (1-6)
Clinical activity—4 hours; lecture—10 hours; fieldwork/—4 hours; seminar—4 hours. Prerequisite: consent of instructor. In-depth experience with Intellectual & Developmental Disability across the lifespan. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Hansen

498. Directed Group Study (1-5)
Variable—3-15 hours. Explore in-depth various topics in Pediatrics. Extensive contact with and oversight by instructor. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV)

499. Research Topics in Pediatrics (1-18)
Prerequisite: Student in Medical School with consent of instructor. Individual research project in pediatric subspecialty areas [cardiology, endocrinology, hematology, metabolism, newborn physiology and others], in depth and as approved with faculty member. Independent research by student will be emphasized and long-term projects are possible. (H/P/F grading only.)

Physical Medicine and Rehabilitation (PMR)

Upper Division

100. Research Approaches to Disability and Rehabilitation (2)
Lecture/discussion—2 hours. Discussion and evaluation of research approaches to medical rehabilitation, community participation and quality of life of disabled persons, with a focus on the progressive disabilities associated with neuromuscular diseases. Intent is to encourage interest in professions that serve this disability community and increase awareness of rehabilitation goals. —II.

198. Directed Group Study (1-5)
Prerequisite: advanced standing and consent of instructor. (P/NP grading only.)

199. Special Studies for Advanced Undergraduates (1-5)
Prerequisite: advanced standing and consent of instructor. (P/NP grading only.)

Graduate

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only.)

Professional

440. Rehabilitation Medicine Clerkship (3)
Clinical activity—36 hours; lecture/discussion—4 hours. Prerequisite: consent of instructor; completion of Internal Medicine 430. Rehabilitation and comprehensive care of physical, cognitive and psychological disability. Emphasis on patient rehabilitation. (H/P/F grading only.)—I, II, III, IV. Davis

461. Rehabilitation Medicine (6)
Clinical activity—36 hours; lecture/discussion—4 hours. Prerequisite: consent of instructor; completion of Internal Medicine 430. Prerequisite: four-week rotation designed to be an overview of PM&R practice for students interested in residency training in the specialty. Emphasis on evaluation and therapeutic management of spinal disorders, sports injuries, neuromuscular disease, and rehabilitation. (H/P/F grading only.)—I, II, III, IV. Davis

462. Rehabilitation Medicine Clinical Elective (5-18)
Clinical activity—full time. Prerequisite: Internal Medicine 430, Surgery 430; completion of third year in Medical School. Emphasis on evaluation of patients with neuromuscular diseases. Scheduling and academic modules: participating in evaluation and therapeutic management of patients with neuromuscular disease. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Davis

493. Applied Musculoskeletal Anatomy: Sports & Spine SSR (6)
Lecture—5 hours; lecture/laboratory—10 hours; laboratory—16 hours; seminar—4 hours. Prerequisite: consent of instructor; restricted to UC Davis School of Medicine students only. This four week module will cover the anatomy and biomechanics of the musculoskeletal system as well as its associated pathology. The student will be instructed on appropriate musculoskeletal exam techniques and apply what they have learned in the lab. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Shin

498. Advanced Group Study (1-5)
Prerequisite: consent of instructor. Study and experience in medical management of patients in areas of physical medicine and rehabilitation. (H/P/F grading only.)

499. Research for Medical Students (1-12)
Prerequisite: consent of instructor. Research on any of a variety of topics in physical medicine and rehabilitation. (H/P/F grading only.)

Psychiatry (PSY)

Lower Division

92. Willow Clinic (1-2)
Clinical activity—2-6 hours; seminar—1-2 hours. Open to lower division undergraduate students. Students run clinic for undergraduate students interested in learning about psychiatric care needs of homeless population. May be repeated for credit. (P/NP grading only.)—I, II, III, IV. (I, II, III, IV) Han, McCarron

Upper Division

192. Willow Clinic (1-2)
Clinical activity—2-6 hours; seminar—1-2 hours; lecture—1-2 hours. Prerequisite: consent of instructor; UC Davis enrollment; upper-division standing. Students run clinic for upper division undergraduate students interested in learning about and meeting the unique health care needs of homeless population. May be repeated for credit. (P/NP grading only.)—I, II, III, IV. (I, II, III, IV) Han, McCarron

198. Directed Group Study (1-5)
Prerequisite: advanced standing and consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: advanced standing and consent of instructor. (P/NP grading only.)

Graduate

298. Directed Group Study For Graduate Students (1-5)
Prerequisite: graduate standing and consent of instructor.

299. Special Study for Graduate Students (1-12)
Prerequisite: graduate standing and consent of instructor. (S/U grading only.)

Professional

403. Fundamentals of Clinical Psychiatry (3)
Clinical activity—1 hour; lecture—3 hours. Prerequisite: approval of SOM Committee on Student Progress prior to selection of medical student only. Psychiatric interviewing. Mental Status Exam and diagnosis. Major child and adult disorders, including substance abuse and dependence. Weekly student interviews of psychiatric patients in small group format. (P/F grading only.)—I. (II) Hah, Newman

412. Psychology Grand Rounds (1)
Lecture—1 hour. Prerequisite: medical students or staff or other qualified mental health professionals with consent of instructor. Weekly interview of psychiatric patients at UC Davis for presentation of selected clinical cases, presentation of lecture and research reports. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Scher

413. Outpatient Psychiatry Clerkship (4)
Clinical activity—36 hours; conference—2 hours; lecture—2 hours. Prerequisite: course 430 and/or consent of instructor. Experience in clinical management/treatment of adult outpatients with psychiatric and substance abuse disorders; crisis management/intervention, evaluation/development of diagnosis and treatment plan; emphasis on outpatient psychopharmacology/brief psychotherapy; observation of group therapy. Individual supervision by faculty/residents. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Ton

414. Psychosomatic Medicine Clerkship (3-12)
Clinical activity—32 hours; discussion—8 hours. Prerequisite: Psychiatry Clerkship or consent of instructor; medical students only. A large university hospital service in which the student functions as a member of the team in evaluation and psychiatric liaison with other medical specialties. Intensive supervision from staff and psychiatric residents. May be repeated two times for credit. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Hilty, Ton

415. Telemedicine Clinical Elective (3-9)
Clinical activity—20 hours. Prerequisite: MS 4 with consent of instructor. Fourth year medical student elective in Telemedicine focusing on psychiatric issues. Align with University, School and Center for Health and Technology mission of rural outreach and public health, particularly in primary care. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Hilty, Ton

416. Child Psychiatry Clerkship (6)
Clinical activity—36 hours; lecture/discussion—2 hours; conference—2 hours. Prerequisite: course 430 and/or consent of instructor. Didactic and clinical inpatient, outpatient, and consultation-liaison experiences with children, adolescents, and families. Clinical observations, diagnostic assessment, and treatment will be undertaken with close supervision. Literature review and case conferences presented on a regular basis. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Ton

417. Jail Psychiatry Clerkship (6)
Clinical activity—28 hours; conference—8 hours; lecture—4 hours. Prerequisite: course 430 and/or consent of course coordinator. Students gain experience under close faculty supervision, assessing acute and chronic mentally ill inmates in both inpatient and clinic settings. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Ton

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; DivDom=Diversity; Wrt=W=Writing Experience
Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; ACGH=American Cultures; DD=Diversity; OL=Oral Skills; SL=Quantitative; SL=Scientific; VL=Visual; WC=World Cultures; WRT=Writing Experience
418. Off-Campus Clinical Experience (3-9)
Clinical activity—20-40 hours. Prerequisite: fourth-year medical students; consent of instructor. Clinical or research elective in off-campus medical school or mental approval of instructor and individual in charge of off-campus setting. May be repeated for credit. [H/P/F grading only]—I, II, III, IV, [I, II, III, IV].

420. Acting Internship in Psychiatry (62)
Clinical activity—40 hours. Prerequisite: course 430 and/or consent of course coordinator. Acting intern positions with current supervision with emphasis on biological psychiatry, psychopharmacology and psychodynamic aspects appropriate to diagnostic and long-term patient management. [H/P/F grading only]—I, II, III, IV, [I, II, III, IV].

421. Combined Medicine-Psychiatry Clerkship (3-6)
Clinical activity—32 hours, discussion—8 hours. Prerequisite: Psychiatry Clerkship or consent of instructor; medical students only. Students will rotate through the county Primary Care Clinic under the supervision of dual-boarded Psychiatry and Internal Medicine/Family Practice faculty to provide medical care to uninsured patients as primary care for psychiatric patients. May be repeated for credit two times. (H/P/F grading only) I, II, III, [I, II, III, IV].

422. Readings in Psychiatry (1-3)
Readings/dissertation—3–9 hours. Independent reading of a selected topic in psychiatry. Supervision and discussion with a psychiatric faculty member. (H/P/F grading only). I, II, III, IV, [I, II, III, IV].

423. Willow Clinic (12)
Prerequisite: open to medical students in all four years of medical school. Student run clinic for medical students interested in learning about and meeting the unique health care needs for the homeless population. May be repeated for credit. (H/P/F grading only). I, II, III, IV, [I, II, III, IV].

424. Functional Genomics (2)
Lecture—1 hour, discussion—1 hour. Prerequisite: graduate standing or consent of the instructor. The theory, methods and principles of functional genomics with emphasis on the relationship to molecular mechanisms involved in development and disease of the nervous system. (H/P/F grading only). I, II, [I, II].

430. Psychiatry Clinical Clerkship (12)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress. Assigned to clinical settings, students build upon skills in preclinical years; emphasis on diagnosis, therapeutic and interpersonal skills. Areas of focus include patient management, interviewing skills, mental status exam, differential diagnosis, basic psychophysiology. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only). I, II, III, IV, [I, II, III, IV].

430A. SJVP Longitudinal Psychiatry Clerkship (12)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 4 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only). I, II, III, IV, [I, II, III, IV].

430B. SJVP Longitudinal Psychiatry Clerkship at UCSF (B) (6)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only). I, II, III, IV, [I, II, III, IV].

430FC. SJVP Longitudinal Psychiatry Clerkship at UCSF (C) (2)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Psychiatry for 24 weeks at UCSF Fresno. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only). I, II, III, IV, [I, II, III, IV].

430TA. TeachMS Longitudinal Psychiatry Clerkship (3)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Promotions; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Medicine for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only). I, II, III, IV, [I, II, III, IV].

430TB. TeachMS Longitudinal Psychiatry Clerkship (B) (6)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Promotions; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Medicine for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only). I, II, III, IV, [I, II, III, IV].

430TC. TeachMS Longitudinal Psychiatry Clerkship (C) (2)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Promotions; consent of instructor. Longitudinal Clerkship runs concurrently with Primary Care and Medicine for 24 weeks. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. May be repeated for credit. (H/P/F grading only). I, II, III, IV, [I, II, III, IV].

439D. Directed Clinical Studies in Psychiatry (1-24)
Clinical activity—40 hours. Prerequisite: consent of instructor. Individual directed studies in extended preparation for remediation of all or part of clinical rotation. Clinical studies to accommodate and satisfy remedial work as directed by the Committee on Student Progress and approved by the course IOR. May be repeated for credit. (P/F grading only). I, II, III, IV, [I, II, III, IV].

439R. Directed Studies in Psychiatry (1-12)
Clinical activity—30 hours; independent study—10 hours. Prerequisite: instructor. Individual directed studies in extended preparation for modified curriculum or to complete a clinical rotation having a leaving of absence. May be repeated for credit. (P/F grading only). I, II, III, IV, [I, II, III, IV].

480. Insights in Psychiatry (1-3)
Clinical activity—3–9 hours. Prerequisite: first- or second-year medical students; good academic standing; consent of instructor. On individual basis, student provided with an opportunity for gaining insight into various clinical activities in the practice of psychiatry. (H/P/F grading only). I, II, III, IV, [I, II, III, IV].

488. Acting Internship in Inpatient Psychiatry, Away Rotation (6)
Clinical activity—40 hours. Prerequisite: Psychiatry Clerkship and/or consent of course coordinator. Inpatient acting internship at approved non-UCDHS affiliated training program that provides experience and preparation for ambulatory medical care. Students perform as an intern, with a smaller number of patients, greater supervision, and responsibility for the ongoing care of assigned patients. (H/P/F grading only). I, II, III, IV, [I, II, III, IV].

489. Acting Internship in Ambulatory Psychiatry, Away Rotation (6)
Clinical activity—40 hours. Prerequisite: Psychiatry Clerkship and/or consent of course coordinator. Outpatient acting internship at approved non-UCDHS affiliated training program that provides experience and preparation for ambulatory medical care. Students perform as an intern, with a smaller number of patients, greater supervision, and responsibility for the ongoing care of assigned patients. (H/P/F grading only). I, II, III, IV, [I, II, III, IV].

493. Culture, Medicine and Society (6)
Seminar—12 hours; clinical activity—16 hours; independent study—8 hours; discussion—4 hours. Prerequisite: consent of instructor; UC Davis School of Medicine students only. Students will learn about the epidemiological significance of health disparities and barriers to access to health care. The course will cover: (1) Epidemiology/Health Disparities; (2) Society and Medicine; (3) Cinemedia; (4) Reflection/Integration. (H/P/F grading only). I, II, III, IV.

498. Directed Group Study (1-5)
Prerequisite: consent of instructor; approved for graduate degree credit. Medical students desiring to explore particular topics in depth. (H/P/F grading only for graduate or medical students.)

499. Research (1-12)
Prerequisite: consent of instructor. Approved for graduate degree credit. Individual research on selected topics or research projects. (H/P/F grading only for graduate or medical students.)

Public Health Sciences (SPH)

Lower Division

92. Internship in Community Health (1-12)
Internship—3–36 hours. Prerequisite: lower division standing; consent of instructor. Students apply theory and concepts learned in the classroom through field work in a community health agency. (P/NP grading only.)

Upper Division

101. Perspectives in Community Health (3)
Lecture—3 hours. Prerequisite: undergraduate standing. Covers comprehensively the responsibilities, obligations, roles and professional activities of various health care disciplines in the community. Prerequisite: students with perspectives on preventive medicine in society. (I, II, III).

132. Health Issues Confronting Asian Americans and Pacific Islanders (4)
Lecture—discussion—4 hours. Prerequisites: course 130; research topics. Issues confronting Asian Americans and Pacific Islanders. (Same course as Asian American Studies 132.) GE credit: SocSci; SS. I, II, III, IV.

160. General Health Education and Promotion (5)
Lecture—4 hours; discussion—1 hour. Restricted to students in the internship program for the Health Education Program only. Topics include addiction, substance abuse prevention, nutrition, stress management, physical fitness, body image, reproductive anatomy and physiology, contraceptive options, safer sex, sexual health, healthy relationship skills, and other general wellness/health promotion topics. Practice in peer counseling and outreach presentations. Limited enrollment. (P/NP grading only). I, II, IV. Ferguson

161. Campus Alcohol/Drug Abuse Prevention Program Peer Educator Training (4)
Lecture/discussion—3 hours; practice—1 hour. Prerequisites: course 160 (may be taken concurrently); consent of instructor. Provides training in campus and community substance abuse prevention and educational intervention. Addition and other physiological responses to alcohol and other drugs. Harm-reduction strategies for individuals and target groups.
162. Health Advocates Peer Educator Training (4)
Lecture/discussion—3 hours; practice—1 hour. Prerequisite: course 160 [may be taken concurrently]; consent of instructor. Preparation for internship in campus and community health promotion and risk reduction. Nutrition, stress management, physical fitness, body image and disordered eating, skin cancer prevention, mental wellness/Health promotion topics. (P/NP grading only.)—II, III.

175W. Health Policy and Health Politics (4)
Seminar—3 hours; extensive writing or discussion—1 hour. Restricted to students attending UC Washington Center program. Following the model of a Congressional subcommittee, identification of four salient health policy issues for study, research, and development of policy models to address them. [Same Course as UC Davis Washington Center 175.] GE credit: SocSci, Wrt | ACCH, OL, SS, WE. —III, (III.) Wintermute

190C. Research Conference in Community and International Health (1)
Discussion—1 hour. Prerequisite: consent of instructor. Weekly conference on research problems, progress, and techniques in community and International Health. Critical discussion of recent journal articles. May be repeated for credit. (P/NP grading only.)—I, II, III, (I, II, III.)

192. Internship in Community Health Practice (1-12)
Internship—3.36 hours. Prerequisite: upper division and graduate students; consent of instructor. The student, through fieldwork in a community health agency, learns to apply theory and concepts learned in the classroom. (P/NP grading only.)

199. Research in Community and International Health (1-5)
Prerequisite: undergraduate standing and consent of instructor. Study and experience for undergraduate students in any number of areas in community and international health. (P/NP grading only.)

200. Internship in Public Health (3)
Lecture—3 hours; laboratory/discussion—2 hours. Prerequisite: graduate standing or consent of instructor. Provides an overview of public health. Covers the history of public health in the U.S.; defines its major functions and constituencies; and, introduces fundamental concepts of epidemiology, biostatistics, behavioral sciences, environmental health, infectious diseases, and reducing health disparities. May be repeated one time for credit.—IV, (IV.) Garcia

203. Learning and Teaching in Public Health Contexts (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing or consent of instructor. Aimed at current and future public health professionals interested in learning more about the educational potential for interactions with community members and other health professionals—all stakeholders in improving the health of communities.—III, (III.) Cassedy, Zie-gahn

210. Public Health Informatics (2)
Lecture—2 hours; laboratory—2 hours. Restricted to upper division or graduate standing. Collection, verification, validation, and analysis of data related to populations; infrastructure, functions, and tools used to
generate public health knowledge supporting public health policies and practice development/dissemination. (S/U grading only.)—I, II.

211. Infectious Diseases and Global Health (3)
Lecture—2 hours; discussion—1 hour. Infectious disease epidemiology and prevention, with emphasis on human and veterinary diseases of global health importance. Major global health epidemics and challenges of infectious diseases, by mode of transmission.—II, (II.) DiKeimer, Sandrock

212. Migration and Health (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing. Principles of migration and health. Topics will include demographics, public health immigration programs, health care delivery, occupational health, and effects of international migration on the health in communities of origin, transit and destination. Guest presentations by outside experts. Offered in alternate years.—III, (III.) Schneider

222. Social & Behavioral Aspects of Public Health (3)
Lecture/discussion—3 hours. Prerequisite: consent of instructor required; graduate standing, Statistics 102 and 106. Theories and strategies of health behavior change at the individual, group, community, and environmental levels. Examples include: transteoretical model, social networks, and social marketing. Theories are applied to solve common public health problems (cancer, smoking, and HIV/AIDS).—II, (II.) De Vogli

232. Health Communication (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Health communication theories and research traditions. Topics include consumer health information seeking; physi- cian-patient interaction; information, social marketing, “edutainment,” and media advocacy campaigns; social networks and coping; media influences on health; and new communication technologies in health promotion and healthcare delivery. [Same course as Communication 232.] Offered in alternate years.—IV, (IV.) Yang

244. Introduction to Medical Statistics (4)
Lecture/discussion—6 hours; laboratory/discussion—3 hours. Introduction to statistical methods and software in clinical, laboratory and population medicine. Graphical and tabular presentation of data, probability, binomial, Poisson, normal, t, F, and Chi-square distributions, elementary nonparametric methods, simple linear regression and correlation, life tables. Only one credit for students who have completed Statistics 100 or Preventive Veterinary Medicine 402.—IV, (IV.) Yang

245. Statistical Analysis of Laboratory Data (3)
Lecture—3 hours; laboratory/discussion—1 hour. Prerequisite: course 244 and 247; consent of instructor. Priority given to K30 training program in School of Medicine. Analysis of data and design of experiments for laboratory settings with an emphasis on gene expression arrays and other high-throughput biological assay technologies. Offered in alternate years.—III, (III.) Roeke

246. Biostatistics for Clinical Research (4)
Lecture—3 hours; laboratory/discussion—1 hour. Prerequisite: courses 244 and 247. Emphasizes critical biostatistics for clinical research and targets biomedical audience. Students will develop understanding and proficiency in the analysis of clinical studies and learn to develop collaborations with biostatisticians. May be repeated for credit.—II, (II.) Qi

247. Biostatistics for Epidemiology (4)
Lecture—2 hours; laboratory—1 hour. Prerequisite: courses 246. Introduction to the principles and methods of statistical inference for categorical data and survival data in epidemiological studies. The major topics include contingency table methods, logistic regression, Kaplan-Meier and log-rank methods, and Cox regression.—I, (I.) Kim

252. Social Epidemiology (2)
Lecture/discussion—2 hours. Prerequisite: Epidemiology 205A; consent of instructor. Social determinants of health; psychosocial and psychological pathways; health and social inequality; gender and racial/ethnic disparities in health; social support, social cohesion and health; social determinants in behavioral risk factors; social ecological approaches to health intervention; interventions addressing social determinants. [Same Course as Epidemiology 252.]—III, (III.) Gibson

255. Human Reproductive Epidemiology (3)
Lecture—3 hours. Prerequisite: Preventive Veterinary Medicine 405, 406, Physics 220, Physiology 222 or equivalents, or consent of instructor. Human reproductive effects and risk of reproductive disorders, examined from macro- and micro-environmen- tal exposures in community and occupational settings; epidemiologic study designs and analyses. Offered in alternate years.—I, (I.) Hertz-Picciotto

262. Principles of Environmental Health Science (3)
Lecture—3 hours. Prerequisite: consent of instructor required. Principles, approaches and issues related to environmental health. Recognizing, assessing, understanding and controlling the impact of people on their environment and the impact of the environment on the public.—I, (I.) Bennett

264. Public Health Econometrics (2)
Laboratory/discussion—3 hours. Prerequisite: consent of instructor. Principles of demand and supply; elasticity; benefits and costs; least squares regression; stepwise regression; economic and statistical significance; fixed and random effects; longitudinal data; non-linear relations; categorical variables; instrumental variables; attrition bias; tobit regression; two-part cost model. (S/U grading only.)—III, (III.) Leigh

266. Applied Analytic Epidemiology (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: Preventive Veterinary Medicine 404 or consent of instructor. Principles and applications in analysis of epidemiologic data. Methods of analyzing stratified and matched data, logistic regression and binary and case-control studies, Poisson regression, survival-time methods. [Same course as Population Health and Reproduction 266.]—III, (III.) Schenker

273. Health Services Administration (3)
Laboratory—3 hours. Prerequisite: consent of instructor required. Structure and function of public and pri- vate medical care. Topics include categories and trends in national medical spending, predictors of patient use, causes of death, managed care, HMOs, Medicare, Medicaid, costs of technology, and medi- cal care in other countries. Limited enrollment.—II, (II.) Leigh

290. Topics in Public Health (1)
Seminar. Prerequisite: consent of instructor. Open to students in Master of Public Health program, or permission of instructor. Seminar on key issues and current topics in public health. Course begins in August/SSSI. Students must enroll in August, then Fall and Winter. The course is a series but grades and units are given at end of each quarter. May be repeated four times for credit. (S/U grading only.)—I, II, IV, III, (IV.) Kasa, McCurdy

295. International Health (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing or consent of instructor. Forum for learning health issues and health care systems in other coun- tries. Topics include health care in resource-limited settings, the impact of political strife on health, the health care professional in international settings. (S/U grading only.)—III, (III.) Koga, Schenker

297. Public Health Fieldwork (1-16)
Prerequisite: consent of instructor. Open to Master of Public Health students. Practical fieldwork experi- ence in public health. Placement site will vary based on the interest and experience of each student. May be repeated up to four times for credit. (S/U grading only.)—I, II, IV, (IV.) McCurdy
298. Study in Community and International Health (1-5)
Prerequisite: graduate student in good academic standing; consent of instructor and study. Experience for graduate students in any number of areas in community and international health. (S/U grading only.)—I, II, III, IV

299. Research in Community and International Health (1-12)
Prerequisite: graduate standing; consent of instructor. Student will work with faculty member in areas of research interest, including but not limited to injury control, international health, health policy, occupational and environmental health, health promotion and wellness, women's health, and health demographics. (S/U grading only.)—I, II, III, IV

Professional

402. Introductory Medical Spanish (2)
Lecture—2 hours. Prerequisite: medical student or consent of instructor. The vocabulary needed to conduct a basic history and physical examination in Spanish. (H/P/F grading only.)—III.

461. Clerkship in Community Health Group Practice (3-9)
Clinical activity—full time (2-6 weeks). Prerequisite: third- or fourth-year medical student. Overview of local community health in group practice situations. Students participate in treatment at several clinic sites in Yolo County. Topics include primary care, environmental health, maternal and child health, jail health, and preventive health care for the aged. (S/U grading only.)—I, II, III, IV

465. Community Health Preceptorship (3-18)
Clinical activity—5-40 hours. Prerequisite: fourth-year medical student; consent of instructor. Participate at state or county health department or other public health organization in ongoing investigations into current public health problems, e.g., birth defects, cancer control, diabetes, hypertension, injury control, infectious diseases, aging, Alzheimer's disease, and smoking and tobacco use control. (H/P/F grading only.)—I, II, III, IV

466. Occupational and Environmental Medicine Elective (6-12)
Clinical activity; laboratory. Prerequisite: fourth-year medical student in good academic standing; consent of instructor. Participate in activities of Occupational and Environmental Medicine Unit. Major activity is an epidemiologic research project of the University. Participate in Occupational and Environmental Medicine Clinic at UC Davis Medical Center and other sites, as arranged. Gain experience in occupation and environmental medicine, use of medical literature resources, the worker's compensation system, and toxicological principles. Students may take up to four weeks for six units. (H/P/F grading only.)—I, II, III, IV

470. Clinical Selective in Occupational and Environmental Medicine (3-6)
Clinical activity—9-18 hours. Prerequisite: fourth-year medical student in good academic standing; consent of instructor. Outpatient clinical experience in Occupational and Environmental Medicine at UCDMC and other sites, as arranged. Gain experience in occupational and environmental medicine, use of medical literature resources, the worker's compensation system, and toxicological principles. Students may take up to four weeks for six units. (H/P/F grading only.)—I, II, III, IV

480. Insights in Occupational and Environmental Medicine (1-3)
Clinical activity—3-9 hours. Prerequisite: first or second-year medical student in good academic standing, consent of instructor. Observation and participation in research and clinical activities in occupational and environmental medicine which include conferences, occupational and environmental medicine clinical activities and field visits. Develop and present student individual research projects. (P/F grading only.)—I, II, III, IV

495. International Health (2)
Lecture/discussion—2 hours. Prerequisite: medical student in good academic standing, consent of instructor. Forum for learning about health issues and health care systems in other countries. Topics include health care for refugees, the impact of political strife on health, the health care professional in international settings. (H/P/F grading only.)—III. (Koga, Schenker)

496. Current Issues in Public Health (1-1)
Lecture/discussion—1 hour. Topical issues in public health. Speakers from the local public health community address issues such as disease control programs, access to care. May be repeated up to three times for credit. (P/F grading only.)—III.

498. Study in Public Health Sciences (1-6)
Prerequisite: medical student in good academic standing and consent of instructor. Study and experience for medical students in areas in community and international health. (H/P grading only.)—I, II, III, IV

499. Research in Public Health Sciences (1-9)
Prerequisite: medical students with consent of instructor. Work with faculty member in areas of research interest, including but not limited to injury control, international health, health policy, occupational and environmental health, health promotion and wellness, women's health, and health demographics. (H/P/F grading only.)—I, II, III, IV

Radiation Oncology (RON)

Upper Division

199. Special Study for Advanced Undergraduates; Research in Radiation Biology (1-5)
Prerequisite: undergraduate standing; consent of instructor. Radiation Oncology is a unique discipline combining elements linked to complex physics based dosimetry and treatment planning. Included within this clinical environment is a strong basis in biology that underpins the clinical effectiveness of radiation treatment. (P/NP grading only.)—I, II, III, IV

299. Independent Study and Research (1-12)
Prerequisite: consent of instructor. Advanced-level work with the course instructor. Clinical activity—30 hours. Prerequisite: completion of course 461, or the equivalent, is required. Consent of Group Advisor and Sponsor. Research under supervision of Radiation Oncology faculty. Work must be appropriate to fulfill the requirements for the Ph.D. dissertation. (S/U grading only.)—I, II, III, IV

495. Independent Study and Research in Therapeutic Radiology
Prerequisite: consent of instructor. Advanced-level work with the course instructor. Clinical activity—30 hours. Prerequisite: completion of course 461, or the equivalent, is required. Consent of Group Advisor and Sponsor. Research under supervision of Radiation Oncology faculty. Work must be appropriate to fulfill the requirements for the Ph.D. dissertation. (S/U grading only.)—I, II, III, IV

463. Radiation Oncology Clerkship (3-9)
Clinical activity—30 hours. Prerequisite: completion of Medical Sciences 420, 431, third-year clerkship, consent of instructor required. Introduction to radiation oncology. Students will participate in workup and treatment planning for radiation oncology patients and will be introduced to the concepts involved in clinical radiation oncology, radiation biology, and radiation physics. (H/P/F grading only.)—I, II, III, IV

499. Independent Study and Research in Therapeutic Radiology
Prerequisite: consent of instructor. Advanced-level work with the course instructor. Clinical activity—30 hours. Prerequisite: completion of course 461, or the equivalent, is required. Consent of Group Advisor and Sponsor. Research under supervision of Radiation Oncology faculty. Work must be appropriate to fulfill the requirements for the Ph.D. dissertation. (S/U grading only.)—I, II, III, IV

414. Medical Radiation Biology (3)
Lecture—27 hours total. Prerequisite: consent of instructor. Medical radiation biology; molecular cellular and organ system response to acute and chronic irradiation; radiation carcinogenesis and genetic effects; radiation risk assessment; diagnostic ultrasound and magnetic resonance imaging health effects. Medical/legal considerations of radiation exposure. Offered in alternate years. (H/P/F grading only.)—III. Bushberg

461. Advanced Clinical Clerkship in Diagnostic Radiology (3-6)
Clinical activity—35 hours total; conference—4 hours; discussion/ laboratory—1 hour. Prerequisite: satisfactory completion of second year medical school curriculum and of third-year clerkships in Internal Medicine and General Surgery; consent of instructor. Restricted to eight students per rotation; open to visiting medical students from accredited programs. Work with clinical Radiologists in image interpretation, diagnostic imaging, x-ray production and interaction; image formation; modulation transfer function; fluoroscopy; cine fluoroscopy; stereoscopy; xeroradiography; computerized and geometrical tomography; magnetic resonance and ultrasound. Principles of radiation protection in imaging environment. Offered in alternate years. (H/P/F grading only.)—III.

462. Diagnostic Imaging of Acquired and Congenital Heart Disease (2)
Lecture—5 hours total; conference—5 hours; discussion—5 hours; field work—9 hours; exam—1 hour. Prerequisite: fourth-year medical student in good academic standing and course 461 [may be taken concurrently]. Main emphasis on radiation of acquired and congenital heart disease, but also on magnetic resonance, nuclear medicine, and echocardiography of heart diseases. (H/P/F grading only.)—III

473. Advanced Clinical Clerkship in Neuroradiology (3-6)
Clinical activity—35 hours total; conference—4 hours; independent study—1 hour. Prerequisite: fourth-year medical student with interest in Diagnostic Radiology, Neuroradiology. Neurological Anatomy, Psychiatry, Psychology, or related field; satisfactory completion of course 461, or the equivalent, is strongly encouraged. Restricted to one student per 2-4 week rotation. Students will work with Radiologists in image interpretation of CT, MRI, and fluoroscopy. Opportunity to participate in assessment of Neurointerventional patients, and to observe Neurointerventional procedures. Daily conferences in...
advanced clinical clerkship in pediatric radiology (3-6)
clinical activity—35 hours; conference—4 hours; discussion/laboratory—1 hour. prerequisite: fourth-year medical student with interest in musculoskeletal radiology, orthopedic surgery, sports medicine, pmrn, or related field; satisfactory completion of course 461, or the equivalent, is strongly encouraged. restricted to one student per 2/4 week rotation. work with musculoskeletal radiologists in interpretation of ct, mri, radiography, and fluoroscopy. opportunities for evaluation by students and for image-guided procedures. daily conferences in musculoskeletal imaging, general radiology, health physics, and radiology safety. assigned readings. credit limited to 3 units for 2 weeks, 6 units for 4 weeks. may be repeated for credit.

advanced clinical clerkship in musculoskeletal radiology (msk) (3-6)
clinical activity—35 hours; conference—4 hours; discussion/laboratory—1 hour. prerequisite: fourth-year medical student with interest in musculoskeletal radiology, orthopedic surgery, sports medicine, pmrn, or related field; satisfactory completion of course 461, or the equivalent, is strongly encouraged. restricted to one student per 2/4 week rotation. work with musculoskeletal radiologists in interpretation of ct, mri, radiography, and fluoroscopy. opportunities for evaluation by students and for image-guided procedures. daily conferences in musculoskeletal imaging, general radiology, health physics, and radiology safety. assigned readings. credit limited to 3 units for 2 weeks, 6 units for 4 weeks. may be repeated for credit.

advanced clinical clerkship in vascular/interventional radiology (ir) (3-6)
clinical activity—35 hours; conference—4 hours; discussion/laboratory—1 hour. prerequisite: fourth-year medical student with interest in diagnostic radiology, vascular/interventional radiology, cardiovascular imaging, cardiology, cardiovascular surgery, surgical oncology, general surgery, or related field; satisfactory completion of course 461, or the equivalent, is strongly encouraged. restricted to one student per 2/4 week rotation. work with vascular/interventional radiologists in the evaluation of patients for interventional procedures. there will be opportunities to daily conferences in general radiology, health physics, and radiology safety. assigned readings. credit limited to 3 units for 2 weeks, 6 units for 4 weeks. may be repeated for credit.

advanced clinical clerkship in ultrasound radiology (3-6)
clinical activity—30 hours; conference—5 hours; film viewing—3 hours. prerequisite: fourth-year medical student with interest in obstetrics and gynecology, ob/gyn, or in other medical or surgical subspecialties employing ultrasound in their clinical practice; prior completion of course 461, or the equivalent, is encouraged. restricted to two students per 2/4 week rotation. participation as an active team member on a busy clinical ultrasound service. credit limited to 3 units for 2 weeks, 6 units for 4 weeks. may be repeated for credit.

advanced clinical clerkship in abdominal imaging (3-6)
clinical activity—35 hours; conference—4 hours; discussion/laboratory—1 hour. restricted to two students per 2/4 week rotation. work with clinical radiologists on abdominal and pelvic ct, mr, ultrasound, digital radiography, gastrointestinal and genitourinary procedures, image-guided intervention. offered as a 2-week rotation for third-year medical students and a 2/4-week rotation for fourth-year medical students. credit limited to 3 units for 2 weeks, 6 units for 4 weeks. may be repeated for credit.

specialty externship in radiology (3-16)
clinical activity—25 hours; discussion—10 hours. prerequisite: consent of instructor. externship provides in-depth exposure to one of a variety of subspecialties in radiology. students and a 2/4-week rotation for fourth-year medical students. credit limited to 3 units for 2 weeks, 6 units for 4 weeks. may be repeated for credit.

specialty externship in diagnostic radiology (1-12)
clinical activity—25 hours; discussion—10 hours. prerequisite: consent of instructor. externship provides in-depth exposure to one of a variety of subspecialties in radiology. students and a 2/4-week rotation for fourth-year medical students. credit limited to 3 units for 2 weeks, 6 units for 4 weeks. may be repeated for credit.

specialty externship in diagnostic radiology (1-12)
clinical activity—25 hours; discussion—10 hours. prerequisite: consent of instructor. externship provides in-depth exposure to one of a variety of subspecialties in radiology. students and a 2/4-week rotation for fourth-year medical students. credit limited to 3 units for 2 weeks, 6 units for 4 weeks. may be repeated for credit.

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475. Pediatric Surgery (6-9) Clinical activity—full time (4-6 weeks). Prerequisite: fourth-year medical student or third-year medical student with completion of course 430. Care of patients with neonatal congenital surgical problems. Fluid and electrolyte management in infants. General experience with acquired surgical diseases in children. (H/P/F grading only)—I, II, III, IV (I, II, III, IV) Marr

476. Surgical Consult Service (6-9) Clinical activity—full time (4-6 weeks). Prerequisite: fourth-year medical student or third-year medical student with completion of course 430. Students function as acting interns working in parallel with the interns on the service. They consult on all non-trauma patients in the emergency room and on the wards and also participate in the operating room. (H/P/F grading only)—I, II, III, IV (I, II, III, IV) Wisner

477. Clinically Oriented Anatomy (3) Clinical activity—40 hours. Prerequisite: completion of three years of medical school. Analysis of selected regions of the body using cadaver dissection, prosections and interactive CD-ROMs. Anatomical relationships relevant to common surgical procedures. (H/P/F grading only)—II, III, IV (I, II, III, IV) Bold

480. Insights in Surgery (1-3) Clinical activity—3-9 hours. Prerequisite: medical student in good academic standing and consent of instructor. Individualized activities, including ward rounds, sub specialty clinics and conferences, grand rounds, and observation of a variety of surgical procedures. (H/P/F grading only)—I, II, III, IV, (I, II, III, IV) Khatri

481. Interactive Clinical Case Presentation (ICCP) (3) Clinical activity—1 hour. Prerequisite: fourth-year medical students; open for third and fourth year student observers; maximum of 10-15 students in good standing. Case presentation of common clinical scenarios (i.e. chest pain/MI, fever/pneumonia, abdominal/overlay/cecy stiles, etc.) from various discipline held in an auditorium with real patients exposure. Interactive session to review history, physical findings and case management. Students are asked to perform and discuss the presentation and answer questions. Course taught as one session (4 hours) per month for three quarters (July to March). The students who enroll can earn up to three credits and the minimum requirement is attendance at least six sessions. Students can do all nine sessions and work toward an honor. For the written part students will have to pick two of the nine case presentations and write a five page paper and a half hour presentation. "The Current management" of that disease-this can be a literature review and/or review article or a case presentation. (H/P/F grading only)—I, II, III, IV

482. Cardiothoracic Surgery Clerkship (6-9) Clinical activity—full time (4-6 weeks). Prerequisite: fourth-year medical student, or third-year medical student with completion of course 430. Student works as an extern on the Cardiothoracic Surgical Service, participating in perioperative management and critical care management of patients requiring surgery for cancer, endocrine disease and selected general surgical problems. Cases include malignant melanoma, sarcomas, gastrointestinal cancer, head and neck pathology, and metastatic malignancies. Attending rounds daily. Four teaching conferences weekly. (H/P/F grading only)—I, II, III, IV (I, II, III, IV) Bold

483. Gastrointestinal Surgery (3-9) Clinical activity—full time (4-6 weeks). Prerequisite: fourth-year medical student or third-year medical student with completion of course 430, Internal Medicine 430 and Pediatrics 430. Student participates on the GI Surgical Service, working under the immediate supervision of the faculty and surgical housestaff, involving the full spectrum of gastrointestinal diseases performed by the medical student. (H/P/F grading only)—I, II, III, IV (I, II, III, IV) Young

485. Artificial Cardiac Ventricular Assist System (1) Clinical activity—full time. Prerequisite: fourth-year medical student or third-year medical student with completion of course 430, Internal Medicine 430 and Pediatrics 430. Student participates on the vascular surgery service and in the management and operations of arterial and venous system, exclusive of diseases that require cardiopulmonary bypass for treatment. Includes in-hospital care responsibilities with appropriate supervision. (H/P/F grading only)—I, II, III, IV (I, II, III, IV) Dawson

493. Clinically-Oriented Anatomy Special Study Module (6) Lecture—5 hours; lecture/laboratory—10 hours; laboratory—16 hours; clinical activity—4 hours. Prerequisite: consent of instructor and School of Medicine students only. Reviews aspects of the anatomy of the head and thoracic cavity, abdominal, pelvis, extremities, vascular system, peripheral nervous system, and skeletal system. Focus on the understanding of anatomy related to common surgical procedures. (Cell Biology and Human Anatomy 493) (H/P/F grading only)—I, II, III, IV, (I, II, III, IV) Khatri

499H. Fourth-Year Surgical Honors Program (18) Prerequisite: completion of third year of medical school with superior performance on course 430; consent of instructor. To provide intensive and comprehensive training in surgery to students interested in a postgraduate surgical career. Participation in projects to include the formulation and conduct of original research. (P/F grading only)—I, II, III, IV (I, II, III, IV) Khatri, Olson, Ruebner

495. Intensive Introduction to Cardiac Surgery (3) Clinical activity—16 hours; lecture/discussion—4 hours. Prerequisite: consent of instructor. Restricted to Medical student between first and second year. Clinical activity-4 hours, directed reading and discussion and/or laboratory investigation on selected topics. (H/P/F grading only)—I, II, III, IV (I, II, III, IV) I. P. G. Holcroft
Medieval and Early Modern Studies

[College of Letters and Science]

Advisor: Ph.D., Program Director

Program Office: 176 Voorhis Hall

Committee in Charge

Emily Albu, Ph.D. (Classics)
Carlson Arnett, Ph.D. (German/Russian)
Seeta Chaganti, Ph.D. (English)
A. Katie Harris, Ph.D. (History)
Sally McKee, Ph.D. (History)
Baki Tezcan, Ph.D. (History/Religious Studies)

The Major Program

The major in Medieval and Early Modern Studies examines the intellectual, political, and cultural forces that shaped modern European civilization during the period from the end of Ancient Rome (fifth century) to the beginning of the Enlightenment (mid-eighteenth century). An interdisciplinary and interdepartmental program, the major includes studies in history, literature, philosophy, literature, drama, music, national languages, religion, rhetoric, and political theory.

The Program.

The major requires interdisciplinary work, while allowing the student to focus on the early Middle Ages (5th-9th centuries), the High Middle Ages, the Renaissance, or the Baroque. The series of medieval and early modern courses in the program provides the foundation for the major and prepares students for advanced work within the individual disciplines. On the upper-division level, students may choose course work in specific areas of History, Comparative Literature, English, French, German, Italian, Spanish, and Latin, philosophy and religion, arts and language, and cultural and political thought. In addition, each student may elect to complete a senior thesis on a selected aspect of medieval and/or early modern culture.

Career Alternatives.

The major in Medieval and Early Modern Studies is a liberal arts degree providing excellent preparation for the rigors of professional schools as well as careers in law, museology, journalism, and teaching.

Medieval and Early Modern Studies

A.B. Major Requirements:

Preparatory Subject Matter: .......................... 22

Medieval Studies 20A, 20B .......................... 10

Three additional courses from among:

Art History 13B, 140, 141A, 141B, 141C, 141D, 142
History 10A, 10B, 10C, 10D, 10E
History 20A, 20B, 20C

Total Units for the Major: .......................... 66

History 102B, 102D, 103, 104, 105, 106
Italian 101, 102, 111, 112, 113, 114, 115A, 115B, 115C
Latin 101, 102, 103, 104, 105, 106, 108, 109, 110, 111
Latin 115, 116, 118, 120, 121, 125
Medieval Studies 130A, 130B, 131, 139, 190
Music 121*, 124A, 124B
Philosophy 105, 145, 168, 170
Political Science 115, 116, 118A
Religious Studies 102, 115, 130*
Spanish 130, 133N, 134A, 134B, 142*

Total Units for the Major: .......................... 66

Pre-Fall 2011 General Education (GE):

ACGH = American Cultures;
DD = Domestic Diversity;
QL = Quantitative;
SL = Scientific;
Wrt = Writing Experience

Quarter Offered: T-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): ArtHum = Arts and Humanities; SciEng = Science and Engineering; SocSci = Social Sciences; Divw = Diversity Student; Wrt = Writing Experience

Fall 2011 and on Revised General Education (GE): ArtHum = Arts and Humanities; SciEng = Science and Engineering; SocSci = Social Sciences; ACGH = American Cultures; DD = Domestic Diversity; QL = Quantitative; SL = Scientific; Wrt = Writing Experience

Medicine and Epidemiology

See Medicine and Epidemiology (VME), on page 539.
spheres: exploration, medical pathology, daily life, baroque culture. Immersion in source material from 1300-1650. May be repeated for credit. GE credit: ArtHum, Wrt | AH, WC, WE.

131. Cross-Cultural Relations in the Medieval and/or Early Modern World (4) Lecture/discussion—3 hours; extensive writing. Pre-requisite: course 20A or 20B or consent of instructor. Medieval and/or Renaissance aspects of cross-cultural relations between Christians, Jews, and Muslims: Europeans, Africans, and Asians; Old World and New World. Offered irregularly. GE credit: BC, WC, WE.

189. Seminar in Medieval and Early Modern Culture (4) Seminar—3 hours, term paper. Pre-requisite: course 20A or 20B or consent of instructor. Focus on a particular problem or issue in the Medieval or Early Modern period. Seminar topics might include (but not limited to) monasticism, origins of the university, chivalry, exploration, the role of women in the Middle Ages and Early Modern World. Offered in alternate years. GE credit: WE.

190. Senior Thesis (4) Seminar—4 hours. Pre-requisite: senior standing and major in Medieval Studies. Preparation of a research paper dealing with a selected aspect of medieval culture, under supervision of three members of the Committee in Charge. II, III, IV. (II, III, IV.)

197T. Tutoring in Medieval Studies (1-4) Seminar—2 hours. Pre-requisite: courses 20A and 20B, upper division standing; consent of instructor and chairperson of curriculum committee. Tutoring in Medieval Studies 20A and 20B, including leadership in small discussion groups affiliated with the course. May be repeated for credit for a total of 6 units. (P/NP grading only.)

198. Directed Group Study (1-5) (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.)

Microbiology

See Microbiology and Molecular Genetics, on page 423; Medical Microbiology (MMI), on page 410; Microbiology (A Graduate Group), on page 423; and Pathology, Microbiology, and Immunology (PMI), on page 540.

Meteorology

See Atmospheric Science, on page 173.

Mexican-American (Chicano) Studies

See Chicana/Chicano Studies, on page 192.

A.B. Major Requirements:

Preparatory Subject Matter ..............44-56

Biological Sciences 2A/2B-2C .....14-15
Chemistry 2A-2B .......................10
Chemistry 8A-B or 118A-118B-118C ...........................................6-12
Mathematics 17A-17B or 21A/21B ...................................8
Physics 1A-1B or 2A/2B-2C ..........6-12

Depth Subject Matter ...............36

Biological Sciences 101, 105 (or 102+103) .....................................7-10
Microbiology 104, 104L, 105, 105L ........................................13
Select at least one course from each of the areas of study below.

Areas of Study:

1. Molecular Microbiology: Microbiology 115, 150, 170, 171 ................3
2. Medical Microbiology: Microbiology 162, Medical Microbiology and Immunology 188, Pathology, Microbiology and Immunology 126, 128, 173, 183 ........3-4
3. Electives restricted to Elsewhere ...........6-10

Select from:

Upper division Microbiology courses not used in satisfaction of any other requirement; or Biological Sciences 104, 181, 183; Food Science and Technology 104; Molecular Cellular Biology 120L, 121, 160L, 182; Plant Pathology 120, 130, 148, 150; Plant Sciences 174; Pathology Microbiology and Immunology 126, 127; Soil Science 111

Note: Although a course may be listed in more than one category, that course may satisfy only one requirement in the entire major.

Total Units for the Major ...............80-92

B.S. Major Requirements:

Preparatory Subject Matter ..............55-65

Biological Sciences 2A/2B-2C .....14-15
Chemistry 2A-2B .......................10
Chemistry 8A-B or 118A-118B-118C ...........................................6-12
Mathematics 17A-17B-17C or 21A/21B (21C recommended) ...............8-12
Physics 7A-7B-7C .......................12
Microbiology 91 or 191 .................1

Areas of Study:

1. Molecular Microbiology: Microbiology 115, 150, 170, 171 .................3
2. Medical Microbiology: Microbiology 162, Medical Microbiology and Immunology 188, Pathology, Microbiology and Immunology 126, 128, 173, 183 ........3-4
3. Electives restricted to Elsewhere ...........6-12

Select from:

Upper division Microbiology courses not used in satisfaction of any other requirement; or Biological Sciences 180L, 181, 183; Food Science and Technology 104; Molecular Cellular Biology 120L, 121, 160L, 182; Plant Pathology 120, 130, 148, 150; Plant Sciences 174;
104. General Microbiology (4)
Lecture—4 hours. Prerequisite: Biological Sciences 101, 103 or 105. Designed for students continuing in microbiology or using microorganisms as tools for the study of genetics and biochemistry. Biology of microorganisms, including viruses, archaea, bacteria and eukaryotic microbes. Topics include microbial structure, growth, antibiotics, pathogenesis, immunology, and epidemiology. Only two units of credit for students who have taken course 101. Not open for credit to students who have completed course 102. GE credit: SciEng | QL, SE — I. (I.) Stewart

104L. General Microbiology Laboratory (3)
Lecture—1 hour; laboratory—6 hours. Prerequisite: course 102 or 104 (may be taken concurrently), consent of instructor. Students must complete a petition for consideration of enrollment; petition available on department of Microbiology website. Introduction to prototrophic methods in microbiology. Designed for students continuing in microbiology or using microorganisms as tools for the study of genetics and biochemistry. In combination with course 104, fulfills the microbiology requirement for professional schools. Only two units of credit allowed to students who have completed course 101. Not open to students who have completed course 102L. GE credit: SciEng | SE, WE — II. (I.) Nagy, Nelson

105. Microbial Diversity (3)
Lecture—3 hours. Prerequisite: course 102 or 104; Biological Sciences 103 or 105. Survey of microbial diversity in the three domains of Life: Bacteria, Archaea, and microbial eukaryotes. Emphasizes microbial evolution and phylogeny, physiology and metabolism, global biogeochemical cycles, environmental adaptation and environmental methods for analyzing culture-independent microbial diversity and microbial communities. GE credit: SciEng | SE — II. (II.) Dawson, Parales

105L. Microbial Diversity Laboratory (3)
Lecture—1 hour; laboratory—6 hours. Prerequisite: course 102 or 104; 102L or 104L; 105 (may be taken concurrently); Biological Sciences 103 or 105. Students must complete a petition for consideration of enrollment; petition available on department of Microbiology website. Classical enrichments for the isolation of metabolically diverse microbes; modern molecular methods for the identification of isolates; cultivation independent analysis of microbial communities from environmental samples. GE credit: SciEng | SE, WE — II. (II.) Dawson, Parales

115. Recombinant DNA Cloning and Analysis (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101 or equivalent. Cloning and analysis of recombinant DNA, with emphasis on Escherichia coli host-vector systems. DNA-modifying enzymes; vectors and their use, manipulation and expression of insert DNA; polymerase chain reaction; and sequence annotation. Graduate students see course 215. GE credit: SciEng | SE — I. (I.) Xu

120. Microbial Ecology (3)
Lecture—3 hours. Prerequisite: course 105; Biological Sciences 102 or 105. Interactions between non-pathogenic microorganisms and their environment, emphasizing physiological and metabolic characteristics of various groups and their adaptation to and modification of spatial and temporal heterogeneity. Offered irregularly. GE credit: SciEng | SE — Nelson

140. Bacterial Physiology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101, 102 or 103 (102 may be taken concurrently), or Biological Sciences 101, 105; Microbiology 102 recommended. Fundamentals of bacterial growth and bacterial responses to environmental stresses. Topics will include carbon and nitrogen regulation, growth rate control, post-growth survival, quorum sensing, and motility and chemotaxis. Not open for credit to students who have completed course 130A. Offered irregularly. GE credit: SciEng | SE
290C. Advanced Research Conference (1-5)
Prerequisite: consent of instructor. (P/NP grading only)—I, II, III, (I, II, III)
Graduate

290B. Advanced Bacteriology (3)
Lecture—3 hours. Prerequisite: course 200A. Intended for first year graduate students in microbiology and closely related fields. Advanced topics in phylology, physiology, and diversity of bacteria. Offered irregularly. Privalsky, Parales

215. Recombinant DNA (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101, 102, 103 or the equivalent. Application of recombinant DNA technology to modern problems in biology, biochemistry, and genetics, emphasizing molecular cloning strategies, choice of vectors, preparation of insert DNA, and selection procedures. —I. (II) Privalsky

262. Advanced General and Molecular Virology (3)
Lecture—3 hours. Prerequisite: graduate standing. Advanced integrated presentation of animal, bacterial, and plant viruses, including their structure, modes of regulation, expression and replication, and effects on host cells and organisms. Offered in alternate years. —II. Luciw

263. Principles of Protein-Nucleic Acid Interactions (3)
Lecture—3 hours. Prerequisite: advanced graduate standing and completion of one year of basic graduate course work in biochemistry, biophysics, chemistry, genetics, microbiology, or molecular biology. Physical basis and molecular principles of DNA-nucleic acid interaction. Topics include nucleic acid recognition by proteins, thermodynamics of protein-nucleic acid stability, and kinetics of binding process for both non-specific and sequence-specific nucleic acid binding proteins. Emphasis on systems that represent paradigms in protein-nucleic acid interactions. Offered irregularly. Offered irregularly.—Kowalczykowski

274. Seminar in Genetic Recombination (1)
Seminar—1 hour. Prerequisite: graduate standing and completion of one year of basic graduate course work in biochemistry, biophysics, chemistry, genetics, microbiology, or molecular biology. Physical basis and molecular principles of DNA-nucleic acid interaction. Topics include nucleic acid recognition by proteins, thermodynamics of protein-nucleic acid stability, and kinetics of binding process for both non-specific and sequence-specific nucleic acid binding proteins. Emphasis on systems that represent paradigms in protein-nucleic acid interactions. Offered irregularly. Offered irregularly.—Kowalczykowski

275. Seminar in DNA Repair and Recombination (1)
Seminar—1 hour. Prerequisite: consent of instructor; graduate standing in microbiology or closely related field. Review and discussion of current research and literature in DNA repair and recombination with presentations by individual students and invited speakers. May be repeated for credit. (S/U grading only)—I, III, (II, III) Heyer

276. Advanced Concepts in DNA Metabolism (3)
Lecture—3 hours. Prerequisite: Molecular and Cellular Biology 221 or Genetics 201C or equivalent course recommended. DNA damage checkpoints, homologous recombination, and meiotic recombination. An advanced treatment of the clinical and current literature to discuss emerging principles and current models in these research areas. Offered in alternate years. —II (Hunter)

290C. Advanced Research Conference (1)
Discussion/conference—1 hour. Prerequisite: graduate standing and consent of instructor. Presentation and critical discussion of staff research activities. Designed for advanced graduate students. May be repeated for credit. (S/U grading only)—I, II, III, (II, III)

291. Selected Topics in Microbiology (1)
Seminar—1 hour. Prerequisite: graduate standing and consent of instructor. Current progress in microbiology and plant and molecular biology. May be repeated for credit. (S/U grading only)—I, II, III, (II, III)

292. Seminar in Bacterial Physiology and Genetics (1)
Seminar—1 hour. Prerequisite: consent of instructor, graduate standing in microbiology or closely related field. Review and discussion of current research and literature in bacterial physiology and genetics, with presentations by individual students. (S/U grading only)—I, II, III, (II, III)

298. Group Study (1-5)
Prerequisite: consent of instructor. (S/U grading only)—I, II, III, (II, III)

299. Research (1-12)
(S/U grading only)—I, II, III, (II, III)
Professional

399. Teaching Asistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only)—I, II, III, (II, III)

Microbiology (A Graduate Group)

Glenn Young Ph.D., Chairperson of the Group

Group Office. 2143 Tupper Hall (Medical Microbiology and Immunology Dept.) 503-752-0262

Faculty

David Asmuth, M.D., Ph.D., Assistant Professor (JUDHS: Infectious Diseases, Div. of)
Shota Atsumi, Ph.D., Professor (Chemistry)
Enoch P. Baldwin, Ph.D., Associate Professor (Molecular and Cellular Biology)
Nicole Baumgarth, D.V.M., Ph.D., Professor (Center for Comparative Medicine)
Andreas Baumler, Ph.D., Professor (Medical Microbiology and Immunology)
Charles L. Bevins, Ph.D., Professor (Medical Microbiology and Immunology)
Linda F. Boson, Ph.D., Professor (Viticulture and Enology)
Barbara A. Byrne, D.V.M., Ph.D., Associate Professor (Pathology, Microbiology, and Immunology)
R. Holland Cheng, Ph.D., Professor (Molecular Cellular Biology)
Kiho Cho, Ph.D., Associate Professor (Surgery and Pediatric Regenerative Medicine)
Patricia A. Conrad, Ph.D., Professor (Pathology, Microbiology, and Immunology)
Satyadeva Dandekar, Ph.D., Professor (Medical Microbiology and Immunology)
Scott Dawson, Ph.D., Professor (Microbiology)
Katherine DeReimer, Ph.D., M.P.H., Associate Professor (Medical Microbiology and Immunology)
Jonathan Eisen, Ph.D., Professor (Biological Agricultural Engineering)
Heather Fritz, D.V.M., Ph.D., Lecturer, Assistant Research Scientist (Pathology, Microbiology & Immunology)
Angela Gelli, Ph.D., Associate Professor (Pharmacology and Toxicology)
Volkmann Heinrich, Ph.D., Associate Professor (Biomedical Sciences)
Wolfdietrich Heyer, Ph.D., Professor (Microbiology)
Neil Hunter, Ph.D., Professor (Microbiology)
Michele M. Igo, Ph.D., Professor (Microbiology)
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Su-Ju Lin, Ph.D., Associate Professor (Microbiology)
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Mitchell H. Singer, Ph.D., Professor (Microbiology)
Jay V. Salnick, M.D., Ph.D., Professor (Internal Medicine)
Jeffrey L. Stott, Ph.D., Professor (Pathology, Microbiology, and Immunology)
Dawn Summer, Ph.D., Professor (Earth and Planetary Sciences)
Michael Svyanten, Ph.D., Professor (Medical Microbiology and Immunology)
Ilias Tagkopoulos, Ph.D., Assistant Professor (Computer Science)
George Thompson, M.D., Assistant Professor (Medical Microbiology & Immunology)
Jose V. Torres, Ph.D., Professor (Medical Microbiology and Immunology)
Renee Tsolis, Ph.D., Associate Professor (Medical Microbiology and Immunology)
Bart Weimer, Ph.D., Professor (Population Health & Reproduction)
Stefan Wurzitz, Ph.D., Professor (Civil and Environmental Engineering)
Lileng Xu, Ph.D., Assistant Professor (Microbiology)
Tilahun Yilma, Ph.D., Professor (Pathology, Microbiology, and Immunology)
Glenn M. Young, Ph.D., Associate Professor (Food Science and Technology)
Harry Zhou, Ph.D., Associate Professor (Animal Science)

Affiliated Faculty

Kathryn DeReimer, Ph.D., M.P.H., Adjunct Associate Professor (Medical Microbiology & Immunology)
Patsy S. C. Leung, Ph.D., Adjunct Professor (Internal Medicine)
Woutrina Miller, Ph.D., Assistant Adjunct Professor (VM: Pathology, Microbiology, and Immunology)
Ellen E. Sparger, Ph.D., Associate Adjunct Professor (VM: Medicine and Epidemiology)

Graduate Study. The Graduate Group in Microbiology offers study and research leading to the M.S. and Ph.D. degrees. Strong preference is given to doctoral applicants. The group offers study in modern molecular approaches to microbiological problems. Areas of research span fundamental, applied, and pathogenic microbiology, including bacterial and viral pathogenesis, eukaryotic microbiology, microbial genomics and genetics, microbial physiology and development, microbial ecology and environmental microbiology, cancer biology, and bioengineering and bioremediation. For information on the graduate study and undergraduate
courses in Middle East/South Asia Studies

[College of Letters and Science]
Baki Tezcan, Ph. D., Program Director
Program Office, 1272 Social Science & Humanities 530-754-4926;
http://mesa.ucdavis.edu/

Committee in Charge
Ali Anooshahr, Ph.D. [History]
Omnia El Shakry, Ph.D. [History]
Sudipta Sen, Ph.D. [History]

The Major Program
A study of the Middle East and South Asia as a whole requires students to explore a unique set of issues at both historical and contemporary importance. In order to guide students in comparative analysis, faculty help majors deepen their inquiries through coursework on antique, medieval, and early modern empires and political systems. Given the dynamism of modern cultural contexts, majors are invited to concentrate their studies on a wide range of variables including the evolution of states along with new understandings of citizenship, the rise and development of nationalist movements, political conflicts informed by religious majorities, the nuclearization of India and Pakistan, the growth of information societies and computer industries, the production of oil and its social and cultural legacies, labor migrations, urbanization, the emergence of sizeable middle classes, transnational literary movements using sophisticated media technologies, the expansion and intrusion of global security regimes into everyday life, and peace initiatives that shape struggles for justice across the world. Our program’s focus on both the Middle East and South Asia is a pioneering achievement in the United States rivalled by only four other colleges or universities.

By the end of their studies, majors will have acquired an in-depth understanding of the common historical experiences shared by people in these regions, and of the legacies of culture, social exchange, power and empowerment across diverse settings. Students are also required to complete at least two years of training in a language appropriate to their area of expertise.

The major in Middle East/South Asia Studies at UC Davis offers a unique opportunity to study exchanges, complementarities, and correspondences in such fields as history, political economy, culture, literature and film, religion, family structures, gender relations, media, anthropology, law, internationals relations, development, diasporas, and urbanism. Students who complete our major will be well suited to embark on careers in non-governmental organizations, journalism and media industries, education and research, governmental service and diplomacy.

Programs, Internships, and Career Alternatives. Many internship opportunities are available for the Middle East/South Asia Studies major and minor, consult with your advisor.

Middle East/South Asia Studies Abroad Program. University of California Education Abroad Program. More information can be found at http://eap.ucop.edu/ and http://summer-abroad.ucdavis.edu/.

A.B. Major Program Requirements:

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<thead>
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<th>8-38</th>
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</thead>
<tbody>
<tr>
<td>History 6, 8 .................. 8</td>
<td></td>
</tr>
<tr>
<td>Two years (or the equivalent) of Arabic, Hebrew, or Hindi/Urdu (other Middle East/South Asia Studies regional languages accepted with petition): Arabic 1, 2, 3, 21, 22, 23, Hebrew 1, 2, 3, 21, 22, 23, Hindi/Urdu 1, 2, 3, 21, 22, 23 30</td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>Depth Subject Matter</th>
<th>40-42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle East/South Asia Studies 100 ....... 4</td>
<td></td>
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<tr>
<td>Middle East/South Asia Studies 180 ....... 4</td>
<td></td>
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<tr>
<td>Two courses from: Anthropology 142; Comparative Literature 144; History 113, 190A, 190B, 190C, 193A, 193B; Political Science 135, 136; Religious Studies 160, 162; Women’s Studies 178A, 184 ....... 8</td>
<td></td>
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<table>
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<tr>
<th>Total Units for Major</th>
<th>48-80</th>
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<tbody>
<tr>
<td>Core Course List</td>
<td>42-48</td>
</tr>
<tr>
<td>Anthropology 142, 145; Arabic 1, 2, 3, 21, 22, 23; Art History 1E, 155; Asian American Studies 150F, 189E; Classics 1; Comparative Literature 528B; Middle East 1, 2, 3, 21, 22, 23; Hindi/Urdu 1, 2, 3, 21, 22, 23; History 102Q, 102R, 113, 190A, 190B, 190C, 193A, 193B, 196A, 196B; Middle East/South Asia Studies (MA) 100, 160, 161, 162, 170, 190C, 192, 198, 199, 180, 192, 198, 199, Music 129B, 148; Political Science 135, 136; Religious Studies 21, 23, 60, 65C, 68, 160, 161, 162, 170; Women's Studies 21, 22, 23, 213 Note: With prior consultation with an advisor, students can petition the Program Committee in advance to accept other elective courses toward the major program, including language courses. Note: While some courses are identified as fulfilling more than one requirement, a given course can only fulfill one such requirement. Restriction: No more than six units of MSA 92, 98, 99, 192, 198, 199 may be offered in satisfaction of the major requirements. However, students must have completed at least 40 units of upper division course work in satisfaction of the major requirements.</td>
<td></td>
</tr>
</tbody>
</table>

Minor Adviser. Consult the Middle East/South Asia Studies Program in 1272 Social Science & Humanities 530-754-4926 or the Middle East/South Asia Studies website at http://mesa.ucdavis.edu/.

Courses in Middle East/South Asia Studies (MSA)

Lower Division
92. Internship in Middle East/South Asia Studies (3-15) Internship. Prerequisite: consent of instructor. Work experience on and off campus in all subject areas offered as part of the ME/SA Studies program. Internship supervised by a member of the ME/SA faculty. May be repeated for credit up to 15 units. (P/NP grading only) — I, II, III, IV, (II, III, IV)

98. Directed Group Study (1-5) Prerequisite: consent of instructor (P/NP grading only).

99. Special Study for Undergraduates (1-5) Prerequisite: consent of instructor (P/NP grading only).

Upper Division
100. Middle East and South Asia: Comparative Perspectives (4) Lecture — 3 hours, extensive writing. Ethnographic and historical points of integration and divergence in various aspects of the Middle East and South Asia in precolonial, colonial, and postcolonial societies.
Military Science

(College of Letters and Science)

Reserve Officers’ Training Corps (ROTC), Army

Patrick Rose, U. Col., Chairperson of the Department

Department Office: 125 Hickey Gymnasium 530-752-5211

Faculty

Major Aimee Myrick, Assistant Professor
U. Col. Patrick Rose, Professor

Program of Study

The Military Science Department offers hands-on training in management and leadership. The program stresses the following: the ability to lead, self-discipline, respect, selflessness, honor, integrity, and personal courage. The program also stresses leadership dimensions as taught in the classes. Also stressed are current events, national and international politics, military affairs, ethics training, and human relations with emphasis on eliminating racial and gender discrimination. Management and leadership are taught using the U.S. Army as a model. Military skills (such as drill and ceremony, map reading, and squad tactics) are taught to the extent necessary to create an environment where students can enter leadership positions and apply theories taught in the classroom. Students learn by doing. The program assists students in all academic fields to prepare for positions of leadership in military or civilian careers.

The department offers two program tracks: (1) a purely academic track; (2) a pre-commissioning track for those desiring a commission in the U.S. Army. The academic track entails no obligation to the military and is open to all students. Students pursuing the academic track do not wear a uniform or otherwise participate in extra-curricular activities designed as part of the pre-commissioning process. Activities for all students include a range of sports and clubs (a club designed for adventure activities such as rappelling, white-water rafting, orienteering, and patrolling) and intramural sports teams.

Students who desire a commission in the U.S. Army participate in both the academic portion of the program and the leadership laboratories and extra-curricular activities designed to enhance their leadership and technical skills. They wear uniforms to leadership laboratories and classes and become ROTC cadets. Students may be cadets in the lower division courses without incurring a military obligation. Students participating in the upper division pre-commissioning programs or a military obligation. See below for details. Extra-curricular activities for cadets include an intercollegiate sports team (Ranger Challenge), the university color guard, a military honor society, and opportunities to participate in field training exercises.

Department Programs

Students are enrolled in Military Science under one of two programs.

Four-Year Program

There is no military obligation associated with attendance in lower division courses. Students are enrolled in the basic course (lower division) for the first two years on a voluntary basis. Admission to the advanced course (upper division) is by application from second-year lower division students who meet the academic, physical, and military aptitude requirements. Qualified veterans can enter the advanced course immediately because of their military service experience, upon approval by the Department Chairperson.

Juniors receive $450 subsistence per month, and Seniors $500 per month, after executing a contract agreeing to complete the courses and accept a commission in the U.S. Army upon graduation. During
the course, all Military Science text books, uniforms and equipment are provided without cost. Students are given leadership development experience at the Leader Development and Assessment Course (LDAC) between their third and fourth years of the course. Emphasis is on individual participation, leadership development and the capability to function effectively in positions of significant responsibility.

Two-Year Program

The two-year program is for students, including gradu- ate students, who have not attended lower division Military Science classes. In lieu of lower division courses an applicant attends a six-week summer pro- gram, the Army Training Course (ITC) which is volun- tary and carries no military obligation. Applicants are paid and transportation costs covered. Applica- tions are accepted at anytime prior to the student’s junior year; graduate students are also accepted. All other provisions explained above for the upper divi- sion course apply to the two-year program.

Scholarship Program

The U.S. Army offers four, three, and two-year Active Duty scholarships, two-year Reserve Forces Duty, and two-year Dedicated National Guard schol- arships to students planning to attend or attend UC Davis. The U.S. Army ROTC scholarship package pays tuition. Also included in all scholarships is a flat rate of $1200 per year for textbooks.

The Army Reserve Officers’ Training Corps four-year Active Duty programs are awarded to qualified high school seniors in a national competition each year. A deadline of 10 January is set for sub- mission of the four-year scholarship application. As high school seniors, students compete for the scholar- ship by submitting their complete application at http://www.goarmy.com/rotc/ or contact UC Davis, Department of Military Science at 530-754-6707.

The three-year Active Duty and two-year Reserve Forces Duty scholarships are awarded to college stu- dents who are already attending UC Davis or trans- ferring from a junior college to UC Davis. Students apply for and are awarded these Army scholarships through the Military Science Department.

Leadership Laboratory

During the course of the school year, two hours per week are spent conducting practical exercises. Classes emphasize adventure activities including off-road, defense and patrolling techniques, weapons familiarization, rappelling, rope bridging, obstacle courses, leadership reaction course, and land navi- gation. All cadets are required to attend leadership laboratories for practical leadership experience and to prepare for attendance at LDAC, held at Fort Lewis, Washington.

Academic Credit

College of Agricultural and Environmental Sciences. The Bachelor of Science degree in agri- culture requires the completion of 180 units. Military Science courses are counted in the unit allowance for electives.

College of Biological Sciences. The Bachelor of Science degree requires the completion of 180 units. Military Science courses are counted in the allow- ance for electives.

College of Engineering. Military Science units are acceptable toward the requirements for the Bachelor of Science degree to the extent of the unre- stricted elective units available in the curriculum being followed.

College of Letters and Science. The Bachelor of Arts degree requires the completion of 180 units. Military Science courses are counted in the allow- ance for electives.

School of Veterinary Medicine. The number of Military Science units acceptable toward the Bache- lor of Science degree in Veterinary Medicine is an individual program basis approved by the Dean of the School. Graduates with the D.V.M. degree may apply for direct commission in the United States Army Veterinary Corps.

Aerospace Studies (Air Force)

The Air Force Reserve Officer’s Training Corps (AFROTC) is an educational program providing training in leadership, management, communica- tions and military proficiency on college and univer- sity campuses. It also provides an opportunity to obtain a commission as a second lieutenant in the Air Force and entrance after you complete a bachelor’s or a graduate degree. The skills you acquire will become valuable assets for any subsequent career you choose.

The program is normally four years long, but a flexi- ble design allows students to complete the curriculum in as little as two years. Undergraduate scholarships are available, but are not necessary for participa- tion. Until you accept a scholarship or enter your junior year of the program, you have no obligation to join the Air Force. There are no costs for AFROTC uniforms, books, or classes.

UC Davis students have the option of taking the Air Force program on the UC Berkeley or CSU Sacra- mento campus.

Qualifications

Freshmen/Sophomore applicants must:

• Be full-time college students in good academic standing.

• Have good moral character.

• Be in strong physical condition.

• Be at least 14 years old.

Additionally, Juniors/Seniors/Scholarship recipients must:

• Be United States citizens or in the process of applying for citizenship.

• Be 18 years old (or 17 years old with consent of parent or guardian).

• Pass the Air Force Officer Qualifying Test.

• Pass a medical examination.

• Be under the age of 31 at time of graduation (may be waived).

Scholarships

Opportunities for four-year and three-year under- graduate scholarships are better than ever. Scholar- ships cover the full cost of tuition, books and required fees at the University of California and are available for eligible high school seniors. It also includes $300-$500 monthly stipend during the school year. If you are a junior or senior in high school and plan on attending a college or university in Northern California, you can write, call or visit the local AFROTC detachment for a scholarship appli- cation. Applications are also available from local Air Force recruiters or your high school guidance counselors.

All scholarships are merit-based and consider a vari- ety of factors: cumulative GPA, class standing, SAT/ ACT scores, academic awards/achievements, lead- ership ability, athletic involvement, extracurricular activities, community service and letters of recom- mendation. A personal interview with an Air Force officer is also part of the application process. Prior to activating a scholarship, students must meet AFROTC medical and physical fitness standards. All scholarships must be used at an accredited college or university that offers AFROTC on campus or through cross-registration. The program is available at more than 1,000 universities and colleges nation- wide.

If you are already in college, contact our office directly and apply for enrollment into AFROTC as a cadet. Three- and two-year full tuition scholarships are available for all academic majors, especially sci- entific and technical majors such as engineering, atmospheric science, math, computer science, and physics. GPA Scholarship requirements for non- technical majors are slightly higher. Applicants are pri- marily evaluated on their leadership ability and academic performance.

Challenging Careers

All commissioned officers enter the Air Force as sec- ond lieutenants for a 4-year active duty service com- mitment. Pilots and navigators serve longer committments, based on training requirements. Once on active duty, you’ll be given instant responsibility in one of 32 primary career fields. Opportunities to fly are better than ever. Whether you are piloting the F-22 lighter, supervising 150 aircraft maintainers on the flightline, or caring for sick personnel in the emergency room, you will be regarded knowing that you are making a difference.

Air Force ROTC is offered through the Aerospace Studies departments at California State University Sacramento and U.C. Berkeley. Scholarships (including tuition, book allowance, and stipend) are avail- able for qualified students. Students may enroll and attend one course per semester at the U.C. Berkeley or CSU Sacramento campus at no cost. Topics cov- ered in AFROTC courses include Basic Military knowledge (1-credit), Military History (1-credit), Leadership Training (3-credits), and U.S. National Security Affairs and Preparation for Active Duty (3- credits). Additional components of the AFROTC pro- gram include 2 hours per week of fitness activities, 2 hours per week of Leadership Lab, and a 4-week Summer Field Training between the Sophomore and Junior years. Upon completion of the program and granting of 4-year degree, students will commission as Second Lieutenants in the United States Air Force. To be eligible for AFROTC, applicants should be a full-time student and meet all fitness, GPA testing, and other requirements. Interested students, please contact their department of choice:

For CSU Sacramento: http://www.csus.edu/afrotc/ 916-278-7315; det088@maxwell.af.mil

For U.C. Berkeley: http://airforcrotc.berkeley.edu/ (510) 642-3572; airforce@berkeley.edu

Naval ROTC

Department of Naval Science 152 Hearst Gymnasium, UC Berkeley, CA 94720-3640 (510) 642-3551; http://navyrotc.berkeley.edu

UC Davis students may participate in the Navy and Marine Corps ROTC program at UC Berkeley. The program is 4 years long and includes courses and weekly professional development laboratories (drill) at UC Berkeley. Students normally compete for national scholarships as high school seniors, although interested students may enroll as freshmen or sophomores and compete for scholarships based on successful participation in the program. A student who satisfactorily completes an ROTC program and is awarded a degree from UC Davis receives an active duty commission as a Second Lieutenant in the U.S. Marine Corps or an Ensign in the U.S. Navy.

Navy option students take the following courses:

Freshman year:

• NS 1 Introduction to Naval Science

• NS 2 Sea Power and Maritime Affairs

Sophomore year:

• NS 3 Leadership and Management

• NS 10 Naval Ship System I

Junior year:

• NS 12A Navigation and Naval Operations I

• NS 12B Navigation and Naval Operations II

Senior year:

• NS 401 Naval Ship System II

• NS 412 Leadership and Ethics

In lieu of NS401, NS10, NS12A and NS12B, Marine Corps students participate in shipyard seminars and complete MA154, History of Littoral War- fare and MA20, Evolution of Warfare (or a designated equivalent).

Scholarship students are required to complete a num- ber of other courses at Davis, including one year each of calculus, physics, and English, and one...
Military Science

228. Foundations of Tactical Leadership (2)
Lecture—2 hours. Prerequisite: course 222 or consent of instructor. Leadership of tactical teams in complex operating environment. Self-assessment of leadership style. Basic military skills: terrain analysis, patrolling and operations orders. Dynamics of adaptive leadership in the context of military operations.—II. (II.)

24A. Individual Military Leadership Skills (0.5)
Laboratory—2 hours. Prerequisites: courses 14A, B and C, enrolled in course 22B or consent of instructor. Development and practice of individual leadership skills in extensive supervised leadership labs. Cadets perform basic military skills, improve on troop leading procedures and lead subordinates in tactical situations. Begin with drill and ceremony, land navigation and individual movement techniques. (P/NP grading only)—I. (I.)

24B. Individual Military Leadership Skills (0.5)
Laboratory—2 hours. Prerequisites: courses 14A, B and C, enrolled in course 22B or consent of instructor. Development and practice of personal military leadership skills in extensive supervised leadership labs. Performance of basic military skills, improvement on troop-leading procedures, leadership of subordinates in tactical situations. (P/NP grading only)—II. (II.)

24C. Individual Military Leadership Skills (0.5)
Laboratory—2 hours. Prerequisites: courses 14A, B and C, enrolled in course 21 or consent of instructor. Develop and practice personal military leadership skills in extensive leadership labs. Develop and practice personal military leadership skills through practical application. Small unit military skills, improve on troop leading procedures and lead subordinates in tactical situations. (P/NP grading only)—III. (III.)

Upper Division

131. Military Leadership and Management (2)
Lecture—2 hours. Prerequisite: upper division standing and consent of instructor. Leadership and management in organizational context. Team dynamics, leadership styles, professional ethics, development of a leadership framework. Management skills for planning, decision making, and organizing developed through practical exercises and the development of courses of action, implementation of solutions.—I. (I.)

132A. Advanced Military Operations (2)
Lecture—2 hours. Prerequisite: upper division standing, course 131 or consent of instructor. Military small unit tactical theory as the basis for leadership development. Principles of war, contemporary operating environment, Geneva Law of Land Warfare, military offensive and defensive operations. Emphasis on development of critical thinking, problem solving, and communication skills.—II. (II.)

132B. Applied Leadership (2)
Lecture—2 hours. Prerequisite: upper division standing, course 132A or consent of instructor. Military small unit tactical theory and application as basis for leadership development. Application of leadership styles and skills to complete problem-solving exercises and the development of an adaptable framework applicable to a variety of shifting environments and situations.—III. (III.)

134A. Adaptive Tactical Leadership (0.5)
Laboratory—2 hours. Prerequisite: upper division standing, course 131 or consent of instructor. Small unit tactical operations serve as the basis for enhancement of leadership performance through tactical application. Assessment of leadership attributes, skills, and actions through participation in a variety of leadership roles in problem-solving exercises. (P/NP grading only)—I. (I.)

134B. Adaptive Tactical Leadership (0.5)
Laboratory—2 hours. Prerequisite: upper division standing, course 132A or consent of instructor. Small unit tactical operations served as the basis for enhancement of leadership performance through tactical application. Assessment of leadership attributes, skills, and actions through participation in a variety of leadership roles in problem-solving exercises. (P/NP grading only)—II. (II.)

141. Ethical Leadership (2)
Lecture—2 hours. Prerequisite: upper division standing; consent of instructor. Direct influence of leaders on individual moral development and ethical behavior. The complexities of balancing moral, legal, and ethical obligations while applying fundamental business principles in determining the best possible outcome from competing solutions.—I. (I.)

142. Military Law (2)
Lecture—2 hours. Prerequisite: division standing and course 141, or consent of instructor. The United States Constitution and the Military Justice System. Basic law of war, with an emphasis on issues that might arise on the battlefield or during a national emergency.—II. (II.)

143. U.S. Army Management Systems (2)
Lecture—2 hours. Prerequisite: division standing and course 142 or consent of instructor. Leadership and management, focusing on four management systems: planning, organizing, leading and controlling. Practical methodologies for assessing management decisions while balancing competing ethical, economic, infrastructure and future growth trade-offs.—III. (III.)

144A. Military Training Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: upper division standing, course 141 or consent of instructor. Enhancement of student leadership performance through practical application. Small unit military tactical operations as the basis for the student exploration and development. (P/NP grading only)—I. (I.)

144B. Military Training Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: upper division standing, course 142 or consent of instructor. Enhancement of student leadership performance through practical application. Small unit military tactical operations serve as the basis for student exploration and development. (P/NP grading only)—II. (II.)

144C. Military Training Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: upper division standing, course 143 or consent of instructor. Enhancement of student leadership performance through practical application. Small unit military tactical operations serve as the basis for student exploration and development. (P/NP grading only)—III. (III.)

191. Special Studies in Military Science (2)
Independent study—6 hours. Prerequisite: consent of department chair, and courses 131, 132A, 132B, 141, 142, 143. Intensive examination of one or more special problems in military science. Possible areas of study include leadership dimensions, principles of war, air-land battle imperatives, military strategy, the operational art and professional ethics, may be repeated twice for credit when topic differs. (P/NP grading only.)
Molecular and Cellular Biology

Molecular and Cellular Biology Major Program

The Biochemistry and Molecular Biology Major introduces students to the chemistry of living organisms and the experimental techniques that are used to probe the structures and functions of biologically important molecules. Students who enjoy both chemistry and biology and who are comfortable with quantitative approaches to problem solving will find this major a rewarding field of study.

The Program. The biochemistry and molecular biology program begins with an introduction to the upper division common curriculum that provides an introduction to the principles of biochemistry, genetics, and cell biology. Majors then take a comprehensive and rigorous laboratory course to familiarize them with the most important aspects of biochemical research. Additional upper division courses in biochemistry and molecular biology explore detailed aspects of these subjects. Students are also required to take courses in other biological sciences and a full year of physical chemistry.

Career Alternatives. The biochemistry and molecular biology major program provides a solid scientific basis for careers in research, teaching, or service careers in the life sciences. Positions are open to biochemists in bio-medical, bio-technological, pharmaceutical, agricultural research and chemical industries. Also, university-affiliated research laboratories, hospital laboratories, and government-sponsored research facilities provide employment opportunities. The major provides excellent preparation for advanced study in graduate or professional schools.

B.S. Major Requirements: UNITS

Preparatory Subject Matter: 55-65

Biological Sciences 2A-2B-2C .......................... 14
Chemistry 2A-2B-2C .................................... 15
Mathematics 17A-17B-17C or 21A-21B-21C (21C recommended) .......................... 8-12
Physics 7A-7B-7C ........................................ 12
Chemistry 8A-8B or 118A-118B ........................... 118C .......................... 6-12

Depth Subject Matter: 45-51

Biological Sciences 101, 102, 103, 104 ........................................... 13
Statistics 100 or 130A-130B .............................. 4-8
Molecular and Cellular Biology 140L .......................... 5
Two courses from: Molecular and Cellular Biology 143, 144, or 145 ........................................... 6
Molecular and Cellular Biology 121 ....... 3
Molecular and Cellular Biology 130; or 163 and 164 ........................................... 4-6
Select at least 10 additional units from the following:

Chemistry 107A, 107B .......................... Evolution and Ecology 100, 150
Microbiology 101, 102, 150, 170 .......................... Molecular and Cellular Biology 120L, 123, 124, 138, 143, 145, 146, 150, 158, 160, 162, 163, 164, 178, 182, 191
Neurobiology, Physiology, and Behavior 100, 101, 103, 112, 160, 161 .......................... Pathology, Microbiology, and Immunology 126, 126L, 128
Plant Biology 111, 111D, 113, 113D, 152

Pre-Fall 2011 General Education (GE): Arts and Humanities: Sociology; Social Sciences; Div-Domestic Diversity; Wrt-Writing Experience
Biology Academic Success Center
Master Adviser.

Total Units for the Major .................................. 101-116
ics. Additional upper division courses in biological
tory courses in the principles of genetics and genom-
ics, including gene expression, evolution, development,
genic diseases, sexual determination, develop-
ment, and behavior. GE credit: SciEng | QL, SE, SL—III. (III.) Engbrecht, Kannala

99. Special Study (1-5)
Independent study. (P/NP grading only.) GE credit: SE.

Lower Division

10. Introduction to Human Heredity (4)
Lecture—3 hours; discussion—1 hour. Topics in
erenity and human gene structure and func-
tion, including the genetic basis of human develop-
ment, causes of birth defects, mental retardation,
genic diseases, sexual determination, develop-
ment, and behavior. GE credit: SciEng | QL, SE, SL—III. (III.) Engbrecht, Kannala

99. Special Study (1-5)
Independent study. (P/NP grading only.) GE credit: SE.

Upper Division

120L Molecular Biology and Biochemistry Laboratory (6)
Laboratory—10 hours; lecture—2 hours; labora-
tory/discussion—1 hour. Prerequisite: Biological Sci-
ciences 103 (may be taken concurrently). Restricted
enrollment. Introduction to laboratory methods and
procedures employed in studying molecular biology
and biochemical processes. Designed for students who
need experience in the use of molecular biolo-
gy and biochemical techniques as research and
analytical tools. GE credit: SciEng | QL, SE, SL, VI, WE—II, III, III. (II, III.) McIlvain

121. Advanced Molecular Biology I (3)

Laboratory—3 hours. Prerequisite: Biological Sciences 101 and 102 or 105 or Animal Biology 102 (may be taken concurrently, prior completion recom-
ated). Structure, expression, and regulation of eukaryotic genes. Chromosome structure and repli-
cation; gene structure, transcription, and RNA pro-
cessing; protein synthesis and translation control;
development, immune system, and oncogenes. Not open for credit to students who have completed
Molecular and Cellular Biology 161. GE credit: SciEng | QL, SE, SL—I, II, III, III. (II, III.) Burgess, Gass-
er, Hamner, Powers.

122. Behavior and Analysis of Enzyme and Receptor Systems (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101. Introduction to the principles of enzyme kinetics
and receptor-ligand interactions with emphasis on
metabolic regulation and data analysis. Topics include
simultaneous equilibria, chemical and
steady-state kinetics, allosteric enzymes, multireac-
tant systems, enzyme assays, membrane transport
and computer-assisted simulations and analyses. GE credit: SciEng | QL, SE, SL—I, II, III, III. (II, III.) Fraser, Wilson

124. Macromolecular Structure and Function (4)
Lecture—4 hours. Prerequisite: Biological Sciences 103, Chemistry 18C. An in-depth investigation into protein and nucleic acid structure and thermodynam-
ics and how these properties influence their biologi-
cal functions. Key examples of important functional
classes of these molecules will be examined. Not open for credit to students who have completed
course 122 or Chemistry 108. GE credit: SciEng | SE, SL—I, III, III. (III.) Baldwin

126. Plant Physiology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 103 or 105. The biochemistry of important plant
processes and metabolic pathways. Discussion of
methods used to understand plant processes, includ-
ing use of transgenic plants. [Same course as Plant
Biology 126.] GE credit: SciEng | SE, SL—I, II. (II.) Callis, Tiran

138. Undergraduate Seminar in Biochemistry (1)
Seminar—1 hour. Prerequisite: Biological Sciences 103. Discussion of the historical developments
of modern biochemistry or current major research prob-
lems. May be repeated two times for credit when

140L. Cell Biology Laboratory (5)
Lecture—2 hours; laboratory—6 hours; discussion—
1 hour. Prerequisite: Biological Sciences 104 (may be taken concurrently). Exercises illustrating the prin-
ciples of cell biology with emphasis on light micros-
copy. GE credit: SciEng | QL, QL, SE, SL—VI, VI—II. (II.) Kaplan

142. Advanced Cell Biology: Contractile and Motile Systems (4)
Lecture—3 hours; term paper. Prerequisite: Biologi-
cal Sciences 102, 104 (may be taken concurrently);
Mathematics 168. Advanced cell biology with
emphasis on molecular, biophysical and cellular
properties of contractile and motile systems. GE credit: SciEng | SE.

143. Cell and Molecular Biophysics (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101, 102, 103, 104. Physical chemical principles
by which molecules form living, moving, reproduc-
cing cells. Physical nature of cytoplasm; molecular
structure/bonding in membranes and molecular
assemblies and protein machines. Physical tech-
niques and modeling of cytoskeletal polymer-motor
dynamics and function during intracellular transport,
motility and motility. GE credit: SciEng | QL, SE—I, III. (III.) AlBassam

144. Mechanisms of Cell Division (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101, 102, 104. The molecules and mechanisms that
allow eukaryotic cells to coordinate cell growth,
DNA replication, segregation of chromosomes and
cell division. GE credit: SciEng | SE, WE—II—II. (II.) McIlvain

145. Assembly and Function of Cell Signaling Machinery (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101, 102, 104. Molecular basis of cell signaling,
including positioning of cellular machinery, compo-
ents of various signaling pathways, and down-
stream effects of signaling on cell adhesion, cell
differentiation, and programmed cell death. GE credit: SciEng | SE—III, III. (III.) Erickson

148. Undergraduate Seminar in Cell Biology (2)
Seminar—2 hours. Prerequisite: upper division standing in the biological sciences or a related disci-
pline. Student reports on current topics in cell biol-
yogy with emphasis on integration of concepts,
synthesis, and state-of-the-art research approaches.
Reviews of literature and reports of undergraduate
research may be included. May be repeated for credit. (P/NP grading only.) GE credit: OL, SE.

150. Developmental Biology (4)
Lecture—4 hours. Prerequisite: Biological Sciences 101. Analysis of the mechanistic basis for animal
development with a focus on experimental evidence and
the relevant fundamental experimental strate-
gies. Fertilization and early development, morphe-
genesis and patterning, cell differentiation,
regulation of cell proliferation and tissue growth. GE credit: SciEng | SE, SL—I, II. (II.) Armstrong, Draper, Edwards, Natleze

158. Undergraduate Seminar in Developmental Biology (2)
Seminar—2 hours. Prerequisite: upper division standing in the biological sciences or a related disci-
pline. Student reports on current topics in cell biol-
yogy with emphasis on integration of concepts,
synthesis, and state-of-the-art research approaches.
Reviews of literature and reports of undergraduate
193. Advanced Research (3)
Laboratory—6 hours; discussion—1 hour. Prerequisite: upper division standing, completion of an upper division Molecular Genetics and Genomics Laboratory course and consent of instructor. Research project carried out under the supervision of a faculty sponsor. Discussion and analysis of results and proposed experiments. May include presentation of a seminar to a research group. May be repeated for credit. (P/NP grading only.) GE credit: SE—II, III, IV, V.

194H. Research Honors Project
Independent study—9 hours. Prerequisite: consent of instructor. The independent study honors project. May be repeated two times for credit. (P/NP grading only.) GE credit: SE—II, III, IV, V.

198. Directed Group Study (1-5)
Variable—1-5 hours. Prerequisite: consent of instructor. Pass One restricted to graduate students. Enrolled in number of credits designated by instructor in consultation with the section’s regular courses. GE credit: SE.

Graduate

210. Molecular Genetics and Genomics (3)
Lecture/discussion—3 hours. Prerequisite: Biological Sciences 101 and Molecular & Cellular Biology 121, or equivalent. Pass One restricted to graduate students. Emphasizes molecular genetic and genomic approaches to address fundamental biological questions. Introduces and emphasizes the strengths of prokaryotic and eukaryotic model systems and serves as building block for the BMCDB core courses, which use model systems to develop their themes. May be repeated one time for credit. —I (K.) Engbrecht

211. Macromolecular Structure and Interactions (3)
Lecture—3 hours. Prerequisite: Biological Sciences 102, or the equivalent, or consent of instructor. Pass One restricted to graduate students. Emphasizes structural and quantitative basis for macromolecular structure-function relationships. Investigation of the paradigm form follows function. Review of key elements of protein, nucleic acid, and lipid structural and regulation of specific macromolecular associations by analyzing chemical structure and physical-chemical behavior. No credit for students that have taken course 221A. —I (K.) Engbrecht

212. Cell Biology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 104, or equivalent, or consent of instructor. Pass One restricted to graduate students. Analysis of basic processes governing cell division, migration, and transport. Study of the integration and regulation of cell behavior in response to changes in cellular environment. No credit for students that have taken course 221A. —I (K.) Engbrecht

213. Developmental Biology (3)
Lecture—3 hours. Prerequisite: undergraduate biology course or consent of instructor. Pass One restricted to graduate students. Fundamental principles in embryonic development that guide application of modern cellular and genetic approaches to understand developmental mechanisms. Emphasis on experimental approaches utilized to critically address scientific questions. —I (I.) Erickson

214. Molecular Biology (3)
Lecture—3 hours. Prerequisite: course 211, or equivalent, or consent of instructor. Pass One restricted to graduate students. Development of critical reading skills through study of major paradigms and recent advances in specialized fields of biochemistry, molecular, cell, and developmental biology. Emphasis on active learning and student participation. May be repeated one time for credit if topic differs. —III (I.) Kaplan

220L. Advanced Biochemistry Laboratory (5)
Laboratory—15 hours. Prerequisite: course 210 and 211 (may be taken concurrently) and 120L or the equivalent. Two five-week assignments in BMCDB laboratory researches. Individual research problems with emphasis on the design of paradigm experiments and the development of the techniques that can be applied in the current research. May be repeated two times for credit if topic differs. —III (I.) Kaplan

248. Seminar in Cell Biology (2)
Seminar—2 hours. Prerequisite: consent of instructor. Discussion of recent literature on the physical and chemical aspects of organization and function of living systems, topics of current interest in ultrastructure and function of cells. Organizational and functional properties of the molecular and cellular levels of biological systems. May be repeated for credit. —I

251. Molecular Mechanisms in Early Development (3)
Lecture—3 hours. Prerequisite: graduate standing or consent of instructor. Introductory background in developmental biology and/or cell biology recommended. Analysis of the early events of development including germ cells and other stem cells, gametogenesis, meiosis, imprinting, histone modification, and early somatic tissues. GE credit: SE—II, III, IV, V. (Same course as Biological Sciences 242.)

255. Molecular Mechanisms in Pattern Formation and Development (3)
Lecture—3 hours. Prerequisite: graduate standing or consent of instructor. Introductory background in developmental biology and/or genetics recommended. Genetic and molecular analysis of mechanisms that control animal development after fertilization. Establishment of embryonic axes, cell fate and embryonic patterning, and tissue patterning. Critical reading of current literature in C. elegans, Drosophila, and mouse genetic model systems. Offered in alternate years. —III (I.) Natels, Rose
257. Cell Proliferation and Cancer Genes
(3)
Lecture—1.5 hours; seminar—1.5 hours. Prerequisites: course 221C and 221D or the equivalent. Genetic and molecular alterations underlying the conversion of normal cells to cancers, emphasizing regulated cell division and differentiation and pathways. Critical reading of the current literature and development of experimental approaches.—I (I) Carraway

258. Seminar in Development (2)
Seminar—2 hours. Prerequisite: consent of instructor. Reports and discussion on embryology, morphogenesis, and developmental mechanisms. May be repeated for credit.—II (II) Erickson

259. Literature in Developmental Biology (1)
Seminar—1 hour. Prerequisite: consent of instructor. Critical presentation and analysis of recent journal articles in developmental biology. May be repeated for credit. (S/U grading only)—I, II, III (I, II, III) Erickson

263. Biotechnology Fundamentals and Application (2)
Lecture—2 hours. Prerequisite: Biological Sciences 101, 102 and Microbiology 102 or consent of instructor. Must be a graduate student in good standing and fundamentals of molecular biology and chemical engineering involved in recombinant DNA technology. Topics: principles of rate processes of biological systems, optimization of bioreactors, and issues related to expression and production of recombinant molecules. Participation in student-directed team projects.—II (II) McDonald, Privalsky, Rodriguez, VanderGheynst

283. Biotechnology Internship (7-12)
Internship—2-36 hours. Prerequisite: graduate standing and consent of instructor. Research at a biotechnology company or interdisciplinary cross-college lab for a minimum of 3 months as part of the Designated Emphasis in Biotechnology Program. (S/U grading only)—I, II, III (I, II, III) Dandeker

290C. Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Presentations and critical discussions of faculty and graduate student research in molecular and cellular biology including biochemistry, genetics, and cell biology. May be repeated for credit. (S/U grading only)—I, II, III (I, II, III)

294. Current Progress in Biotechnology
Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Seminars presented by guest lecturers on subjects of their own research activities. May be repeated for credit. (S/U grading only)—I, II, III (I, II, III)

201C. Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Presentations and critical discussions of faculty and graduate student research in molecular and cellular biology including biochemistry, genetics, and cell biology. May be repeated for credit. (S/U grading only)—I, II, III (I, II, III)

299. Research (1-5)
Variable—1.5 hours. Prerequisite: consent of instructor. (S/U grading only)

300. Professional
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Practical experience in the methods and problems of teaching biochemistry/
grams of study and research leading to the M.S. and Ph.D. degrees and participates in joint Ph.D./M.D. and Ph.D./D.V.M. programs. The program provides broad training in the fundamental principles of cellular, molecular, and integrative physiology.

Graduate Advisers: Gretchen Casazza, Master Adviser; J. David Furlow, Nipavan Chiamvimonvat, Chao-Yin Chen

Courses in Molecular, Cellular, and Integrative Physiology (MCP)

(Formerly courses in Physiology)

Graduate

200L. Animal Cell Culture Laboratory (4)
Discussion—2 hours; laboratory—6 hours. Prerequisite: courses in undergraduate biochemistry, cell biology, or general physiology, or consent of instructor. Techniques of cell culture, with emphasis on cell physiology and the actions of drugs and toxins on cultured somatic cells. Design, performance and interpretation of experiments with animal cells in vitro. —II. (III.) B. Wilson, R. Wu

210A. Advanced Physiology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Physiology Ph.D. program, or consent of instructor. Advanced course on general principles of physiology, surveying homeostasis, cellular and selected topics, and neurophysiology. (Same course as Human Physiology 210A.) —I. (II.) Zheng

210B. Advanced Physiology (6)
Lecture—5 hours; discussion—1 hour. Prerequisite: Physiology 210A; Physiology Ph.D. program, or consent of instructor. Advanced course on general principles of physiology, surveying homeostasis, cellular and selected topics, and neurophysiology. —II. (III.) Stebbins

210C. Advanced Physiology (5)
Lecture—5 hours. Prerequisite: doctoral student in the Molecular, Integrative and Comparative Physiology Graduate program or consent of instructor. Graduate level instruction in the general principles of physiology and the neural and hormonal control of the cardiovascular, renal, respiratory, gastrointesti- nal, sensory, muscular, and endocrine systems. —III. (III.) Navedo, Xiang

210L. Physiology Laboratory Rotations (5)
Laboratory—15 hours. One mandatory rotation and up to two voluntary rotations. Students learn techniques and perform experiments related to particular research problems. At the end of the rotations students give a short talk and hand in a research paper. May be repeated twice for credit. (S/U grading only.)—I, II, III. (I, II, III.) Byrnes, Pao, Krayevsky

216. Neurophysiology Literature (3)
Lecture—1 hour; discussion—2 hours. Lectures covering experimental and theoretical methods in studying cell membrane ion channels and the resulting characterization of the physiological functions and structure/function relationships of some of the most important channel types. Discussion of classical and current original papers. —I. (I.)

219. Muscle Growth and Development (3)
Lecture—2 hours; seminar—1 hour. Prerequisite: Biolog-ical Sciences 103, Biological Sciences 104 or Molecular and Cellular Biology 150, or consent of instructor. Integration of growth and development of skeletal muscle. Biochemistry, neural control mechanisms, circulatory and nutritional factors. Prenatal and neonatal differentiation of fiber types. Experimental and hereditary myopathies. Offered in alternate years. —III. Bodine, Carlson

220. General and Comparative Physiology of Reproduction (3)
Lecture—3 hours. Prerequisite: Neurobiology, Physi-ology, and Behavior 110, 110L; Biological Sciences 101, 110. Basic phenomena of sexual and asexual reproduction and comparisons of processes in a wide variety of animals; gamete formation, structure, and metabolism; fertilization; neuroendocrine mech- anisms in reproductive cycles; behavioral aspects. —III. (III.) Adams, Berger, Conley

222. Mammalian Gametogenesis and Fertilization (3)
Lecture/discussion—3 hours. Prerequisite: Neurobiol-ogy, Physiology, and Behavior 121 or the equivalent. Course will emphasize our current understanding of events in mammalian gamogene-sis and the fertilization process. Published results, conclusions drawn from these results, and their con- tribute to our understanding will be discussed. —III. (III.) Berger

230. Advanced Endocrinology (2)
Lecture—2 hours. Prerequisite: Neuroendocrinology, Physiology, and Behavior 130 or the equivalent, and graduate standing. Focus on timely topic of endo-crine research. Critical review of current literature and discussion of future research strategies in the area. May be repeated for credit when topic differs.

231. Neuroendocrinology (3)
Lecture—3 hours. Prerequisite: Neurobiology, Physi-ology, and Behavior 110 or the equivalent course in systemic physiology, Neurobiology, Physiology, and Behavior 130 or the equivalent course in endocrinol-ogy. Neural-endocrine interactions; neural regu-lation of the endocrine system, especially in relation to reproduction, the role of hormones and growth fac-tors in sexual differentiation of the brain. —II. (III.)

234. Current Topics in Neurotoxicology (3)
Lecture—3 hours. Core course in the following graduate programs: Pharmacology and Toxicology, Agricultural and Environmental Chemistry, Biotechnology, Biochemistry, Cell and Developmental Biology, Immunology, Mole- cular Cellular and Integrative Physiology or Neurosci-ence. Restricted to upper level graduate students must obtain permission from the course coordinator. General principles of neurotoxicology, the cell and molecular mechanisms and health impacts of specific neurotoxicants and the contribu-tion of neurotoxic compounds to complex neurode-velopmental disorders and neurodegenerative diseases. (Same course as Environmental Toxicology 224 and Molecular Sciences 234.) Offered in alternate years. —II. (III.) Pfeifer

242. Biological Rhythms (3)
Lecture—2 hours; lecture/discussion—1 hour. Prerequisite: Neurobiology, Physiology, and Behavior 110 or the equivalent. General aspects and basic mechanisms of biological rhythms; the importance of rhythm desynchrony in the integration of pharmacology and space medicine; telemetry; mathematical method-ods; chronometry; daily, reproductive, and annual periods; shifts and desynchrony; occupational disorders. Offered in alternate years. —I. (II.) Fuller

255. Physiology of the Stress Response (2)
Lecture/discussion—2 hours. Prerequisite: graduate student status. Discussion of Stress, Physiological mechanisms of adaptation to stress, Hormonal control of the systemic stress response; Discussion of current trends in stress physiology and current methods for studying the stress response as part of Animal Biology 255. —III. (III.) Kuetz

261A. Topics in Vision: Eyes and Retinal Mechanisms (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing, Neurobiology, Physiology, and Behavior 100 or 112 or the equivalent. Structure and function of the visual system, with emphasis on the eye and retina, including optics, anatomy, transduction, retinal synapses, adaptive plasticity, and visual processing. (Same course as Neuroscience 261A and Neurobi-ology, Physiology, and Behavior 261A.) (S/U grading only.) —I, II, III. (I, II, III.)

261B. Topics in Vision: Systems, Psychophysics, Computational Models (2)
Lecture/discussion—2 hours. Prerequisite: consent of instructor; course 261A recommended. Functions of the central visual pathways and their underlying mechanisms. Recent findings in aspects of anatomy, psycho-physics, neuroscience, and genetics of the visual system. (Same course as Neuroscience 261B and Neurobi-ology, Physiology, and Behavior 261B.) (S/U grading only.) Offered in alternate years. —II, III. (II, III.)

261C. Topics in Vision: Clinical Vision Science (2)
Lecture/discussion—2 hours. Prerequisite: courses 261A and 261B, or consent of instructor. Causes and mechanism based on visual disorders. Recent research on aspects of anatomy, biochem-istry, electrophysiology, psychophysics, development, and genetics of the visual system related to disease. (Same course as Neuroscience 261C and Neurobi-ology, Physiology, and Behavior 261C.) (S/U grading only.) Offered irregularly. —III. Werner

275. Neurohumoral Regulatory Mechanisms of Thermogenesis (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: Biological Sciences 104 or the equivalent; Biological Sciences 102 or the equivalent; consent of instructor. Designed for graduate and advanced undergraduate students, this course will examine thermogenic systems in homeotherms (primarily mammals) with respect to regulation (hormonal and central nervous control) and effector mechanisms (basis of heat generation at the target cell).

280. Seminar (1)
Seminar—1 hour. Discussion and critical evaluation of advanced topics and current trends in research. (S/U grading only.) —I, II, III, (I, II, III.)

290C. Research Conference in Physiology (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Presentation and discus-sion of faculty and graduate student research in physiology. May be repeated for credit. (S/U grading only.) —I, II, III, (I, II, III.)

291B. Seminar in Cellular Mechanisms of Adaptation (1)
Discussion—0.5 hour; seminar—0.5 hour. Prerequi-site: Neurobiology, Physiology, and Behavior 100B; Biological Sciences 102B. Designed for graduate and advanced undergraduate students. Review and evaluation of current literature and research in cellular adaptations to the environment. May be repeated for credit when topic differs. (S/U grading only.)

291D. Research Approaches in Physiology (2)
Seminar—2 hours. Prerequisite: graduate standing in Graduate Group in Physiology or consent of instructor. Current research in the field. May include analyses of texts and supporting evidence. May include analyses of texts and supporting evidence. May be repeated for credit. (S/U grading only.)

299. Group Study (1-5)
299. Research (1-12)
(S/U grading only)

Professional

300A-300B. Pedagogical Aspects of Physiology in Higher Education (3-3)
Lecture, discussion, or laboratory, or combination. Prerequisite: meet qualifications for teaching assis-tant in physiology. Participation as a teaching assis-tant for one quarter in a designated physiology course. Instruction in methods of leading discussion groups, laboratory sections, writing and grading quizzes, operation and use of laboratory equipment, and reading and grading laboratory reports. Course meets teaching requirements for Ph.D. program in Physiology. (S/U grading only.) —I, II, III, (I, II, III.)

390. The Teaching of Physiology (1)
Discussion—1 hour. Prerequisite: Teaching Assistant assignment to a physiology lecture course and con- sent of instructor. Practical experience in methods and problems of teaching physiology lecture courses. May include analyses of texts and support-
Music

(College of Letters and Science)

Henry Spiller, Ph.D., Chairperson of the Department

Department Office, 112 Music Building 530-752-5537; Fax 530-752-0983; http://music.ucdavis.edu

Faculty

Christian Baldini, Ph.D., Associate Professor
Ross Bauer, Ph.D., Professor
Anna Maria Busse Berger, Ph.D., Professor
Beth Levy, Ph.D., Associate Professor
Jessie Ann Owens, Ph.D., Professor
Pablo Ortiz, D.M.A., Professor
Mika Pelo, Ph.D., Associate Professor
Christopher A. Reynolds, Ph.D., Professor

Academic Senate Distinguished Teaching Award, UC Davis Prize for Teaching and Scholarly Achievement
Kurt Rohde, M.M., Professor
Laurie San Martin, Ph.D., Professor
Henry Spiller, Ph.D., Associate Professor
Jeffrey Thomas, Professor

Emeriti Faculty

Robert S. Bloch, M.A., Professor Emeritus
Sydney R. Charles, Ph.D., Professor Emerita
Andrew D. Frank, M.A., Professor Emeritus
D. Kern Holzman, Ph.D., Professor Emeritus

Academic Senate Distinguished Teaching Award, UC Davis Prize for Teaching and Scholarly Achievement
Alpert J. McNeil, M.S., Professor Emeritus
David A. Nutter, Ph.D., Professor Emeritus
Wayne Slawson, Ph.D., Professor Emeritus

Affiliated Faculty

Phebe Craig, M.M., Lecturer
Sam Nichols, Ph.D., Lecturer

Academic Federation Award for Excellence in Teaching
Robert Storlina, Lecturer
Amalia Triest, B.A., Lecturer

Faculty Affiliates in Applied Music

Lois Brandwine, M.A., Lecturer (piano)
Ted Brody, B.A., Lecturer (flute)
Scott Choate, Lecturer (tuba)
Bruce Chrisp, M.M., Lecturer (trombone)
Susan Manski, Lecturer (tuba)
Phebe Craig, M.M., Lecturer (harpsichord)
Thomas Derthick, B.M., Lecturer (double bass)
Daniel Flanagan, M.M., Lecturer (soprano)
Jadon Friedholl, M.M., Lecturer (violin)
Christopher Froh, M.M., Lecturer (percussion)
Michael Goldberg, M.A., Lecturer (guitar)
David Granger, M.M., Lecturer (woodwinds)
Sam Griffin, D.M.A., Lecturer (tuba)
Ann Lavin, D.M.A., Lecturer (clarinet)
Scott Macomber, M.M., Lecturer (trumpet)
Zoila Muñoz, M.M., Lecturer (violin)
Jonathan Nadel, M.M., Lecturer (voice)
Peter Nowlen, B.M., Lecturer (French horn)
Michael Seth Orland, A.B., Lecturer (piano)
Laura Reynolds, M.M., Lecturer (oboe)
Ellen Ruth Rose, M.M., Lecturer (viola)
Rita Sahai, M.A., Lecturer (Hindustani vocal music)
Michael Sand, M.M., Lecturer (violin)
Marilyn Swan, B.M., Lecturer (piano)

The Major Program

The Bachelor of Arts degree in music provides both a broad liberal arts education and the skills necessary to explore music through its history, composition, theory, and performance. Students majoring in music may choose from three tracks for the major: (1) composition, (2) music history, theory, and ethnomusicology, or (3) performance. After a core of courses in the lower division, students pursue their chosen track with specialized courses leading to an appropriate senior project.

All majors are expected to complete a substantial project (composition, research presentation, recital) in the senior year (Music 195). Music majors who intend to pursue graduate studies in music are encouraged to satisfy the requirements of one of the honors programs in music.

Study Abroad and the Music major. The department encourages students to pursue a portion of their studies abroad. In close collaboration with their undergraduate advisors, students plan a course of study abroad that complements their coursework at Davis. UC Davis Music majors have completed upper division coursework at a number of foreign institutions in Australia, England, France, Germany, and Italy; Music faculty members lead a summer program in Argentina.

The Program. A fundamental grounding in music theory, music history, and performance during the first two years of study leads to more specialized study of composition, history, or performance during the last two years of undergraduate work.

Career Alternatives. Students who graduate with a B.A. in music from UC Davis have gone on to careers as composers and performers, in academia, and in the concert, media, and computing industries. Others have continued in medicine, law and business.

A.B. Major Requirements:

Preparatory Subject Matter

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Music 6A, 6B, 6C</td>
<td>9</td>
</tr>
<tr>
<td>Plus Music 2A, 2B, 2C</td>
<td>(0-6)</td>
</tr>
<tr>
<td>And Music 16A, 16B, 16C</td>
<td>(0-6)</td>
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Depth Subject Matter

<table>
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<tr>
<th>Track</th>
<th>Course</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Track 1: Music Composition</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Music 124A, 124B</td>
<td>6</td>
<td></td>
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<tr>
<td>Music 121 or 122</td>
<td>4</td>
<td></td>
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<tr>
<td>Music 131 (one year)</td>
<td>6</td>
<td></td>
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<tr>
<td>Music 195</td>
<td>2</td>
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<tr>
<td>At least 6 units selected from:</td>
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<tr>
<td>Music 140-150</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Music 101A, 101B</td>
<td>8</td>
<td></td>
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<tr>
<td>Music 103</td>
<td>3</td>
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<td>At least 4 further units selected from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>114, 121, 122, 192, 198, 199</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Track 2: Music History, Theory, and Ethnomusicology</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Music 124A, 124B</td>
<td>8</td>
<td></td>
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<tr>
<td>Music 121 and/or 122</td>
<td>8</td>
<td></td>
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<tr>
<td>Need eight units of seminar courses chosen from above in any combination. Note: Music 121 and 122 may be repeated for credit.</td>
<td></td>
<td></td>
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<tr>
<td>Music 131, one year</td>
<td>6</td>
<td></td>
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<tr>
<td>Music 195</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>At least 6 units selected from:</td>
<td></td>
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<tr>
<td>Music 140-150</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>At least 12 further units selected from:</td>
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</table>

Minor Program Requirements:

Music

<table>
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<tr>
<th>Course</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Courses chosen from:</td>
<td>22</td>
</tr>
<tr>
<td>Music 140, 141, 142, 144, 145, 147, 148, 149, 150</td>
<td>16</td>
</tr>
<tr>
<td>Courses chosen from:</td>
<td>6</td>
</tr>
<tr>
<td>A minimum of six units in upper division music performance courses</td>
<td>6</td>
</tr>
</tbody>
</table>

Total Units for the Major: 44-85

Note: A maximum of 19 units in performance courses (Music 131, 140-150) apply toward the degree; see Unit Credit Guidelines, College of Letters and Science degree requirements section. Faculty of the College of Letters and Science bylaws makes it possible for students to take more than 19 units of performance classes without those additional units counting toward the 225-unit cap on units:

Composition Honors: 43-47
Music 101A, 101B: 6
Music 124A, 124B: 8
Music 103: 3
Music 121 or 122: 4
Music 131 (one year): 6
At least six units selected from: Music 140-150: 6
Two quarters of Music 194H for a total of at least six units resulting in a Senior thesis: 6
Music History, Theory, and Ethnomusicology Honors: 44
Music 124A, 124B: 6
Music 121 or 122 (twice): 8
Music 131 (one year): 6
At least 6 units selected from: Music 140-150: 6
Two quarters of Music 194H for a total of at least six units resulting in a Senior thesis: 6
At least 12 further units selected from: Music 101A, 101B, 102, 108A, 108B, 113, 114, 121, 122, 192, 198, 199: 12

A student becomes eligible for graduation with honors by meeting the minimum GPA and course requirements established by the College of Letters and Science. To qualify for high or highest honors, students must also complete the Music Department honors program with a GPA of 3.500 or above and write a thesis or submit a project that meets the criteria for high or highest honors. Students apply to participate in the department honors program during the latter part of their junior year. Admission to the program is based on GPA, a thesis proposal, examples of previous writing, and the recommendation of a faculty member who is willing to sponsor the student’s project. Students who anticipate seeking admission to the honors program are urged to complete at least one offering of Music 121 or 122 before the end of their junior year. Interested students are urged to consult with faculty in their field early in their junior year.

Major Advisers: C. Reynolds (A-F), A. Triest (G-M), L. San Martin (N-Z)

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses.


Courses in Music (MUS) Lower Division

2A. Keyboard Competence, Part 1 (2)
Performance—2 hours. Prerequisite: course 6A and 16A concurrently; consent of instructor. Training to meet the minimum piano requirements for the major in music. Harmonic progressions, and keyboard skills at the beginning of each quarter. Transfer students should take the Music 6 diagnostic exam during the first class meeting.

Beginning and transfer students are required to take Music 2A-2B-2C (Keyboard Competence) unless they can demonstrate proficiency on the piano through auditions in the Department of Music. Piano instruction is required of all majors and non-majors in the UC Davis Symphony Orchestra, University Chorus, Concert Band and Wind Ensemble, Early Music Ensemble, Baroque Chamber Orchestra, Jazz Band, world music ensembles (Gamelan, Samba School, Hindustani Vocal Ensemble, Korean Drumming Ensemble) and numerous chamber music groups in a close relationship with the Robert and Margrit Mondavi Center for the Performing Arts, where several of the ensembles are resident.

Chamber ensembles perform frequently in the popular recital series. Performance groups have collaborated with the Department of Theatre and Dance in productions of musical theater and opera. Study of instruments and voice with professional performers and teachers is required of all majors. Similar opportunities exist for qualified non-majors.

Faculty and Facilities. The faculty is noted for its achievements in a variety of areas. The music scholars are active in research, writing, and performance; the music of the composers is performed and recorded nationally and internationally. The journal, 19th-Century Music, is housed in the department.

The regular faculty is joined throughout the year by visiting Artists-in-Residence, distinguished performers who give master classes, guest lectures and who work with students informally.

The Empyrean Ensemble, a professional new music ensemble, is in residence at UC Davis, where it presents a series of concerts. Performance groups have collaborated with the Department of Theatre and Dance in productions of musical theater and opera. Study of instruments and voice with professional performers and teachers is required of all majors. Similar opportunities exist for qualified non-majors.

Focus on analysis of music by Chopin, Schumann, Liszt, and Wagner. Works of Debussy, Stravinsky, and Mahler are included. The social, historical, and cultural context of the repertory is emphasized. GE credit: ArtHum | AH—I. (I.) Triest

3A. Introduction to Music Theory, Part 1 (4)
Lecture—1 hour; recitation—3 hours. Fundamentals of music theory, ear-training, harmony, counterpoint, and analysis directed toward the development of listening and writing techniques. Intended for the general student. GE credit: ArtHum | AH—I, II, III. (I, II, III.) Triest

3B. Introduction to Music Theory, Part II (4)
Lecture—1 hour; recitation—3 hours. Prerequisite: completion of course 3A. Harmony, counterpoint, and analysis toward the development of listening and writing techniques. GE credit: ArtHum | AH—I, II, III. (I, II, III.) Triest

6A. Elementary Theory, Part 1 (3)
Lecture—3 hours. Prerequisite: Admission by examination given during first class meeting; concurrent enrollment in course 16A and 2A or demonstration of required proficiency level on diagnostic exam. Development of melodic and harmonic writing skills. Basic analysis training. Intended for the general student. GE credit: ArtHum | AH—I, II, III. (I, II, III.) Triest

6B. Elementary Theory, Part 2 (3)
Lecture—3 hours. Prerequisite: course 6A; concurrent enrollment in course 16C and 2B or demonstration of required proficiency level on diagnostic exam. Continuation of course 6A. GE credit: ArtHum | AH—I, II, III. (I, II, III.) Triest

6C. Elementary Theory, Part 3 (3)
Lecture—3 hours. Prerequisite: course 6B; concurrent enrollment in course 16C and 2C or demonstration of required proficiency level on diagnostic exam. Continuation of courses 6A-B. GE credit: ArtHum | AH—I, II, III. (I, II, III.) Nicholas

7A. Intermediate Theory, Part 1 (3)
Lecture—3 hours. Prerequisite: course 6C; 17B concurrently. Harmony of the Classical era with a focus on analysis of music by Haydn, Mozart, and Beethoven. Composition of pieces in the harmonic language of the Classical era. GE credit: ArtHum | AH—I. (I.) San Martin

7B. Intermediate Theory, Part 2 (3)

7C. Intermediate Theory, Part 3 (3)
Lecture—3 hours. Prerequisite: course 7B; 17C concurrently. The music of the first thirty years of the twentieth century and various analytical tools pertaining to it. Works of Debussy, Stravinsky, Schoenberg, Berg, and others. Composition of small pieces for solo instruments, voice and piano. Intended for Music majors. GE credit: ArtHum | AH—I, II, III. (I, II, III.) San Martin

10. Introduction to Musical Literature (4)
Lecture—3 hours; listening—1 hour. Introduction to composers and major styles of Western music. Lectures, listening sections, and selected readings. For non-majors. GE credit: ArtHum | AH—I, II, III. (I, II, III.) Hess, Levy, Polo, San Martin

11. Musics of the World (4)
Lecture—3 hours; listening section—1 hour. Survey of selected art, folk, and popular music cultures from different regions of the world. Emphasis on understanding relationship of musical style, aesthetic principles, and performance practice to wider cultural contexts. GE credit: ArtHum, Div | AH—I, II, III. (I, II, III.) Lee, Skiller

16A. Elementary Musicianship, Part 1 (2)
Lecture/laboratory—2 hours. Prerequisite: concurrent enrollment in course 6A is required; students must pass a short diagnostic exam, at the beginning of the quarter, in order to be placed in the course. The melodic, rhythmic, and harmonic materials of Western music. Includes sight singing, explanations, drills, melodic/rhythmic/harmonic dictations, and listening analysis. GE credit: ArtHum | AH—I, II. (I, II.) Triest

16B. Elementary Musicianship, Part 2 (2)
Lecture/laboratory—2 hours. Prerequisite: concurrent enrollment in course 6B is required; course 16A or demonstration of required proficiency level on diagnostic exam. The melodic, rhythmic, and harmonic materials of Western music. Includes sight singing, explanations, drills, melodic/rhythmic/harmonic dictations, and listening analysis. GE credit: ArtHum | AH—I, II. (I, II.) Triest

16C. Elementary Musicianship, Part 3 (2)
Lecture/laboratory—2 hours. Prerequisite: concurrent enrollment in course 6C is required; course 16B or demonstration of required proficiency level on diagnostic exam. Performance—2 hours. Prerequisite: course 6C and 16C concurrently; consent of instructor. Training to meet the minimum piano requirements for the major in music. Harmonic progressions, modulations and score reading at the piano. (P/NP grading only.) GE credit: AH—II, III. (II, III.) Triest

17A. Intermediate Musicianship, Part 1 (2)
Lecture/laboratory—2 hours. Prerequisite: course 7A concurrently; successful completion of course 16C or demonstrate required proficiency level on diagnostic exam. The melodic, rhythmic, and harmonic materials of Western music. Includes sight singing, explanations, drills, melodic/rhythmic/harmonic dictations, and listening analysis. GE credit: ArtHum | AH—I, II. (I, II.) Triest

17B. Intermediate Musicianship, Part 2 (2)
Lecture/laboratory—2 hours. Prerequisite: course 7B concurrently; successful completion of course 17A or demonstrate required proficiency level on diagnostic exam. GE credit: ArtHum | AH—I, II. (I, II.) Craig

17C. Intermediate Musicianship, Part 3 (2)
Lecture/laboratory—2 hours. Prerequisite: course 7C concurrently; successful completion of course 17B or demonstrate required proficiency level on diagnostic exam. GE credit: ArtHum | AH—I, II. (I, II.) Craig

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2015-2016 offering in parentheses.
107A. Computer and Electronic Music (3)
Lecture—3 hours; laboratory—1 hour. Prerequisite: consent of instructor. Studies in electronic and computer music composition. The principles and procedures of composition in various electronic media are explored through compositional exercises. Limited enrollment. GE credit: ArtHum | AH—II (I) Nichols

107B. Computer and Electronic Music (3)
Lecture—3 hours; laboratory—1 hour. Prerequisite: course 107A and consent of instructor. Continuation of course 107A. Limited enrollment. GE credit: ArtHum | AH—II (I) Nichols

108A-108B. Orchestration (2-2)
Lecture—2 hours. Prerequisite: 108A—course 7C; 108B—course 108A. Techniques of orchestration from study of basic instrumental techniques to analysis of orchestral scores and scoring for various instrumental combinations. GE credit: ArtHum | AH—III. (III) Ortiz

110A. The Music of a Major Composer: Beethoven (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 10 or 3A-3B. The work of Beethoven will be studied in the context of his time and his contemporaries. Lectures, discussion/guided listening sections, and selected readings. For non-majors. GE credit: ArtHum, Wrt | AH, VL, WE—III.

110B. The Music of a Major Composer: Stravinsky (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 10 or 3A-3B. The work of Stravinsky will be studied in the context of his time and his contemporaries. Lectures, discussion/guided listening sections, and selected readings. For non-majors. GE credit: ArtHum, Wrt | AH, VL, WC, WE—II (II) Bauer

110C. The Music of a Major Composer: Bach (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 10 or 3A-3B. The work of Bach will be studied in the context of his time and his contemporaries. Lectures, discussion/guided listening sections, and selected readings. For non-majors. GE credit: ArtHum, Wrt | AH, VL, WC, WE—II (II) San Martin

110D. The Music of a Major Composer: Mozart (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 10 or 3A-3B. The work of Mozart will be studied in the context of his time and his contemporaries. Lectures, discussion/guided listening sections, and selected readings. For non-majors. GE credit: ArtHum, Wrt | AH, VL, WC, WE—II (II) Busse Berger

110E. The Music of a Major Composer: Haydn (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 10 or 3A-3B. An overview of American concert music by master composers from Charles Ives to the present. Lectures, discussion/guided listening sections, and selected readings. For non-majors. GE credit: ArtHum, Wrt | AH, VL, WC, WE—II (II) San Martin

110F. American Masters (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 10 or 3A-3B. An overview of American concert music by master composers from Charles Ives to the present. Lectures, discussion/guided listening sections, and selected readings. For non-majors. GE credit: ArtHum, Wrt | AH, VL, WC, WE—II (II) Levy

110G. Music of a Major Composer—Handel (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 10 or 3A-3B. Work of Handel in the context of his time and his contemporaries. Lectures, discussion/guided listening sections, and selected readings. For non-majors. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WC, WE—III (III) Thomas

113. Introduction to Conducting (2)
Lecture—1 hour; performance—1 hour. Prerequisite: consent of instructor; course 7C. Principles and techniques of conducting as they apply to both choral and instrumental ensembles. Offered irregularly. GE credit ArtHum | AH—II, II. Baldini, Thomas

114. Intermediate Conducting (2)
Lecture—1 hour; performance—1 hour. Prerequisite: course 113. Intermediate conducting with a continued focus on principles as they apply to both choral and instrumental ensembles. GE credit: ArtHum | AH—II. Baldini, Thomas

115. History of Film Music (4)
Lecture—2 hours; film viewing—2 hours. Prerequisite: courses 3A and 3B, or course 10. Film music from silent films to movies of the past decade. How music supports and shapes film narrative and structure. Use of jazz, rock and classical music in film. Offered in alternate years. GE credit: ArtHum, Wrt | AH, VL, WE—II (II) Ortiz

116. Introduction to the Music of The Beatles (4)
Lecture—2 hours; listening—1 hour. Prerequisite: course 3A; course 10; course 11; or consent of instructor. Survey of music of The Beatles, focusing on the songs of Lennon and McCartney. Emphasis on understanding their evolution as musicians, composers and cultural figures. Discussion of their musical influences in wider cultural contexts. GE credit: AH, VL, WC—III (III) Reynolds

121. Topics in Music Scholarship (4)
Seminar—4 hours. Prerequisite: courses 7C and 24C, or consent of instructor. Examination of music as its implications in other musical genres. Taught in alternate years. GE credit: ArtHum | AH, OL—II, III, III, III, III

122. Topics in Analysis and Theory (4)
Seminar—4 hours. Prerequisite: course 7C and course 24C, or consent of instructor. Analysis of works of a composer or musical style selected by the instructor and announced in advance. Consideration of theoretical issues. May be repeated for credit. GE credit: ArtHum | AH, OL—II, III, III, III, III

124A. History of Western Music: Middle Ages to 1600 (3)
Lecture—3 hours. Prerequisite: course 6C and 24C. Historical survey of composers and musical styles from the Middle Ages to the beginning of the 17th century. GE credit: ArtHum, Wrt | AH, VL, WE—II. Berger

124B. History of Western Music: 1600-1750 (3)
Lecture—3 hours. Prerequisite: course 124A. Historical survey of composers and musical styles from the late 1600s to the mid 18th century. GE credit: ArtHum, Wrt | AH, VL, WE—II. Busse Berger

126. American Music (4)
Lecture—3 hours; listening—1 hour. Prerequisite: course 10 or 3A-3B or consent of instructor. Introduction to American music from the late 1800s to the mid 1900s. GE credit: ArtHum, Wrt | AH, VL, WE—II (II) Levy

127. Music from Latin America (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: consent of instructor. Examination of music from Latin America. Characteristic music [i.e., tango, bossa nova, salsa, musica matena and Vietnamese as well as its implications in other musical genres. Taught in Spanish. Not open to students who take Spanish 171 and 171S. [Same course as Spanish 171] Offered in alternate years. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, WE—II (II) Irvin, Ortiz

129A. Musics of the Americas (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 11 or 3A-3B. Survey of music by Native American music, Hispanic polyphony, New England psalmody, and selected 20th-century composers and styles. Offered in alternate years. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, WE—II (II) Levy

129B. Music from China (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: consent of instructor. Examination of music from China. GE credit: ArtHum, Wrt | AH, VL, WE.

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer. 2013-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SeSci—Social Sciences; ACGH—American Cultures; DD—Diverse Domestic; OL—Oral Skills; Q—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Diverse Domestic; OL—Oral Skills; Q—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
129. Folk Musics of Europe (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 11 or 3A-3B. Survey of folk musics from all of Europe, with emphasis on the role of music in society and on the elements of music (instruments, genre, form, etc.). Introduction to ethnomusicological theory, methods, approaches. Offered irregularly. GE credit: ArtHum, Div W | AH, VI, WC, WE — Lee

Performance instruction—1 hour. Prerequisite: open to Music majors with majors only. Admission by audition and consent of instructor. Individual instruction in (A) Voice (prerequisite of course 1 or the equivalent); (B) Piano; (C) Harpsichord; (D) Organ; (E) Violin; (F) Viola; (G) Cello; (H) Double Bass; (I) Flute; (J) Oboe; (K) Clarinet; (L) Bassoon; (M) French Horn; (N) Trombone; (O) Tuba; (P) Percussion; (Q) Classical Guitar; (R) Recorder. May be repeated for credit. Offered as demand indicates. —I, II, III, (I, II, III)

132. Singing for Actors (1)
Performance instruction—1 hour. Prerequisite: consent of instructor. The elements of basic singing techniques, through selected exercises, vocalises, and songs. May be repeated for credit. (P/NP grading only.) GE credit: AH

140. University Jazz Band (2)
Rehearsal—4 hours. Prerequisite: consent of instructor. Open to students in any major. Rehearsal, study, and performance of jazz band music and full variety of jazz styles. May be repeated for credit. (P/NP grading only.) GE credit: AH —I, II, III, (I, II, III) Griffin

141. University Symphony (2)
Rehearsal—4 hours. Prerequisite: audition subject to audition before first class meeting. Open to all students in the University whose proficiency meets the requirements of concert performance. Sight-reading, rehearsal and performance of music from the orchestral literature. May be repeated for credit. (P/NP grading only.) GE credit: AH —I, II, III, (I, II, III) Baldini

142. University Chamber Singers (2)
Rehearsal—3 hours. Prerequisite: audition subject to audition before first class meeting. Rehearsal and performance of works for small choral group. May be repeated for credit. (P/NP grading only.) GE credit: AH —I, II, III, Thomas

143. University Concert Band (2)
Rehearsal—4 hours. Prerequisite: admission subject to audition before first class meeting. Open to any student in the University whose proficiency meets the requirements of concert performance. Rehearsal and performance of music for band. May be repeated for credit. (P/NP grading only.) GE credit: AH —I, II, III, (I, II, III) Janes

144. University Chorus (2)
Rehearsal—4 hours. Prerequisite: admission subject to audition before first class meeting. Open to any student in the University. Rehearsal and performance of choral music. May be repeated for credit. (P/NP grading only.) GE credit: AH —I, II, III, (I, II, III) Thomas

145. Early Music Ensemble (2)
Rehearsal—4 hours. Prerequisite: admission subject to audition before first class meeting. Rehearsal and performance of Medieval, Renaissance, and Baroque music for vocal ensemble and historical instruments. May be repeated for credit. (P/NP grading only.) GE credit: AH —I, II, III, (I, II, III)

146. Chamber Music Ensemble (1)
Rehearsal—2 hours; student practice—1 hour. Prerequisite: admission subject to audition before first class meeting. Open to any student in the University. Study, rehearsal, and performance of ensemble music for strings, winds, voice, piano, harpsichord, and organ. May be repeated for credit. (P/NP grading only.) GE credit: AH —I, II, III, (I, II, III)

147. University Wind Ensemble (2)
Rehearsal—4 hours. Prerequisite: consent of instructor. Rehearsal, study, and performance of a full variety of wind ensemble music. Students share their work in public performances. May be repeated for credit. (P/NP grading only.) GE credit: AH —I, II, III, (I, II, III) Baldini

148. Hindustani Vocal Ensemble (2)
Rehearsal—2 hours; Basics of Hindustani music through theory and practice. Fundamentals of raga (mode) and tala (rhythm) with special emphasis on improvisation, a central feature of khyal (singing style). Five ragas have been repeated up to six times for credit. (P/NP grading only.) GE credit: AH —I, II, III, (I, II, III) Sahaib

149. Indonesian Gamelan Ensemble (2)
Rehearsal—2 hours. Prerequisite: consent of instructor. Indonesian music practice. Basic instrumental technique and repertory. Focus on the music of Sundanese gamelan (tuned percussion orchestras): salendro and degung. May be repeated for credit. (P/NP grading only.) GE credit: AH —I, II, III, (I, II, III) Spiller

150. Brazilian Samba School (2)
Rehearsal—2 hours. Prerequisite: consent of instructor. Practice of Brazilian music. Basic instrumental technique and repertory. Focus on the music traditions of Rio de Janeiro and Bahia. May be repeated up to six times for credit. (P/NP grading only.) GE credit: AH —I, II, III, (I, II, III) Lee

151. Korean Percussion Ensemble (2)
Rehearsal—2 hours; listening—2 hours; practice—2 hours. Prerequisite: consent of instructor. Class size limited to 20 students. Practice of Korean percussion styles. Basic instrumental practice and repertory. Focus on the percussion traditions of samulnori and basic concepts of p'ungmul. (P/NP grading only) May be repeated six times for credit. GE credit: AH —I, II, III, (I, II, III)

192. Internship in Music (1-4)
Internship—3-12 hours. Prerequisite: consent of instructor and academic advisor or department chairperson. For Music majors. Internship outside the university related to music. May submit a written proposal to an appropriate Music Department instructor. May be repeated up to eight units of credit. (P/NP grading only.) GE credit: AH —I, II, III, IV, (I, II, III, IV) Baldini

194HA-194HB. Special Study for Honors Students (2-4)
Independent study—6-12 hours. Prerequisite: course 7C, 124B. Open only to students who qualify for the honors program and admission to Music Senior Honors Program. Preparation and presentation of a culminating project, under the supervision of an instructor, in one of the creative or scholarly areas of music. (Deferred grading only; pending completion of sequence.) GE credit: ArtHum | AH —I, II, III, (I, II, III)

195. Senior Project (2)
Project—6 hours. Prerequisite: Consent of instructor and undergraduate advisor. Preparation of a senior project in music composition (public presentation of a musical work), in music performance (a public recital), or in music history and theory (public presentation of research results). Restricted to music majors with senior standing. GE credit: ArtHum | AH —I, II, III, (I, II, III)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.) GE credit: AH

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only) GE credit: AH

Graduate
202. Notation (4)
Seminar—3 hours; term paper. Study of musical notation; investigation of techniques for notating Medieval and Renaissance music. —I. Busse Berger

203. Music Composition (4)
Seminar—3 hours; term paper. Technical projects that explore compositional problems, the skill and technique with which to solve them, and free composition. May be repeated for credit. —I, II, III, (I, II, III) Bauer, Ortiz, Rohde, San Martin

204. Advanced Conducting (3)
Tutorial—2 hours; practice. Prerequisite: courses 113 and 114 or equivalent; keyboard skills appropriate to graduate standing. Open to graduate students in conducting. This course covers the technical aspects of conducting and the broader issues in music theory and analysis that conductors must face before leading a rehearsal or performance. May be repeated for credit. —I, II, III, (I, II, III) Baldini, Thomas

207. Advanced Electronic and Computer Music (4)

210A. Proseminar in Music (Theory and Analysis) (4)
Seminar—3 hours; term paper. Voice-leading analyses of tonal music derived from Schenker and pitch-class set theory. Recent work on compositional design, generalizations of the concept of interval, psychologically oriented music theory, and theories of durational structure and timbre. —I. Bauer

210B. Proseminar in Music (Musicology and Criticism) (4)
Seminar—3 hours; term paper. Issues and concepts of music history, including performance practice questions for specific repertoires and periods; principles, aims, and methods of archival study; historical theory, evolution of musical styles, philosophical debates about goals and aims of the discipline in general. —III. Levy

210C. Proseminar in Music (Ethnomusicology) (4)
Seminar—3 hours; term paper. Introduction to ethnomusicology through its intellectual history, theoretical approaches, analytical techniques, and methodologies. —I. (I.) Spiller

212. Ethics of Musical Ethnography (4)
Seminar—3 hours; field course 210C. The role, methodology, perception, and assumptions of the ethnomusicologist in ethno-
Native American Studies

(College of Letters and Science)

Steven J. Crum, Ph.D., Chairperson of the Department

Department Office. 2407 Hart Hall

http://nas.ucdavis.edu

Faculty

Steven J. Crum, Ph.D., Professor

Inés Hernandez-Avila, Ph.D., Professor

Academic Senate Distinguished Teaching Award

Liza Grandia, Ph.D., Associate Professor

Zoëllner, Ph.D., Professor

Elisabeth Rose Middleton, Ph.D., Assistant Professor

Jessica B. Perea, Ph.D., Assistant Professor

Justin D. Spence, Ph.D., Assistant Professor

Hullalah Tsikhahajhina, M.F.A., Associate Professor

Emeriti Faculty

George C. Longish, M.F.A., Professor Emeritus

Martha J. Macri, Ph.D., Professor Emeritus

Victor D. Montejo, Ph.D., Professor Emeritus

Stefano Varese, Ph.D., Professor Emeritus

The Major Program

Native American Studies provides a multi-disciplinary introduction to the indigenous cultures of North, Central, and South America. It challenges students to consider indigenous issues of cultural diversity, sovereignty, and the indigenous knowledge systems which prepared us for living in a world of constantly increasing social and cultural complexity.

The Program. Students electing a major in Native American Studies may complete Plan I, Plan II, or Plan III. Plan I enables students to concentrate chiefly upon the Native American experience in North America (north of Mexico). Plan II encourages interested students to focus upon Mexico, with some course work integrating Meso-America with North America and South America. Plan III focuses upon South America. with some course work integrating that region with areas to the north.

Career Alternatives. Native American Studies is excellent preparation for a scholarly career or an professional career such as teaching, law, human services, health, tribal administration, social work, and inter-ethnic relations. Graduate schools and agencies in these and related areas are looking for students with broad interdisciplinary preparation and who possess knowledge and sensitivity relating to ethnic issues and cultural diversity.

A.B. Major Requirements: UNITS

Preparatory Subject Matter.................16-24

Native American Studies 1; 10 or 12, 14, 16, 18, 20, 22, 24, 50, 53

Three courses from: African American and African Studies 12, 52, Anthropology 2, 20, 24, Asian American Studies 1, 2, 4, Chicana/o Studies 10, 21, 23, Comparative Literature 25, Community and Regional Development 2, Environmental Science and Policy 10, History 72, Linguistics 1, Religious Studies 90, Technocultural Studies 2, 120, 124-128, 140, 141, 142, 144, 145, 146, 147, 148

One of these courses must be completed by the end of the sophomore year. Students may not repeat these courses for credit.

III. Composition Seminar—3 hours. Analysis and analytical techniques and their application. Techniques of Analysis (4)

Topics in Ethnomusicology (4)

Emphasis on theory and methodology. Offered irregularly. —Spiller

222. Techniques of Analysis (4)

Seminar—3 hours. Analysis and analytical techniques as applied to music of all historical styles and periods. May be repeated for credit. —Ill, III, Levy, Musicology faculty

224. Independent Study (1-12)

(S/U grading only)

225. Native American Studies

Minor Program Requirements:

UNITS

Preparatory Subject Matter.................4

One or two American courses 107, 108, 110, 133, 135, 142, 191

Two courses from: African American and African Studies 12, 52, Anthropology 2, 20, 24, Asian American Studies 1, 2, 4, Chicana/o Studies 10, 21, 23, Comparative Literature 25, Community and Regional Development 2, Environmental Science and Policy 10, History 72, Linguistics 1, Religious Studies 90, Technocultural Studies 2, 120, 124-128, 140, 141, 142, 144, 145, 146, 147, 148

III. Composition Seminar—3 hours. Analysis and analytical techniques and their application. Techniques of Analysis (4)

Topics in Ethnomusicology (4)

Emphasis on theory and methodology. Offered irregularly. —Spiller

222. Techniques of Analysis (4)

Seminar—3 hours. Analysis and analytical techniques as applied to music of all historical styles and periods. May be repeated for credit. —Ill, III, Levy, Musicology faculty

224. Independent Study (1-12)

(S/U grading only)

225. Native American Studies

Minor Program Requirements:

Native American Studies 107 or 108 or 12, 14, 16, 18


One of these courses must be completed by the end of the sophomore year. Students may not repeat these courses for credit.

Areas of Specialization (complete one plan)

Plan I—North American Emphasis...........20

Native American Studies 107 or 108 or 110, 115


One course from: Native American Studies 100, 103, 136, 172, 173, 175, 176, African American and African Studies 12, 52, Anthropology 100, 102, 112, 115, 121, Chicana/o Studies 100, 110, Sociology 100, 102, 160, 162, 170, 178F, 180, 182

One other upper division Native American Studies course, selected in consultation with advisor

Plan II—Mexico-Central America Emphasis.......20

Native American Studies 107, 133 or 138


One course from: Art History 151, Native American Studies 122, 133A, 184 (Study Abroad), 185, Political Science 143B, Sociology 158, Spanish 177

Plan III—South American Emphasis...........20

Two courses from: Native American Studies 107, 110A, 110B, 110C, 110D, 120 (Study Abroad)

Two courses from: African American and African Studies 107A, 158, 160, 162, 175

One course from: Anthropology 103, 144, 175, History 162, 165, Political Science 143A, Sociology 104, Spanish 170, 170S, 171, 171S (Summer Abroad)

One course from History 163B, 164, 167, Political Science 143A

Total Units for the Major....................60-68

Major Adviser. Z. Mendoza

Major Advising. All new and prospective Native American Studies majors must see the Student Affairs Officer individually, once per year, at minimum.

Minor Program Requirements:

The Native American Studies minor provides an introduction to the Native experience in the Americas by means of exposure to course work dealing with some of the major aspects of Indian life, including history, values, politics, literature, and art.

Native American Studies.................24

Four upper division courses, at least one of which is chosen from the following groups:


One other upper division course selected in consultation with advisor.

Study Off Campus. Majors have the option of spending one to three quarters elsewhere in the Americas or on or near a reservation as part of the fulfillment of the Area of Specialization. Each student’s plan must be approved by the student’s adviser and by the chairperson and may fulfill from 12 to 20 of the 28 units required for the emphasis. The courses or field internship taken elsewhere must be focused upon indigenous peoples or indigenous languages and the institution of study shall be located in an area with substantial indigenous population. Students must have upper division standing and, for Plan I, course 107 or the equivalent should have been completed; for Plan II, courses 107 and 133 should have been completed; and for Plan III, courses 107 and 120 should have been completed prior to departure. Several options may be used for receiving academic credit, including course 195. The department strongly encourages students to participate in the UC Education Abroad Program or Short Term Programs Abroad.

Graduate Study. The Department offers a program of study leading to the M.A. and Ph.D. degrees in Native American Studies, as well as a designated emphasis in Native American Studies for graduate students in approved programs. Further information regarding graduate study may be obtained at the Department office and at Graduate Studies.

Graduate Advisers. Elisabeth Rose Middleton

Courses in Native American Studies (NAS)

Lower Division

1. Introduction to Native American Studies (4)

Lecture—3 hours; discussion—1 hour. Introduction to Native American Studies with emphasis upon basic concepts relating to Native American historical and political development. GE credit: SocSci, Div | ACGH, DD, DS, WC, WE, –I, II, III, Crum, Middleton

3.5. Introduction to Native American Literature (4)

Lecture/discussion—4 hours. Prerequisite: completion of Subject A requirement. Intensive focus on analysis of Native American literary texts, with fre-
110A. Native American Ethno-Historical Development (4)
Lecture—4 hours. Prerequisite: course 1 or 10; History 17A recommended. Study of Native American ethno-history in North America before 1770. GE credit: SocSci, Div, Wrt | ACGH, DD, SS, WC, WE. —I. Crum

110B. Native American Ethno-Historical Development (4)
Lecture/discussion—4 hours. Prerequisite: course 1; History 17A-17B recommended. Study of Native American ethno-history in North America, 1770-1890. GE credit: SocSci, Div, Wrt | ACGH, DD, SS, WC, WE. —II. Crum

110C. Native American Ethno-Historical Development (4)
Lecture/discussion—4 hours. Prerequisite: course 1; History 17A-17B recommended. Study of Native American ethno-history in North America after 1890. GE credit: SocSci, Div, Wrt | ACGH, DD, SS, WE. —III. Crum

113. Ethnohistory of Native People of Mexico and Central America (4)
Lecture/discussion—4 hours. Prerequisite: course 1, 10 or 55. Ethnohistorical development of pre-colonial, colonial, post-colonial Mexican and Central American indigenous peoples; the impact of economic and political factors on the process of cultural adaptation. Attention is given to the questions of nation-building, forced assimilation, indigenous resistance, organized political responses. GE credit: SocSci, Div, Wrt.
133A. Ethnoshistory of Native Peoples of Mexico and Central America to 1500 (4)
Lecture/discussion—4 hours; term paper. Prerequisite: course 1 or consent of instructor. Ethnoshistorical development of the indigenous peoples of Mexico and Central America up to and including the second millennium of European contact. Focus is on indigenous written historical records of the Maya, Mixtec, and Nahua peoples. May be repeated one time for credit. This course can be repeated with the student choosing a new topic for the term paper/project and for the PowerPoint presentation. The material is so extensive that more than one exposure to it can be very beneficial to students wanting to focus on ancient Mesoamerican GE credit: ArtHum or SocSci, Div | AH or SS, VL, WC, WE.—II.

133B. Ethnoshistory of Native Peoples of Mexico and Central America to 2000 (4)
Lecture/discussion—4 hours; term paper. Prerequisite: course 1 or 10, or consent of instructor. Ethnoshistory of indigenous peoples of Mexico and Central America from 1500 to contemporary times. Focus on social and cultural dynamics, particularly the role of indigenous people in the process of nation-state building in Mexico and Central America. Offered in alternate years. GE credit: ArtHum or SocSci, Div | Wrt | AH, OL, SS. WE.—II.

134. Race and Sex: Race Mixture and Mixed Peoples (4)
Lecture—4 hours. Prerequisite: one course chosen from course 10, Human Biology 5, 10, 181A, 181C. Race and sexual mixing and reproduction in indigenous peoples. Emphasizes the Americas and upon the sociocultural effects of intermixtures and on the lives of bi- and multiracial peoples. (Same course as Anthropology 134.) GE credit: ArtHum or SocSci, Div | Wrt | AH, OL, SS, WC.—II.

135. Gender Construction in Native Societies (4)
Lecture—4 hours. Prerequisite: one course from course 1, 10, Anthropology 30, Chicana/Chicano Studies 111, African American and African Studies 100 or Asian American Studies 110. The phenomena of racial, ethnic and religious intertwinings and mixing in the examination of indigenous peoples. Emphasizes the Americas and upon the sociocultural forms of intermixtures and on the lives of bi- and multiracial peoples. (Same course as Anthropology 133.) GE credit: ArtHum or SocSci, Div | Wrt | AH, OL, SS, WE.—II.

136. Orientation to Research in Native American Studies (4)
Lecture/discussion—4 hours; term paper. Prerequisite: Native American Studies major or minor, or consent of instructor. Limited enrollment. Introduction to basic research resources pertinent to Native American subjects available in the region, including libraries, archives, museums, etc. Emphasis on learning to use documentary resources or other collections of data. Students will carry out individual projects. GE credit: SocSci | ACGH, DD, SS, WE.—II. Crum

157. Native American Religion and Philosophy (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing; course 1, 5, or 10. Religious and philosophical traditions of Native American/indigenous peoples of the Americas. Offered in alternate years. GE credit: ArtHum | AH, OL, WE.—Hernández-Avila

161. California Indian Environmental Policy (1)
Lecture/discussion—4 hours; term paper. Prerequisite: course 1 or Consent of instructor. California Indian environmental policy issues, with a focus on water, minerals, contamina-
nation, and alliance-building. Issues will be placed within historical and political context, drawing on theories of Native American, environmental justice, and Federal Indian law. Offered in alternate years. GE credit: ACGH, DD, SS, WE.—Middleton

162. California Indian Environmental Policy II (4)
Lecture/discussion—4 hours; term paper. Contemporary California Indian environmental policy issues, with a focus on planning, site protection, and collaborative structures developed within historical and political context, drawing on theories of Native American environmental ethics, environmental justice, and Federal Indian law. Offered in alternate years. GE credit: SocSci | ACGH, DD, SS, WE.—Middleton

180. Native American Women (4)
Lecture/discussion—4 hours. Prerequisite: course 1, 10, or Women's Studies 50. Native American women’s lives and cultural constructions of gender roles, and Native women’s contemporary feminist thought. Utilizes texts from literature, social science, and autobiography/biography. GE credit: ArtHum or SocSci | AH or SS, DD, OL, WE.—II. 181A. Native American Literature (4)
Lecture/discussion—4 hours. Prerequisite: one course from course 5, English 3, Comparative Literature 1, 2, 3. Works of fiction (short story, novel) by contemporary Native American authors, with an emphasis on writers from the United States. Offered in alternate years. GE credit: ArtHum, Wrt | AH, ACGH, AH, DD, OL, WE.—Hernández-Avila

181B. Native American Literature (4)
Lecture/discussion—4 hours. Prerequisite: one course from course 5, English 3, Comparative Literature 1, 2, 3. Works by or about Native Americans including non-fiction novels, biographies and autobiographies. Explore ways Native Americans create and recollect their culture through the creative process in literature. Examine from a critical perspective autobiographies and testimonial literature. Offered in alternate years. GE credit: ArtHum, Wrt | AH, ACGH, AH, DD, OL, WE.—Hernández-Avila

181C. Contemporary Native American Poetry (4)
Lecture—4 hours. Prerequisite: one of the following: course 5, English 3, Comparative Literature 1, 2, 3. Works of poetry by contemporary Native American/indigenous poets, with some attention to traditional cultural poetic expressions. GE credit: ArtHum, Div | Wrt | AH, DD, OL, WE.—Hernández-Avila

184. Contemporary Indigenous Literature of Mexico (4)
Lecture/discussion—4 hours. Prerequisite: course 1 or 10; course 181A or 181C recommended; reading knowledge of Spanish required. Contemporary indigenous literature of Mexico, with a focus on the genres (poetry, fiction, drama, essay); analysis of cultural, historical, and spiritual themes, imagery, styles and perspectives. BIO: the biases of and influences on the Native writers themselves. Offered irregularly. GE credit: ArtHum or SocSci | AH or SS, OL, WC.—IV. Hernández-Avila

185. Native American Literature in Performance (4)
Performance instruction—4 hours. Prerequisite: consent of instructor. Performance of contemporary Native American literature onstage, through adaptation of selected literature as well as the creation of original pieces. Offered in alternate years. May be repeated up to four units for credit GE credit: ArtHum or SocSci | AH or SS, DL, OL, WC.—Hernández-Avila

188. Special Topics in Native American Literary Studies (4)
Lecture/discussion—4 hours; term paper. Prerequisite: upper division standing and one of the following: courses 1, 181A, 181C. Special topics drawn from American literature. May be repeated for credit when topic differs. Offered irregularly. GE credit: ArtHum, Div | Wrt | AH, DD, OL, WE.—II, IV. Hernández-Avila

190. Seminar in Native American Studies (2)
Discussion—2 hours. Prerequisite: senior standing. Seminar of critical issues faced by Native American people. (P/NP grading only)

191. Topics in Native American Studies (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Selected topics in Native American Studies related to indigenous perspectives and viewpoints from a historical, cultural, hemispheric perspective. May be repeated for credit when topic differs and/or when offered by a different instructor. Offered irregularly. GE credit: ArtHum or SocSci, Div | AH or SS, DD, OL, WE.—II, III, III. Hernández-Avila

192. Internship (1-12)
Internship—1 hour. Supervised internship in the CN Gorman Museum, community, and institutional settings related to Native American concerns. May be repeated up to 12 units for credit including 192 and other internships taken in other departments and institutions. (P/NP grading only.) GE credit: ArtHum | AH.—I, II, III, IV. Tsininháhninjéh

194HA/194HB. Special Studies for Honors Students (4-4)
Independent study—12 hours. Prerequisite: senior qualifying for honors. Directed reading, research and writing culminating in the completion of a senior honors thesis or project under direction of faculty adviser. (Deferred grading only, pending completion of sequence.)

195. Field Experience in Native American Studies (12)
Field work—36 hours. Prerequisite: senior standing and major in Native American Studies. Completion of upper division major requirements and course 161. Field work with governmental and community groups, under supervision of faculty adviser and sponsor. Knowledge acquired in other courses to be applied in field work. (P/NP grading only)—I, II, III

196. Senior Project in Native American Studies (4)
Discussion—1 hour; independent study—3 hours. Prerequisite: senior standing and major in Native American Studies, course 192 (may be taken concurrently), and consent of instructor. Guided research project that enables student to apply the theory and research principles from major course work. Final product is to be a major senior project or thesis. (P/NP grading only)—I, II, III.

197TC. Community Tutoring in Native American Studies (1-5)
Tutorial—3-15 hours. Prerequisite: consent of major committee; upper division standing with major in Native American Studies. Supervise tutoring in community. (P/NP grading only)—I, II, III.

198. Directed Group Study (1-5)
Prerequisite: upper division standing; consent of instructor. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Graduate

200. Basic Concepts in Native American Studies (4)
Seminar—4 hours. Prerequisite: graduate standing and consent of instructor. Analysis of the characteristics of the discipline of Native American Studies. Concentration is on both traditional and contemporary Native American scholarship and thought as well as the theoretical and methodological consequences derived from application of these ideas. Offered in alternate years.—II. Crum, Hernández-Avila, Middleton

202. Advanced Topics in Native American Studies (4)
Seminar—4 hours. Prerequisite: graduate standing. Advanced study of selected topics or themes relevant to the field of Native American studies. Topics will

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer. 2015-2016 offering in parentheses.


Fall 2011 and on Revised General Education (GE): AH | Arts and Humanities; SE | Science and Engineering; SS | Social Sciences; ACGH | American Cultures; DD | Domestic Diversity; OL | Oral Skills; QL | Quantitative; SL | Scientific; VL | Visual; WC | World Cultures; WE | Writing Experience

Native American Studies 441
207. Leadership Skills and Strategies in California Language Documentation & Revitalization (4)
Seminar—3 hours; term paper. Introduction to the indigenous languages of the Americas, with a focus on California; an examination of how contemporary Native American communities document and revitalize their heritage languages. Learn to assist and administer language programs. Offered in alternate years. —Granada

212. Community Development for Sovereignty and Autonomy (4)
Seminar—4 hours. Prerequisite: graduate standing. Examination of “deviance” in Native communities with focus on Native sovereignty in North America. Analysis of the concept of deviance from several different world views. Readings from a range of theories to incorporate varying theoretical perspectives on deviance and social control. Offered in alternate years. —Granda

213. Native Criminality and Deviance (4)
Seminar—4 hours. Prerequisite: graduate standing. Examination of “deviance” in Native communities with focus on Native criminality in North America. Analysis of the concept of deviance from several different world views. Readings from a range of theories to incorporate varying theoretical perspectives on criminality and deviance. Offered in alternate years. —Granada

217. Public Law 83-280: Colonial Termination (4)
Seminar—4 hours. Prerequisite: graduate standing, including school of law students. Examination of the signature law of the Termination Era. Public Law 83-280. Discussions to include termination, societal conformity, political consent, jurisdiction, self-determination & decolonization, and colonial relationship between Native peoples and the United States.—II, III, Crum

220. Colonialism/Racism and Self-Determination (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing. Study of imperial/colonialist systems and their psychosocial impacts upon oppressors and oppressed, of racism as the outgrowth of colonialism, and of nationalism, ethnic conflict and self-determination. Focus on indigenous peoples, but other groups will also be considered. Offered in alternate years. —Granada

224. Performance in the Americas (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing. Ethnomusical and anthropological approaches to study of public performance in the Americas. New ways of looking at music, dance, ritual and other forms of public expressive forms normally called “popular culture.” Not open for credit to students who have completed Music 224. (Former course Music 224.)—Mendoza

233. Visual Sovereignty (4)
Seminar—3 hours; film viewing—2 hours; term paper. Extensive examination of the field of contemporary Native American and Indigenous photography, film and performance through research of artworks, writings by artists, theorists, and material in museum collections. May be repeated two times for credit when topic differs. Offered in alternate years. —Tsinnahjinnie

237. Native American Art Collections and Museums (4)
Seminar—3 hours; term paper. Research and examination of regional Native American art held in museums and other public institutions, as well as privately held collections. Includes onsite viewing and research of museum collections. Offered in alternate years. —Tsinnahjinnie

240. Native American Public Health: Topics and Issues (4)
Seminar—3 hours; term paper. Introduction to Native American public health issues and contributing causal factors (including environmental justice and historical trauma); the dimensions of cultural competency in diagnosis and service provision; the structure of Native health care institutions; and debates in Native treatment modalities.—II. Middle

250. Indigenous Critique of Classic Maya Ethnographies (4)
Seminar—4 hours. Prerequisite: graduate standing or consent of instructor. Construction of the Maya world through ethnographic writing during the present century. Deconstruction of ethnographies about the Mayans considering the modern theories and social, anthropological critiques of modern ethnographies. Offered in alternate years.

280. Ethnohistorical Theory and Method (4)
Seminar—3 hours; term paper. Discussion of the ethnohistorical method; the utilization of diverse types of data, especially documentary sources, to reconstruct socio-cultural history. Particular attention to the applied area of ethnohistory in the solution of contemporary social problems. Offered in alternate years. —Granda

298. Group Study for Graduate Students (1-5)
Prerequisite: graduate standing, consent of instructor. (S/U grading only.)

299. Special Study for Graduate Students (1-12)
Prerequisite: graduate standing, consent of instructor. (S/U grading only.)

Professional

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III

Natural Sciences

[College of Letters and Science]

Advising Center, 104 Everson Hall

Committee in Charge
Howard W. Day, Ph.D., Chair
(Earth and Planetary Sciences)
Tessa Hill, Ph.D. (Earth and Planetary Sciences)
Susan Keen, Ph.D. (Evolution and Ecology)
J. Richard Pomeroy, Chair
Neil Schore, Ph.D. (Chemistry)
David Webb, Ph.D. (Physics)

The Major Program
Natural Sciences is an interdisciplinary major that provides significant breadth in biology, chemistry, earth sciences, physics and mathematics while offering additional depth in two of the natural sciences. It is especially designed to meet the needs of prospective science teachers, but will also serve students who wish to attain higher work in more than one science. The major is sponsored by the Department of Earth and Planetary Sciences.

The Program. The Natural Sciences curriculum offers an unusually broad training in science and mathematics. All students must complete a one year sequence in a calculus, a course in statistics and one year sequence in chemistry, earth science, life science and physics. Each student will complete depth courses in two of these sciences. Prospective teachers may use these depth courses as preparation for primary and supplementary teaching credentials in science. Students who might wish to prepare for a teaching credential program should consult an advisor at their first opportunity to combine the prerequisites with General Education requirements.

Career Alternatives. Students whose goals include business, journalism, law, or medicine may acquire a broad background in science through this curriculum. The study of natural sciences also prepares a student to meet the subject matter requirements for primary and supplementary science teaching credentials in California. Students who might wish to become a teacher should consult an advisor in the Mathematics and Science Teaching Program [MAST, http://mast.ucdavis.edu] at their first opportunity. MAST advisors can help students combine the prerequisites for a science program with General Education requirements. The program also offers seminars that give participants experience in elementary, middle school, and high school classrooms.

B.S. Major Requirements:

Preparatory Subject Matter.......................... 48-74
Chemistry 2A, 2B, 2C .................................. 15
Biological Sciences 2A, 2B, 2C ................. 15
Geology 2, 3, 3L, 50I, 60 ................................ 13
Mathematics 16A, 16B, 16C or 17A, 17B, 17C or 21A, 21B, 21C .............. 9-12
Physics 7A, 7B, 7C or 9A, 9B, 9C .................. 12-15
Statistics 100 ........................................ 4

Depth Subject Matter.................................. 42
Concentration (chosen from among the four fields of concentration listed below) ...... 27
Supplementary Field; chosen from among the four fields listed below. May not include the same field as the concentration. The same course may not be used to fulfill the requirements for both a Concentration and a Supplementary Field. .... 15

Total Units for the Major .......................... 110-116

Fields of Concentration:

Chemistry ........................................... 27-36
Chemistry 105 ........................................ 4
Chemistry 107A/107B or 110A/110B ........ 110C ........................................ 6-12
Chemistry 118A/118B or 128A/128B- 129A/129B ........................................ 8-10
Chemistry 124A ...................................... 3
One course from Chemistry 100, 104, 118C, 128C ........................................ 3-4
Three units from Chemistry 197, 199 or Education/Geology 181, 183 ........ 3
Earth Science ........................................ 27
One course from Geology 107, 108, 131 ........................................ 1
Three units from Geology 199 or Education/Geology 181, 183 ........ 3
Life Science ........................................... 27-33
Chemistry 8A, 8B or 118A, 118B, 118C ........................................ 6-12
Biological Sciences 101 ................................ 4
Evolution and Ecology 100 or approved electives and Biological Sciences 105 ........................................ 8
Neurobiology, Physiology, and Behavior 101 ........................................ 5
Four units from Biological Sciences 199, Evolution and Ecology 199, Molecular and Cellular Biology 199, or Neurobiology, Physiology, and Behavior 199 or Education/Geology 181, 183 ........ 4

Supplementary Fields:

Chemistry ........................................... 15-17
Chemistry 100 ........................................ 3
Chemistry 104 or 105 ................................ 3
Chemistry 107A ...................................... 3
Chemistry 118A or 128A ......................... 3-4
Chemistry, 124A ...................................... 3
Other Chemistry or related science courses may be substituted with the prior approval of the major adviser.

Earth Science ........................................ 15
Geology 108L, 109L, 109L, 116N ........ 10
Geology 138 or 140 .................................. 4
Approved elective .................................. 1
Other Geology or related science courses may be substituted with the prior approval of the major adviser.

Life Science ........................................... 15
Biological Sciences 101* ......................... 4

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (GE): Arts and Humanities; Sciences and Engineering, Social Sciences; Div=Dominant Diversity; Wrt=Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SC=Science and Engineering, SS=Social Sciences; ACH=American Cultures, DD=Dominant Diversity, OL=Oral Skills, QL=Quantitative, SL=Scientific, VL=Visual, WC=World Cultures; Wrt=Writing Experience

Nature and Culture

This major was discontinued effective June 30, 2011.

Courses in Nature and Culture (NAC)

Upper Division

192. Internship in Nature and Culture (1-12)
Internship—3.36 hours. Prerequisite: course 1.
Internship in natural sciences, social sciences, or humanities on or off campus in which students use and improve their interdisciplinary skills and perspectives gained through the Nature and Culture curriculum. Supervised by a faculty member. May be repeated for credit. (P/NP grading only.)

Nematology

Please see the department of Entomology and Nematology, on page 293, for further information.

(College of Agricultural and Environmental Sciences)

Michael Parella, Ph.D., Chairperson of the Department
Edwin Lewis, Ph.D., Vice Chairperson of the Department
Department Office, 367 Briggs; 530-752-0300

Faculty
Edward P. Caswell-Chen, Ph.D., Professor
Howard Ferris, Ph.D., Professor
Edwin Lewis, Professor
Steven A. Nadler, Ph.D., Professor
Beechy B. Werder, Ph.D., Professor

Emeriti Faculty
Bruce A. Jaffe, Ph.D., Professor Emeritus
Harry K. Kaya, Ph.D., Professor (Entomology)

Minor Program Requirements:

UNITS
Nematology .................................................. 18-20
Nematology 100, 110, and Soil Science 100 .................................................. 10
Two or three courses from one of the following areas: .................................................. 8-10
(a) Plant Science: Microbiology 102; Entomology 100, 135, 153, 156, 156L; Evolution and Ecology 112; Plant Pathology 120, 148; Plant Biology 121; Soil Science 111, 112

(b) Entomology: One upper division Entomology course; Evolution and Ecology 112; Microbial Plant Biology 102; Plant Pathology 120, 148; Soil Science 102, 111, 112

Minor Adviser. S. Lawler

Graduate Study. Graduate degrees specializing in Nematology are offered through the Departments of Entomology and Plant Pathology and through various Graduate Groups (Biochemistry, Ecology, Genetics, Plant Protection, and Pest Management). Refer also to the Graduate Studies chapter of this catalog.

Courses in Nematology (NEM)

Related Courses. See Entomology and Nematology, on page 293.

10V. General Biology (4)
Web virtual lecture—3 hours; web electronic discussion—1 hour. Concepts and issues in biology. Emphasis on composition and structure of organisms; regulation and signaling; heredity, evolution and the interaction and interdependence among life forms and their environments. Significant writing is required. Designed for students not specializing in biology. Not open for credit to students who have completed course Biological Sciences 1A, 1B, 2A, 2B, 2C or 10. (Same course as Biological Sciences 10V.) GE credit: SciEng, Writ | SE, SL, WE, — Ill. (III.) Westerdahl

Upper Division

100. General Plant Nematology (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1B or 10. An introduction to the classification, morphology, biology, and control of the nematodes attacking cultivated crops. GE credit: SciEng | SE— II. (I.) Ferris

110. Introduction to Nematology (2)
Lecture—2 hours. Prerequisite: Biological Sciences 1B or the equivalent or consent of instructor. The relationship of nematodes to human environment. Classification, morphology, ecology, distribution, and importance of nematodes occurring in water and soil as parasites of plants and animals. GE credit: SciEng | SE—II. (I.) Caswell-Chen, Nadler

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

Graduate

201. Molecular and Physiological Plant Nematology (2)
Lecture—1 hour; discussion—1 hour. Prerequisite: Biological Sciences 101; Plant Pathology 120, course 100 or 110. Molecular biology and physiology of nematodes using Caenorhabditis elegans as a model, but with emphasis on plant-parasitic species. Plant responses to nematodes. Discussion of current literature emphasized. Offered in alternate years.—II. Williamson

203. Ecology of Parasitic Nematodes (2)
Lecture—1 hour; discussion—1 hour. Prerequisite: course 100 or 110 or Entomology 156; Evolution and Ecology 101 or Plant Biology 117. Major concepts in population and community ecology of animal and plant-parasitic nematodes. Current advances in techniques, theory, and basic information about nematode host dynamics, and application to management of nematode diseases. Offered in alternate years.—(III.) Caswell-Chen

204. Management of Plant-Parasitic Nematodes (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 100 or 110. Theory, foundation, principles and practices of nematode management. Techniques and equipment used to manage nematodes and methods used to analyze their effectiveness. Offered in alternate years.—II. Westerdahl

205. Insect Nematology and Biological Control (2)
Lecture—1 hour; discussion—1 hour. Prerequisite: courses 100 and 110, Entomology 100 or 110. The biology of insect-parasitic nematodes, their effect on the host, and their potential as biological control agents of insect and other invertebrate pests. Application of ecological theory in classical and augmentative biological control. Offered in alternate years.—(I.) Kaya, Lewis

206. Nematode Systematics and Evolution (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 100 or 110 or Entomology 156; Evolution and Ecology 100 recommended. Nematode diversity as revealed by morphological and molecular evidence. Laboratory experience focuses on structural features used in taxonomy. Phylogenetic relationships based on morphological and molecular data used to construct patterns of character change among taxa. Offered in alternate years.—(I.) Nadler

210. Molecular Phylogenetic Analysis (3)
Lecture—2 hours; laboratory—3 hours. Theory and practice of inferring phylogenetic trees using molecular sequence data. Practical techniques for obtaining sequence data, advantages and disadvantages of common approaches for inferring trees, statistical methods for comparing alternative hypotheses. (Same course as Evolution and Ecology 210.) Offered in alternate years.—(II.) Nadler

245. Field Nematology (1)
Fieldwork—6 days. Prerequisite: course 100. Six-day demonstration and field study in applied nematology including diagnosis and prediction of nematode field problem strategies for control field demonstration design, and establishment in association with diverse California crops. (S/U grading only.)—I. (I.)

290. Seminar (1)
Seminar—1 hour. (S/U grading only.)—II, III, (II, III.)

299. Advanced Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Planning and results of research programs, proposals, and experiments. Discussion and critical evaluation of original research being conducted by the group. Discussion led by individual research instructors for research group. (S/U grading only.)

298. Group Study (1-5)
(S/U grading only.)

299. Research (1-12)
(S/U grading only.)

Neurobiology, Physiology, and Behavior

(College of Biological Sciences)

James S. Trimmer, Ph.D., Chairperson of the Department
Department Office, 196 Briggs Hall; 530-752-0203; http://www.npb.ucdavis.edu

Faculty

Primary Department Members
Keith Baar, Ph.D. Associate Professor (Physiology & Membrane Biology)
Sue C. Bodine, Ph.D., Professor (Physiology & Membrane Biology)
Kenneth H. Britten, Ph.D., Professor
Earl E. Carstens, Ph.D., Distinguished Professor (Anesthesiology & Pain Medicine)
Ernest S. Chang, Ph.D., Professor (Animal Science)
Hwai-Jong Cheng, M.D., Ph.D., Professor (Pathology & Laboratory Medicine)
Thomas P. Coombs-Hahn, Ph.D., Professor
William DeBello, Ph.D., Associate Professor
Jochen Ditterich, Ph.D., Associate Professor

Pre-Fall 2011 General Education (GE): AH=Arts and Humanities; SCI=Science and Engineering; SS=Social Sciences; ACGH=American Cultures; DD=Dominant Diversity; Writ=Writing Experience
Pre-Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SCI=Science and Engineering; SS=Social Sciences; ACGH=American Cultures; DD=Dominant Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; VL=Visual; WC=World Cultures; Writ=Writing Experience
Exercise biology deals with the mechanisms and adaptive effects of physical activity (and inactivity). We examine consequences of activity from the molecular to the organismal (human ecological) level. We have unique and dedicated faculty for the Bachelor of Arts program, which provides a greater breadth of knowledge in the humanities and social sciences and is more appropriate for those who wish to apply their knowledge within the human community. The Bachelor of Science program is appropriate for students who desire a strong preparation in human biology.

Advising and Career Alternatives. Meet with an Exercise Biology staff advisor in the Biology Academic Success Center (BASC); 1023 Sciences Laboratory Building; 530-752-0410; http://www.biosci.ucdavis.edu/BASC, to learn more about the best course sequences to take to prepare you for careers in basic science or applied exercise physiology, or biomechanics; for graduate study in exercise physiology or biomechanics; or for professional programs in medicine, or physical therapy, athletic training or occupational therapy. Students with further academic or professional interests in medicine and other health sciences, community service, business, sales, communications, education or coaching might find the Bachelor of Arts program attractive. The Bachelor of Science could lead to further graduate study in any field related to human biology as well as careers in medicine and other health sciences (e.g., exercise physiology, biomechanics and biomedical engineering and medical equipment and pharmaceutical development and sales.

A.B. Major Requirements:

- Preparatory Subject Matter .................. 37-40
  - Biological Sciences 2A-2B-2C .............. 14
  - Chemistry 2A, 2B ........................... 10
  - Physics 1A-1B or 7A-7B .................... 6-8
  - Psychology 1 ....................... 4
  - Statistics 13, 32, 100, or 102 .......... 3-4
  - Psychology 41 recommended

Depth Subject Matter .................. 40-45

- Biological Sciences 101 ..................... 4
- Neurobiology, Physiology, and Behavior 101 ............... 5
- Exercise Biology 106 and 106L ......... 7
- Exercise Biology 111, 112, 113, 117 .... 15
- One additional upper division course in Exercise Biology ............ 3-4
- Select one additional course from two of the three content areas listed below: .... 6-10
  - Sociology and Culture option: African American and African Studies 100; Anthropology 101; Communication 165; Community Development 176; Exercise Biology 120; History 178B; Science and Society 105, 120; Science and Technology Studies 150; Sociology 122, 154, 159, 177
  - History and Philosophy option: American 141; History 135A, 135B, 136, 139A, 139B, 185A; Philosophy 108; Science and Technology Studies 131
  - Psychology and Communication option: Agricultural and Resource Economics 112, Communication 134, 136; Exercise Biology 121, 122; Human Development 100C; Psychology 101, 121, 126, 140.

No variable unit courses or Exercise Biology 148, 148L may be used to fulfill these requirements. Consult your adviser regularly.

Total Units for the Major .................. 105-128

Minor Requirements:

- Exercise Biology ............................ 18

At least 15 upper division units in exercise biology from the following courses: Exercise Biology 101, 102, 103, 110, 111, 112, 113, 115, 124, 126, 127, 128
- Exercise Biology or other approved course: An additional three upper division units from either the previous list of Exercise Biology courses or the following courses: Exercise Biology 106; Neurobiology, Physiology, and Behavior 101; Biological Sciences, 101, 104, 105

Master Adviser. Paul Saltzsky for the Exercise Biology Major and Exercise Biology Minor

The Neurobiology, Physiology, and Behavior Major Program

Neurobiology, Physiology, and Behavior is a major that emphasizes the understanding of vital functions common to all animals. All animals perform certain basic functions—they grow, reproduce, move, respond to stimuli, and maintain homeostasis. The physiological mechanisms upon which these functions depend are precisely regulated and highly integrated. Actions of the nervous and endocrine systems determine behavior and the interaction between organisms and their physical and social environments. Students in this major study functional mechanisms; the control, regulation, and integration of these mechanisms; and the behavior that relates to those mechanisms. They do so at the level of the cell, the organism, and the system.

The Program. In the freshman and sophomore years, students majoring in Neurobiology, Physiology, and Behavior build a broad scientific background, taking courses in biology, biochemistry, physics, and mathematics. As juniors or seniors, students can enroll in a variety of Neurobiology, Physiology, and Behavior courses and related upper division courses. Students can participate in a number of advanced laboratory courses or may design an individual, independent project guided by a member of the faculty.

Quarter Offered: Fall, Winter, Spring, Summer; 2015-2016 offering in parentheses

Pre-Fall 2011 General Education (Gen) Courses: AH = Arts and Humanities; SE = Social Sciences; Div = Domestic Diversity; WC = World Cultures; WE = Writing Experience

Fall 2011 and on Revised General Education (Gen): AH = Arts and Humanities; SE = Social Sciences; Div = Domestic Diversity; WC = World Cultures; WE = Writing Experience
Career Alternatives. Completion of the Neurobiology, Physiology, and Behavior major provides the foundation for advanced study leading to careers in high school teaching, college level teaching or research. It also serves as the basis for further training in the health professions, including but not limited to: Pharmacy, medicine, medical technology, physical therapy, pharmacy, nursing, dentistry and optometry. The major is also appropriate for those intending to seek careers in biotechnology or other biologically related industries.

B.S. Major Requirements:

Preparatory Subject Matter

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<tr>
<th>Course Code</th>
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<td>14</td>
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<td>8A-8B or 118A-118B</td>
<td>Chemistry</td>
<td>15</td>
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<td>118C</td>
<td>Mathematics</td>
<td>6-12</td>
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<td>17A-17B-17C or 21A-21B</td>
<td>Physics</td>
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Depth Subject Matter

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<td>12, 141P, 150, 194H</td>
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<td>Mathematics</td>
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Preparatory Subject Matter

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<tr>
<td>100</td>
<td>Neurobiology, Physiology, &amp; Behavior</td>
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Select one or more units of laboratory course within the following list:

- 3-5 Neurobiology, Physiology, and Behavior
- 100L, 101L, 104L, 111L, 124, 141P, 150, 194H | Other courses with the approval of the master advisor.
- Statistics 100                  | 10    |
- Additional Neurobiology, Physiology, and Behavior course not in saturation of any other requirement | 12    |

Total Units for Major

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Minor Program Requirements

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<td>Exercise Biology</td>
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Neurobiology, Physiology, & Behavior

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Courses in Exercise Biology (EXB)

Lower Division

10. Exercise and Fitness: Principles and Practice

Lecture—3 hours. Human movement from physiological, psychological, sociological, and historical perspectives. Biology and psychology of exercise across the human lifespan. Not open for credit to students who have completed an upper division Exercise Biology course.

Graduate Study. Information on graduate study in neurosciences, physiology or behavior may be obtained by writing to Graduate Advisor, College of Biological Sciences, Graduate Academic Programs. See also the graduate course offerings listed under Animal Behavior (A Graduate Group), on page 149, Molecular, Cellular, and Integrative Physiology (A Graduate Group), on page 433, Neurosciences, on page 450 and Physiology, on page 471. See also Graduate Studies, on page 111.

Courses in Exercise Biology (EXB)
Neurobiology, Physiology, and Behavior

extensive hands-on experience. [Same course as Cell Biology and Human Anatomy 101L] GE credit: SciEng | SE—II. (III.) Gomes

110. Exercise Metabolism (3)
Lecture—3 hours. Prerequisite: course 101 or Neurobiology, Physiology and Behavior 101. Exercise metabolism, with emphasis on skeletal muscle and cardiovascular responses during activity and inactivity. Basics of bioenergetics, substrate utilization, and cell signaling; mechanisms that regulate these properties, and differences between skeletal muscle and cardiac muscle. GE credit: SciEng | SE—II. (III.) Shaffrath

111. Environmental Effects on Physical Performance (3)
Lecture—2 hours; discussion/laboratory—3 hours. Prerequisite: courses 101 or consent of instructor. The effects of thermal, barometric and gravitational conditions on physiological function and physical performance of humans. Acute and chronic effects, emphasizing physiological adaptations and limitations, will be studied. GE credit: SciEng | QR, SE—II. (III.) Shaffrath

112. Clinical Exercise Physiology (4)
Lecture—3 hours; laboratory/discussion—3 hours. Prerequisite: courses 101 or consent of instructor. Physical activity as a therapeutic modality in normal and diseased populations (cardiovascular, pulmonary, diabetic). Effects of exercise and inactivity in terms of normal physiology, pathophysiology, and therapeutic benefit. Exercise fitness and disease assessment methods. GE credit: SciEng | SE, SL—II. (III.) Harris, Shaffrath

113. Growth and Development in Human Performance (3)
Lecture—3 hours. Prerequisite: Cell Biology and Human Anatomy 101, and Neurobiology, Physiology, and Behavior 101. Development of human performance potential from conception to old age, including influence of exercise, athletic participation, and preventive medicine. Alterations in motor skill patterns, morphology, and body composition, and physiological capacities with aging. GE credit: SciEng | SE

115. Biomechanical Bases of Movement (3)
Lecture—2 hours; laboratory—3 hours to alternate weekly with discussion—1 hour. Prerequisite: course 103 or consent of instructor. Biomechanical bases of human movement investigated; topics include musculo-skeletal mechanics, tissue mechanics, electromyography, and measurement and analysis techniques. Application to clinical, and work environments, including extensive analysis of locomotion. GE credit: SciEng | QR, SE, VL, WE—II. (I) Liets

116. Nutrition for Physically Active Persons (3)
Lecture—3 hours. Prerequisite: course 101, Neurobiology, Physiology, and Behavior 101. The role of nutrition and exercise in modifying metabolism, body composition, performance, and health of humans. GE credit: SciEng | SE

117. Exercise and Aging in Health and Disease (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 101 or consent of instructor. Exercise physiology and standard therapy for various diseases associated with aging (e.g., cardiovascular, pulmonary, and renal diseases, diabetes, obesity, lipemias, etc.). Exercise will be considered as a protective and/or therapeutic modality. GE credit: SciEng | SE—II. (III.) Shaffrath

120. Sport in American Society (3)
Lecture—3 hours. Sociological approaches to the study of sport. [II.] Contemporary American culture, including sport interaction with politics, economics, religion, gender, race, media and ethics. Socialization factors involving youth, scholastic, collegiate, and Olympic sport. [Same course as Physical Education 120] GE credit: SocSci, Div | SS—II. (III.) Ditterich

121. Advanced Sport Psychology (3)
Lecture—3 hours. Prerequisite: course 102, Psychol 1 recommended. Advanced study and consideration of major theoretical and practical issues in sport psychology. Emphasis on practical application to sport and human performance. —Salitsky

122. Psychological Effects of Physical Activity (3)
Lecture—3 hours. Prerequisite: Psychology 1; upper division standing. Physical activity is evaluated in terms of its ability to enhance the quality of life. Topics studied include: individual factors (self-concept, type A), special populations (elderly, cardiovascu-lar); and mental health changes (depression, anxie-ty). —Salitsky

124. Physiology of Maximal Human Performance (3)
Lecture—3 hours, practice—4 hours. Prerequisite: course 101 or permission of instructor; Biological Sciences 101, 102, and 103 recommended. Molecular mechanisms underlying adaptation to training. Learning how to exercise to their maximal potential as well as learning how the frequency, intensity and timing of exercise and nutrition affect the molecular signals that underlie performance. GE credit: SciEng | SE—II. (III.) Shaffrath

125. Neuromuscular and Behavioral Aspects of Motor Control (3)
Lecture—2 hours; lecture/discussion—2 hours. Prerequisite: course 101. Factors which affect control of movement from psychological, physiological, behavioral, and mechanical viewpoints. Topics include central vs. peripheral control mechanisms, open and closed loop theories, motor programming, cognition, learning and memory, and effects of bio-chemical and biomechanical influences. GE credit: SciEng | SE—II. (III.) Bodine

126. Tissue Mechanics (3)
Lecture—2 hours; laboratory/discussion—3 hours. Prerequisite: course 103 or Engineering 45 or consent of instructor. Structural and mechanical properties of biological tissues including bone, cartilage, ligaments, tendons, nerves, and skeletal muscle. [Same course as Biomedical Engineering 126.] GE credit: SciEng | QR, SE, SL, WE—II. (III.) Hawkins

148L. Adult Fitness Testing Laboratory (1)
Lecture—3 hours. Prerequisite: courses 148 (concurrently). Testing asymptomatic or pre-existing conditions such as cardiovascular, pulmonary, metabolic and musculoskeletal abnormalities. GE credit: SciEng | SE—II. (III.) Casazza

148L. Adult Fitness Testing Laboratory (1)
Lecture—3 hours. Prerequisite: courses 148 (concurrently). Testing asymptomatic or pre-existing conditions such as cardiovascular, pulmonary, metabolic and musculoskeletal abnormalities. GE credit: SciEng | SE—II. (III.) Casazza

179. Froehlich Research Project (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: courses 101, 102 and 103 (may be taken concurrently); 104L recommended. Lectures by leading authorities and discussion of the latest research in newly emerging areas in exercise biology. Offered every fourth year. GE credit: SciEng | SE—II. (III.)

189. International Perspectives in Exercise Biology (4)
Lecture—4 hours. Prerequisite: course 10 or upper division standing required. Prerequisite: consent of instructor; students will be accepted based upon academic merit, personal experience, and academic discipline in order to provide multidisciplinary perspectives. Comparative case studies/ exercise issues between the US and an international location. Identify political, economic, cultural, technological and environmental issues that impact human exer-cise, physical activity, wellness, and sport from a global perspective. Limited enrollment. Offered irreg-ularly.

190C. Research Conference (1)
Discussion—1 hour. Prerequisite: upper division standing in Exercise Biology or related biological science and consent of instructor. Fulfillment in course 199. Research findings and methods in exercise biology. Presentation and discussion of research by faculty and students. May be repeated for credit. [P/NP grading only.]—I, II, III. (I, II, III.)

192. Exercise Biology Internship (1-12)
Internship—3-36 hours. Prerequisite: consent of instructor, dependent on availability of intern positions. Work experience in the application of physical activity programs to teaching, recreational, clinical or research situations under program faculty supervision. Written report required. May be repeated up to 15 units of credit, including course 99. [P/NP grading only.]—I, II, III. (I, II, III.)

194H. Research Honors (2)
Independent study—6 hours. Prerequisite: senior standing, minimum of 6 units of course 199, 3.500 GPA or greater in major courses, consent of honors theses advisor. Preparation and completion of individual honors research project in Exercise Biology, under the guidance of an Exercise Biology faculty adviser, culminating in written honors thesis. [P/NP grading only.] GE credit: SE—II. (III.)

197T. Tutoring in Exercise Biology (1-5)
Tutorial—3-15 hours. Prerequisite: upper division standing and consent of instructor. Assisting the instructor by tutoring students in exercise biology course-related projects. May be repeated up to 10 units of credit including courses 97T, 97TC and 197T. No tutorial units will be counted towards the Exercise Biology major. [P/NP grading only.]—I, II, III. (I, II, III.)

197TC. Tutoring Exercise Biology in the Community (1-5)
Tutorial—3-15 hours. Prerequisite: consent of instructor and chairperson. Tutoring in the community in exercise biology related projects. May be repeated up to 10 units of credit including courses 97T, 97TC, 197T. [P/NP grading only.]—I, II, III. (I, II, III.)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor and chairperson. [P/NP grading only.] GE credit: SE—II. (III.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of chairperson. [P/NP grading only.]—I, II, III. (I, II, III.)

Courses in Neurobiology, Physiology, and Behavior (NPB)

Lower Division

10. Elementary Human Physiology (3)
Lecture—3 hours. Introduction to physiology for non-science majors. Includes basic cell physiology and survey of major organ systems and how they function in homeostasis and human health. Not open for credit to students who have completed course 101. GE credit: SciEng | SE—II. (III.) Bautista, Mogilner

12. The Human Brain and Disease (3)
Lecture—3 hours. Normal function and diseases of the human brain and nervous system. Diseases discussed include Parkinson’s, Alzheimer’s, leprosy, amnesia and schizophrenia. Intended for non-science majors. Not open for credit to students who have completed courses 100, 101, 112, or Psychology 121. GE credit: SciEng. [I. (I) Cheng, Recan-za]

14. Illusions: Fooling the Brain (3)
Lecture—3 hours. Introduction to perceptual processing in the human nervous system; illusions. GE credit: SciEng | QR, SE, SL—II. (III.) Ditterich
15. The Biology and Physiology of Aging (4)
Lecture—3 hours; discussion—1 hour. Broad examination of age-associated changes in body functions. Includes basic cell physiology, a survey of major organ systems and the age-induced alterations in system function. System age-associated diseases will also be examined. Not open for credit to students who have completed course 15V. GE credit: SciEng | SE.

15V. The Biology and Physiology of Aging (4)

68. Biology of Drug Addiction and Abuse (3)
Lecture—3 hours. Broad examination of addictive substances and their use/abuse. Topics include historical perspective, physiological effects, etiology, neurobiology of addiction and the impact of drugs on cognitive function and behavior. Intended for non-science majors. Not open for credit to students who have completed course 168. GE credit: SciEng. (III.) Bautista.

90A. Lower Division Seminar: Issues in Body Weight Regulation (2)
Seminar—2 hours. Prerequisite: lower division standing. Discussion of critical examination of issues in body weight regulation through shared readings, discussions, written assignments, debates and oral presentations. Limited enrollment.—C. Warden.

90B. Human Color Perception (2)
Seminar—2 hours, term paper. Prerequisite: lower division standing. The neural determinants of color appearance, and why we see the world in the way we do. Discussions center around demonstrations of color phenomena and what they tell us about the human brain. Limited enrollment.—Werner.

90C. Current Issues in Animal Behavior (2)
Seminar—2 hours. Prerequisite: lower division standing. The mechanisms and outcomes of sexual selection (male choice and mate competition). Theory, current models and evidence that supports or refutes the models. Limited enrollment.—II. (II.) Hedrick.

90D. Lower Division Seminar: Current Issues in Reproductive Endocrinology (2)
Seminar—2 hours. Prerequisite: lower division standing. The integrative roles of reproductive hormones in mammalian reproduction and health. Current theory and models regarding hormone function and use in reproductive health and contraception, and evidence that supports or refutes the models. Offered irregularly.

90E. Biology of Aging (2)

90F. Visual Impairment and Blindness: A World Wide Problem (2)
Seminar—2 hours. Prerequisite: lower division standing. Examination of various abnormalities of the eye and the important geographic and cultural factors that influence the epidemiology of those abnormalities. Offered irregularly.

91C. Research Conference (1)
Discussion—1 hour. Prerequisite: Lower division standing in Neurobiology, Physiology, and Behavior related biological science and consent of instructor; concurrent enrollment in course 99. Research findings and methods in neurobiology; physiology, and/or behavior. Presentation and discussion of research by faculty and students. (P/NP grading only)—II, III, IV.

92. Internship (1-12)
Internship—3-36 hours. Prerequisite: lower division standing; consent of instructor. Work experience off and on campus in all subject areas offered in the Department of Neurobiology, Physiology, and Behavior. Internships supervised by a member of the faculty. May be repeated for credit. (P/NP grading only)—I, II, III, IV.

98. Directed Group Study (1-5)
Prerequisite: lower division standing and consent of instructor. (P/NP grading only)—I, II, III, IV.

99. Special Study for Undergraduates (1-5)
Prerequisite: lower division standing and consent of instructor. (P/NP grading only)—I, II, III, IV.

Upper Division

100. Neurobiology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1AB or 2ABC, Physics 9 ABC or 7ABC. Brains and nervous systems, neurons and neural circuits. Coordination of movement. Development of nervous systems. Vision, hearing, and feature extraction by the central nervous system. The cell biology of plasticity and memory. Not open for credit to students who have completed course 112, 160, 161 or 162, or Neuroscience 221 or 222. GE credit: VL—I, II, III, IV. (I, II, III, IV.) Carstens, Cheng, Miller, Sutter, Zito.

100L. Neurobiology Laboratory (3)
Lecture—1 hour; laboratory—3 hours; extensive writing or discussion. Prerequisite: course 100 (may be taken concurrently). Experimental basis of neurobiology principles. Course 100. Topics include neurophysiology, sensory systems, motor systems, cellular neuroscience, cognitive neuroscience, and quantitative data analysis and modeling techniques. GE credit: SciEng | SE—II. (II.) Goldmann, Suter.

101. Systemic Physiology (5)
Lecture—5 hours. Prerequisite: Biological Sciences 1A, or 2A and Chemistry 2B, Physics 18 or 7C strongly recommended. Systemic physiology with emphasis on aspects of human physiology. Functions of major organ systems and the structure of those systems described as a basis for understanding the functions. GE credit: SciEng | SE—II. (II, III, IV.) Bautista, Debello, Fuller, Furrow, Gomes, Ishida, Liets, Urey, Weidner.

101L. Systemic Physiology Laboratory (3)
Laboratory—3 hours; discussion—2 hours; term paper. Prerequisite: course 101. Selected experiments to illustrate functional characteristics of organ systems discussed in course 101. (I, II, III, IV.) Bautista, Liets.

102. Animal Behavior (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C. Basic principles of behavioral organization in vertebrate and invertebrate animals. Underlying physiological and ethological mechanisms. The evolution of behavior, with special emphasis on behavior under natural conditions. Not open for credit to students who have completed course 155. (Former course 155.) GE credit: SL—II, III. (II, III.) Britten, Hahn, Nevitt.

102G. Quantitative Topics in Animal Behavior (3)
Lecture—1.5 hours; extensive problem solving—1.5 hours. Prerequisite: Mathematics 16B; course 102 (may be taken concurrently). Study of the quantitative concepts and exemplar models used in animal behavior. Offered irregularly. GE credit: SciEng—II. (II.) Hahn.

103. Cellular Physiology/Neurobiology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 103 or 105, and 104; Physics 7C recommended. Cellular physiology with emphasis on membrane transport processes of neurobiology. Fundamental physical-chemical and biological mechanisms of membrane transport will be considered in relation to cytoplasmic homeostasis, communication between cells, and the cellular mechanisms of sensory and motor transduction. Not open for credit to students who have completed course 100B (Former course 100B.) Offered irregularly.

104L. Cellular Physiology/Neurobiology Laboratory (4)
Lecture—1 hour; laboratory—3 hours; discussion—1 hour; term paper or discussion. Prerequisite: courses 101 and 101L. Biological Sciences 103 or 105. Experiments in the physical and chemical processes of cells and tissues. GE credit: Wrt—II. (II.) Horwitz.

105. Introduction to Computer Models (4)
Lecture—3 hours; lecture/laboratory—1 hour. Prerequisite: Mathematics 16C or the equivalent, Physics 7C, Chemistry 2C, or course 100 or 101. Introduction to the ideas, mathematical techniques and computer tools required for developing models of cellular processes in physiology and neurobiology. Applications include cellular, ion channel, action potentials, Ca2+ oscillations, respiration, and muscle contraction. Offered irregularly.

106. Experiments in Neurobiology, Physiology, and Behavior: Design and Execution (3)
Lecture—7.5 hours; discussion—0.5 hours. Prerequisite: course 100 or 101 or 102, and 199 and consent of instructor. Design and execution of experiments in neurobiology, physiology, and/or behavior. Students choose criteria and designs in consultation with the sponsoring faculty member. May be repeated one time for credit to complete the project, with consent of instructor. An additional repeat is permitted for a different project under the guidance of another faculty member. (P/NP grading only.) GE credit: OL, QL, VL, WE—II, III, IV. (I, II, III, IV.) Rosenquist.

107. Cell Signaling in Health and Disease (3)
Lecture—3 hours. Prerequisite: Biological Sciences 102 or 105. Basics of cell signaling pathways, their disruption in disease, and their current utility and future potential as therapeutic targets. Emphasis on signaling pathways specific to nervous, endocrine and immune systems, and those fundamental to all cells. GE credit: SL—II. (II.) Trimmer.

111C. Advanced Systemic Physiology Laboratory (3)
Lecture—1 hour; laboratory—6 hours. Prerequisite: courses 101, 101L, Statistics 13; course 112, 113, or 114 recommended. Interfacing physiological recording equipment with computer systems; data acquisition and analysis using the microcomputer; data interpretation within the framework of physiological and/or behavioral concepts. Offered irregularly. GE credit: QL, VL, WE.

111L. Advanced Systemic Physiology Laboratory (4)
Lecture—1 hour; discussion—2 hours; laboratory—6 hours. Term paper. Prerequisite: courses 101 and 101L. Selected comprehensive experiments in the autonomic nervous system and the cardiovascular, respiratory, and neuromuscular systems. Emphasis on conceptual and methodological approaches in demonstrating the physiology of organ systems. GE credit: Wrt—II. (II.) Liets.

112. Neuroscience (3)
Lecture—3 hours. Prerequisite: course 100 or 101. Presentation of concepts in neuroscience including sensory systems, motor systems, and higher neural integration. Emphasis on mammalian nervous system. Offered irregularly. GE credit: SL.
113. Cardiovascular, Respiratory, and Renal Physiology (4)
Lecture—3 hours. Prerequisite: course 101; Biological Sciences 105 or 103 recommended. An intense and advanced presentation of concepts in cardiovascular, respiratory, and renal physiology including discussions of base balance.

114. Comparative Physiology I (3)
Lecture—3 hours. Prerequisite: course 101; Biological Sciences 105 or 103 recommended. Gastrointestinal Physiology (3) cardiovascular, respiratory, and renal physiology try 8B, Physics 7B and 7C recommended. An introduction to the fundamental relationships between hormones and various behaviors engaged in by the organism during its lifetime. Role of hormones in behavioral homeostasis, social behavior, reproductive behavior, parental behavior, adaptation to stress. (Same course as Physiology 123.)—II. (Ill.) Bale, Furlow, Hahn, Trainer, Wingfield

115. Avian Physiology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 18, or 2A and Chemistry 2B; course 101 strongly recommended. Physiology of the various systems of birds with emphasis on digestion, respiration, excretion, and endocrine systems. —II. (III.) Hahn, Klaising

121. Biology of Reproduction (4)
Lecture—4 hours. Prerequisite: course 101. Physiological mechanisms related to reproduction, breeding efficiency with special reference to domestic animals. GE credit: QL, SL.—II. (II.) Berger

121L. Physiology of Reproduction Laboratory (1)
Laboratory—3 hours. Prerequisite: course 121 recommended. Experiments on the reproductive systems of domestic animals including male and female gametes. (P/NP grading only.)—II. (II.) Berger

122. Developmental Endocrinology (3)
Lecture—3 hours. Prerequisite: course 101. Hormonal control of development, maturation and senescence from the cellular to the organismal level, with emphasis on the human. Prenatal and neonatal life, childhood, adolescence, adulthood and pregnancy, as well as the endocrinology of aging. Offered irregularly.

123. Comparative Vertebrate Organology (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Biological Science 1A or 1B and 2A and 2B. Functional anatomy of major organ systems in vertebrates. Each system examined from cellular to gross level in fish, birds, and mammals. Emphasis on how differentiated cell types are integrated into tissues and organs to perform diverse physiological functions. (Same course as Anatomic Physiology and Cell Biology 100—II. Banner)

124. Comparative Neuroanatomy (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: Psychology 101, or course 100 or 101. Overview of the neuroanatomy of the nervous system in a variety of mammalian and non-mammalian vertebrates. Examine changes or modifications to neural structures as a result of morphological or behavioral specializations. (Same course as Psychology 124.) GE credit: SL.—II. (II.) Krubitzer, Recanzone

125. Comparative Physiology: Neurointegrative Mechanisms (3)
Lecture—3 hours. Prerequisite: course 101. Comparisons of physiological functions in the animal kingdom: neuromotor systems of integration including aspects of phylogenetic development at both neuronal and systemic levels. Offered irregularly.

126. Comparative Physiology: Sensory Systems (3)
Lecture—3 hours. Prerequisite: course 100 or 101. Basic physiological mechanisms involved in sensory systems. Comparative approach to considerations of mechanisms of audition, olfaction, touch, echolocation, equilibration, chemical senses (olfaction, taste, pheromones), photosensitive systems (vision, infrared detection, UV detection), electroreception, and pain. Emphasis on receptors. Offered irregularly.

127. Comparative Physiology: Circulation (3)
Lecture—3 hours. Prerequisite: course 101. Comparisons of physiological functions in the animal kingdom: circulation. Comparative approach to cardiovascular function in vertebrates and invertebrates. Offered irregularly. GE credit: VL, VQ.

128. Comparative Physiology: Endocrinology (3)
Lecture—3 hours. Prerequisite: course 101. Comparisons of physiological functions in the animal kingdom: animal hormones and their functions. —II. (II.) Furlow, Chase

129. Comparative Physiology: Respiration (3)
Lecture—3 hours. Prerequisite: course 101. Comparisons of physiological functions in the animal kingdom: respiration.

130. Physiology of the Endocrine Glands (4)
Lecture—4 hours. Prerequisite: course 101. Advanced presentation of concepts in endocrinology with emphasis on the role of hormones in reproduc tion, metabolism, and disease. GE credit: VQ. —I. (I.) Adams

132. Nature vs. Nurture: Physiological Interactions Among Genes, Nutrients and Health (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A or 2A or consent of the instructor. Biochemical, physiological, genetic, and nutritional causes of important medical conditions such as obesity, anorexia, heart disease and diabetes. One unit of credit allowed to students who have completed course 131. GE credit: SciEng.—I. (I.) Pinney, Ward

139. Frontiers in Physiology (3)
Lecture—2 hours; discussion—1 hour. Prerequisites: courses 100 and 101; 102 (may be taken concurrently). Lectures by leading authorities and discussion of the latest research in newly emerging areas in physiological science. Offered every fourth year. Offered irregularly. GE credit: SciEng | QL, SE.

140. Principles of Environmental Physiology (3)
Lecture—3 hours. Prerequisite: course 101; Biological Sciences 102 recommended. Physiological aspects of interactions of organisms and environment: cellular, system, and organismal levels. Emphasis on regulatory responses/mechanisms to thermal, pressure, gravity and light environmental variables. Not open for credit to students who have completed course 148. (Former course 148.) GE credit: WE.—II. Fuller

141. Physiological Adaptation of Marine Organisms (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: upper division standing; consent of the instructor; residence at Bodega Marine Laboratory required. Students must submit application available at http://www.bml.ucdavis.edu. Physiology adaptation to the environment among organisms in marine and estuarine habitats. GE credit: QL, VQ, WE.—III. (III.) Chang, Cheng, Cher

141P. Physiological Adaptation of Marine Organisms/Advanced Laboratory Topics (5)
Laboratory—12 hours; discussion—1 hour. Prerequisite: course 102 or Psychology 101. Laboratory course at Bodega Marine Laboratory required. Students must submit application available at http://www.bml.ucdavis.edu. Training in scientific research from hypothesis to publication, including use of BML library research. Research related to a topic covered in course 141. GE credit: VQ, WE.—II. (II.) Fuller

150. Advanced Animal Behavior (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 102 or Psychology 101. Advanced integrative survey of biological principles of behavioral organization, emphasizing historical roots, current research directions, conceptual issues and controversies. Laboratory exercises on the description and analysis of the behavior of captive and free-living animals. (Same course as Psychology 122.) Offered irregularly.—Hahn

152. Hormones and Behavior (3)
Lecture—3 hours. Prerequisite: course 101, and either course 102 or Psychology 101. Endocrine physiology with an emphasis on the principles of behavioral homeostasis. Fundamental relationships between hormones and various behaviors engaged in by the organism during its lifetime. Role of hormones in behavioral homeostasis, social behavior, reproductive behavior, parental behavior, adaptation to stress. (Same course as Psychology 123.)—III. (III.) Bale, Furlow, Hahn, Trainer, Wingfield

159. Frontiers in Behavior (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: courses 100, 101, 102. Lectures by leading authorities and discussion of the latest research in newly emerging areas in behavioral biology. Offered every fourth year. Offered irregularly. GE credit: SciEng | QL, SE.

160. Molecular and Cellular Neurobiology (3)
Lecture—1.5 hours; discussion—1.5 hours. Prerequisite: course 100, Biological Sciences 101 and consent of instructor. Selected topics in neurobiology. Topics include channel biophysics, action potential propagation, intracellular signal transduction pathways, synaptic physiology and quantal analysis, cellular mechanisms of synaptic plasticity, and neuropeptide regulation of synaptic efficacy. (Same course as Neuroscience 160.) GE credit: VQ.

160L. Advanced Cellular Neurobiology Laboratory (4)
Laboratory—12 hours. Prerequisite: course 160, Physics 7C recommended. Students will learn to record neural activity, to interpret their recordings, and to label neurons with antibodies against neuron transmitters.

161. Developmental Neurobiology (3)
Lecture—3 hours. Prerequisite: course 100 or 101. Issues, theoretical concepts, and methodologies in development neurobiology. Topics include prenatal and postnatal differentiation of neurons, and plasticity in the mature and aging brain. Integration of neurochemical, structural, physiological and behavioral perspectives. GE credit: SciEng | QL, VQ.—II. (II.) McAllister, Zito

162. Neural Mechanisms of Behavior (3)
Lecture—3 hours. Prerequisite: course 100 or 101. The relationship between brain and behavior: Identification and analysis of the relevant neural circuits involved. Examples of systems considered are birdsong, locomotion, echolocation.—III. (III.) Britton

163. Systems Neuroscience (3)
Lecture—3 hours. Prerequisite: course 100 or equivalent basic neuroscience training with consent of instructor. Concepts and theories in systems neuroscience: e.g., measuring and manipulating neural activity, structure of neocortex, sensory processing, motor control, short-term and long-term storage of information, neural codes, neural mechanisms underlying cognitive functions. GE credit: SE.—III. (III.) Ditrich

164. Mammalian Vision (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 101, 112, or Psychology 101. Structure and function of the mammalian visual system, from the formation of images on the retina through visually guided behavior and perception. Emphasis on biological mechanisms underlying vision.—II. (II.) Britton, Werner

165. Neurobiology of Speech Perception (3)
Lecture—3 hours. Prerequisite: courses 100 or 101, or consent of instructor. Interdisciplinary approach to speech perception with emphasis on mechanisms, neuro-physiologically and behavior. Topics include auditory processing in time and space, intelligibility in noisy environments, visual speech, evolution of vocal communication, models of speech perception, development and hearing impairment. CE credit.—III. (III.) Miller
166. Math Tools for Neuroscience (4)
Lecture—4 hours. Prerequisite: course 100 or permission of instructor; Math 16A, B, C, or equivalent; Physics 7C strongly recommended. Introduction to mathematics techniques used in neuroscience. Applications to neuroscience of differential equations, linear systems, Fourier transforms, correlation, convolution, and probability theory. GE credit: QL.—Goldman

167. Computational Neuroscience (5)
Lecture—4 hours; lecture/laboratory—3 hours. Prerequisite: Math 17A, 17B, 17C, or equivalent; Physics 7A, B, C or equivalent strongly recommended; consent of instructor. Mathematical models and data analysis techniques used to describe computations performed by nervous systems. Lecture topics include single neuron biophysics, neural coding, network dynamics, memory, plasticity, and learning. Lab topics include statistical and computational techniques used in MATLAB. Offered in alternate years. GE credit: SciEng | SE, QL.—[I.] Goldman

168. Neurobiology of Addictive Drugs (4)
Lecture/discussion—4 hours. Prerequisite: course 100 or 101 or the equivalent. Neurobiological basis for the effects and mechanisms of action of drugs with addictive potential, including opioids (morphine, heroin), benzodiazepines, cocaine, nicotine, marijuana (cannabinoids), alcohol, caffeine, and mind-altering drugs such as LSD and antidepressants. GE credit: SL, VL.—III. (III.) Liets

169. Frontiers in Neurobiology (3)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or 101 or the equivalent (may be taken concurrently). Lectures by leading authorities and discussion of the latest research in new emerging areas in neuroscience offered every fourth year. Offered irregularly. GE credit: QL.

190C. Research Conference (1)
Discussion—1 hour. Prerequisite: upper division standing in Neurobiology, Physiology, and Behavior or related biological science and consent of instructor; concurrent enrollment in course 199. Research findings and methods in neurobiology, physiology, and/or behavior. Presentation and discussion of research by course 199 and students. May be repeated for credit. (P/NP grading only.)—I, II, III, (II, III, III.)

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: completion of 84 units and consent of instructor. Work experience off and on campus in all subject areas offered in neurobiology, physiology, and behavior. May be repeated for credit. (P/NP grading only.)—I, II, III, (II, III, III.)

194HA-194HB-194HC. Neurobiology, Physiology, and Behavior—Honors (1-2)
Laboratory—3-12 hours. Prerequisite: senior standing; minimum 3.50 GPA in courses counted toward major; approval by the Master Adviser. Honors project in Neurobiology, Physiology, and Behavior. Laboratory research on a specific question. The project is developed with the sponsoring faculty member and approved by the student’s Honors Thesis Committee. Honors thesis to be submitted upon completion of the project. (P/NP grading only.)—I, II, III, (II, III, III.)

197T. Tutoring in Neurobiology, Physiology, and Behavior (1-5)
Discussion—2-6 hours. Prerequisite: upper division standing and consent of instructor. Assisting the instructor by tutoring students in one of the Department’s regular courses. May be repeated for credit. (P/NP grading only.)—I, II, III, (II, III, III.)

199. Directed Group Study (1-5)
(P/NP grading only.)—I, II, III, (II, III, III.)

199S. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.)—I, II, III, (II, III, III.)

Graduate
211. Advanced Topics in Neuroimaging (2)
Seminar—2 hours; discussion—1 hour. Prerequisite: Psychology 210 or consent of instructor. Restricted to 16 students. Critical presentation and discussion of the most influential advanced issues in neuroimaging, emphasizing fMRI design and analysis and the integration of fMRI with EEG/MEG. (Same course as Neuroscience 211 and Psychology 211.) (S/U grading only.)—II. (III.) Miller

212. Light and Fluorescence Microscopy (2)
Lecture—2 hours. Prerequisite: consent of instructor. Restricted to maximum 16 students. Theory and practical application of light and fluorescence microscopy in the biological sciences. (S/U grading only.)—II. (III.) Zito

217. Advanced Avian Physiology (1)
Project—1 hour. Prerequisite: graduate standing and concurrent enrollment in course 117; consent of instructor. Study in depth of a topic in avian physiology through development of a lecture with associated instructional materials such as lesson plan, readings, and presentation aids. (III.) Millam

222. Systems Neuroscience (5)
Lecture—4 hours; discussion—1 hour. Prerequisite: graduate standing or consent of instructor. Integration and information-processing aspects of nervous system organization. Topics include sensory systems, motor function, sensorimotor integration, the limbic system, and the neurogenetics of learning and memory. (Same course as Neuroscience 222.)—II. (III.) DeBello, Ditterich, Usrey

245. Computational Models of Cellular Signaling (3)
Lecture—3 hours. Prerequisite: consent of instructor. Computational and mathematical techniques in modeling of regulatory and signaling phenomena in neurobiology and cell physiology, focusing on linear and nonlinear ordinary differential equation models. Applications include ion channel kinetics, electrical activity, signal transduction, calcium oscillations, and simple neural circuits. Offered irregularly.

247. Topics in Functional Neurogenomics (2)
Lecture—1 hour; discussion—1 hour. Prerequisite: graduate standing or consent of instructor. The theory, methods and principles of functional neurogenomics with emphasis on the relationship to molecular mechanisms involved in development and disease of the nervous system. (Same course as Neuroscience 247.)

261A. Topics in Vision: Eyes and Retinal Mechanisms (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing, course 100 or 112 or the equivalent. Structure and function of the visual system, with emphasis on the relationship to anatomy, transduction, retinal synapses, adaptation, and parallel processing. (Same course as Neuroscience 261A and Molecular, Cellular, and Integrative Physiology 261A.) (S/U grading only.)

261B. Topics in Vision: Systems, Psychophysics, Computational Models (2)
Lecture/discussion—2 hours. Prerequisite: consent of instructor, course 261A recommended. Functions of the central visual pathways and their underlying mechanisms. Recent research on aspects of anatomy, biochemistry, electrophysiology, psychophysics, development, and genetics of the visual system. (Same course as Psychology and Behavior 261B and Molecular, Cellular, and Integrative Physiology 261B.) Offered in alternate years. (II.) Britten

261C. Topics in Vision: Clinical Vision Science (2)
Lecture/discussion—2 hours. Prerequisite: courses 261A and 261B or consent of instructor. Causes and mechanistic bases of major blinding diseases. Recent research on aspects of anatomy, biochemistry, electrophysiology, psychophysics, development, and genetics of the visual system related to disease. (Same course as Neuroscience 261C and Molecular, Cellular, and Integrative Physiology 261C.) Offered irregularly. (S/U grading only.)—III. Werner

263. Modeling in Systems Neuroscience (4)
Lecture—3 hours; lecture/laboratory—1 hour. Prerequisite: consent of instructor. Modeling as a tool in systems neuroscience. Mathematical techniques will be introduced and used to explore advanced topics in echolocation, sound localization, electrophysiology, communications, and motor systems. Other topics include transforms, modeling assumptions, scales and hierarchy. Offered in alternate years.

267. Computational Neuroscience (5)
Lecture—4 hours; lecture/laboratory—3 hours. Prerequisite: one course in general neuroscience at the level of course 100, one year college-level calculus at level of Math 1A, B, C, or equivalent; at the level of Physics 7A, B, C, strongly recommended; students from other departments should contact the instructor. Mathematical models and data analysis techniques used to describe computations performed by nervous systems. Lecture topics include single-neuron biophysics, neural coding, network dynamics, memory, plasticity, and learning. Lab topics include programming mathematical models and data analysis techniques in MATLAB. Offered in alternate years. (Same course as Neuroscience 267.)—(I.) Goldman

270. How to Write a Fundable Grant Proposal (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing in a life science and consent of instructor. Familiarization with the skills required to craft a successful grant proposal submitted to extramural agencies such as NIH and NSF.

285. Literature in Visual Neuroscience (2)
Seminar—2 hours. Literature in Visual Neuroscience. (Same course as Neuroscience 285.) May be repeated for credit. (S/U grading only.)—I, II, III, (II, III, III.)

287A. Topics in Theoretical Neuroscience (2)
Seminar—2 hours. Prerequisite: consent of instructor. In-depth exploration of topics in theoretical neuroscience. Topics vary each year. Fall quarter (287A): foundational material from books and review articles. Spring quarter (287B): continuation of year’s topics through readings of seminal articles from the primary literature. Offered in alternate years. May be repeated for credit. (Same course as Neuroscience 287A.)—I. Ditterich, Goldman

287B. Topics in Theoretical Neuroscience (2)
Seminar—2 hours. Prerequisite: consent of instructor. In-depth exploration of topics in theoretical neuroscience. Topics vary each year. Fall quarter (287A): foundational material from books and review articles. Spring quarter (287B): continuation of year’s topics through readings of seminal articles from the primary literature. May be repeated for credit. (Same course as Neuroscience 287B.)—I. Ditterich, Goldman

291. Auditory Neuroscience (1)
Seminar—0.5 hours; discussion—0.5 hours. Prerequisite: course 100 or 112 or Neuroscience 222 or the equivalent. Exploration of various important aspects of auditory physiology, and psychophysics through review of original literature. New topic each quarter. May be repeated for credit with consent of instructor. (S/U grading only.)—I, II, III, (II, III) Kecskeméti, Suther

Quarter Offered: I=Fall; II=Winter; III=Spring; IV=Summer; 2015-2016 offering in parentheses.
Neuroscience

See Neurobiology, Physiology, and Behavior, on page 443; and Neuroscience (A Graduate Group), below.

Neuroscience
(A Graduate Group)

W. Martin Usrey, Ph.D., Chairperson of the Group

Laura Borodinsky, Ph.D., Assistant Professor
Julie Barkmeier-Kraemer, Ph.D., Professor
David Amaral, Ph.D., Professor
Leonard J. Abbeduto, Ph.D., Professor

http://neuroscience.ucdavis.edu/grad
530-757-8845;
Group Office.
148 Center for Neuroscience

W. Martin Usrey, Ph.D., Chairperson of the Group

(A Graduate Group)
Neuroscience
See Neurobiology, Physiology, and Behavior, on page 443; and Neuroscience (A Graduate Group), below.

Graduate Advisers. B. Rerman (Neurological Surgery), A. Ekstrom (Psychology), A.K. McAllister (Neurology and Neurobiology, Physiology, and Behavior), W. M. Usrey (Neurobiology, Physiology, and Behavior), B. Wiltgen (Psychology)

Courses in Neuroscience (NSC)

Upper Division
160. Molecular and Cellular Neurobiology (3)
Lecture—1.5 hours; discussion—1.5 hours. Prerequisite: Neurobiology, Physiology, and Behavior 100, Biological Sciences 101 and consent of instructor. Selected topics in neurobiology. Topics include channel biophysics, action potential propagation, intra-cellular signal transduction pathways, synaptic physiology and quantal analysis, cellular mechanisms of synaptic plasticity, and neurotransmission of synaptic circuitry. (Same course as Neuroscience, Physiology, and Behavior 160.) CE credit: V—III. (III.) Burns, Mulloney

Graduate

200LA. Laboratory Methods in Neurobiology (6)
Laboratory—18 hours. Prerequisite: graduate standing in the Neuroscience Graduate Group. Individual research in the laboratory of a faculty member. Research problems emphasize the use of contemporary methods and good experimental design. May be repeated three times for credit. (S/U grading only)—I, II, III. (I, II, III.)

200LB. Laboratory Methods in Neurobiology (3)
Laboratory—9 hours. Prerequisite: graduate standing in the Neuroscience Graduate Group. Individual research in the laboratory of a faculty member. Research problems emphasize the use of contemporary methods and good experimental design. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III.)

201. Neuroanatomy (3)
Lecture—2 hours; laboratory/discussion—1 hour. Prerequisite: consent of instructor. Mix of lectures, demonstrations, and dissections, emphasizing functional significance of neuroanatomy from a biological perspective, with comparisons between human and non-human brains. Emphasis placed on functional anatomy of the nervous system, integrated with cellular, molecular, cognitive, and developmental concepts. Limited enrollment.—I. (I.)

211. Advanced Topics in Neuroimaging (2)
Seminar—2 hours. Prerequisite: Psychology 210 or consent of instructor. Restricted to 15 students. Critical presentation and discussion of the most influential advanced topics in neuroimaging, emphasizing fMRI design/analysis and the integration of fMRI with EEG/MEG. (Same course as Psychology 211 and Psychology 211.) CE credit: S/U grading only.—I, II, III. (III.) Miller

220. How to Give a Scientific Seminar (3)
Lecture/discussion—3 hours. Prerequisite: consent of instructor. Presentation of effective seminars. Student presentations of selected neuroscience topics in seminar format. Must be taken in two consecutive quarters. Offered in alternate years.—I, II, III. (III.)

221. Cellular Neurophysiology (4)
Lecture—4.5 hours. Prerequisite: graduate standing or consent of instructor. Physiological aspects of cellular and subcellular organization of the nervous system. Neuronal cell biology, the structure and function of ion channels, electrical excitability, signaling cascades, sensory transduction and, mechanisms of synaptic transmission, and the cellular basis of learning and memory.—I. (I.)
222. Systems Neuroscience (5)
Lecture—4 hours; discussion—1 hour. Prerequisite: graduate standing or consent of instructor. Integrative and functional aspects of nervous system organization. Topics include sensory systems, motor function, sensorimotor integration, the limbic system, and the neurobiology of learning and memory. [Same course as Neurobiology, Physiology, and Behavior 222.]—II. [III.] DeBello, Ditterich, Usrey

223. Cognitive Neuroscience (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: graduate student standing in Psychology or Neuroscience or consent of instructor. Graduate core course for neuroscience. Neurobiological bases of higher mental function including attention, memory, language. One of three in a three-quarter sequence. [Same course as Psychology 261.]—II. III. Swaab

224A. Molecular and Developmental Neurobiology (2)
Lecture/discussion—2 hours. Prerequisite: consent of instructor. Key issues in developmental and molecular neurobiology. Discussion emphasis on critical evaluation of the experiments and methods described in research papers. Readings of seminal, primary research papers, reviews, and book chapters. Reading materials will be distributed one week in advance. —II. [III.] Cheng, Diaz

224B. Molecular and Developmental Neurobiology (2)
Lecture/discussion—2 hours. Prerequisite: course 224A or consent of instructor. Continuation of course 224A. Key issues in developmental and molecular neurobiology, focusing on developmental topics. Discussion emphasis on critical evaluation of experimental approaches described in associated literature. —II. Cheng, Diaz

225. Translational Research in the Neurobiology of Disease (2)
Lecture—1 hour; discussion—1 hour. Prerequisite: Past or concurrent enrollment in Neuroscience courses 221, 222, 223, or permission of instructor; restricted to current graduate student enrollment or permission of instructor. This course will provide an overview of the diagnostic, pathophysiological, and neurological disorders from both the clinical and fundamental science perspectives. Offered in alternate years. —II. McAllister

226. Molecular and Developmental Neurobiology (4)
Lecture/discussion—4 hours. Prerequisite: consent of instructor. Introduction to molecular and developmental neurobiology. Topics range from neurotoxicity to development of sensory systems and include current molecular methods and their application in developmental neuroscience. —II. [III.] McAllister

243. Topics in Cellular and Behavioral Neurobiology (1)
Discussion—1 hour; seminar—1 hour. Prerequisite: consent of instructor. An advanced examination of several current problems in neurobiology. Topics will vary in different years; may be repeated for credit. [S/U grading only.]

247. Topics in Functional Neurogenomics (2)
Lecture—1 hour; discussion—1 hour. Prerequisite: graduate standing or consent of instructor. The theory, methods, and principles of functional neurogenomics. Emphasis on the relationship to molecular mechanisms involved in development and disease of the nervous system. [Same course as Neurobiology, Physiology, and Behavior 247.]—II. Choudary

250. Biology of Neurogia (2)
Lecture/discussion—1.5 hours. Prerequisite: consent of instructor. The properties and functions of nonneuronal cells in the mammalian central nervous system with relevance to neuronal development, physiology and injury response. Offered in alternate years. [Same course as Cell Biology and Human Anatomy 250.]—S/U grading only.

261A. Topics in Vision: Eyes and Retinal Mechanisms (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing, Neurobiology, Physiology, and Behavior 100 or 112 or the equivalent. Structure and function of the visual system, with emphasis on the eye and retina, including optics, anatomy, transduction, retinal synapses, adaptation, and parallel processing. [Same course as Neurobiology, Physiology, and Behavior 261A and Molecular, Cellular, and Integrative Physiology 261A.]—S/U grading only. Offered in alternate years. —II. Britten

261B. Topics in Vision: Systems Psychophysics, Computational Models (2)
Lecture/discussion—2 hours. Prerequisite: consent of instructor, course 261A recommended. Functions of the central visual pathways and their underlying mechanisms. Recent research on aspects of anatomy, biochemistry, electrophysiology, psychophysics, development, and genetics of the visual system. [Same course as Neurobiology, Physiology, and Behavior 261B and Molecular, Cellular, and Integrative Physiology 261B.]—S/U grading only. Offered in alternate years. —III. Werner

267. Computational Neurosciences (5)
Lecture—4 hours; lecture/laboratory—3 hours. Prerequisite: one course in general neuroscience at the level of course 100; one year college-level Calculus at level of Math 16A, B, C; one year Physics at the level of Physics 7A, B, C; strongly recommended, students from other departments should contact the instructor. Mathematical models and data analysis techniques used to describe computations performed by nervous systems. Lecture topics include single-neuron biophysics, neural coding, network dynamics, memory, plasticity, and learning. Lab topics include programming mathematical models and data analysis techniques in MATLAB. Offered in alternate years. [Same course as Neurobiology, Physiology & Behavior 267]—I. Goldman

283. Neurobiological Literature (1)
Seminar—1 hour. Prerequisite: consent of instructor. Critical presentation and analysis of recent journal articles in neurobiology. May be repeated for credit. [S/U grading only.]-II, III, [I, II, III]

284. Development of Sensory Systems (1)
Seminar—1 hour. Prerequisite: consent of instructor. Presentation and discussion of recent literature on the development of sensory systems. May be repeated for credit. [S/U grading only.]—II, III, [I, II, III]

285. Literature in Visual Neuroscience (2)
Seminar—2 hours. Critical presentation and discussion of current literature in neuroscience. [Same course as Neurobiology, Physiology, and Behavior 285.] May be repeated for credit if topic differs. [S/U grading only.]—II, III, [I, II, III] Usrey, Britten

287A. Topics in Theoretical Neuroscience (2)
Seminar—2 hours. Prerequisite: consent of instructor. In-depth exploration of topics in theoretical neuroscience. Topic varies each year. Fall quarter (287A): foundational material from books and review articles. Spring quarter (287B): continuation of year’s topic through readings of seminal articles from the primary literature. May be repeated for credit. [Same course as Neurobiology, Physiology & Behavior 287A.]—I. (II) Ditterich, Goldman

287B. Topics in Theoretical Neuroscience (2)
Seminar—2 hours. Prerequisite: consent of instructor. In-depth exploration of topics in theoretical neuroscience. Topic varies each year. Fall quarter (287A): foundational material from books and review articles. Spring quarter (287B): continuation of year’s topic through readings of seminal articles from the primary literature. May be repeated for credit. [Same course as Neurobiology, Physiology & Behavior 287B.]—S/U grading only. —III. (III.) Ditterich, Goldman

289. Topics in Molecular and Developmental Neurobiology (2)
Seminar—2 hours. Analysis and discussion of seminal and current research papers in molecular and developmental neurobiology. Different topics will be covered each quarter. In the past topics have included, “Synaptic vesicle dynamics,” “Neuronal polarity,” and “Glutamate receptors.” May be repeated ten times for credit when topic differs. [S/U grading only.]-II, III, [I, II, III]

290C. Research Conference in Neuroscience (1)
Seminar—2 hours. Prerequisite: Neurobiology, Physiology, and Behavior 100 or 112 or equivalent or consent of instructor. Examination of research articles on cortical plasticity and changes in perception. Examples drawn from the somatosensory, visual, auditory, and motor cortex. [Same course as Neurobiology, Physiology, and Behavior 292.] Offered in alternate years. [S/U grading only.]—I, II, III

298. Group Study (1-5)
[S/U grading only.]

299. Research (1-12)
[S/U grading only.]

Neurology
See Medicine, School of, on page 396.

Neurosurgery
See Medicine, School of, on page 396.

Nursing, School of, Betty Irene Moore
Heather M. Young, Ph.D., R.N., F.A.A.N.; Associate Vice Chancellor for Nursing, UC Davis, and Dean, Betty Irene Moore School of Nursing Deborah Ward, Ph.D., R.N., F.A.A.N., Associate Dean for Academics and Clinical Professor
Jill G. Joseph, M.D., Ph.D., M.P.H.; Associate Dean for Research and Professor
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Mission Statement
The Betty Irene Moore School of Nursing at UC Davis cultivates academic excellence through
Health care and leadership at various levels, e.g., Health-Care Leadership graduate program or consent of instructor. Foundation for analyzing research, health, and systems data to answer clinical, systems, or policy questions. Use and examine multiple sources of data and information as a basis for planned change and transformation in health care. —II. (II.)

205. Research Design in Nursing and Health Care (4)
Lecture/discussion—4 hours. Prerequisite: current enrollment in the Nursing Science and Health-Care Leadership graduate program or consent of instructor. Major types of quantitative and qualitative research design and their application to nursing and health-care research. Implications of choosing alternative research designs and critical analysis of philosophical underpinnings and validity, sampling, instruments to measure health concepts. —II. (II.)

206. Community Connections (2-5)
Prerequisite: current enrollment in the Nursing Science and Health-Care Leadership graduate program or consent of instructor. Open to NSHSL MS students only. Community-based learning and experiences including community participation, assessment, data collection and analysis. Multiple approaches to community health improvement projects, collabora-
tive leadership practice, all with the guidance of community members and Nursing faculty. May be repeated for credit. —I, II, III. (I, II, III.)

210Y. Applied Health Informatics (4)
Lecture/discussion—1 hour; web virtual lecture—3 hours. Open to current student in NSHSL graduate program or consent of instructor. Within this conceptual framework of the Foundation of Knowledge model, this course integrates nursing science, information science, computer science and cognitive science to acquire, process, generate and disseminate knowledge. —I, II, III. (I, II, III.)

290. Master’s Seminar (2)
Discussion—2 hours. Prerequisite: current enrollment in the Nursing Science and Health-Care Leadership graduate program or consent of instructor. Open to NSHSL MS students only or by consent of course instructor of record. Subject varies from quarter to quarter. Current knowledge and issues relevant to one of two fields of emphasis: population health or health systems. May be repeated 10 times for credit. —I, II, III. (I, II, III.)

291. Doctoral Seminar (2)
Discussion—2 hours. Prerequisite: current enrollment in the Nursing Science and Health-Care Leadership graduate program or consent of instructor. Focus on the theory, research and knowledge relevant to one of two fields of emphasis: population health or health systems. Emphasis placed on reading, cri-
tique and synthesis of cutting-edge research in nursing and health care. May be repeated 10 times for credit. —I, II, III. (I, II, III.)

291D. Dissertation Research and Writing (1-12)
May be repeated for credit. Offered irregularly. —I, II, III. (I, II, III.)

299. Research and Writing (1-12)
Extensive writing or discussion—3-36 hours. Prereq-
usite: consent of instructor. Students in the Nursing Science and Health-Care Leadership graduate program may conduct research and writing under the supervision of a faculty member. May be repeated for credit. (S/U grading only.) —I, II, III. (I, II, III.)

299D. Dissertation Research and Writing (1-12)
Extensive writing or discussion—3-36 hours. Prereq-
usite: consent of instructor. Students in the Nursing Science and Health-Care Leadership graduate program conduct dissertation research and writing under the supervision of a faculty member. May be repeated for credit. (S/U grading only.) —I, II, III. (I, II, III.)

Professional
301. Methods for Teaching Nursing and Health Sciences: Use of Simulation (4)
Lecture/discussion—4 hours. Prerequisite: current enrollment in the Nursing Science and Health-Care Leadership graduate program or consent of instructor. Best practices in simulation, system-based curriculum models and instructional design. Experience in planning student-centered learning activities that are engaging, effective and aligning desired student performance. Use of distance technologies, case-based teaching, clinical teaching, role of clinical teacher. Offered in alternate years. —I.

302. Methods for Teaching Nursing and Health Sciences: Curriculum and Instruction (4)
Lecture/discussion—4 hours. Prerequisite: current enrollment in the Nursing Science and Health-Care Leadership graduate program or consent of instructor. Best practices in curriculum development and system-based curriculum models and instructional design. Experience in planning student-centered learning activities that are engaging, effective and aligning desired student performance. Use of distance technologies, case-based teaching, clinical teaching, role of clinical teacher. Offered in alternate years. —I.

303. Methods for Teaching Nursing and Health Sciences: Assessment/Evaluation of Learning (4)
Lecture/discussion—4 hours. Prerequisite: current enrollment in the Nursing Science and Health-Care Leadership graduate program or consent of instructor. Application of approaches, processes, and tools for assessing adult learning, especially those that assess the student’s ability to apply knowledge/skills in practical situations. Other topics include: design of performance evaluation tasks, instructional rubrics, use of portfolios, grading, and reporting. Offered in alternate years. —III.

Professional
400. Basic Clinical Skills (1-4)
Lecture/laboratory—1-4 hours. Open to Graduate Students. Essential conceptual, technical, and physical skills necessary for patient care. Prepares the student for effective communication in establishing the therapeutic provider-patient relationship. —I, II, III. (I, II, III, IV.)

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Dom=Domestic Diversity; Writ=Writing Experience
Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; ASC=American Cultures; DD=Domestic Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; VL=Visual; WC=World Cultures; WE=Writing Experience
401. Basic Clinical Skills (1-4)
Lecture/laboratory—1–4 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Continuation of focus on history taking and physical examination skills with advanced/specialized content—II, III, IV, (I, II, III, IV)

401A. Advanced Clinical Skills (1-4)
Lecture/laboratory—1–4 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Continuation of focus on history taking and physical examination skills with advanced/specialized content—II, III, IV, (I, II, III, IV)

401B. Advanced Clinical Skills (1-4)
Lecture/laboratory—1–4 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Continuation of focus on history taking and physical examination skills with advanced/specialized content related specified systems—II, III, IV, (I, II, III, IV)

401C. Advanced Clinical Skills (1-4)
Lecture/laboratory—1–4 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Continuation of focus on history taking and physical examination skills with advanced/specialized content related specified systems—II, III, IV, (I, II, III, IV)

401D. Advanced Clinical Skills (1-4)
Lecture/laboratory—1–4 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Continuation of focus on history taking and physical examination skills with advanced/specialized content related specified systems—II, III, IV, (I, II, III, IV)

401E. Advanced Clinical Skills (1-4)
Lecture/laboratory—1–4 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Continuation of focus on history taking and physical examination skills with advanced/specialized content related specified systems—II, III, IV, (I, II, III, IV)

402. Supervised Clinical Hours (1-3)
Clinical activity—36 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Students are placed in clinical settings and/or clinical simulation laboratories to observe and practice the integration of clinical skills with direct supervision by faculty.—I, II, III, IV, (I, II, III, IV)

403. Supervised Clinical Practice—Primary Health Care (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Each of the required primary care rotations is a four-week supervised clinical practice experience in primary care, under the supervision of an appropriate community-based primary care provider per accreditation requirements.—II, III, IV, (I, II, III, IV)

404. Supervised Clinical Practice—Primary Health Care (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Each of the required primary care rotations is a four-week supervised clinical practice experience in primary care, under the supervision of an appropriate community-based primary care provider per accreditation requirements.—II, III, IV, (I, II, III, IV)

405C. Supervised Clinical Practice—Primary Health Care (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Each of the required primary care rotations is a four-week supervised clinical practice experience in primary care, under the supervision of an appropriate community-based primary care provider per accreditation requirements.—I, II, III, IV, (I, II, III, IV)

405D. Supervised Clinical Practice—Primary Health Care (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Each of the required primary care rotations is a four-week supervised clinical practice experience in primary care, under the supervision of an appropriate community-based primary care provider per accreditation requirements.—I, II, III, IV, (I, II, III, IV)

450. Supervised Clinical Practice—Primary Health Care (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Four-week clinical rotation under the supervision of an appropriate inpatient per accreditation requirements.—I, II, III, IV, (I, II, III, IV)

451. Supervised Clinical Practice—Pediatrics (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Continuation of focus on history taking and physical examination skills with advanced/specialized content related specified systems.—I, II, III, IV, (I, II, III, IV)

452. Supervised Clinical Practice—Women’s Health (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Four-week clinical rotation under the supervision of an appropriate community-based pediatri sne provider per accreditation requirements.—II, III, IV, (I, II, III, IV)

453. Supervised Clinical Practice—Mental Health (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Four-week clinical rotation under the supervision of an appropriate community-based psychiatric, psychiatric/mental health provider per accreditation requirements.—II, III, IV, (I, II, III, IV)

454. Supervised Clinical Practice—Emergency Medicine (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Four-week clinical rotation under the supervision of an appropriate Emergency Medicine provider per accreditation requirements.—II, III, IV, (I, II, III, IV)

455. Supervised Clinical Practice—Inpatient Surgery (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Four-week clinical rotation under the supervision of an appropriate surgical provider per accreditation requirements.—II, III, IV, (I, II, III, IV)

456. Supervised Clinical Practice—Inpatient Medicine (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Four-week clinical rotation under the supervision of an appropriate inpatient per accreditation requirements.—I, II, III, IV, (I, II, III, IV)

459. Supervised Clinical Practice—Other Specialties (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Four-week clinical rotation under the supervision of an appropriate community-based primary care provider per accreditation requirements.—I, II, III, IV, (I, II, III, IV)

470. Health Care Ethics (3-9)
Lecture/discussion—2 hours, laboratory/discussion—1 hour. Prerequisite: consent of instructor. Guided independent study of issues in biomedical ethics, with discussion relevant to the personal involvement of student interests and needs. Participation in ethics rounds. (Same course as General Medicine 470. S/U grading only.)—I, II, III, IV, (I, II, III, IV)

471. Supervised Clinical Practice—Geriatrics (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Rural health rotations focus on providing care in medically underserved rural sites. Students will experience care across the continuum in ambulatory, inpatient, and community based settings.—I, II, III, IV, (I, II, III, IV)

475. Supervised Clinical Practice—Acute Care Health (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. A two to four week rotation focuses on providing acute care in inpatient settings. Students will work directly with specific inpatient units.—I, II, III, IV, (I, II, III, IV)

480. Supervised Clinical Practice—Rural Health (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Rural health rotations focus on providing care in medically underserved rural sites. Students will experience care across the continuum in ambulatory, inpatient, and community based settings. —I, II, III, IV, (I, II, III, IV)

485. Supervised Clinical Practice—Inpatient Surgery (1-16)
Clinical activity—48 hours. Open to Graduate Students in the Nursing Science and Health-Care Leadership Graduate Degree programs, or by consent of instructor. Four-week clinical rotation under the supervision of an appropriate surgical provider per accreditation requirements.—II, III, IV, (I, II, III, IV)

493A. Improving Quality in Health Care (3)
Lecture—8 hours; discussion/laboratory—10 hours; project—10 hours. Prerequisite: consent on instructor. Working in interdisciplinary teams, will explore the theory and practical methods being employed to make improvement in health care systems while providing an opportunity for interprofessional educational experience. (Same course as Medical Sciences 493QA. S/U grading only, pending completion of sequence.)—I.

493B. Improving Quality in Health Care (3)
Lecture—9 hours; discussion/laboratory—10 hours; project—10 hours. Prerequisite: consent on instructor. Working in interdisciplinary teams, will explore the theory and practical methods being employed to make improvement in health care systems while providing an opportunity for interprofessional educational experience. (Same course as Medical Sciences 493QA. S/U grading only, pending completion of sequence.)—I.
Nutrition

See Clinical Nutrition, on page 203; Food Service Management, on page 315; Nutrition; Nutritional Biology (A Graduate Group), on page 457; Nutrition Science, on page 458.

Nutrition

(College of Agricultural and Environmental Sciences)
Francene M. Steinberg, Ph.D., R.D., Chair of the Department
Lucia Kaiser, Ph.D., Vice Chairperson of the Department

Department Office. 3135 Meyer Hall 530-752-6630, http://nutrition.ucdavis.edu

Faculty
Elizabeth Applegate, Ph.D., Senior Lecturer (SOE) Academic Senate Distinguished Teaching Award Gary Cherr, Ph.D., Professor (Nutrition, Environmental Toxicology) Kathryn G. Dewey, Ph.D., Distinguished Professor Nilesh W. Gokalke, Ph.D., Assistant Professor (Nutrition, Environmental Toxicology) Fawaz G. Haj, Ph.D., Associate Professor (Nutrition, Internal Medicine) Carl L. Keen, Ph.D., Distinguished Professor (Nutrition, Internal Medicine) Bo L. Lönnerdal, Ph.D., Distinguished Professor (Nutrition, Internal Medicine) Roger McDonald, Ph.D., Professor Emeritus Patricia Oteiza, Ph.D., Professor (Nutrition, Environmental Toxicology) Carolyn M. Slupsky, Ph.D., Associate Professor (Nutrition, Food Science & Technology) Francene M. Steinberg, Ph.D., R.D., Professor and Chair Christine Stewart, Ph.D., Assistant Professor Angela Zivkovic, Ph.D., Assistant Professor

Emeriti Faculty
Lindsay H. Allen, Ph.D., Professor Emeritus Kenneth H. Bower, M.D., Professor Emeritus Andrew J. Cliftord, Ph.D., Professor Emeritus Louis E. Grivetti, Ph.D., Professor Emeritus Janet King, Ph.D., Professor Emeritus Robert S. Tucker, Ph.D., Professor Emeritus Barbara O. Schneman, Ph.D., Professor Emeritus Judith S. Stern, Sc.D., R.D., Professor Emeritus

Affiliated Faculty
Sean Adams, Ph.D., Associate Adjunct Professor Ellen Bonnel, Ph.D., Academic Administrator Betty Burri, Ph.D., Adjunct Professor Britt Buehnebrenner, Ph.D., Associate Research Nutritionist Joan Frank, M.S., R.D., Academic Coordinator/Lecturer Ellen Fung, Ph.D., R.D., Associate Adjunct Professor Robert M. Hackman, Ph.D., Research Nutritionist

Marjorie Haskell, Ph.D., Associate Researcher Peter Havel, Ph.D., D.V.M., Professor Wayne Hawkes, Ph.D., Adjunct Professor M. Jane Heining, Ph.D., Academic Administrator Sonja Hess, Ph.D., Associate Project Scientist Leping Huang, Ph.D., Associate Adjunct Professor Daniel Hwang, Ph.D., Professor Lucia Kaiser, Ph.D., R.D., Specialist in Cooperative Extension Nancy Keim, Ph.D., Adjunct Professor Darshana Kelley, Ph.D., Adjunct Professor Kevin Laugero, Ph.D., Assistant Adjunct Professor Louise Lanooue, Ph.D., Associate Project Scientist Roy Martin, Ph.D., Adjunct Professor John Newman, Ph.D., Associate Adjunct Professor Charles Stephenshen, Ph.D., Adjunct Professor Marilyn S. Townsend, Ph.D., R.D., Specialist in Cooperative Extension Janet Uri-Udams, Ph.D., Associate Researcher Marta Van Loan, Ph.D., Adjunct Professor Sheri Zidenberg-Cherr, Ph.D., Specialist in Cooperative Extension Susan Zunino, Ph.D., Associate Adjunct Professor

Major Programs. See the majors in Clinical Nutrition, on page 203 and Nutrition Science, on page 458.

Minor Program Requirements: The Department of Nutrition offers four minor programs open to students majoring in other disciplines who wish to complement their study programs with a concentration in the area of food and nutrition.

Note: If the student’s major program requires the same course in biochemistry and physiology, only one of the courses may duplicate credit toward the minor. Each program below lists replacement courses to fulfill the minimum unit requirement.

Community Nutrition .......................... 20

Preparation. Plan in advance to include the required course prerequisites.

Nutrition 111A and 111B .......................... 5
Nutrition 118, 192 (2 units) ....................... 6
Nutrition 120AN or 120BN ....................... 4
Neurobiology, Physiology, and Behavior 101 .................................................. 5
Replacement courses; see note above:

Nutrition 114, 116A-116B, 116AL-116BL

Food Service Management ..................... 25

Preparation. Plan in advance to include the required course prerequisites.

Food Science and Technology 100A-100B, 101A-101B ... 12
Food Service Management 120, 120L, 122, 123 ........................................... 9
Agricultural and Resource Economics 112 ....................................................... 4
Replacement courses; see note above:

Nutrition 10, 111A, 111B, 114, 116A-116B, 120AN, or 120BN, Economics 1A-1B

Nutrition and Food ................................. 22

Preparation. Plan in advance to include the required course prerequisites.

Nutrition 111A and 111B .......................... 5
Nutrition 120AN or 120BN ....................... 4
Food Science and Technology 100A, 100B ....................................................... 8
Neurobiology, Physiology, and Behavior 101 .................................................. 5
Replacement courses; see note above:

Nutrition 114, 116A-116B, 116AL-116BL

Nutrition Science ................................. 20

Preparation. Plan in advance to include the required course prerequisites.

Animal Biology 102 and 103, Biological Sciences 102 and 103 and Nutrition 111A and 111B ......................... 11-15
Neurobiology, Physiology, and Behavior 101 .................................................. 5
Replacement courses; see note above:

Nutrition 114, 115, 116A-116B, 117, 120AN or 120BN, 122, 123, 124, 201, 204.

Minor Adviser. 3202 Meyer Hall 530-752-2512

Graduate Study. Programs of study leading to the M.S. and Ph.D. degrees are available in Nutrition. For information on graduate study contact the Nutrition Graduate Group.

Courses in Nutrition (NUT)

Lower Division
11. Current Topics and Controversies in Nutrition (3) Discussion—1 hour; term paper. Exploration of current applications and controversies in nutrition. Students read scientific journal articles and write summaries, as well as give brief oral presentations. Topics change to reflect current interests and issues. GE credit: SciEng, Wrt I | OL, SE, WE—II, III. (II, III) Applicable
99. Individual Study for Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE

Upper Division
104. Environmental & Nutritional Factors in Cellular Regulation and Nutritional Toxicants (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 101; Biological Sciences 103 or Animal Biology 101. Cellular regulation from nutritional/toxicological perspective. Emphasis: role of biofactors on modulation of signal transduction pathways, role of specific organelles in organization/ regulation of metabolic transformations, major cofactor functions, principles of pharmacology/toxicology important to understanding nutrient/toxicant metabolism. (Same course as Environmental Toxicology 104.) GE credit: SciEng | SE, SL—II, III. (II, III) Applicable

111AV. Introduction to Nutrition and Metabolism (3) Web virtual lecture—3 hours. Prerequisite: Chemistry 88, Biochemistry 1A or 1B or the equivalent. Introduction to metabolism of protein, fat, and carbohydrate; the biological role of vitamins and minerals; nutrient requirements during the life cycle; assessment of dietary intake and nutritional status. Not open for credit to students who have completed course 101. E credit: SciEng | SE—II, III. (II, III) McDonald

111B. Recommendations and Standards for Human Nutrition (2) Lecture—2 hours. Prerequisite: Chemistry 88, Biochemistry, Physiology, and Behavior 101 or the equivalent. Critical analysis of the development of nutritional recommendations for humans. Topics include history of modern recommendations, development of the Recommended Dietary Allowance (RDA) and other food guides; the Dietary Reference Intakes (DRI); administrative structure of regulatory agencies pertinent to nutrition recommendations; introduction to scientific methods used to determine the recommendations; food labeling laws; nutrition...
Nutrition

112. Nutritional Assessment: Dietary, Anthropometric, and Clinical Measures (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Animal Biology 102 and course 101, course 111 (may be taken concurrently). Statistics 13. Methods of human nutritional assessment, including dietary, anthropometric, biochemical and hemato-
logical techniques, and physical examination. Princi-
ples of nutrition, accuracy, and interpretation of results for individuals and populations. GE credit: SciEng | QL, SE—III. (II.) Stewart

114. Developmental Nutrition (4)
Lecture—4 hours. Prerequisite: Animal Biology 102 and 103 or course 101, course 111. Role of nutri-
tional factors in embryonic and postnatal develop-
ment. GE credit: SciEng, Wrt | SE—II. (II.) DePeters

115. Animal Nutrition (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Chemistry 88. Comparative differences among ani-
mals in digestion and metabolism of nutrients. Nutri-
ent composition of feeds, digestive systems, digestion, absorption, feeding strategies. GE credit: SciEng; SciEng | QL, SE, VL, WE—II. (II.) DePeters

116A. Clinical Nutrition (3)
Lecture—3 hours. Prerequisites: courses 111, 112 and Neurobiology, Physiology, and Behavior 101 or the equivalent. Biochemical and physiological bases for therapeutic diets. Problems in planning diets for normal and pathologic conditions. GE credit: SciEng | SE—II. (I.) Steinberg

116AL. Clinical Nutrition Practicum (3)
Lecture—1 hour; laboratory—3 hours; discussion—1 hour. Prerequisite: course 116A (may be taken concurrently). Fundamental principles of planning and evaluating therapeutic diets and patient education for pathological conditions covered in 116A. GE credit: SciEng; SciEng | SE—II. (I.) Frank

116B. Clinical Nutrition (3)
Lecture—3 hours; discussion—1 hour. Prerequisites: courses 111, 112 and Neurobiology, Physiology, and Behavior 101 or the equivalent. Biochemical and physiological bases for therapeutic diets. Prob-
lems in planning diets for normal and pathological conditions. GE credit: SciEng | SE—II. (II.) Zivotic

116BL. Clinical Nutrition Practicum (3)
Lecture—1 hour; laboratory—3 hours; discussion—1 hour. Prerequisite: courses 116A and 116B (may be taken concurrently). Fundamental principles of planning and evaluating therapeutic diets and patient education for pathological conditions covered in 116A. GE credit: SciEng | SE—II. (II.) Steinberg

117. Experimental Nutrition (6)
Lecture—3 hours; laboratory—6 hours; extensive writing. Prerequisites: courses 111, Biological Sci-
ces 102 and 103, and a laboratory course in nutrition or biochemistry. Methods of assessing nutritional status. Application of chemical, microbiologi-
cal, chromatographic and enzymatic techniques to current problems in nutrition. GE credit: SciEng, Wrt | SE—II. (II.) Galikwad

118. Community Nutrition (4)
Lecture—4 hours. Prerequisite: course 101 or 111, and 116A. Nutrition problems in contemporary communities and of selected target groups in the United States and in developing countries. Nutrition programs and policy, principles of nutrition educa-
tion. GE credit: SciEng | SE, SL—II. (II.) Heining

119A. International Community-Based Nutritional Aids (1-2) (P/NP grading only.)
Lecture/discussion—1 hour. Prerequisite: course 112 (may be taken concurrently) and consent of instructor. Issues and problems related to community-
based nutritional assessment in a low-income coun-
try, or in low-income countries, ethical issues in human investigation; survey design, data collection techniques, and data analy-
sis; preparation for international travel; cross-cultural communication, health, and safety while living abroad.

119B. International Community-Based Nutritional Assessment (6)
Lecture—2 hours; fieldwork—12 hours. Prerequi-
tive: course 119A and consent of instructor. A six-
week summer program in Peru. Investigation of a community-based nutritional assessment survey, including development of the survey instrument, selection of the study sample, collection and verifica-
tion of data, preparation of the results; the project will be carried out by paired par-
ticipation of students and faculty members of UC Davis and the collaborating foreign institution.

120AN. Nutritional Anthropology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or Geography 2 recommended. Nutritional anthropology from historical and contemporary per-
spectives; the anthropological approach to food and diet; field methods that explore food patterns and their nutritional implications. GE credit: SciEng or SocSci, Div | SE, SS—IV. (IV.) Kurtz

120BN. Nutritional Geography (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Geography 2 recommended. Nutritional geography from historical and contemporary per-
spectives; the geographical approach to food and diet; cultural and environmental factors that influence dietary practices; food-related landscapes and patterns. GE credit: SciEng or SocSci, Div | SE, SS.

122. Ruminant Nutrition and Digestive Physiology (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: upper division standing; Animal Biology 103 or con-
sent of instructor; Neurobiology, Physiology, and Behavior 101, Biological Sciences 1C, and Mathe-
matics 16B recommended. Study of nutrient utiliza-
tion as influenced by the unique aspects of digestion and fermentation in ruminants, both domestic and wild. Laboratories include comparative anatomy, feed evaluation, digestion kinetics using fistulated cows, computer modeling, and microbial exercises. GE credit: SciEng | QL, SE—III. (III.) Fadel

123. Comparative Animal Nutrition (3)
Lecture—3 hours. Prerequisite: Animal Biology 103. Restricted to upper division or graduate students. Comparative nutrition of animals, including labora-
tory, companion, zoo, and wild animals. Digestion and metabolic adaptations required for animal spe-
cies to consume vegetative material from grasses and leaves to nectar to insects and meat. Relation of nutrition to metabolic adaptations and physiological states, including growth, reproduction, and dis-
eases. GE credit: SciEng | SE—II. (II.) Klassen

123L. Comparative Animal Nutrition Laboratory (1)
Laboratory—3 hours. Prerequisite: Animal Biology 103, course 123 (may be taken concurrently). Labo-
atory exercises related to various reports on establish-
ment of nutritional requirements and formulation of complete diets for laboratory, companion, zoo and wild animals.—III. (III.) Klassen

124. Nutrition and Feeding of Finfishes (3)
Lecture—3 hours. Prerequisite: Biological Sciences 103 and Wildlife, Fish, and Conservation Biology 121. Principles of nutrition and feeding of fishes under commercial situations; implication of fish nutri-
tion to the conservation of endangered species. GE credit: SciEng | QL, SE, SL

127. Environmental Stress and Development in Marine Organisms (10)
Lecture—4 hours; laboratory—12 hours; discus-

sion—2 hours. Prerequisite: Biological Toxicology 101 or Biological Sciences 102 or 104 or the equivalent; Environmental Toxicology 114A or course 114 recommended. Course taught at Bodega Marine Laboratory. Effects of environmental and nutritional stress, including pollutants, on developmental and function in embryos and larvae of marine organisms. Emphasis on advanced experimental methods. (Same course as Environmental Toxicology 127.) GE credit: SciEng | QL, QL, SE, SL, WE—IV. (IV.) Cherr

129. Journalistic Practicum in Nutrition (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 111; a course in written or oral expression or consent of instructor. Critical analysis and discussion of current, controversial issues in nutrition; the use of journalistic techniques to interpret scientific findings for the lay public. Students will be required to write several articles for completion of course may be repeated one time for credit. GE credit: SciEng | OL, QL, SE, SL, WE

130. Experiments in Nutrition: Design and Execution (2)
Laboratory—6 hours. Prerequisite: consent of instruc-
tor; course 101, 110, 111, or 114 recommended. Experiments in current nutritional problems. Experi-
mental design: students choose project and, inde-
dependently or in groups of two-three, design a proto-

col, complete the project, and report findings. May be repeated for credit up to six times (three times per instructor) with consent of instructor. GE credit: SciEng | SE—I, II, III, IV, (I, II, III) Zidenberg-Cherr

190. Proseminar in Nutrition (1)
Seminar—1 hour. Prerequisite: senior standing; course 111. Discussion of human nutrition problems. Each term will involve a different emphasis among experimental, clinical, and socio-cultural con-

munity, national and international scope. May be repeated two times for credit with consent of instruc-
tor. GE credit: SciEng | QL, VL, SE, SS—II. (II.) Zidenberg-Cherr

190C. Nutrition Research Conference (1)
Discussion—1 hour. Prerequisite: upper division standing in Nutrition or related biological science; consent of instructor. Introduction to research find-
ngs and methods in nutrition. Presentation and dis-
cussion of research by faculty and students. May be repeated for credit. (P/NP grading only.) GE credit: SE—I, II, III, IV, (I, II, III)

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: one upper divi-
sion course in nutrition and consent of instructor. Work experience on or off campus in practical appli-

cation of nutrition, supervised by a faculty member. (P/NP grading only.)

197. Tutoring in Nutrition (1-2)
Discussion/laboratory—3 or 6 hours. Prerequisite: Nutrition Science, Clinical Nutrition or related major. Completion of course 101. Tutoring of stu-

dents in nutrition courses, participation in class-
groups or laboratory sections, weekly conference with instructor in charge of course: written evalua-
tions. May be repeated if tutoring a different course. (P/NP grading only.)

198. Directed Group Study (1-5) (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only) GE credit: SE.

Graduate

201. Vitamin and Cofactor Metabolism (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: one upper division nutritional biochemistry and phys-

iology course. Review of studies and relationships involving the metabolic functions of vitamins. Com-

parative nutritional aspects and the metabolism and chemistry of vitamins and vitamin-like compounds.

202. Advanced Nutritional Energetics (2)
Lecture—2 hours. Prerequisite: Animal Biology 102, 103, Neurobiology, Physiology, and Behavior 101 or the equivalent. History of nutritional energetics. Examination of energy transformations associated with food utilization. Energy expenditures at cellular, tis-

sue, and animal levels as affected by diet and physi-

ological state. Current and future feeding systems.
203. Advanced Protein and Amino Acid Nutrition (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: one upper division nutrition biochemistry and physiology course. Nutritional function of protein and amino acids, including studies of the influence of dietary protein on digestion and absorption, metabolism, resistance to disease, and food intake. Study of dietary requirements and interrelationships among amino acids.

204. Mineral Metabolism (2)
Lecture—2 hours. Prerequisite: upper division nutrition or biochemistry and physiology courses. Studies of metabolic functions and nutritional interrelationships involving minerals.

219A. International Nutrition (3)
Lecture—3 hours. Prerequisite: graduate standing; undergraduates only admitted with consent of instructor after completion of course 1111 AVE. Epidemiology, etiology, and consequences of undernutrition, with particular focus on the nutritional problems of children and women in low-income populations. Offered in alternate years.—II. Dewey

219B. International Nutrition (3)
Lecture—3 hours. Prerequisite: course 219A. Intervention programs to prevent or ameliorate nutritional problems in low-income populations. Planning, implementing, and evaluating nutrition intervention programs. Offered in alternate years.—III. Dewey

230. Experiments in Nutrition: Design and Execution (2)
Laboratory—6 hours. Prerequisite: consent of instructor; courses 201, 202, 203, 204, or the equivalent recommended. Student selected projects to enhance laboratory skills; independently, or in groups of two-three students, design and carry out the experiment, analyze the results and report the findings. May be repeated for credit up to six times (limit of three times per instructor) with consent of instructor.—I, II, III. (I, II, III)

250. Metabolic Homeostasis (3)
Lecture—2 hours; discussion—1.5 hours. Prerequisite: passing the Nutrition Graduate Group Preliminary Examination or consent of instructor. Preference given to students with advanced standing in the Nutrition Graduate Group. Regulatory mechanisms of carbohydrate, lipid, and protein homeostasis; mechanisms of metabolic enzyme regulation and of the metabolic hormones: homeostatic mechanisms and interactions; fuel-fuel interactions; nutrition energy balance.

251. Nutrition and Immunity (2)
Lecture/discussion—2 hours. Prerequisite: Pathology, Microbiology and Immunology 126, Medical Microbiology 107 or the equivalent. Animal Biology 102. Cellular and molecular mechanisms underlying interactions of nutrition and immune function, including modulation of immunocompetence by diet and effects of immune responses on nutritional needs. Lectures and discussion explore implications for resistance to infection, autimmunity and cancer. Offered in alternate years.—II. (I) Klasing, Erickson, Stephenson

252. Nutrition and Development (3)
Lecture—3 hours. Prerequisite: courses 201, 202, 203, 204. Relationship of nutrition to prenatal and early postnatal development.—I. (I, II) Koen, Oteiza

253. Control of Food Intake (3)
Lecture—2 hours; discussion—1 hour; 2 or 3 laboratory demonstrations per quarter. Prerequisite: course 201 or 202 or consent of instructor. Comprehensive study of the biochemical, nutritional, behavioral, and physiological mechanisms controlling food intake. Subject matter will be approached through lectures, laboratory demonstration and discussions where students and staff will critically evaluate the literature. Offered in alternate years.

254. Applications of Systems Analysis in Nutrition (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: courses 201, 202, 203, 204 or the equivalent. Quantitative aspects of digestion and metabolism; principles of systems analysis. Evolution of models of energy metabolism as applied in current feeding systems and evaluation of mechanistic models used analytically in support of nutritional research. Offered in alternate years.

257. Selected Topics in Nutritional and Hormonal Control of Nitrogen Metabolism (2)
Lecture—2 hours. Prerequisite: courses 201 through 204, Physiological Sciences 205 A-B, or the equivalent. Quantitative and qualitative aspects of nitrogen metabolism, biochemistry of dietary intake, hormones and diet-hormone interactions which affect nitrogen metabolism, including protein synthesis-degradation, amino acid synthesis-catabolism, nitrogen transpendence on current literature. Offered in alternate years.

258. Field Research Methods in International Nutrition (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing or consent of instructor. Topics related to implementation of nutrition field research in less-developed countries, including ethics; relationships with local governments, community, and scientific entities; data collection techniques and quality assurance; field logistics; research budgets; and other administrative and personal issues. Offered in alternate years.—II. Dewey

259. Nutrition and Aging (2)
Lecture—2 hours; discussion—1 hour. Prerequisite: courses 201, 202, 203 and 204. Interaction between nutrition and aging. Topics include physiological/biochemical basis of aging, age-related changes affecting nutritional requirements, mortality rate, assessment of nutritional status in the elderly, and relationship between developmental nutrition and the rate of aging. Offered in alternate years.

260. Nutrition During Pregnancy (6)
Lecture—5 hours; term paper. Prerequisite: acceptance into the Master’s Degree program of Advanced Studies in Maternal and Child Nutrition. Overview of the anatomical, physiological and biochemical changes that occur during pregnancy and early development. Discussion and evaluation of nutritional/lifestyle factors associated with pregnancy outcomes and nutrition programs/interventions for pregnant women.—I. (I) Heining

261. Lactation and Infant Nutrition (6)
Lecture—5 hours; discussion—1 hour. Prerequisite: course 260. Overview of the physiological and biochemical processes underlying human lactation and nutritional needs of infant. Development of skills in assessment, nutrition counseling, education and support of new mothers and their families.—II. (II) Heining

262. Child and Adolescent Nutrition (6)
Lecture—5 hours; discussion—1 hour. Prerequisite: course 261. Relationships among nutrition, growth, and development during childhood and adolescence. Nutritional assessment for normal and high-risk groups; psychological and economic factors contributing to nutritional status. Nutritional needs and interventions for special groups, including obese children/adolescents, athletes, and eating disorders.—III. (III) Heining

Lecture—3 hours; term paper. Prerequisite: graduate standing; restricted to students enrolled in the MAS program and graduate students by consent of instructor. Application of epidemiological principles to the study of maternal and child nutrition. Topics include quantitative and qualitative study procedures, including study design, data collection, and related analytical techniques.—I. (I) Heining

264A. Current Topics in Maternal and Child Nutrition: Principles of Adult Education (2)
Seminar—2 hours. Prerequisite: graduate standing; restricted to students enrolled in the MAS program and graduate students by consent of instructor. Current scientific literature related to Maternal and Child Nutrition. Topics include epidemiology, evidence-based practice, breastfeeding promotion, and nutritional assessment of populations.—II. Heining

264B. Current Topics in Maternal and Child Nutrition: Epidemiology and Evidence-Based Practice (2)
Seminar—2 hours. Prerequisite: graduate standing; restricted to students enrolled in the MAS program and graduate students by consent of instructor. Current scientific literature related to Maternal and Child Nutrition. Topics include epidemiology, evidence-based practice, breastfeeding promotion, and nutritional assessment of populations.—II. Heining

264C. Current Topics in Maternal and Child Nutrition: Public Policy Development and Implementation (2)
Seminar—2 hours. Prerequisite: graduate standing; restricted to students enrolled in the MAS program and graduate students by consent of instructor. Current scientific literature related to Maternal and Child Nutrition. Topics include nutrition surveillance and monitoring, as well as public policy development and implementation.—III. Heining

270. Scientific Ethics in Biomedical Studies: Emphasis on Nutrition (3)
Lecture—1 hour; discussion—1 hour; term paper. Scientific ethics in biomedical studies, especially nutrition. Discussion and case study presentations on scientific integrity, fraud, misconduct, conflict of interest, human and animal protection issues. Not open for credit to students who have completed course 4928.—Steinberg

290. Beginning Nutrition Seminar (2)
Lecture/discussion—1 hour; seminar—1 hour. Prerequisite: first year graduate standing or consent of instructor. Application of epidemiological principles to research on topics in nutrition with emphasis on literature review and evaluation in this field. Students give oral presentations on relevant topics.—II, III

290C. Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Major professors lead research discussions with their graduate students. Research papers are reviewed and presentation formulas presented and evaluated. Format will combine seminar and discussion style. (SU/grading only)—I, II, III. (I, II, III)

291. Advanced Nutrition Seminar (1)
Seminar—1 hour. Prerequisite: second-year graduate standing. Advanced topics in nutrition research. Multiple sections may be taken concurrently for credit. May be repeated for credit. (SU/grading only)—I, II, III. (I, II, III)

293A. Current Topics in Obesity, Food Intake and Energy Balance (3)
Lecture—1 hour; seminar—1 hour; discussion—1 hour. Prerequisite: graduate standing or course 129. Undergraduates with upper division standing with at least one writing course may enroll with consent of instructor. Current research and its evaluation. Principles of experimental design and scientific background for given article. Articles summarized for posting on Internet for use by healthcare professionals. May be repeated for credit with consent of instructor

293B. Current Topics in Obesity, Food Intake and Energy Balance with Special Topics (3)
Lecture—1 hour; seminar—1 hour; discussion—1 hour. Prerequisite: graduate standing or course 129. Undergraduates with upper division standing with at least one writing course may enroll with consent of instructor. A continuation of course 293A, with additional special topics. May be repeated for credit up to 3 times with consent of instructor.

294A. Current Topics in Developmental Nutrition (2)
Seminar—2 hours. Prerequisite: course 114 or 252 or consent of instructor. Effects of nutrition on embryology, morphogenesis, and developmental mechanisms. May be repeated for credit when topic differs.—I. (I)
297T. Supervised Teaching in Nutrition (1-3) teaching under faculty supervision—3/9 hours. Prerequisite: graduate standing in nutrition or consent of instructor. Practical experience in teaching nutrition at the university level; curriculum design and evaluation; preparation and presentation of material. Assistance in laboratories, discussion sections, and evaluation of student work. (S/U grading only.)

298. Group Study (1-5) (S/U grading only)

Professional

492A. Professionalism: An Academic Perspective (2) Lecture/discussion—2 hours. Prerequisite: graduate standing. For graduate students in their initial quarter of residence. Professionalism topics are presented and examples drawn from both the biological and social sciences.

492C. Grant Writing (3) Lecture—1.5 hours, discussion—1.5 hours. Prerequisite: graduate standing. Preparation of grants for governmental agencies (particularly NIH and USDA) and private foundations. Students will write a research grant or fellowship application. May be repeated once for credit with consent of instructor. Offered in alternate years.

Nutritional Biology (A Graduate Group)

Sheri Zidenberg-Cherr, Ph.D., Chairperson of the Group
Graduate Group Office. 1249 Meyer Hall
530-752-6784; http://nutritionalbiology.ucdavis.edu

Faculty

Lars Berglund, Ph.D., Professor (Endocrinology)
Kenneth H. Brown, M.D., Professor (Nutrition)
C. Christopher Carter, Ph.D., Professor (Animal Science)
Andrew J. Clifford, Ph.D., Professor (Nutrition)
Douglas E. Conkin, Ph.D., Associate Professor (Animal Science)
Edward J. DePeters, Ph.D., Professor (Animal Science)
Kathryn G. Dewey, Ph.D., Professor (Nutrition)
Kent L. Erickson, Ph.D., Professor (Cell Biology and Human Anatomy)
James G. Fadel, Ph.D., Professor (Animal Science)
Andrea J. Fassett, D.V.M., Ph.D., Associate Professor (Molecular Biosciences)
J. Bruce German, Ph.D., Professor (Food Science and Technology)
M. Eric Gershwin, M.D., Professor (Internal Medicine)
Ralph Green, M.D., Professor (Pathology)
Jean-Xavier Guinard, Ph.D., Professor (Food Science and Technology)
Fawaz G. Hajj, Ph.D., Assistant Professor (Nutrition)
Silas S. O. Hung, Ph.D., Professor (Animal Science)
Thomas Jue, Ph.D., Professor (Biological Chemistry)
Sidika E. Kasim-Karakas, M.D., Professor (Internal Medicine)
George A. Kayser, M.D., Ph.D., Professor (Internal Medicine)
Carl L. Keen, Ph.D., Distinguished Professor (Nutrition, Internal Medicine)
Kirk C. Klausing, Ph.D., Professor (Animal Science)
Jennifer A. Larsen, Ph.D., Assistant Professor of Clinical Nutrition (Molecular Biosciences)
Sa I. Lönnerdal, Ph.D., Professor (Nutrition, Internal Medicine)

Stanley L. Marks, B.V.Sc., Ph.D. Associate Professor (Medicine and Epidemiology)
Roger B. McDonal, Ph.D., Associate Professor (Nutrition)
Alyson Mitchell, Ph.D., Professor (Food Science and Technology)
Patricia Oteiza, Ph.D., Associate Professor (Nutrition, Environmental Toxicology)
Anthony F. Phillips, M.D., Professor (Pediaitrics)
Jon I. Ramsey, Ph.D., Associate Professor (Molecular Biosciences)
Helen E. Raybould, Ph.D., Professor (Anatomy, Physiology and Cell Biology)
John C. Rutherford, Ph.D., Professor (Endocrinology)
Dorothy W. Gietzen, Ph.D., Professor Emeritus (Nutrition)
José Santos, Ph.D., Associate Professor (WVTRC)
Francene M. Steinberg, Ph.D., R.D., Professor (Nutrition)
Charles Stebbins, Ph.D., Professor (Cardiovascular Medicine)
Judith S. Stern, Sc.D., R.D., Distinguished Professor (Nutrition)
Christine F. Stewart, Ph.D., Assistant Professor (Nutrition)
Natalie Torok, Ph.D., Associate Professor (Gastroenterology & Hepatology)
Craig H. Warden, Ph.D., Associate Professor (Neurobiology, Physiology, and Behavior)
Vincent A. Ziboh, Ph.D., Professor (Dermatology, Biological Chemistry)
Angela M. Zivkovic, Ph.D., Assistant Professor (Nutrition)

Emeriti Faculty

Harry W. Colvin, Jr., Ph.D., Professor Emeritus
Robert E. Feney, Ph.D., Professor Emeritus
Richard A. Freedland, Ph.D., Professor Emeritus
William N. Garrett, Ph.D., Professor Emeritus
Dorothy W. Gietzen, Ph.D., Professor Emeritus
C. Richard Grau, Ph.D., Professor Emeritus
Louis Grivetti, Ph.D., Professor Emeritus
Charles H. Halsted, M.D., Professor Emeritus
Robert J. Hansen, Ph.D., Professor Emeritus
Jiro J. Kaneko, D.V.M., Ph.D., D.V.Sc. (M), Professor Emeritus
Jane King, Ph.D., Professor Emeritus
Verne E. Mendel, Ph.D., Professor Emeritus
James G. Morris, Ph.D., Professor Emeritus
Ernesto Pollitt, Ph.D., Professor Emeritus
Quinton R. Rogers, Ph.D., Professor Emeritus
Barbara O. Schneeman, Ph.D., Professor Emeritus
Howard G. Schutz, Ph.D., Professor Emeritus
Donal A. Walsh, Ph.D., Professor Emeritus
Bruce M. Wolfe, M.D., Professor Emeritus
Francis J. Zeman, Ph.D., Professor Emeritus

Affiliated Faculty

Lindsay H. Allen, Ph.D., RD, Professor (Nutrition)
Betsy Burri, Ph.D., Associate Adjunct Professor (Nutrition)
Brill Burton-Freeman, Ph.D., Assistant Research Nutritionist (Nutrition)
Paul A. Davis, Ph.D., Research Nutritionist (Nutrition)
Cesar Fraga, Ph.D., Research Chemist (Nutrition)
Wayne Chris Hawkes, Ph.D., Assistant Adjunct Professor (Nutrition)
Peter J. Havel, D.V.M., Ph.D., Professor (Molecular Biosciences)
Liping Huang, Ph.D., Assistant Adjunct Professor (Nutrition)
Daniel Hwang, Ph.D., Adjunct Professor (Nutrition)
Amy Block Jay, Ph.D., Specialist in Cooperative Extension
Lucia Kaiser, Ph.D., RD, Specialist in Cooperative Extension (Nutrition)
Nancy L. Keim, Ph.D., RD., Adjunct Professor (Nutrition)
Darshan S. Kelley, Ph.D., Adjunct Professor (Nutrition)

Kevin Laugero, Ph.D., Assistant Adjunct Professor (Nutrition)
Joshua W. Miller, Ph.D., Associate Adjunct Professor (Pathology)
John Newman, Ph.D., Assistant Adjunct Professor (Nutrition)
James W. Oltjen, Ph.D., Management Systems Specialist (Animal Science)
Peter H. Robinson, Ph.D., Associate Extension Specialist (Animal Science)
Charles B. Stephensen, Ph.D., Adjunct Professor (Nutrition)
Mark D. Van Loan, Ph.D., Adjunct Professor (Nutrition)
Sheri A. Zidenberg-Cherr, Ph.D., Specialist in Cooperative Extension (Nutrition)
Susan Zunino, Ph.D., Associate Adjunct Professor (Nutrition)

Graduate Study. The Graduate Group in Nutritional Biology offers programs of study and research leading to the M.S. and Ph.D. degrees. The great diversity of research interests represented by the faculty members allows students to choose from a wide variety of themes: nutritional biochemistry, animal nutrition, nutrition and development, nutrient bioavailability, human/clinical nutrition, nutrition and behavior, nutritional energetics, community nutrition, community health, maternal and child nutrition, nutrition and endocrinology, international nutrition, obesity/body composition, physiology of digestion, nutrition and chronic disease, culture and nutrition, nutrition and gene expression, nutrition and aging, food preferences, nutrition and immunity, diet and exercise, dietary assessment, protein and lipid metabolism, food intake regulation, nutrition education.

Graduate Advisers. Consult the Nutritional Biology Graduate Group office.

Courses in Nutritional Biology (NUB)

Graduate

210A. Advanced Nutrition I: Nutrition and Metabolism, Macronutrients (5) Lecture—4 hours; discussion—1 hour. Prerequisite: admission to the Nutritional Biology Graduate Group or consent of instructor. Class size limited to 30 students. Advanced general biochemistry, concepts in animal nutrition, nutrition and development, nutrient bioavailability, human/clinical nutrition, nutrition and behavior, nutritional energetics, community nutrition, community health, maternal and child nutrition, nutrition and endocrinology, international nutrition, obesity/body composition, physiology of digestion, nutrition and chronic disease, culture and nutrition, nutrition and gene expression, nutrition and aging, food preferences, nutrition and immunity, diet and exercise, dietary assessment, protein and lipid metabolism, food intake regulation, nutrition education. —I (II) Cheira

210C. Advanced Nutrition III: Nutrition in Health and Disease (5) Lecture—4 hours; discussion—1 hour. Prerequisite: admission to the Nutritional Biology Graduate Group or consent of instructor. Class size limited to 30 students. Integration of biochemical, physiological, and genetic aspects of nutrition in the context of clinical and epidemiological observations related to health and disease, including obesity and diabetes, cancer, vascular and neurodegenerative diseases, osteoporosis, and birth defects. Review and consideration of governmental. —II (III) Miller

290C. Research Group Conference (1) Discussion—1 hour. Prerequisite: graduate standing. Weekly conference on research problems, progress and techniques in animal sciences. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III)

299. Directed Group Study (1-5) Prerequisite: graduate standing in Nutritional Biology Graduate Group, or consent of instructor. May be repeated three times for credit when topics differs and consent of instructor. —I, II, III. (I, II, III)

299. Research (1-12) Prerequisite: consent of instructor. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III)
Nutrition Science

(College of Agricultural and Environmental Sciences)

Faculty
See the Department of Nutrition, on page 454.

The Major Program
The study of nutrition encompasses all aspects of the consumption and utilization of food and its constituents. Key areas of study include: the biochemical reactions important to the utilization of nutrients and food constituents; the impact of diet on health and disease; and, nutrition-related policy and public health issues. The nutrition science major includes two options for studying these areas: nutritional biology and nutrition in public health.

The Program. Nutrition as it is taught on the Davis campus is a biological science and requires a complete background in chemistry and biology, along with calculus and physics (nutritional biology option) or economics (nutrition in public health option). These courses are generally completed during the first two years, and along with biochemistry, must be completed before most nutrition classes can be taken. During their junior and senior years, students in the nutritional biology option take additional course work in biochemistry, physiology, and toxicology. Students in the nutrition in public health option take additional course work in social and health-related sciences.

Career Alternatives. Both options are excellent preparation for professional or graduate training in medicine, public health, or other health sciences. The nutritional biology option also provides preparation for technical work in nutrition in the animal, food and pharmaceutical industries. The nutrition in public health option prepares students for jobs in administrative, teaching, or public health/public service positions.

B.S. Major Requirements:

Preparatory Subject Matter .......... 63-66
Biological Sciences 2A, 2B & 2C .........15
Chemistry 2A-2B-2C and 8A-8B, or 118A-
118B, or 128A-128B and 129A ........21-23
Nutrition 10 .....................................3
Plant Sciences 120 ......................... 4
Sociology 46A or Psychology 41 ..........4
The remaining preparatory subject matter is based on which major option you choose.
Nutritional Biology option:
Anthropology 2 or Psychology 1 or
Sociology 1 or 3 ......................... 4-5
Mathematics 16A-16B .................... 6
Physics 1A-1B ............................... 6
Nutrition in Public Health option:
Anthropology 2 or Sociology 1 or 3 . 4-5
Economics 1A-1B .......................... 8
Psychology 1 ..................................4

Depth Subject Matter ................. 76-85
Biological Sciences 101 ...................4
Food Science and Technology 100A and
100B .............................................8
Microbiology 101 ......................... 5
Neurobiology, Physiology, and Behavior
101, 101L, 102, 103 ........................ 8
Nutrition 111AV, 111B, 112, 116A ..........8
The remaining depth subject matter is based on which major option you choose when completing your preparatory courses.
Nutritional Biology option:
Biological Sciences 102, 103 .............6
Molecular and Cellular Biology 120-L ....6
Neurobiology, Physiology, and Behavior
114, 115 .......................................3
Nutrition 104, 117 ..........................10
Nutrition Restricted Electives ..........15-20

Selection of courses must be made in consultation with a faculty advisor prior to or upon reaching the 120 unit level: Exercise Biology 110; Nutrition 99, 105, 114, 115, 116B, 118, 120AN, 120BN, 122, 123, 124, 127, 130, 190, 192, 199

Nutrition in Public Health option:
Animal Biology 102, 103 ..................10
Exercise Biology 110 ..................... 3
Nutrition 118 .................................4
Nutrition Restricted Electives ..........15-20
Selection of courses must be made in consultation with a faculty advisor prior to or upon reaching the 120 unit level: Food Service Management 120, 122, Nutrition 99, 104, 105, 114, 116B, 117, 120AN, 120BN, 129, 130, 190, 192, 199

Restricted Electives .......................8-12
Choose one of the following areas to complete the restricted elective units in: Agricultural and Health Policy:
Agricultural Economics 15, 120, Public Health Sciences 175W, or Political Science 109
Cultural Diversity & Community Change:
African American and African Studies 100, American Studies 55, Agricultural and Resource Economics 112, Communication 136, Community & Regional Development 2, 152, 176, International Agricultural Development 10, 103, Science and Society 130, or Sociology 181
Community Health and Education:
Communication 165, Education 110, 120, 153, Psychology 126, 130 or Sociology 154

B.S. Major Requirements:

Preparatory Subject Matter .......... 63-66

Total Units for the Degree .......... 139-151

Major Adviser. B. L. Liengner

Advising Center for the major is located in 3202 Meyer Hall 530-752-2512.

Dietetics Internship. To fulfill the academic requirements for an internship in Dietetics, students are strongly advised to declare the Clinical Nutrition option no later than the first quarter of the junior year for selection of courses.

Graduate Study. The Department of Nutrition offers programs of study and research leading to the M.S. and Ph.D. degrees in Nutrition. For information on graduate study contact the graduate adviser. See Graduate Studies, on page 171.

Obstetrics and Gynecology

See Medicine, School of, on page 396.

Organizational Studies

See Sociology, on page 304.

Oceanography

(College of Letters and Science)

Oceanography is the study of the earth’s oceans, investigating connections between geological, biological, chemical and physical processes in the marine realm, and the interactions between the Earth’s ocean/atmosphere system. The interdisciplinary minor in oceanography is for students with backgrounds in any of these fields, as well as those interested in marine policy and conservation. The curriculum reflects the integrative nature of oceanography, with core courses covering the major disciplines in oceanography and elective courses that allow students to cater the minor to their interests. The oceanography minor includes courses taught at the Davis campus and courses offered at Bodega Marine Laboratory. The minor is sponsored by the Department of Earth and Planetary Sciences in 2119 Earth and Physical Sciences Building.

Minor Program Requirements:

Oceanography ........................................ 22-24
Geology 150A/Environmental Science and Policy 150A .................. 4
Geology 150B/Environmental Science and Policy 150B .................. 3
Geology 150C/Environmental Science and Policy 150C .................. 4
Environmental Science and Policy 152 ....... 3
An electives sequence, with one course from group (a) and one to two additional electives from either groups (a) or (b) ........................................ 8-10
(a) Geology 116N/Environmental Science and Policy 116N, Atmospheric Science 158, Wildlife, Fish, and Conservation Biology 120, 157, Environmental Toxicology 120, Evolution and Ecology 112, 115;
(b) Atmospheric Science 121A, 121B, Geology 108, 109, 152, Evolution and Ecology 106, 114, Environmental Science and Policy 124, Environmental Toxicology 127

Note. Courses Geology 150C/Environmental Science and Policy 150C, Environmental Science and Policy 124, 152, Environmental Toxicology 127, and Evolution and Ecology 106 and 114 are taught at Bodega Marine Laboratory.

Minor Adviser. T.M. Hill (Geology), 3115 Earth and Physical Sciences Building 530-752-0179

Ophthalmology

See Medicine, School of, on page 396.

Quarter Offered: I-II-Fall; II-Winter; III-Spring; IV-Summer; 2015-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): AHC=Arts and Humanities; SCIEng=Science and Engineering; Sosci=Social Sciences; Div=Domestic Diversity; Writ=Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; ACHG=American Cultures, DD=Domestic Diversity, OL=Oral Skills, GL= Quantitative, SL=Scientific, VL=Visual, WC=World Cultures; Writ=Writing Experience
Orthopaedic Surgery

See Medicine, School of, on page 396.

Otolaryngology

See Medicine, School of, on page 396.

Parks and Recreation

See Community and Regional Development, on page 207; Design, on page 219; Environmental Planning and Management (under Environmental Horticulture, on page 296); Landscape Architecture, on page 365; and Physical Education, on page 464.

Pathology

See Pathology (PMD), on page 414; Pathology, Microbiology, and Immunology, on page 459; and Plant Pathology, on page 474.

Pathology, Microbiology, and Immunology

See Veterinary Medicine, School of, on page 539.

Pediatrics

See Medicine, School of, on page 396.

Performance Studies (A Graduate Group)

Maxine Craig, Chairperson of the Group
Marian Bilheimer, Graduate Coordinator

Arts Group Graduate Office, 216B Art Building; 530-754-6973; mbilheimer@ucdavis.edu
http://performancesstudies.ucdavis.edu/

Faculty: Executive: Maxine Craig (Women and Gender Studies), Joseph Dumit (Science and Technology Studies, Anthropology), Peter Lichtenfels (Theatre and Dance), Halifu Osumare (African American and African Studies)

There are over 45 affiliated faculty in departments throughout HAVCS and other faculty, all of whom offer courses relevant to the discipline.

Graduate Study. The Ph.D. in Performance Studies is a four-year program. In the first two years of study, students develop an understanding of performance by drawing from a range of regular course offerings in the field to identify, explore, and define a field or fields of research. Students are required to complete four core courses out of five in performance studies, and one colloquium course. Each individual program is then built from seminar and/or practice as research courses, as well as independent or group studies, development of one or more of the four strands of the program: Comparative Medias, Embodiments, Cultures/Ecologies, and History/Text. A wide range of affiliated faculty offer courses throughout the HAVCS faculty, and Designated Emphases are available in Studies in Performance and Practice, African American and African Studies, Critical Theory, Feminist Theory and Research, Native American Studies, and Writing, Rhetoric and Composition Studies. Students are required to complete a minimum of 60 units before taking the qualifying examination. No more than 12 units may be taken at a graduate level unless specifically approved by the Ph.D. graduate program adviser.

Main Program Adviser: Lynette Hunter (Theatre and Dance)

Graduate Advisers: Emily Albu (Spanish & Classics), Susan Avila (Design), Seeta Chaganti (English), Maxine Craig (Women and Gender Studies), Halifu Osumare (African American and African Studies), Kriss Ravetto (Cinema and Technocultural Studies), Henry Spiller (Music), Archana Venkatesan (Comparative Literature, Religious Studies), Hegnar Watenauphaug (Art, Art History)

Courses in Performance Studies (PFS)

Graduate

200. Methods and Materials in Theatre Research (4)
Seminar—3 hours; term paper. Essential research tools in theatre and related fields; bibliographies, primary sources; methods of evaluating and presenting evidence; delineating research areas in the field. I. (I)

259. Topics in Contemporary Theatre and Performance (4)
Seminar—3 hours; term paper. Special topics designed to study in depth aspects of contemporary performance including performance analysis, cultural and historical context, modes of production, theoretical and political entailments, and issues of spectatorship; e.g., "Brecht and After," "British Theatre," "Race and Gender in Performance." May be repeated five times for credit—II, III, III, III, III.

265A. Performance Studies: Modes of Production (4)
Seminar—3 hours; term paper. Introduction to the literature of performance production in a variety of media: theatre, dance, film, video, computer-based, looking at cultural, aesthetic, rhetorical and political theory. May be repeated three times for credit when topic differs. Offered in alternate years.

265B. Performance Studies: Signification and the Body (4)
Seminar—3 hours; term paper. Introduction to analysis of the body in performance, drawing on theoretical models from several fields. May be repeated three times for credit when topic differs. Offered in alternate years.

265C. Performance Studies: Performance and Society (4)
Seminar—3 hours; term paper. Introduction to the role of performance (broadly defined), in everyday life, sociopolitical negotiation, identity, social movements, the media, and the state. May be repeated three times for credit when topic differs. Offered in alternate years.

265D. Performance Studies: Theory, History, Criticism (4)
Seminar—3 hours; term paper. Introduction to the theory, history and criticism, informing performance studies. May be repeated three times for credit when topic differs. Offered in alternate years.

270A. Individually Guided Research in Performance Studies (4)
Discussion—1 hour; independent study; extensive writing. Prerequisite: course 200; one from course 265A, B, C, or D; consent of instructor. Restricted to students in the Graduate Group PhD in Performance Studies. Individually guided research, under the supervision of a faculty member, on a Performance Studies topic related to the student’s proposed dissertation project to produce a dissertation prospectus.

270B. Individually Guided Research in Performance Studies (4)
Discussion—1 hour; independent study; extensive writing. Prerequisite: course 200; one of courses 265A, B, C, or D; consent of instructor. Restricted to students in the Graduate Group PhD in Performance Studies. Individually guided research, under the supervision of a faculty member, on a Performance Studies topic related to the student’s proposed dissertation project to produce a dissertation prospectus.

270C. Individually Guided Research in Performance Studies (4)
Discussion/labatory—2 hours; fieldwork; term paper. Prerequisite: course 200; one of courses 265A, B, C, or D; consent of instructor. Restricted to students in the Graduate Group PhD in Performance Studies. Individually guided research, under the supervision of a faculty member, on a Performance Studies topic related to the student’s proposed dissertation project to produce a dissertation prospectus.

290. Colloquia in Performance Studies (4)
Lecture-discussion—2 hours; discussion/labatory—1 hour; term paper. Prerequisite: registration in Performance Studies Graduate Group and prior to Qualifying Examination. Designed to provide cohort identity and faculty exchange. Opportunity to present papers, hear guest lecturers, and see faculty presentations, gather for organizational and administrative new, exchange of information and make announcements. Course must be taken every year that a Performance Studies graduate is registered, prior to taking the Qualifying Examination. May be repeated four times for credit. Limited to four units per year. (S/U grading only.)—II, III.

298. Group Study (1-5)
Independent study—1-5 hours. Prerequisite: consent of instructor. I, II, III, IV, V.

299. Individual Study (1-12)
Prerequisite: consent of instructor. (S/U grading only.)—I, II, III, IV, V.

299D. Dissertation Research (1-12)
Prerequisite: consent of advisor, graduate student. (S/U grading only.)—I, II, III, IV, V.

Professional

459. Approaches to Theatre and Dance (4)
Seminar—3 hours; term paper; project. Prerequisite: consent of instructor; advanced graduate students. Work on approaches to theatre, dance, film/video, design and performance, with a focus on methodology and professional development. May be repeated five times for credit. Offered irregularly.

Pharmacology and Toxicology

See Medical Pharmacology and Toxicology (PHA), on page 411; Molecular Biosciences (VMB), on
Pharmacology and Toxicology (A Graduate Group)

203. Principles of Pharmacology and Toxicology III (4)
Lecture—4 hours. Prerequisite: courses 201 and 202. Integrated physiological systems, cardiovascular and nervous systems and how drugs and toxicants act to perturb function. —III. (III.) Berman, Gelli

230. Advanced Topics in Pharmacology and Toxicology (1-3)
Lecture/discussion/seminar—1 hour each (course format can vary at option of instructor). Prerequisite: course 201 and consent of instructor. In-depth coverage of selected topics for graduate students in Pharmacology-Toxicology and related disciplines: topics determined by instructor in charge for each quarter. —I, II, III, (II, III, III)

277. Life and Death Decisions at the Cellular Level (2)
Lecture—2 hours. Prerequisite: undergraduate or graduate introductory course in cell biology (such as Biological Sciences 104), and general biochemistry (Molecular and Cellular Biology 121 or 122) required; restricted to graduate standing or consent of instructor. Fundamental concepts in cell signaling; signaling pathways as related to cell death and a variety of human diseases including cancer, Alzheimer’s, and Parkinson’s. —III. (III.) Goldkorn

290. Seminar (1)
Current topics in pharmacology and toxicology. (S/U grading only.)—I, II, III. (II, II, III)

290C. Advanced Research Conference (1)
Lecture/discussion. Provide credit for participation in and attendance at research conferences. May be repeated three times for credit. (S/U grading only.)—I, II, III, (II, II, III, III, III)

299. Research (1-12)
(S/U grading only.)

Philosophy

[College of Letters and Science]
David Copp, Ph.D., Chairperson of the Department
Department Office. 1240 Social Sciences and Humanities Building 530-752-0703, http://philosophy.ucdavis.edu

Faculty
Aldo Antonelli, Ph.D., Professor
David Copp, Ph.D., Distinguished Professor Cody Gilmore, Ph.D., Associate Professor James R. Grice, Ph.D., Professor Elaine M. Landry, Ph.D., Professor George J. Matthey II, Ph.D., Senior Lecturer Robert May, Ph.D., Professor Roberta Millstein, Ph.D., Professor Bernard Maloney, Ph.D., Associate Professor Marina A. L. Oshana, Ph.D., Professor Adam Sennett, Ph.D., Associate Professor Jan Szafi, Ph.D., Professor

Emeriti Faculty
William H. Bossart, Ph.D., Professor Emeritus Gerald Drwing, Ph.D., Distinguished Professor Emeritus

201. Principles of Pharmacology and Toxicology I (5)
Lecture—3 hours. Prerequisite: Biological Sciences 102 and Neurobiology, Physiology, and Behavior 101. First of three courses presenting fundamental principles of pharmacology and toxicology. Introducory overview of basic concepts in pharmacology and toxicology, followed by in-depth blocks on fate processes of chemicals in the body, fate processes in tissues and selective responses, selective toxicity employed therapeutically.—I. (I.) Puschner, Knirsch

202. Principles of Pharmacology and Toxicology II (4)
Lecture—4 hours. Prerequisite: course 201. The second of three courses presenting fundamental principles of pharmacology and toxicology. Principles of pharmacodynamics and mechanisms of drug/toxicant actions.—II. (II.) Angelastlo, Eiserich

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Domestic Diversity; Writ=Writing Experience
Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences;
ACGH=American Cultures, DD=Domestic Diversity, OL=Oral Skills, QL=Quantitative, SL=Scientific, VL=Visual, WC=World Cultures; Writ=Writing Experience
Graduate Advisers. Obtained by writing to the Graduate Adviser. Ph.D. degrees. Detailed information may be obtained in the Department office. Discussions. Information can be obtained in the Department Activities. The Philosophy department sponsors a lecture series with well-known philosophers who present papers in their fields of expertise. The department also organizes ongoing focus groups and department workshops. Undergraduate students are welcome to attend and join these discussions. Information can be obtained in the Department office.

Graduate Study. The Department of Philosophy offers programs of study leading to the M.A. and Ph.D. degrees. Detailed information may be obtained by writing to the Graduate Adviser.

Graduate Adviser. Cody Gilmore

Courses in Philosophy (PHI)

Lower Division

1. Introduction to Philosophy (4)
   Lecture—3 hours; discussion—1 hour. Problems of philosophy through major writings from various periods. Problems are drawn from political, aesthetic, religious, metaphysical, and epistemological concerns of philosophy. GE credit: ArtHum, Writ | AH, WE, —I, II, III, (I, II, III.)

2. Critical Reasoning (4)
   Lecture—3 hours; discussion—1 hour. Criteria of good reasoning in everyday life and in science. Topics to be covered may include basic principles of deduction and induction; fallacies in reasoning; techniques and aids to reasoning; principles of scientific investigation; aids to clarity. Not open to students who have completed course 6. GE credit: Writ | WE.

7. Philosophical Perspectives on Sexuality (3)
   Lecture—3 hours. Philosophical issues related to sexuality, including, but not limited to, ethical and social issues regarding sexual practice, orientation, classification and identity. GE credit: ArtHum | AH, —II.

11. Asian Philosophy (4)
   Lecture—3 hours; discussion—1 hour. Survey of the main philosophical systems of south and east Asia: Hinduism, Buddhism, Confucianism, and Taoism. Topics include the nature of reality, including God, the universe and the self, human knowledge, and the proper conduct of human life. Offered in alternate years. GE credit: ArtHum, Div, Writ | AH, WC, WE, —I, II, III.

12. Introduction to Symbolic Logic (4)
   Lecture—3 hours; discussion—1 hour. Syntax and semantics of the symbolic language sentence logic. Syntax and semantics of the symbolic language sentence logic. Translation between sentence logic and English. Truth table interpretation of sentence logic. Proof techniques. Application of truth tables and proof techniques to arguments in English. Not open to students who have taken course 112, 113, 134, or 135 and passed with a grade of C or better. GE credit: AH, —I, II, III, (I, II, III.)

13. Minds, Brains, and Computers (4)
   Lecture—3 hours; discussion—1 hour. Contemporary theories of the nature of the mind. The mind as a brain process and as a computer process. Ways in which neuroscience, artificial intelligence and psychology seek to understand mind. GE credit: SciEng or SocSci, Writ | SE, SL, SS, WE. —Molyneux

13G. Minds, Brains, and Computers Discussion (1)
   Discussion—1 hour. Restricted to concurrent enrollment in course 13. Small group discussion and preparation of short papers for course 13. GE credit: WE. —Molyneux

14. Ethical and Social Problems in Contemporary Society (4)
   Lecture—3 hours; discussion—1 hour. Philosophical issues and positions involved in contemporary moral and social problems. Possible topics include civil disobedience and revolution, racial and sex discrimination, environmental protection, technology and human values, sexual morality, freedom in society. GE credit: ArtHum, Div, Writ | AH, WE.

15. Bioethics (4)
   Lecture—3 hours; discussion—1 hour. Critical analysis of normative issues raised by contemporary medical medicine and biology. Possible topics include euthanasia, abortion, reproductive technologies, genetic engineering, practitioner/patient relationships, allocation of medical resources, experimentation on human subjects. GE credit: ArtHum, Writ | AH, WE.

16. Philosophical Foundations of American Democracy (4)
   Lecture—2 hours; discussion—1 hour. The philosophical underpinnings of democratic government and the tension between the goals of providing security and of preserving democracy and civil liberties. Illustration of the tension through focus on issues related to war and terrorism. GE credit: ACGH, AH, WE. —I. Copp

17. Language, Thought, and World (4)
   Lecture—3 hours; discussion—1 hour. Puzzles in the philosophy of language, such as what language is, how language conveys thoughts, whether we each speak our own private language, and what we can learn about the world by studying language. GE credit: SocSci, Writ | SS, WE. —May

21. History of Philosophy: Ancient (4)
   Lecture—3 hours; discussion—1 hour. Survey of Greek philosophy with special attention to the Pre-Socratics, Plato, and Aristotle. GE credit: ArtHum, Writ | AH, WE, —I, II, III, (I, II, III.)

22. History of Philosophy: Early Modern (4)
   Lecture—3 hours; discussion—1 hour. Survey of major figures in philosophy of the seventeenth and eighteenth centuries, with emphasis on Descartes, Hume, and Kant. GE credit: ArtHum, Writ | WC, WE. —II. (II) Mattey

24. Introduction to Ethics (4)
   Lecture—3 hours; discussion—1 hour. Reading of historical and contemporary philosophical works in ethics. Topics include the nature of morality, the justification of major ethical theories, such as consequentialist, deontological, and virtue theories. GE credit: ArtHum, Writ | AH, WE. —II.

30. Introduction to Philosophy of Science (4)
   Lecture—3 hours; discussion—1 hour. Basic problems in the philosophy of science, common to the physical, biological, and social sciences. Analysis of explanation, confirmation theory, observational and theoretical terms, the nature of theories, operationalism and behaviorism, realism, reduction. Not open to credit to students who have taken course 104. GE credit: ArtHum or SciEng, Writ | AH or SE, SL, WE. —Landry, Millstein

31. Approaching Scientific Reasoning (4)
   Lecture—3 hours; discussion—1 hour. Introduction to scientific hypotheses and the kinds of reasoning used to justify such hypotheses. Emphasis on adequate justification, criteria, and strategies for distinguishing scientific from pseudoscientific theories. Concrete historical and contemporary cases. GE credit: ArtHum or SciEng | AH or SE, SL, WE. —Griesemer

32. Understanding Scientific Change (4)
   Lecture—3 hours; discussion—1 hour. Concepts of scientific change in historical and philosophical perspective. Survey of models of growth of knowledge, 17th century to present. Relationship between logic of theories and theory choice. Kuhn’s revolution model. Examples from various sciences. GE credit: ArtHum or SciEng, Writ | AH or SE, WE. —Griesemer

38. Introduction to Philosophy of Biology (4)
   Lecture—3 hours; discussion—1 hour. Non-technical introduction to philosophical, social, and scientific ideas, methods and technologies in contemporary biological fields such as evolution, genetics, molecular biology, ecology, behavior. Philosophical considerations of determinism, reductionism, explanation, theory, modeling, observation, experimentation. Evaluation of scientific explanations of human nature. GE credit: ArtHum, Writ | AH or SE, SL, WE. —Griesemer, Millstein

98. Directed Group Study (1-5)
   Prerequisite: consent of instructor. (P/NP grading only)

99. Special Study for Undergraduates (1-5)
   Prerequisite: consent of instructor. (P/NP grading only)

Upper Division

101. Metaphysics (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: one course in philosophy recommended. Theories of being. Such topics as reality, universals, space, time, causality, becoming, body, experience, persons, freedom, and determinism. Views of the nature and method of metaphysics. Anti-metaphysical arguments. GE credit: ArtHum, Writ | AH, WE. —Gilmore

102. Theory of Knowledge (4)
   Lecture—3 hours; extensive writing or discussion. Prerequisite: one course in philosophy. Analysis of the concept of knowledge. The relation between knowledge, belief and truth. Development of foundational, coherentist and externalist theories of justified belief. Examination of skepticism. GE credit: ArtHum, Writ | AH, WE. —Mattey

103. Philosophy of Mind (4)
   Lecture/discussion—3 hours, term paper. The relation between mind and body, our knowledge of other minds, and the explanation of mental acts. Discussion of such concepts as action, intention, and causation. GE credit: ArtHum, Writ | AH, WE. —Molyneux

104. The Evolution of Mind (4)
   Lecture/discussion—3 hours, term paper. Prerequisite: one previous Philosophy course or instructor permission. The interpretation of human thought and behavior through the lens of evolutionary theory. Topics include the nature/nurture debate concerning
cognitive and other mental capacities and traits, and the interaction between evolution, learning and development. GE credit: SocSci | SS, WE.

105. Philosophy of Religion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in philosophy recommended. Logical, metaphysical, epistemological, and existential aspects of selected religious concepts and problems. GE credit: ArtHum, Writ | AH, WE. — Gilmore, Szaif

107. Philosophy of the Physical Sciences (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in philosophy recommended. Nature of scientific methodology and confirmation of scientific hypotheses; nature of scientific laws, theories, explanations, and models. Problems of causality, determinism, induction, and probability; the structure of scientific revolutions. GE credit: ArtHum, SciEng, Writ | AH; or SE, SL, WE. — Griesser, Millstein

109. Philosophy of the Social Sciences (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in philosophy recommended. The nature of the social sciences, their subject matter and methods. Similarities to and differences from natural and life sciences. Predicting and explaining human behavior. Behavioral reduction, holism, and individualism. Related moral issues. The social sciences and philosophy. GE credit: ArtHum or SocSci, Writ | AH or SS, WE.

111. Philosophy of Space and Time (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course in philosophy recommended. Philosophical problems of space and time. The philosophical implications of space-time theories, such as those of Newton and Einstein. Topics may include the nature of geometry, conventionalism, absolutist versus relationalist views of space and time, philosophical implications of relativity theory. GE credit: AH, WE — Gilmore

112. Intermediate Symbolic Logic (4)
Lecture/discussion—4 hours. Prerequisite: course 12 or consent of instructor. Predicate logic syntax and semantics. Transcription between predicate logic and English. Identity, functions, and definite descriptions. Introduction to concepts of metalogic. GE credit: AH. — II. (LL) Landry, Matthey

113. Metalogic (4)
Lecture/discussion—4 hours. Prerequisite: course 112, Mathematics 108, or the equivalent. The meta-logic of classical propositional and first-order predicate logic. Consistency, soundness and completeness of both propositional and predicate logic. The Löwenheim-Skolem theorem for predicate logic. Undecidability of predicate logic. GE credit: AH. — III. Antonelli

114. History of Ethics (4)
Lecture/discussion—4 hours. Prerequisite: one philosophy course. Study of some classic texts from the history of philosophy examining the ethical problems of the agent’s reasons. GE credit: ArtHum, Writ | AH, WE. — Matthey, Oshana

115. Problems in Normative Ethics (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course in philosophy. Moral philosophy studied through examining ethical problems and the moral principles and common sense intuitions that bear on them. Problems discussed may include: animal rights, fetal rights, euthanasia, justice and health care, war, nuclear deterrence, world hunger, environmental protection. GE credit: ArtHum, Writ | AH, WE. — Matthey, Oshana

116. Ethical Theories (4)
Lecture/discussion—3 hours, term paper. Prerequisite: one course in philosophy; one course in ethics recommended. Study of fundamental concepts and problems in ethics through an examination of classical and contemporary philosophical theories of ethics. Among the theories that may be discussed are utilitarianism, virtue theory, theories of natural rights, Kantian ethics, freedom, and contractualism. GE credit: AH, WE. — Copp

117. Foundations of Ethics (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one of courses 114, 115, 116, 101, or 137. Advanced investigation of questions about the nature and foundations of morality. Among the topics that may be discussed are moral realism and anti-realism, cognitivism and non-cognitivism, types of relativism, moral linguistic and normative language and normative belief. GE credit: AH, WE. — Copp

118. Political Philosophy (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in philosophy. Intensive examination of some central concepts of political thought such as the state, sovereignty, rights, obligations, freedom, law, authority, and responsibility. GE credit: SocSci, Div, Writ | AH, WE. — Oshana

119. Philosophy of Law (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in philosophy or consent of instructor. Philosophical theories of the nature of law, legal obligation, the relation of law and morals. Problems for law involving the implications of expression, privacy, rights, discrimination and fairness, responsibility, and punishment. GE credit: SocSci, Div, Writ | AH, WE. — Oshana

120. Environmental Ethics (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course in philosophy recommended. Nature of art, of artistic creation, of the work of art, and of aesthetic experience; nature and validity of criticism; relations of art to its environment. GE credit: ArtHum, Writ | AH, WE. — Millstein

123. Aesthetics (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course in philosophy recommended. Study of fundamental concepts and positions concerning the nature of formal beauty and the aesthetic function. GE credit: SocSci, Div, Writ | AH, WE. — Oshana

125. Theory of Action (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: one course in Philosophy. Survey of prominent contemporary approaches to leading problems in action theory. Problems include issues about the nature of intentional action and the conceptual character of explanations of actions in terms of the agent’s reasons. GE credit: ArtHum, Writ | AH, WE. — Antonelli

128. Rationality (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: at least one course in philosophy. Philosophical issues and problems concerning rationality in its various forms. Focus is on theoretical and practical reasoning and conditions for rational belief, choice, and action. Possible additional topics include rationality and human limitations, paradoxes of rationality; varieties of irrationality; rationality and objectivity. GE credit: AH. — Antonelli

129. Knowledge and the A Priori (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in philosophy. Self-identified intuition, the innateability and indefeasibility of a priori methods. Analytic, formalist and Kantian accounts of how knowledge can be acquired through reasoning and intuition alone, without recourse to empirical methods. Offered in alternate years. GE credit: AH, WE. — Szaif

131. Philosophy of Logic and Mathematics (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 12 or one course for credit in mathematics. Nature of formal systems and mathematical theories. Selected topics include logical and semantical paradoxes; foundations of mathematics; set theory, type theory, and intuitionistic theory; philosophy of geometry; philosophical implications of Gödel’s incompleteness results. GE credit: AH, WE. — Landry

134. Modal Logic (4)
Lecture/discussion—4 hours. Prerequisite: course 112 or Mathematics 108 or the equivalent. Survey of the main systems of modal logic, including Lewis systems S4 and S5. "Possible worlds" semantics and formal proofs. Applications to epistemology, ethics, or temporality. GE credit: AH. — Antonelli

135. Alternative Logics (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 12, Mathematics 108, or the equivalent. Alternatives to standard truth-functional logic, including many-valued logics, intuitionist logics, relevance logics, and non-monotonic logics. GE credit: AH. — Antonelli

136. Formal Epistemology (4)
Lecture/discussion—4 hours. Prerequisite: course 12. Formal (mathematical) approaches to belief revision, knowledge and deduction, multi-agent epistemic logic, Bayesian confirmation, Bayes nets, epistemic and probabilistic paradoxes. Offered irregularly. GE credit: AH. — I. Molyneux

137A. Philosophy of Language: Theory of Reference (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in philosophy or linguistics. Survey of issues and views concerning reference, or how words refer to things. Topics include names and descriptions, the Fregean reference, the puzzle of non-referring terms, causal theories of reference, and possibility and necessity. Only two units of credit for students who have completed course 137. GE credit: AH, WE. — May, Sennet

137B. Philosophy of Language: Truth and Meaning (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in philosophy or linguistics. Comparative treatment of theories about the relationship between truth and meaning. Topics include: the identification of meaning with truth conditions, the nature of propositional attitude, theories of linguistic understanding, the roles of mind and world in determining meaning. Only two units of credit for students who have completed course 137. GE credit: AH, WE. — May, Sennet

137C. Philosophy of Language: Semantics and Pragmatics (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in philosophy or linguistics. Philosophical issues and theories concerning the meaning and use of language. Topics include the distinction between meaning and implication, the roles of context and convention in language use, speaker meaning versus linguistic meaning and speech act theory. Only two units of credit for students who have completed course 137. GE credit: AH, WE. — May, Sennet

141. Socrates and the Socratic Dialogue (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 21 recommended, or one course in philosophy, or consent of instructor. The philosophy of Socrates as found in the Socratic dialogues of Plato. Topics include the Socratic method, epistemological foundation, and moral purpose; Socratic eutamism and Socratic virtue theory; the paradoxes of Socratic intellectualism. GE credit: AH. WE — Szaif
143. Hellenistic Philosophy (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 21 or other course in philosophy. Consideration of central issues such as meaning/ reference, analytic/ synthetic, reductionism, formal and ordinary language, essential properties, ontological commitment, possible worlds, and influential works by philosophers such as Russell, Moore, Wittgenstein, Austin, Carnap, Quine, Putnam, Kripke, and Frassen. GE credit: AH, WE.—Mattey

145. Medieval Philosophy (4)
Lecture/discussion—4 hours. Prerequisite: course 21 or other course in ancient philosophy. Major philosophers in the Christian, Islamic, and Jewish traditions. Offered in alternate years. GE credit: AH, WE.—Szalai

151. Nineteenth Century European Philosophy (4)
Lecture/discussion—4 hours. Prerequisite: course 22N. Survey of the main movements in nineteenth century philosophy on the European continent. Idealism in Schopenhauer and Hegel, dialectical materialism in Marx, irrationalism in Kierkegaard, Nietzsche and Dostoevsky. Offered irregularly. GE credit: ArtHist | AH, WE.—Mattey

156. Contemporary Analytic Philosophy (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course in philosophy. Consideration of central issues such as meaning/reference, analytic/synthetic, reductionism, formal and ordinary language, essential properties, ontological commitment, possible worlds, influential works by philosophers such as Russell, Moore, Wittgenstein, Austin, Carnap, Quine, Putnam, Kripke, and Frassen. GE credit: AH, WE.—Antonelli

157. Twentieth Century European Philosophy (4)
Lecture/discussion—4 hours. Prerequisite: one course in Philosophy. Survey of the main movements in twentieth century philosophy on the European continent, including phenomenology, existentialism, post-structuralism, and post-modernism. Philosophers covered are Husserl, Heidegger, Sartre, Foucault, Derrida. GE credit: ArtHist | AH, WE.—Mattey

160. Pre-Socratics (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 21. Study of the metaphysical views of such pre-Socratic figures as the Milesians, the Pythagoreans, Heraclitus, Parmenides, Empedocles, Anaxagoras, and the atomists. GE credit: AH, WE.—Szalai

161. Plato (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 21. Examines Plato’s most important contributions to metaphysics, epistemology, psychology, cosmology, ethics and political philosophy. Dialogues will be selected from Plato’s middle and later writings. GE credit: AH, WE.—Szalai

162. Aristotle (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 21. An overview of Aristotle’s most central and influential writings. Topics selected from fields such as metaphysics, physics, ethics, logic, and psychology. GE credit: AH, WE.—Szalai

168. Descartes (4)
Lecture/discussion—4 hours. Prerequisite: course 22N. The philosophical writings of René Descartes. Topics include the refutation of skepticism, the nature and existence of substances, the existence of God, and the foundations of science. Offered irregularly. GE credit: AH, WE.—Mattey

170. Leibniz (4)
Lecture/discussion—4 hours. Prerequisite: course 22N. Survey of the philosophical writings of Gottfried Wilhelm Leibniz. Topics include Leibniz’s logic, the existence of God, human freedom, substance, and the relation between science and metaphysics. Offered irregularly. GE credit: AH, WE.—Mattey

172. Locke and Berkeley (4)
Lecture/discussion—4 hours. Prerequisite: course 22N. Principal metaphysical works of John Locke and George Berkeley. Topics include abstract ideas, existence of matter, primary and secondary qualities, essence, substance, existence of God, and the nature of scientific knowledge. May be repeated for credit. GE credit: AH, WE.—Mattey

174. Hume (4)
Lecture/discussion—4 hours. Prerequisite: course 22N. David Hume’s Treatise of Human Nature and related writings. Topics include empiricism, space, causality, belief, skepticism, the passions, and morality. Offered irregularly. GE credit: AH, WE.—Mattey

175. Kant (4)
Lecture/discussion—4 hours. Prerequisite: course 22N. Immanuel Kant’s Critique of Pure Reason and related writings. Topics include the nature of human cognition, space and time, a priori concepts, substance, causality, and the existence of God. Offered irregularly. GE credit: AH, WE.—Mattey

178. Frege (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in philosophy or permission of instructor. Development of Gottlob Frege’s views about language and logic. Formulation of his grand mathematical idea known as logicism and how it led to the philosophy of language. GE credit: AH, WE.—Mattey

189A. Special Topics in Philosophy (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in the area of the special topic. Special topics in (A) History of Philosophy. May be repeated up to eight units of credit. Offered irregularly. GE credit: AH.

189B. Special Topics in Philosophy (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in the area of the special topic. Special topics in (B) Metaphysics. May be repeated up to eight units of credit. Offered irregularly. GE credit: AH.

189C. Special Topics in Philosophy (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in the area of the special topic. Special topics in (C) Theory of Knowledge May be repeated up to eight units of credit. Offered irregularly. GE credit: AH.

189D. Special Topics in Philosophy (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in the area of the special topic. Special topics in (D) Ethics. May be repeated up to eight units of credit. Offered irregularly. GE credit: AH.

189E. Special Topics in Philosophy (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in the area of the special topic. Special topics in (E) Political Philosophy. May be repeated up to eight units of credit. Offered irregularly. GE credit: AH.

189F. Special Topics in Philosophy (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in the area of the special topic. Special topics in (F) Philosophy of Law. May be repeated up to eight units of credit. Offered irregularly. GE credit: AH.

189G. Special Topics in Philosophy (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in the area of the special topic. Special topics in (G) Aesthetics. May be repeated up to eight units of credit. Offered irregularly. GE credit: AH.

189H. Special Topics in Philosophy (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in the area of the special topic. Special topics in (H) Philosophy of Mind. May be repeated up to eight units of credit. Offered irregularly. GE credit: AH.

189I. Special Topics in Philosophy (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: one course in the area of the special topic. Special topics in (J) Philosophy of Language. May be repeated up to eight units of credit. Offered irregularly. GE credit: AH.

194HA-194HB. Honors Research Project (4-4)
Tutoring—3 hours; term paper. Prerequisite: consent of instructor; open to students who are members of the honors program in Philosophy. Completion of honors research project under direction of an instructor. Consult departmental major adviser for list of instructors available in a given quarter.

198. Directed Group Study (1-5)
(P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

Graduate

200A. Proseminar I (4)
Seminar—3 hours; term paper. Prerequisite: consent of instructor; open only to students in their first quarter of Philosophy Ph.D. program. Intensive study of core works in a selected area of philosophy. Intensive experience in philosophical writing, discussion, and presentation of written work.—I. (I.)

200B. Proseminar II (4)
Seminar—3 hours; term paper. Prerequisite: consent of instructor; only for students in their first quarter of Philosophy Ph.D. program. Intensive study of core works in a selected area of philosophy. Intensive experience in philosophical writing, discussion, and presentation of written work. Limited enrollment.—I. (I.)

201. Metaphysics (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Topics vary from quarter to quarter and may include the following: What are things? Do names refer to things? If so, how? Do things have essential properties? What is the nature of necessity? May be repeated for credit when topic differs and with consent of instructor.—Gilmore

202. Theory of Knowledge (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Topics vary from quarter to quarter. Sample topics include belief, skepticism, justification, externalism, naturalized epistemology. May be repeated for credit with consent of instructor.—Mattey, Molyneux

203. Philosophy of Mind (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Topics in the philosophy of mind such as the mind-body problem, mental representation, consciousness, intentionality. May be repeated for credit with consent of instructor.—Mattey, Molyneux

203P. Philosophy of Mind Practicum (4)
Practicum—12 hours. Prerequisite: consent of instructor. Specific research conducted and prepared for publication by advanced students in a team setting. Topics include knowledge representation and learning in neural networks, the nature and formal properties of mental representation. May be repeated for credit when topic differs and with consent of instructor. (S/U grading only.)

207. Philosophy of Physics (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing in Philosophy Ph.D. program. Intensive treatment of one or more topics in the philosophy of physics, such as foundations of space-time theories, the interpretation of quantum mechan-
ics, or foundations of statistical mechanics. May be repeated for credit when topic differs and with consent of instructor. —Landry

208. Philosophy of Biology (4) Seminar—3 hours, term paper. Prerequisite: graduate standing or consent of instructor. Intensive treatment of one or more topics in the philosophy of biology. Topics may include: causes, explanation, reductionism in biology, sociobiology and cultural evolution. May be repeated for credit when topic differs and with consent of instructor. —Grierse, Millstein

210. Philosophy of Science (4) Seminar—3 hours, term paper. Prerequisite: graduate standing or consent of instructor. Treatment of one or more general topics of current interest in philosophy of science. Topics may include: scientific method, explanation, theories of confirmation, scientific realism, reduction in physics and biology. May be repeated for credit when topic differs and with consent of instructor. —Grierse, Landry, Millstein

212. Philosophy of Logic and Mathematics (4) Seminar—3 hours, term paper. Prerequisite: course 112 or 113 or Mathematics 108 or 125 or the equivalent. Philosophical issues in logic and math. Topics may include nature of logical and mathematical truth or knowledge, correctness of logical systems, foundations of mathematics, metamathematical and epistemological presuppositions, applications to philosophical problems and formalization of philosophical theories. May be repeated for credit when topic differs and with consent of instructor. —Antonelli, Landry

213. Advanced Logic for Graduate Students (4) Lecture/discussion—3 hours; extensive problem solving. Prerequisite: graduate standing in Philosophy. Enrollment in the Philosophy Ph.D. program. Intensive study of advanced logic, including set theory, metatheory of predicate logic, and modal logic. May be repeated two times for credit when topic differs—1, II, Antonelli, Matvey

214. Ethics (4) Seminar—3 hours, term paper Prerequisite: graduate standing in philosophy or consent of instructor. Topics may include moral and natural law, morality and justice, ethical theory, and topics in moral and political philosophy. Topics vary from quarter to quarter. May be repeated for credit when topic differs and with consent of instructor.—Copp, Oshana

217. Political Philosophy (4) Seminar—3 hours, term paper. Prerequisite: graduate standing or consent of instructor. Advanced studies in political philosophy. Topics vary but may include distributive justice, enforcement of moral laws and social contract theory. May be repeated for credit when topic differs and with consent of instructor.—Copp, Oshana

220. Environmental Ethics (4) Lecture—3 hours, term paper. Prerequisite: graduate standing or consent of instructor. Intensive treatment of one or more topics in environmental ethics, such as biodiversity, sustainability, the composition of the moral community, invasive species, endangered species, applications of ethical theories to contemporary environmental issues.—Millstein

237. Philosophy of Language (4) Seminar—3 hours, term paper. Prerequisite: graduate standing or consent of instructor. Study of philosophical issues raised by language, such as the nature of semantic content, proper semantics for verbs of propositional attitude, feasibility and limitations of formal semantics and pragmatics for natural languages. May be repeated for credit when topic differs and with consent of instructor.—May, Sennet

238. Philosophy of Language Workshop (4) Seminar—3 hours; extensive writing. Discussion of recently published, unpublished and in-progress research on the philosophy of language, including work on the relation of language and mind, and language and logic, and linguistic theory. Open to graduate students only. May be repeated for credit when topic differs.—Landry

261. Plato (4) Seminar—3 hours, term paper. Prerequisite: graduate standing or consent of instructor. Advanced seminar designed for analysis of arguments, doctrines, and texts from Plato’s works. Methods of argumentation and interpretation are especially stressed. Topics vary according to instructor. May be repeated for credit with consent of instructor.—Szaif

262. Aristotle (4) Seminar—3 hours, term paper. Prerequisite: graduate standing or consent of instructor. Advanced seminar designed for analysis of arguments, doctrines, and texts from Aristotle’s works. Methods of argumentation and interpretation are especially stressed. Topics vary according to instructor. May be repeated for credit with consent of instructor.—Szaif

275. Kant (4) Seminar—3 hours, term paper. Prerequisite: graduate standing in philosophy or consent of instructor. Intensive study of a topic in the philosophy of Kant, in such areas as metaphysics, theory of knowledge, ethics. May be repeated for credit with consent of instructor. —Matvey, Szaif

298. Group Study (1-5) (S/U grading only)

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.—I, II, III, J, I, II, III.)

[College of Letters and Science]

W.J. Weidner, Ph.D., Program Director

Program Office. 264 Hickey Gymnasium

530-752-1111

Committee in Charge

Keith Baer, Ph.D. (Neurobiology, Physiology, and Behavior)
G. Robert Biggs, B.A. (Physical Education)
Stephen T. Bronzan, M.S. (Physical Education)
Barbara A. Jahn, M.S. (Physical Education)
Samantha Lazar, Ph.D. (Chemistry)
Academic Senate Distinguished Graduate Mentoring Award
John Lavallée, M.Ed. (Physical Education)
Maryclare Robinson M.S. (Physical Education)
W.J. Weidner, Ph.D. (Neurobiology, Physiology, and Behavior)

Faculty

G. Robert Biggs, B.A., Supervisor
Barbara A. Jahn, M.S., Supervisor

Affiliated Faculty

Carissa Adams, Ph.D., Lecturer
Alex Antipa, B.S., Lecturer
Steven T. Bronzan, M.S., Lecturer/Assistant Director
Greg Chapla, B.A., Lecturer
Kevin Daft, M.Ed., Lecturer/Coach
Rozanne DeWeese, M.A., Lecturer
Steven Donahue, Ph.D., Lecturer
Adam Getchell, M.S., Lecturer
Ron Gould, B.A. Lecturer/Coach
Yair Levin, B.S., Lecturer

Jennifer Gross, M.A., Lecturer/Coach
Rick Henderson, B.S., Lecturer
Kathryn Henwood, M.A., Lecturer/Coach
Tiffany Hausman, B.S., Lecturer/Coach
Mark Johnson, M.S., Lecturer
Twila Kaufman, M.A., Lecturer/Coach
Andrea Knoe, B.S., Lecturer
John Lavallée, M.Ed., Lecturer/Coach
Darryl Lee, M.S., Lecturer
James Leis, B.S. Lecturer/Coach
Daniel Leyson, M.A., Lecturer/Coach
Ron Manara, B.A., Lecturer
Bill Mize, M.A., Lecturer/Coach
Peter Motekaitis, M.A., Lecturer/Coach
Kevin Nosek, M.S., Lecturer/Coach
Maryclare Robinson, M.S., Lecturer
Anthony Schiliano, B.A. Lecturer/Coach
Dwayne Shaffer, M.A., Lecturer/Coach
Sandy Simpson, M.S., Lecturer
Eric Stellmayer, J.D., Lecturer/Coach
Danielle Stines, M.S, Lecturer/Coach
Anna Temple, B.A., Lecturer/Coach
Lisa Yarnum, B.S., Athletic Trainer/ Lecturer
Matt Yaughn, M.A., Lecturer/Coach
Andrew Wartenburg, B.A. Lecturer/Coach
Robert Watts, M.A., Lecturer/Coach
Cy Williams, M.A., Lecturer/Coach
Jamey Wright, J.D., Lecturer/Coach
Karen Yoder, M.A., Lecturer/Coach
Karen Zufelt, Ph.D, Lecturer

The Program of Study

The Program in Physical Education facilitates the development and offering of non-major courses related to physical activities and education, fitness and health, athletic training, teacher education, and organized sport. The Program is available as part of a student’s general educational experience to enhance and broaden the understanding and experience of physical activity in the maintenance of lifetime health and fitness.

The basic activities series includes Physical Education 1, fitness, lifetime, and sports skills. The PE I activity courses are instructional in nature, designed to introduce new skills to beginners or to improve existing skills. Physical Education 6 is offered for students participating in intercollegiate athletics. Additional lower division courses include those in special skill areas, such as life-saving and water safety, health and fitness, and athletic training. Upper division courses include advanced classes in coaching, sociology of sports, and a series of courses that meet the mandated requirements for students pursuing teacher preparation and certification.

Teaching Credential Subject Representative. W.J. Weidner

Class and Recreational Use of Facilities. The instructional fee payable by all students participating in intercollegiate athletics. The registration entitles students to the use of the gymnasium, pool, showers, lockers, tennis courts, and athletic fields. Equipment for games and sports is available for classes. Lockers must be turned in on the last day of class, i.e., before the final examination period. Fines are imposed for each formal transaction necessitated by failure of the student to comply with the regulations of the program.

Courses in Physical Education (PHE)

Lower Division

1. Physical Activities (0.5)

Laboratory—2 hours. Sections in: (a) sports skills, rules and strategy; (b) physical fitness and personal health; (c) recreation; (d) aerobic dance. May be repeated along with course 6 for a combined total of 6 units. (P/NF grading only.)—I, II, III, J, II, III.

6. Preparation and Participation in ICA Competition (1)

Discussion/labouratory—10:20 hours. Prerequisite: consent of instructor (coach). Preparation and participation in Intercollegiate Athletics. Development of fundamental and advanced individual and team skills. Development of knowledge of rules and strategy.
Advanced sports competition and Conference and NCAA levels. May be repeated along with course 1 for a combined total of 6 units. (P/NP grading only)—I, II, III. (I, II, III)

7. Professional Physical Education Activities: Men and Women (1)
Lecture—1 hour, or laboratory—2 hours. Fundamental skills for a coaching competitive athletics classroom teaching and coaching, and classroom teaching and officiating. May be repeated for a total of six units. —I, II, III. (I, II, III)

8. Student-Athlete Life Skills (1)
Lecture—1 hour. Prerequisite: consent of instructor. Open to intercollegiate student-athletes. Balancing academic and athletic demands. Academic, psychological, and social-cultural issues which influence success as a college student-athlete. (P/NP grading only)—I, II, III.

15. Administration of Intramural Sports (2)
Lecture—2 hours. Planning and administering intramural sports programs at the high school and college level.

25. Theory of Lifesaving and Water Safety (2)
Lecture—1 hour; laboratory—2 hours. Prerequisite: swimming and no physical handicap that would render student unable to perform the required skills and ability to pass preliminary swimming test. Provides the student with the knowledge, organization, procedures, and skill development necessary to provide for water safety and save his/her own life or the life of another in an aquatic emergency. (American Red Cross Advanced Lifesaving Certificate awarded upon successful completion of necessary requirements.)—III. (III) Jahn

27. Training Course for Water Safety Instructors (2)
Lecture—1 hour, laboratory—2 hours. Prerequisite: advanced swimming (course 1) or consent of instructor; course 5 and current American Red Cross Water Safety Instructor Certificate. Theoretical knowledge and practical experience necessary for the organization and teaching of swimming and lifesaving classes. (American Red Cross Water Safety Instructor’s Certificate awarded upon successful completion of necessary requirements.)—III. (III) Jahn

40. Drugs and Society (2)
Lecture—2 hours; fieldwork—2 hours total; filmviewing—5 hours total. Pharmacology, methods of use, and effects of use of psychoactive and performance-enhancing drugs. Historical overview of drug use. Identification of “at-risk” and “use” populations. (P/NP grading only)—I, II, III. (IV)

44. Principles of Healthful Living (2)
Lecture—2 hours. Application of scientific and empirical knowledge to personal, family, and community health problems. (P/NP grading only)—I, II, III. (IV)

92. Physical Education Internship (1-5)
Internship—3-15 hours; written project proposal and evaluation. Prerequisite: consent of instructor; enrollment dependent upon availability of intern positions, with priority given to Exercise Biology majors. Work experience in the application of physical activity programs to teaching, recreational, clinical or research situations under department faculty supervision. May be repeated for a total of 12 units (including course 92) but no internship units will be counted toward Exercise Science major. May be repeated one time for credit. (P/NP grading only).

97TC. Tutoring in the Community (1-5)
Tutoring—2-15 hours; discussion—1 hour. Prerequisite: lower division standing and consent of Program Director. Tutoring of students in lower division physical activity courses. Weekly meetings with instructor in charge of courses. Written reports on methods and materials required. May be repeated one time for credit. (P/NP grading only)

977TC. Tutoring in the Community (1-5)
Tutoring—2-15 hours; discussion—1 hour. Prerequisite: lower division standing and consent of Program Director. Tutoring of students in lower division physical activity courses. Weekly meetings with instructor in charge of courses. Written reports on methods and materials required. May be repeated one time for credit. (P/NP grading only)

144. Principles of Health Education (2)
Lecture—2 hours. Prerequisite: course 44 and upper division standing or consent of instructor. Principles of teaching health education in the public schools. (P/NP grading only).

150. Recreation in the Community (3)
Lecture—2 hours; discussion—1 hour; two Saturday field trips—8 hours. The nature and scope of community recreation programs in California emphasizing low income, highly populated areas, and poor rural communities.

192. Physical Education Internship (1-2)
Internship—3-36 hours; written project proposal and evaluation. Prerequisite: upper division standing and consent of instructor; enrollment dependent on availability of intern positions, with priority given to Exercise Science majors. Work experience in the application of physical activity programs to teaching, recreational, clinical or research situations under department faculty supervision. May be repeated for a total of 12 units (including course 92) but no internship units will be counted toward Exercise Science major. (P/NP grading only)—I, II, III. (I, II, III)

197T. Tutoring in Physical Education (1-5)
Tutoring—2-15 hours; discussion—1 hour. Prerequisite: upper division standing and consent of Department Chairperson. Tutoring in the community in physical education related projects under the guidance of the Physical Education faculty. Regular meetings with instructor in charge and written report required. May be repeated one time for credit. (P/NP grading only).

197TC. Tutoring in the Community (1-5)
Tutoring—2-15 hours; discussion—1 hour. Prerequisite: upper division standing and consent of Department Chairperson. Tutoring in the community in physical education related projects under the guidance of the Physical Education faculty. (P/NP grading only)—I, II, III. (I, II, III)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Professional

300. The Elementary Physical Education Program (3)
Lecture—1 hour; laboratory—2 hours. Prerequisite: consent of instructor. Restricted to senior standing or credential student. Introduction to principles, theories, materials, and practices of elementary school physical education program. —III. (III)

380. Methods of Teaching Physical Education (3)
Lecture—1 hour; laboratory—6 hours. Prerequisite: course 142 and six units of course 7; or consent of instructor. The methods of teaching group and individual activities for grades K-12; program planning, class management, organization, and evaluation. (P/NP grading only).

Physical Medicine and Rehabilitation

See Medicine, School of, on page 396.
Physics

[College of Letters and Science]

Andreas Albrecht, Ph.D., Professor
Robert H. Becker, Ph.D., Professor
Patricia C. Boeshaar, Ph.D., Senior Lecturer
Robert H. Becker, Ph.D., Professor
Faculty

Academic Senate Distinguished Teaching Award

The Department of Physics offers a Bachelor of Arts in Physics and two Bachelor of Science degree programs: in Physics (which also offers an emphasis in Astrophysics), and in Applied Physics. The A.B. degree provides a broad coverage of classical and modern physics while permitting a broader liberal arts education than is possible with the other two programs. The B.S. degree in either Physics or Applied Physics should be followed by the student who plans to enter physics as a profession, and also provides excellent training for a wide variety of technical career options. The B.S. in Applied Physics provides the student with a solid introduction to a particular applied physics specialty. For the student who plans to enter the job market upon completing a B.S. degree, the applied physics orientation would be an asset. Either B.S. program provides a solid foundation in physics for the student interested in graduate work in either pure or applied physics.

Career Alternatives. Careers in physics and applied physics include research and development, either in universities, government laboratories, or industry; teaching in high schools, junior colleges, and universities; management and administration in industrial laboratories and in government agencies; and in production and sales in industry. A major in physics also provides a strong base for graduate-level work in such interdisciplinary areas as chemical physics, biophysics and medical physics, geophysics and environmental physics, astrophysics and astronomy, computer science, and materials science.

Physics

A.B. Major Requirements:

Preparatory Subject Matter: 41-47

Physics 9A, 9B, 9C, 9D or 9HA, 9HB, 9HC, 9HD, 9HE: 19-25
Mathematics 21A, 21B, 21C, 21D, 22A, 22B: 22

Depth Subject Matter: 35-37

At least one course from: 129A, 130A, 140A, 151, 152, or 153: 4
Physics 102 (1 unit) waived if 104B taken: 0
At least one additional fixed-unit upper division Physics course excluding 160: 3-4

Total Units for the Major: 76-84

B.S. Major Requirements:

Preparatory Subject Matter: 50-56

Physics 9A, 9B, 9C, 9D or 9HA, 9HB, 9HC, 9HD, 9HE: 19-25
Mathematics 21A, 21B, 21C, 21D, 22A, 22B: 22

Depth Subject Matter: 38-40

At least one course from: 129A, 130A, 140A, 151, 152, or 153: 4
Physics 102 (1 unit) waived if 104B taken: 0

Total Units for the Major: 76-84

Applied Physics

B.S. Major Requirements:

Preparatory Subject Matter: 49-56

Physics 9A, 9B, 9C, 9D or 9HA, 9HB, 9HC, 9HD, 9HE: 19-25
Mathematics 21A, 21B, 21C, 21D, 22A, 22B: 22

Dependence on area of concentration:

Chemistry 2A or 2HA (2B-2C or 2HB-2HC highly recommended)

Computer Science Engineering 30 or equivalent programming course:

Total Units for the Major: 76-84

Dependence on area of concentration:

Astronomy 25

Further courses from approved lists within one of the following concentrations chosen in consultation with a major adviser:

Quarter Offered: Fall, Winter, Spring, Summer

Pre-Fall 2011 General Education (GE): FLD=Foreign Language, ART=Arts and Humanities, SCI=Science and Engineering, SS=Social Sciences, COM=Communication, HUM=Humanities

Fall 2011 and on Revised General Education (GE): Arts and Humanities, SCI=Science and Engineering, SS=Social Sciences, WRT=Writing Experience
25. Introduction to Modern Astronomy and Astrophysics (4)

Lecture—3 hours; discussion—2.5 hours. Prerequisite: good facility in high school physics and mathematics (algebra and trigonometry). Description and interpretation of astronomical phenomena using the laws of modern physics and observations by modern astronomical instruments. Gravity, relativity, electromagnetic radiation, atomic and nuclear processes in relation to the structure and evolution of stars, galaxies and the universe. Not open to students who have received credit for course 25, 10G, or 10L. GE credit: SciEng | SE; SL, VL—II. (I.) Fassnacht, Lubin

Courses in Physics (PHY)

Physics 10 is primarily a concept-oriented one-quarter lecture/discussion course requiring relatively little mathematical background.

Physics 1 is a two-quarter sequence requiring some mathematical understanding. Physics I alone or both quarters may be taken. The sequence is not intended to satisfy entrance requirements of a year of physics for professional schools, but will satisfy requirements of 3 or 6 units of physics.

Physics 7 is a one-year (three-quarter) introductory physics course with laboratory intended for students majoring in the biological sciences. It has a calculus prerequisite. If you don’t want a full year of introductory physics, you should take one or two quarters of Physics 1 instead. Read the following information carefully if you are using Physics 7 to complete an introductory course you have already begun.

The sequence of material in Physics 7 is different from that in most traditionally taught introductory physics courses. Physics 7B is most like the first quarter or semester of traditionally taught courses which treat classical mechanics. Physics 7C is most like the last quarter or semester of traditionally taught courses, treats optics, electricity and magnetism, and modern physics. The content and sequence of Physics 7A is unlike that of most other traditionally taught courses.

If you have completed one introductory quarter or semester of a traditionally taught physics course and want to continue with Physics 7, you should first take (and will receive full credit for) Physics 7A. Then, either skip 7B, but self-study the last three weeks of material, or take 7B and receive reduced credit. Finally, take 7C for full credit.

If you have taken two quarters of a year-long introductory physics course and have not had extensive work in optics, electricity, magnetism, and modern physics, you should take Physics 7C. In no case should you take Physics 7B without first taking Physics 7A. All other situations should be discussed directly with an instructor.

Students not intending to take the entire sequence should instead take Physics 1.

Physics 9 is a four-quarter sequence using calculus throughout and including laboratory work as an integral component. The course is primarily for students in the physical sciences and engineering.

Physics 9H is a five-quarter honors physics sequence, which may be taken instead of Physics 9. It is intended primarily for first-year students with a strong interest in physics and with advanced placement in mathematics. Information: Mathematics 21B. Students who plan to major in physics, and also motivated non-majors, should take Physics 9H instead of Physics 9 if they are ready to begin MAT218 in fall quarter.

In course requirements and prerequisites, Physics 9HA-9HE can be substituted for Physics 9A-9D. Students not intending to take the entire sequence should instead take Physics 1.

26. Lower Division

10C. Introduction to Stars, Galaxies, and the Universe (3)

Lecture—3 hours. Non-mathematical introduction to astrophysics of the Universe beyond our solar system using concepts of modern physics. Not open for credit to students who have taken Astronomy 2, the former Astronomy 10, any quarter of Physics 9 or 9H, or any upper-division physics course (other than 137 or 160). GE credit: SciEng | SE; SL, VL—II, III. (I, II, III)

10L. Observational Astronomy Laboratory (1)

Laboratory—2.5 hours. Prerequisite: course 10G or 10S (may be taken concurrently). Introduction to observations of the night sky using small telescopes in the nighttime laboratory. Not open for credit to students who have completed course 2 or 10GE. GE credit: SciEng | SE; SL, VL—II, III. (I, II, III)

10S. Astronomy of the Solar System (1)

Lecture—3 hours. Introduction to naked eye and telescopic observations of objects in the night sky: positions of sun, moon, planets throughout the year. Historical perspective on how our understanding of the solar system evolved to current non-mathematical astronomical understanding of planetary systems. Not open for credit to students who have taken course 2, Physics 9 or 9H, or any upper-division physics course (other than 137 or 160). GE credit: SciEng | SE; SL, VL—II, III. (I, II, III)

1A. Principles of Physics (1)

Lecture—3 hours. Prerequisite: trigonometry or concept of instruction. Mechanics. Introduction to general principles and analytical methods used in physics with emphasis on applications in applied agricultural and biological sciences and in physical education. Not open to students who have received credit for course 1B, or 9A. GE credit: SciEng | SE—II. (I.)

1B. Principles of Physics (3)

Lecture—3 hours. Prerequisite: course 1A or 9A. Continuation of course 1A. Heat, optics, electricity, modern physics. Not open for credit to students who have received credit for course 1B, 7C, 9B, 9C, or 9D. GE credit: SciEng | SE—II. (II.)

7A. General Physics (4)

Lecture—1 hour; discussion/laboratory—5 hours. Prerequisite: completion or concurrent enrollment in Mathematics 168, 178, or 21B. Introduction to general principles and analytical methods used in physics for students majoring in a biological science. Only two units of credit allowed to students who have completed course 7A. GE credit: SciEng | SE—II, III. (I, II, III, IV)

7B. General Physics (4)

Lecture—1 hour; discussion/laboratory—5 hours. Prerequisite: course 7A. Continuation of course 7A. Only two units of credit allowed to students who have completed course 9C or 5C. GE credit: SciEng | SE—II, III. (I, II, III, IV)

9A. Classical Physics (5)

Lecture—3 hours; laboratory—2.5 hours; discussion—1 hour. Prerequisite: Mathematics 21B. Introduction to general principles and analytical methods used in physics for physical science and engineering majors. Classical mechanics. Not open for credit to students who have completed course 1A or 7B. Not open for credit to students who have completed course 9HA. GE credit: SciEng | SE—II, III. (I, II, III)

9B. Classical Physics (5)

Lecture—3 hours; laboratory—2.5 hours; discussion—1 hour. Prerequisite: course 9A. Mathematics 21C, 21D (may be taken concurrently). Continuation of course 9A. Fluid mechanics, thermodynamics, wave phenomena, optics. Only 2 units of credit to students who have completed course 7A. Not open for credit to students who have completed course 9HB, 9HC, or Engineering 105. GE credit: SciEng | SE—II, III. (I, II, III)

9C. Classical Physics (5)

Lecture—3 hours; discussion—1.5 hours. Prerequisite: course 9C and Mathematics 22A; Mathematics 22B recommended (may be taken concurrently). Introduction to physics concepts developed since 1900. Special relativity, quantum mechanics, atoms, molecules, condensed matter, nuclear and particle physics. Not open for credit to students who have completed course 9HB, 9HC, or 9HE. GE credit: SciEng | SE—II, III. (I, II, III)

9D. Modern Physics (4)

Lecture—3 hours; discussion—1.5 hours. Prerequisite: course 9D and Mathematics 22A; Mathematics 22B recommended (may be taken concurrently). Continuation of course 9A and 9B. GE credit: SciEng | SE—II, III. (I, II, III)

9HA. Honors Physics (5)

Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: Mathematics 21B (may be taken concurrently) or consent of instructor. Classical mechanics. Some material as course 9A in greater depth. For students in physical sciences, mathematics, and engineering. Only 2 units of credit to students who have completed course 7B. Not open for credit to students who have completed course 9HA. GE credit: SciEng | SE—II. (I.)

9HB. Honors Physics (5)

Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: Physics 9HA or 9A. Mathematics 21C (may be taken concurrently). Special relativity, ther-
ual physics. Continuation of course 9HA. Only 2 units of credit to students who have completed course 2A. Not open to students who have completed course 9B or 9D. GE credit: SciEng | SE.—II. (II.)

9HC. Honors Physics (5)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: courses 9HA and Mathematics 21D. Electricity and magnetism. Continuation of Physics 9HC. Not open for credit to students who have completed course 9C. GE credit: SciEng | SE.—I. (I.)

9HD. Honors Physics (5)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: course 9HD and Mathematics 21D. Electricity and magnetism. Continuation of Physics 9HC. Not open for credit to students who have completed course 9C. GE credit: SciEng | SE.—II. (II.)

9HE. Honors Physics (5)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: course 9HD and Mathematics 228 (may be taken concurrently). Application of quantum mechanics. Not open for credit to students who have completed course 9D. GE credit: SciEng | SE.—II. (II.)

10. Topics in Physics for Nonscientists (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: high school algebra. Emphasis varies: survey of basic principles or a deeper exploration of some particular branch. Past topics included black holes, space time, and relativity; physics of music; history and philosophy; energy and the environment; and natural phenomena. Lecture to back with the Department office for the current emphasis. No units of credit allowed if taken after any other physics course. GE credit: SciEng, Wrt | SE.

12. Visualization in Science (3)
Lecture—3 hours; Class size limited to 20-50 stu-
dents. Production, interpretation, and use of images in physics, astronomy, biology, and chemistry as sci-
entific evidence and for communication of research results. GE credit: VL.—I. (I.)

13. Mathematical Physics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 16A or 21A. Modern ideas about the unify-
ing ideas of fractal geometry, chaos and complexity. Basic theory and applications with examples from physics, earth sciences, mathematics, population dynamics, ecology, history, economics, biology, computer science, art and architecture. Offered in alternate years. Course as Geology 30G. GE credit: SciEng | GL, SE.—II. (II.)

14. Special Study for Undergraduates (1-5)
Prerequisite: instructor. (May be taken concurrently.) Not open to students who have completed course 104B or 105AL. GE credit: S SciEng | E.—I. (I.)

104A. Introductory Methods of Mathematical Physics (4)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: courses 9B, 9C, 9D and Mathematics 21D, 22A, and 228 with grade C- or better or consent of instructor. Introduction to the mathematics used in upper-division physics. Study of vector spaces, Fourier analysis, partial differential equations.—I. (I.)

104B. Computational Methods of Mathematical Physics (4)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: course 104A with grade C- or better and course 105A or consent of instructor. Introduction to the use of computational techniques to solve the mathematical problems of advanced physics courses, complementing the analytical approaches emphasized in course 104A. GE credit: SciEng | SE.—II. (II.)

104C. Intermediate Methods of Mathematical Physics (4)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: course 104A with grade C- or better or consent of instructor. Applications of complex analysis, conditional probability, moment approximations and other advanced topics. Offered in alternate years.—III. (III.)

105A-105B. Analytical Mechanics (4-4)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: courses 104A, 21A, 22A, and 228 with grade C- or better, or consent of department; course 104A and 105A passed with a grade C- or better, or consent of department required for 105B. Principles and applications of Newtonian mechanics; introduction to Lagrange’s and Hamilton’s equations. GE credit: SciEng | SE.—II. (II.)

105C. Continuum Mechanics (4)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: courses 104A and 105A passed with a grade of C- or better, or consent of department. The continuum hypothesis and limitations, tensors, isotropic constitutive equations, and wave propagation. Applications such as elastic solids, heatflow, aerodynamics, and ocean waves. Offered irregularly. GE credit: SciEng | SE.—III. (III.)

108. Optics (3)
Lecture—3 hours. Prerequisite: course 9 or 7 and Mathematics 21D, 22A, and 228 with grade C- or better, or consent of department. Theory of electro-
sotatics, electromagnetism, Maxwell’s equations, electromagnetic waves. GE credit: SciEng | SE.—II. (II.)

110A. Electricity and Magnetism (4)
Lecture—3 hours. Prerequisite: courses 9B, 9C, 9D and Mathematics 21D, 22A, and 228 with grade C- or better, or consent of department. Theory of electro-
sotatics, electromagnetism, Maxwell’s equations, electromagnetic waves. GE credit: SciEng | SE.—II. (II.)

110B. Electricity and Magnetism (4)
Lecture—3 hours. Prerequisite: courses 104A and 105A with a grade of C- or better or consent of department. Theory of electrostatics, electromag-
netism, Maxwell’s equations, electromagnetic waves. GE credit: SciEng | SE.—III. (III.)

110C. Electricity and Magnetism (4)
Lecture—3 hours. Prerequisite: course 110B with a grade of C- or better, or consent of department. The-
ory of electrostatics, electromagnetism, Maxwell’s equations, electromagnetic waves. GE credit: SciEng | SE.—I. (I.)

112. Thermodynamics and Statistical Mechanics (4)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: course 115A or the equivalent. Introduction to classical and quantum statistical mechanics and their connections with thermodynamics. The theory is developed for the ideal gas model and simple magnet-
netic models and then extended to studies of solids, quantum fluids, and chemical equilibria. GE credit: SciEng | SE.—I. (I.)

115A. Foundation of Quantum Mechanics (4)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: courses 104A and 105A passed with a grade of C- or better, or consent of department. Introduction to the methods of quantum mechanics with applications to atomic, molecular, solid state, nuclear and elementary particle physics. GE credit: SciEng | SE.—III. (III.)

115B. Applications of Quantum Mechanics (4)
Lecture—3 hours; discussion/laboratory—4 hours. Prerequisite: course 115A passed with a grade of C- or better, or consent of department. Angular momentum and spin; hydrogen atom; introduction to pertur-
bation theory; scattering theory. GE credit: SciEng | SE.—I. (I.)

116A. Electronic Instrumentation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 9C, 9E and Math 228 or consent of instructor. Experimental and theoretical study of important ana-
log electronic circuits. Linear circuits, transmission lines, input impedance, feedback, amplifiers, oscilla-
tors, noise. GE credit: SciEng | VL.—I. (I.)

116B. Electronic Instrumentation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 9C or 9HD or consent of instructor. Continua-

116C. Introduction to Computer-Based Experiments in Physics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 9D or 9HD, 116B, Mathematics 228 or consent of instructor. Introduction to techniques for mak-
ing physical measurements using computer-based instrumentation. GE credit: SciEng | SE, WE.—III. (III.)

127A. Advanced Laboratory in Condensed Matter Physics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 9D or 9HD, 9C, 9D and 116B or consent of instruc-
tor. Experimental techniques and measurements in solid-state physics. Student performs three to six experiments depending on difficulty. Individual work is stressed. Thorough write-ups of the experiments are required. GE credit: SciEng | SE, WE.—III. (III.)

127B. Advanced Laboratory in Particle Physics (4)
Lecture—4 hours. Prerequisite: course 104A, 105A, 110B, 115A and 112 (may be taken concur-ently) or consent of the department. Experimental techniques and measurements in nuclear and parti-
cle physics. Students perform three to six experi-
ments depending on difficulty. Individual work is stressed. Thorough write-ups of the experiments are required. GE credit: SciEng | SE, WE.—II. (II.)

123. Signals and Noise in Physics (4)
Lecture—3 hours; project—1 hour. Prerequisite: courses 9A, B, C, D and 104A, or consent of instruc-
tor. Techniques of measurement and analysis designed to avoid systematic error and maximize...
signal/noise ratio. Illustrative examples of optimal filters ranging from condensed matter to cosmology.

Survey of basic nuclear properties and concepts requiring introductory knowledge of quantum mechanics: nuclear models and forces, radioactive decay and nuclear reactions, alpha, beta and gamma decay. GE credit: SciEng | SE.—III. (Ill.) Tyson

129A. Introduction to Nuclear Physics (4)
Lecture—3 hours. Prerequisite: course 115A passed with a grade of C- or better or consent of instructor. Survey of basic nuclear properties and concepts ranging from condensed matter to cosmology. Nuclear reactions, neutrons, fission, fusion, accelerators, introduction to meson and particle physics, nuclear astrophysics, and applications of nuclear physics and techniques to mass spectrometry, nuclear medicine, trace element analysis. Offered irregularly. GE credit: SciEng | SE.

130A-130B. Elementary Particle Physics (4-4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 115A passed with a grade of C- or better or consent of instructor. Properties and classification of elementary particles and their interactions. Experimental techniques. Conservation laws and symmetries. Strong, electromagnetic, and weak interactions. Introduction to Feynman calculus. GE credit: SciEng | SE.—I, II, III. (I, II, III.)

140A-140B. Introduction to Solid State Physics (4-4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 115A or the equivalent passed with a grade of C- or better or consent of instructor. Survey of fundamental ideas in the physics of solids, with selected device applications. Crystal structure, x-ray and neutron diffraction, phonons, single metals, energy bands and Fermi surfaces, semiconductors, optical properties, magnetism, superconductivity. GE credit: SciEng | SE.—II, III. (II, III.)

150. Special Topics in Physics (4)
Lecture—3 hours; project. Prerequisite: courses 9A, B, C, D or 9HA, HB, HC, HD, HE or consent of instructor. Topics vary, covering areas of contemporary research in physics. May be repeated for credit. Offered irregularly. GE credit: SciEng | SE.—I, II, III. (I, II, III.)

151. Stellar Structure and Evolution (4)
Lecture—3 hours; project. Prerequisite: courses 9A, B, C, D or consent of instructor. The chemical composition, structure, energy sources and evolutionary history of stars, will be emphasized on both the observational data and theoretical models, including black holes, neutron stars and white dwarfs and the formation of substellar masses. Offered in alternate years. GE credit: SciEng | SE.—I, II, III. (I, II, III.)

152. Galactic Structure and the Interstellar Medium (4)
Lecture—3 hours; project. Prerequisite: courses 9A, B, C, D and 105A concurrently or consent of instructor. The structure of the Milky Way galaxy, viz. its shape and size, the nature of the interstellar medium, stellar populations, rotation curves, gravitational potentials, and evidence of dark matter. Offered in alternate years. GE credit: SciEng | SE.—I. Boeshaar, Knox

153. Extragalactic Astrophysics (4)
Lecture—3 hours; project. Prerequisite: courses 9A, B, C or 105A or consent of instructor. Structure and evolution of galaxies and clusters of galaxies, including distance and mass determination, galaxy types and environments, active galactic nuclei and quasars, galactic evolution, lensing and dark matter, global cosmological properties. Not open to students who have completed course 127. Offered in alternate years. GE credit: SciEng | SE.—II. Fassnacht

154. Astrophysical Applications of Physics (4)
Lecture—2 hours; project. Prerequisite: course 105AB, 110A; 110B and 115A concurrently; 112 or consent of instructor. Applications of classical and quantum mechanics, thermodynamics, statistical mechanics, and electricity and magnetism to astrophysical systems, including Big Bang, degenerate white dwarf and neutron stars, and solar neutrinos. Not open to students who have completed this course previously as course 198. Offered in alternate years. GE credit: SciEng | SE.—I, II, III, II, III. (I, II, III, II, III.)

155. General Relativity (4)
Lecture—3 hours; project. Prerequisite: course 104A and 105A; 105B and 110A or consent of instructor. Definition of the mathematical framework for the description of the gravitational field, introduction of the dynamical equations of Einstein governing its evolution and review of the key solutions, including black holes and expanding universes. Offered in alternate years. GE credit: SciEng | SE.—II. (II.) Kaloper

156. Introduction to Cosmology (4)
Lecture—3 hours; project. Prerequisite: courses 9A, B, C and 105A concurrently or consent of instructor. Contemporary knowledge of the origin of the universe, including the Big Bang and nucleosynthesis, microwave background radiation, formation of cosmic structure, cosmic inflation, cosmic acceleration. Offered in alternate years. Not open to students who have completed course 126. GE credit: SciEng | SE.—II. Albrecht

157. Astronomy Instrumentation and Data Analysis Lab (4)
Lecture—1 hour. Laboratory—8 hours. Prerequisite: course 104A, 105A, 110A; 115A and 110B may be taken concurrently. Open to Astrophysics Specialization majors; consent of instructor required. Experimental techniques, data acquisition and analysis involving laboratory astrophysics plus stellar, nebular and galactic digital imaging, photometry and/or spectroscopy. Students perform telescope experiments. Individual work stressed. Minimum 10-15 page journal style articles of two experiments are required. Offered in alternate years. GE credit: SciEng | SE, WE.—III. (III.) Boeshaar, Tyson

160. Environmental Physics and Society (3)
Lecture—3 hours. Prerequisite: course 9D or 7C; or course 10 or 1B and Mathematics 16B or the equivalent. Linear vector spaces, operators and spectral analysis, complete sets of functions, complex variables, functional analysis, Green’s functions, calculus of variations, introduction to numerical analysis.—I. (I.)

210. Computational Physics (3)
Lecture—3 hours; independent study.—1 hour. Prerequisite: courses 104A and 104B or the equivalent. Linear vector spaces, operators and spectral analysis, complete sets of functions, complex variables, functional analysis, Green’s functions, calculus of variations, introduction to numerical analysis.—I-II. (I-II)

219A. Statistical Mechanics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 213B or the equivalent. Foundations of thermodynamics and classical and quantum statistical mechanics with simple applications to properties of solids, real gases, nuclear matter, etc. and a brief introduction to phase transitions. —I II III (I-II III)

219B. Statistical Mechanics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 213B or the equivalent. Introduction to phase transitions and critical phenomena. —I (I)
223A. Group Theoretical Methods of Physics—Condensed Matter (3)
Lecture—3 hours. Prerequisite: courses 215A, 215B [215C is corequisite] or consent of instructor. Theory of groups and their representations with applications in condensed matter. Offered irregularly.

223B. Group Theoretical Methods of Physics—Electricity (5)
Lecture—3 hours. Prerequisite: courses 215A, 215B [215C is corequisite] or consent of instructor. Theory of groups and their representations with applications in elementary particle physics. Offered irregularly.

224A. Nuclear Physics (3)
Lecture—3 hours. Prerequisite: course 215B. Comprehensive study of the nuclear-nucleon interaction including the deuteron, nucleon-nucleon scattering, polarization, determination of real parameters of S-matrix, and related topics. Offered irregularly.

224B. Nuclear Physics (3)
Lecture—3 hours. Prerequisite: course 224A. Study of nuclear models, including shell model, collective model, unified model. Energy level spectra, static moments, and electromagnetic transition rates. Offered irregularly.

224C. Nuclear Physics (3)
Lecture—3 hours. Prerequisite: course 224B. Study of nuclear scattering and reactions including the optical model and direct interactions. Beta decay and an introduction to weak interactions. Offered irregularly.

229A. Advanced Nuclear Theory (3)
Lecture—3 hours. Prerequisite: course 224A. Advanced topics in nuclear theory; theory of quantum-mechanical scattering processes. Exact formal theory and models for two-body scattering. Offered irregularly.

229B. Advanced Nuclear Theory (3)
Lecture—3 hours. Prerequisite: course 229A. Advanced topics in nuclear theory; theory of quantum-mechanical scattering processes. Exact formal theory and models for three-body scattering. Offered irregularly.

230A. Quantum Theory of Fields (3)
Lecture—3 hours. Prerequisite: course 215C. Relativistic quantum mechanics of particles; techniques and applications of second quantization; Feynman diagrams; renormalization. Offered irregularly.

230B. Quantum Theory of Fields (3)
Lecture—3 hours. Prerequisite: course 230A. Continuation of 230A, with selected advanced topics, such as 5x3 matrix theory, dispersion relations, axiomatic formulations. Offered irregularly.

230C. Quantum Theory of Fields (3)
Lecture—3 hours. Prerequisite: course 230A and B, or consent of instructor. Renormalization theory and applications, including dimensional regularization, Ward and dimensional regularization group equations, coupling constant unification, and precision electroweak calculations. May be repeated for credit with consent of instructor. Offered irregularly.

240A. Condensed Matter Physics A (3)
Lecture—3 hours. Prerequisite: course 215C, 219A; course 140AB or equivalent recommended. Topics in condensed matter physics: Crystal structure; one-electron theory; transport and optical properties of semiconductors, phonons, electron-phonon scattering. Offered irregularly.

240B. Condensed Matter Physics B (3)
Lecture—3 hours. Prerequisite: course 240A. Topics in condensed matter physics: transport and optical properties of metals; quantum structures; experimental measurement the Fermi surface and of phonon spectra. Offered irregularly.

240C. Condensed Matter Physics C (3)
Lecture—3 hours. Prerequisite: course 240AB. Review of second quantization. Interacting electron gas, electron-phonon interaction and effects, including instabilities of electronic systems. Topics in the theory of superconductivity and magnetism. Offered irregularly.

241. Advanced Topics in Magnetism (3)
Lecture—3 hours. Prerequisite: courses 240A-240B and 240C-240D, or consent of instructor. Topics chosen from areas of current research interest. Offered irregularly.

242. Advanced Topics in Superconductivity (3)
Lecture—3 hours. Prerequisite: courses 240A-240B and 240C-240D, or consent of instructor. Topics chosen from areas of current research interest. Offered irregularly.

243A-243B. 243C. Surface Physics of Materials (3)
Lecture—3 hours. Prerequisite: courses 140A-140B, 115A-115B or the equivalents; courses 215A, 240A, or the equivalents recommended. Experimental and theoretical fundamentals of surface and interface physics and chemistry, including electronic and magnetic structure, thermodynamics, adsorption kinetics, epitaxial growth, and a discussion of various spectroscopic and structural probes based on photons, electrons, ions, and scanning probes. Offered in alternate years—II, III, IV.

245A. High-Energy Physics (3)
Lecture—3 hours. Prerequisite: course 230A. Phe- nomenology and systematics of strong, electromag- netic, and weak interactions; hadrons and leptons; determination of quantum numbers; quarks and quarkonia; deep inelastic scattering; the quark part- on model; experiments at hadron colliders and elec- tron-positron colliders. Offered irregularly.

245B. High-Energy Physics (3)
Lecture—3 hours. Prerequisite: course 245A. Electro- weak interactions; phenomenology of the Stan- dard Model of SU(2) L x U(1); weak interaction experiments; results of a series of experiments with W and Z vector bosons; Glashow-Weinberg-Salam model and the Higgs boson; introduction to super- symmetry and other speculations. Offered irregularly.

245C. Collider Physics (3)
Lecture—3 hours. Prerequisite: course 245A; course 252B taken previously or concurrently, or consent of instructor. Collider physics. Topics include quark and gluon distribution functions and the compulsion of cross sections; LHC Collider and Inter- national Linear Collider phenomenology; collider and detector characteristics; extracting models from data; software tools for analyzing experimental data. May be repeated for credit with consent of instructor. Offered irregularly.

246A. Supersymmetry: Theory and Phenomenology (3)
Lecture—3 hours. Prerequisite: courses 230A-230B, 245A-245B recommended, or consent of instructor. Construction of supersymmetric models of particle physics; superfields; supersymmetry breaking the minimal supersymmetric standard model; supergrav- ity; Collider phenomenology; Cosmology. Offered irregularly. Offered irregularly.

246B. Advanced Supersymmetry (3)
Lecture—3 hours. Prerequisite: course 246A. Advanced topics in supersymmetry. Topics include holomorphy, the Affleck-Dine-Seiberg superpotential, Seiberg duality for SUSY QCD, dynamical SUSY breaking. Seiberg-Witten theory, superconformal field theories, supergravity, anomaly and gaugino mediation, and the string theory correspondence. Not offered every year—II.

250. Special Topics in Physics (3)
Lecture—3 hours. Prerequisite: consent of instructor. Topic varies. May be repeated for credit. Not offered every quarter—II, III, IV.

252A. Techniques of Experimental Physics (3)
Lecture—3 hours. Introduction to techniques and methods of designing and executing experiments. Problems and experimental data and matter research will be utilized. Offered irregularly.

252B. Techniques of Experimental Physics (3)
Lecture—3 hours. Introduction to techniques and methods of designing and executing experiments. Problems and experimental data and matter research will be utilized. Offered irregularly.

252C. Statistics and Data Analysis for Particle Physics (3)
Lecture—3 hours. Introduction to statistical data anal- ysis methods in particle physics. Theoretical lectures combined with practical computer laboratory work. Offered irregularly.

253. Signals and Noise in Physics (3)
Lecture—3 hours. Techniques for extracting signals from noise, systematic error. Offered irregularly.

Lecture—3 hours. Prerequisite: course 200A or Mathematics 119A/B or Mathematics 219; course 204A or Mathematics 119A/B or Mathematics 219; course 219A or Mathematics 132A/B or Mathematics 235A. Explores intrinsic unpredictable- ness (deterministic chaos) and the emergence of struc- ture in natural complex systems. Using statistical mechanical, information, and computational techniques and the topological theory, the course develops a systematic framework for analyzing dynamical and stochastic processes in terms of their causal architecture. Offered irregularly.

260. Introduction to General Relativity (3)
Lecture—3 hours. Prerequisite: courses 200A, 200B. An introduction to general relativity. Differential geometry and curved spacetime; the Einstein field equations; gravitational fields of stars and black holes; weak fields and gravitational radiation experimental tests; Big Bang cosmology. Offered irregularly.

262. Early Universe Cosmology (3)
Lecture—3 hours. Prerequisite: second year standing in Physics graduate program or consent of instructor. Introduction to early universe cosmology: Big Bang, inflation, primordial nucleosynthesis, dark matter, dark energy, and other topics of current inter- est. Offered irregularly. Offered irregularly.

264. Cosmic Structure Formation (3)
Lecture—3 hours. Prerequisite: course 260. Growth of structure from small density inhomogeneities in the early universe to the diverse structures observable today. Use of observable properties (cosmic micro- wave background, gravitational lensing, peculiar velocities, number density, etc.) to constrain models of structure formation and fundamental physics. Offered irregularly.

265. High-Energy Astrophysics and Radiative Processes (3)
Lecture—3 hours. Prerequisite: graduate standing in physics or consent of instructor. Survey course cover- ing galactic and extragalactic X-ray and gamma-ray astronomy, radiative processes, and techniques of high-energy astrophysics. Offered irregularly.

266. Data Analysis for Astrophysics (3)
Lecture—3 hours. Prerequisite: graduate standing in physics or consent of instructor. Survey course cover- ing measurement and signal analysis techniques for astrophysics and cosmology throughout the electro- magnetic spectrum. Offered in alternate years.

267. Observational Extragalactic Astronomy & Cosmology (3)
Lecture—3 hours. Prerequisite: graduate standing in physics or consent of instructor. Survey course covering current areas of research on extragalactic objects, their physical properties, origin, evolution, and distribution in space. Offered in alternate years.

270. Current Topics in Physics Research (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing in Physics or consent of instructor. Reading and discussion to help physics graduate students develop and maintain familiarity with the current and past literature in their immediate field of research and related areas. May be repeated for credit (S/U grading only). Offered irregularly.
280. Seminar in Ethics for Scientists (2) Seminar—2 hours. Prerequisite: standing in any department of Science or Engineering. Studies in ethical and historical issues in the ethics of science, possibly including issues such as proper authorship, peer review, fraud, plagiarism, responsible collaboration, and conflict of interest. Limited enrollment. (Same course as Chemical Engineering and Materials Science 280 and Chemistry 280.) (S/U grading only)—I, II, III.

283. Careers in Physics (1) Seminar—1.5 hours. Prerequisite: graduate standing in Physics. Seminar for Physics graduate students on an in-depth appreciation of career opportunities with a graduate degree in physics. Professional physicists, mostly from outside academia, will give seminars describing both research and career insights. May be repeated for credit. Offered irregularly. (S/U grading only)—I. (I.)

289. Seminar in Nuclear Physics (1) Seminar—1 hour. Prerequisite: graduate standing in Physics or consent of instructor. Presentation and discussion of topics of current research interest in physics. Topics will vary weekly and will cover a broad spectrum of the active fields of physics research at a level accessible to all physics graduate students. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III.)

291. Seminar in Nuclear Physics (1) Seminar—1 hour. Prerequisite: graduate standing in Physics or consent of instructor. Presentation and discussion of topics of current research interest in physics. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III.)

292A. Seminar in Elementary Particle Physics (1) Seminar—1 hour. Prerequisite: graduate standing in Physics or consent of instructor. Presentation and discussion of topics of current research interest in elementary particle physics. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III.)

292B. High Energy Frontier Initiative And Cosmology Seminar (1) Seminar—1 hour. Prerequisite: Physics graduate students. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III.)

293. Seminar in Condensed Matter Physics (1) Seminar—1 hour. Prerequisite: graduate standing in Physics or consent of instructor. Presentation and discussion of topics of current research interest in condensed matter physics. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III.)

294. Seminar in Cosmology (1) Seminar—1 hour. Prerequisite: graduate standing in Physics or consent of instructor. Presentation and discussion of topics of current research interest in Cosmology. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III.)

295. Introduction to Departmental Research (1) Seminar—1 hour. Seminar to introduce first- and second-year physics graduate students to the fields of specialty and research of the Physics staff. (S/U grading only)—II, III.

297. Research on the Teaching and Learning of Physics (3) Seminar—3 hours. Prerequisite: graduate standing in Physics or consent of instructor. Discussion and analysis of recent research in how students construct understanding of physics and other science concepts and the implications of this research for instruction. (I, II, III.)

298. Group Study (1-5) Prerequisite: consent of instructor. (S/U grading only.)

299. Research (1-12) (S/U grading only.)

Professional

371. Teaching in an Active-Engagement Physics Discussion/Lab Setting (1) Lecture/discussion—1 hour. Prerequisite: course 90D or equivalent; consent of instructor, open to graduate students only. Analysis of recent research on science/physics teaching and learning and its implications for teaching labs, discussions, and discussion/labs with an emphasis on differences between conventional and active-engagement instructional settings. The appropriate role of the instructor in specific instructional settings. May be repeated twice for credit. I, II, III. (I, II, III.)

390. Methods of Teaching Physics (1) Lecture/discussion—1 hour. Prerequisite: graduate standing in Physics; consent of instructor. Practical experience in methods and problems related to teaching physics laboratories at the university level, including discussion of teaching techniques, analysis of quizzes and laboratory reports and related topics. Required of all Physics Teaching Assistants. May be repeated for credit. (S/U grading only)—I, II, III, IV.

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only)—I, II, III, IV.

Physiology

See Anatomy, Physiology and Cell Biology (APC), on page 539; Human Physiology (HPH), on page 405; Molecular, Cellular, and Integrative Physiology (A Graduate Group), on page 453; and Neurobiology, Physiology, and Behavior, on page 443.

Plant Biology

See Agricultural Management and Rangeland Resources, on page 143; Crop Science and Management, on page 218; Environmental Horticulture, on page 296; Plant Biology, on page 471; Plant Biology (A Graduate Group), on page 473; and Vegetable Crops, on page 539.

Plant Biology

(Graduate of Biological Sciences) William J. Lucas, Ph.D., Chairperson of the Department
Anne B. Britt, Ph.D., Vice Chairperson of the Department
Graduate Program. See Plant Biology (A Graduate Group), on page 473.

Department Office. 1002 Life Sciences 530-752-0617; http://www.plb.ucdavis.edu
Advising. 1023 Sciences Laboratory Building; 530-752-0410; http://www.biocic.ucdavis.edu/BASC
Committee in Charge of the Major
Bo Liu, Ph.D.
Anne Britt, Ph.D.
Steven Theg, Ph.D

Faculty

Faculty includes members of the Departments of Plant Biology, Molecular and Cellular Biology, and Evolution and Ecology in the College of Biological Sciences.

Primary Department Members
Siobhan Brady, Assistant Professor
Anne Britt, Ph.D., Professor
Luca Comai, Ph.D., Professor
Katayoon Dehesh, Ph.D., Professor
S. P. Dinesh-Kumar, Professor
John J. Harada, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Stacey Harmer, Ph.D., Professor
Bo Liu, Ph.D., Professor
William J. Lucas, Ph.D., Professor
Julin Maloof, Ph.D., Professor
Sharman O’Neill, Ph.D., Professor
Neelima Sinha, Ph.D., Professor
Venkatesan Sundaresan, Ph.D., Professor
Steven M. Theg, Ph.D., Professor

Secondary Department Members
Judy Callis, Ph.D., Professor
Academic Senate Distinguished Teaching Award
James A. Doyle, Ph.D., Professor
Marilynn E. Etzler, Ph.D., Professor
Charles S. Gasser, Ph.D., Professor
J. Clark Lagarias, Ph.D., Professor
Marcel Rejmanek, Ph.D., Professor
Raymond L. Rodriguez, Ph.D., Professor

Emeriti Faculty
David E. Bayer, Ph.D., Professor Emeritus
Bruce A. Bonner, Ph.D., Professor Emeritus
Deborah Carrington, Ph.D., Lecturer
Academic Federation Excellence in Teaching Award
Paul A. Castelfranco, Ph.D., Professor Emeritus
Deborah P. Delmer, Ph.D., Professor Emerita
Emmanuel Epstein, Ph.D., Professor Emeritus
Richard H. Falk, Ph.D., Professor Emeritus
Donald W. Kyhos, Ph.D., Professor Emeritus
Norma J. Lang, Ph.D., Professor Emerita
Terence M. Murphy, Ph.D., Professor Emeritus
Thomas L. Rost, Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award
Alan J. Steiner, Ph.D., Professor Emeritus
Kenneth Wells, Ph.D., Professor Emeritus
Affiliated Faculty
John L. Bowman, Ph.D., Professor
Andrew Groover, Ph.D., Adjunct Associate Professor
Joel Ledford, Ph.D., Academic Coordinator

The Major Program

As organisms that sequester carbon and convert solar energy to usable forms, plants are the primary source of food on the planet as well as important buffers against climate change. The Plant Biology major focuses on fundamental aspects of how plants function as organisms and interact with their environment. A wide variety of scientific disciplines are integrated within the Plant Biology major, including physiology, cell and molecular biology, development, genetics and genomics.

The Program. The plant biology major consists of a Biosciences core covering the general principles of biology plus four plant-specific classes dealing with advanced aspects of plant biology including physiology, development, and anatomy. Two required electives allow students to tailor the degree to suit their interests. Independent research in a laboratory setting is a requirement, and majors in Plant Biology are guaranteed this opportunity. Because of the value of plants as a model system for research in molecular genetics, cell biology, and biochemistry, Plant Biology makes an excellent minor or second major for student in these fields.

Career Alternatives. A degree in Plant Biology serves as an excellent launching point for a wide range of career options, including domestic and international opportunities in business, research and
A.B. Major Requirements:

**Preparatory Subject Matter**

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences 2A-2B-2C</td>
<td>14</td>
</tr>
<tr>
<td>Chemistry 2A or 2A-2B-2C</td>
<td>8</td>
</tr>
<tr>
<td>Statistics 13 or 100 or 102</td>
<td>4</td>
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**Depth Subject Matter**

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
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</thead>
<tbody>
<tr>
<td>Biological Sciences 101</td>
<td>4</td>
</tr>
<tr>
<td>Plant Biology 102 or 108</td>
<td>5</td>
</tr>
<tr>
<td>Evolution and Plant Biology 116</td>
<td>4-5</td>
</tr>
<tr>
<td>Plant Biology 105, 111, 112, 117</td>
<td>15</td>
</tr>
</tbody>
</table>

**Total Units for the Major** 75-76

Recommended


For students with interests in specialized areas of plant biology, such as agricultural botany, ecology, systematics and evolution, morphology, plant physiology, etc.), certain substitutions, including courses in other departments, may be allowed upon prior consultation with a Plant Biology major adviser.

B.S. Major Requirements:

**Preparatory Subject Matter**

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Biological Sciences 2A-2B-2C</td>
<td>14</td>
</tr>
<tr>
<td>Chemistry 2A-2B-2C</td>
<td>15</td>
</tr>
<tr>
<td>Chemistry 8A-8B or 118A-118B-118C</td>
<td>6-12</td>
</tr>
<tr>
<td>Mathematics 17A-17B-17C or 21A-21B (21C recommended)</td>
<td>8-12</td>
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<tr>
<td>Physics A7B-7C</td>
<td>12</td>
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**Depth Subject Matter**

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Biological Sciences 101, 105</td>
<td>10-13</td>
</tr>
<tr>
<td>Statistics 100 or 102</td>
<td>4</td>
</tr>
<tr>
<td>Plant Biology 105, 111, 112</td>
<td>11</td>
</tr>
<tr>
<td>Research internship: Plant Biology 92, 99, 189, 192, 199 or equivalent</td>
<td>3</td>
</tr>
<tr>
<td>Restricted electives</td>
<td>15</td>
</tr>
</tbody>
</table>

Upper division courses in plant biology or related natural science courses | 13 |

**Total Units for the Major** 98-111

Minor Requirement:

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor Requirements</td>
<td>18</td>
</tr>
</tbody>
</table>

**Minor Programs**

**Minor Requirements**

1. Upper division units, including at least one course from each of the following four groups:
   - (a) Anatomy and Morphology: Evolution and Ecology 140; Plant Biology 105, 116
   - (b) Physiology and Development: Plant Pathology 111, 112, 123; Plant Pathology 130
   - (c) Evolution and Ecology: Evolution and Ecology 100; Plant Biology 102, 108, 117, 143
   - (d) Biochemistry and Molecular Genetics: Biotechnological 150; Plant Biology 113, 126, Plant Sciences 152, 154, 171, 172

**Minor Adviser**

Same as for major above.

Honors and Honors Programs

- Students on the honors list may elect to include a maximum of 5 units of 194H in their major programs. Refer to the Academic Information chapter and the appropriate College section for Honors List information.

Graduate Study

Consult the Plant Biology Graduate Group listing.

Courses in Plant Biology (PLB)

**Lower Division**

90X. Plant Science Seminar (1-4)

Prerequisite: consent of instructor. Examination of a special topic in a small group setting. Not open for credit to students who have completed course Plant Sciences 90X. (Former course number Plant Sciences 90X.)

92. Internship (1-12)

Internship—3-36 hours. Prerequisite: consent of instructor. Examination of a special topic in a small group setting. Not open for credit to students who have completed course Plant Sciences 90X. (Former course number Plant Sciences 90X.)

98. Directed Group Study (1-5)

Prerequisite: consent of instructor. Technical and/or professional experience or off campus. Supervised by a member of the Plant Biology faculty. (P/NP grading only.)

99. Special Study for Undergraduates (1-5)

Prerequisite: consent of instructor. (P/NP grading only.)

**Upper Division**

Questions for subjects numbered 102 through 126, see the Plant Biology Department office in 1002 Life Sciences.

102. California Floristics (5)


105. Developmental Plant Anatomy (5)

Lecture—3 hours; laboratory—6 hours. Prerequisite: Biological Sciences 2C or equivalent preparation in plant biology. Restricted to 50 students; split equally into two lab groups. Structural anatomy of vascular plants. Training in basic tissue sectioning, staining, and use of the compound microscope. GE credit: SciEng—III. (III.) Doyle

108. Systematics and Evolution of Angiosperms (5)

Lecture—3 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C. Diversity and classification of angiosperms (flowering plants) on a world scale, and current understanding of the origin of angiosperms and evolutionary relationships and trends within them based on morphological and molecular evidence. (Same course as Evolution and Ecology 108.) GE credit: SciEng—III. (III.) Doyle

111. Plant Physiology (3)

Lecture—3 hours. Prerequisite: Biological Sciences 1C, 2A, 2B, and 2C; Chemistry 88 and Physics 7C (e.g., either be taken concurrently). Plant Biology 105 recommended. The plant cell as a functional unit. The processes of absorption, movement, and synthesis of water and minerals. Water loss, translocation, photosynthesis, respiration. (I.) Deheshe, Lucas

112. Plant Growth and Development (3)

Lecture—3 hours. Prerequisite: Biological Sciences 1C, 2A, 2B, and 2C; Chemistry 88 and Physics 7C. Instruction in the mechanisms and control systems that govern plant growth and development and the responses of plants to the environment. Strong emphasis on vegetative development of flowering plants. GE credit: SciEng | QL, SE, SL—II. (II.) Harada, Sundaresan

113. Molecular and Cellular Biology of Plants (3)

Lecture—3 hours. Prerequisite: Biological Sciences 1A and 1C, or 2A, 2B, 2C; 101; Biological Sciences 102 or 105 recommended. Molecular and cellular aspects of the growth and development of plants and their response to external and environmental stresses. Primary focus on processes unique to plants. Experimental approaches will be emphasized. GE credit: QL, SL, VL—III. (III.) Harada

113D. Problems in Molecular and Cellular Biology of Plants (1)

Discussion—1 hour. Prerequisite: course 113 concurrently. Discussion of topics and applications related to principles presented in course 113. Students will be assigned problems each week showing novel applications of the principles described in course 113 and will prepare answers to be delivered orally during the class period. (P/NP grading only.)—(I.) Harada, Sundaresan

116. Plant Morphology and Evolution (5)

Lecture—3 hours; laboratory—6 hours. Prerequisite: introductory plant biology (e.g., Biological Sciences 1C, 2A, 2B, and 2C); plant anatomy recommended (e.g., Plant Biology 105). Introduction to the form, development, and evolution of vascular plants. Emphasis given to the form and development of reproductive structures in ferns and seed-producing plants as a basis for determining evolutionary relationships. GE credit: SciEng—II. (II.) Jernstedt

**Quarter Offered:** I-Fall, II-Winter, III-Spring, IV-Summer
117. Plant Ecology (4)
Lecture—3 hours; fieldwork—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C. Plant biology intended to study the interactions between plants, plant populations or vegetation types and their physical and biological environments, with special emphasis on California. Four full-day field trips and brief write-up of class project required. [Same course as Evolution and Ecology 117—II (I)]

119. Population Biology of Invasive Plants and Weeds (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C; introductory statistics recommended. Origin and evolution of invasive plant species and weeds, reproduction and dispersal, seed ecology, modeling of population dynamics, interactions between invasive species, native species, and crops, biological control. Laboratories emphasize design of competition experiments and identification of weedy species. [Same course as Evolution and Ecology 119.] GE credit: SciEng | SE—III. (III) Rejmanek

123. Plant-Virus-Vector Interaction (3)
Lecture—3 hours. Prerequisite: Biological Sciences 2A, Biological Sciences 101; course 105, Plant Pathology 120, and Entomology 100 recommended. Analysis of interactions necessary for viruses to infect plants. Interactions among insect vectors and host plants involved in the plant-virus life cycle. Evolutionary aspects of the molecular components in viral infection and modern approaches to the study of viral movements. "Invasive course as Entomology 123 and Plant Pathology 123." Offered in alternate years. GE credit: SE, SL, WE—(I) Lucas, Gillbertson, Ullman

126. Plant Biochemistry (3)
Lecture—3 hours. Prerequisite: Biological Sciences 103 or 105. The biochemistry of important plant processes and metabolic pathways. Discussion of methods used to understand plant processes, including the use of transgenic plants. [Same course as Molecular and Cellular Biology 126.] GE credit: SciEng | SE, SL—II. (II) Callis, Tian

143. Evolution of Crop Plants (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Plant Sciences 2 or Biological Sciences 1C or 1D. Origins of crops and agriculture, including main methodological approaches, centers of crop biodiversity, dispersal of crops, genetic and physiological differences between crops and their wild progenitors, agriculture practiced by other organisms, and role and ownership of crop biodiversity. GE credit: SciEng or SocSci, Div, Wrt | SE or SS, SL, WE—III. (III) Gepts

148. Introductory Mycology (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1A, 1B, 1C. Systematics, ecology, evolution, and morphology of fungi. Importance of fungi to humans. [Same course as Plant Pathology 148.] GE credit: SE—(I) MacDonald, Rizzo

189. Experiments in Plant Biology: Design and Execution (3)
Laboratory/discussion—6 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, or 2A, 2B, 2C, or the equivalent courses in Plant Sciences, and consent of the instructor. Provides an opportunity for undergraduate students to formulate experimental approaches to current questions in plant biology and to carry out their proposed experiments. May be repeated for credit for a total of 12 units. (P/NP grading only)—I, II, III, (I, II, III)

190G. Research Conference in Plant Biology (1)
Discussion—1 hour. Prerequisite: upper division standing in Plant Biology or related discipline; consent of instructor. Introduction to research methods in plant biology. Discussion of field or laboratory research projects, survey of appropriate literature, and discussion of research by faculty and students. May be repeated for credit. (P/NP grading only)—I, II, III, (I, II, III)

192. Internship (1-12)
Internship—3.6 hours. Prerequisite: completion of 84 units and consent of instructor. Technical and/or professional experience obtained under the supervision of a member of the Plant Biology Department faculty. May be repeated for credit. (P/NP grading only)

194. Special Study for Honors Students (1-5)
Prerequisite: open only to majors of senior standing on honors list. Independent study of selected topics under the direction of a member or members of the staff. Completion will satisfy the writing of a senior thesis. (P/NP grading only.)

197T. Tutoring in Plant Biology (1-5)
Discussion—2.6 hours. Prerequisite: upper division standing and consent of instructor. Assisting the instructor by tutoring students in one of the Department's regular courses. May be repeated for credit. (P/NP grading only)—I, II, III, (I, II, III)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Professional

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing; consent of instructor. Practical experience in acting as teaching assistant in Plant Biology courses. Learning activity: hands on experience in preparing for and conducting discussions, guiding student laboratory work, and the formulation of questions and topics for examinations. May be repeated for credit. (S/U grading only)—I, II, III, IV (I, II, III, IV)

Plant Biology (A Graduate Group)
Kentarou Inoue, Ph.D., Chairperson of the Group
Group Office, 227A Life Sciences 530-752-2981; Fax 530-752-8822
http://biosci3.ucdavis.edu/GradGroups/PB/

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Arnold Bloom, Ph.D., Professor (Plant Sciences)
Eduardo Blumwald, Ph.D., Professor (Plant Sciences)
Richard Bostock, Ph.D., Professor (Plant Pathology)
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Siobhan Brady, Ph.D., Assistant Professor (Plant Biology)
Anne Britt, Ph.D., Professor (Plant Pathology)
Patrick Brown, Ph.D., Professor (Plant Sciences)
 Judy Callis, Ph.D., Professor/Vice Chair (Molecular and Cellular Biology) Academic Senate Distin. Teaching Award
 Gitta Coaker, Ph.D., Associate Professor (Plant Pathology)
 Luca Comai, Ph.D., Professor (Plant Biology)
 Doojoong Cook, Ph.D., Professor (Plant Pathology)
 Carlos Crisosto, Ph.D., Professor (Plant Sciences)
 Abhaya Dandekar, Ph.D., Professor (Plant Sciences)
 Kayatson Dehesh, Ph.D., Professor (Plant Biology)
 Theodore Dejong, Ph.D., Professor (Plant Sciences)
 Savikhritmani Dinesh-Kumar, Ph.D., Professor (Plant Biology)
 Georgia Drakakaki, Ph.D. Assistant Professor (Plant Sciences)
 Jorge Dubcovsky, Ph.D., Professor (Plant Sciences)
 Albert Fischer, Ph.D., Professor (Plant Sciences)

Charles Gasser, Ph.D., Professor (Molecular and Cellular Biology)
 Paul Gepts, Ph.D., Professor (Plant Sciences)
 Edmund Gilbert, Ph.D., Assistant Professor (Plant Sciences)
 David Gilchrist, Ph.D., Professor (Plant Pathology)
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 John Harada, Ph.D., Professor (Plant Biology)
 Academic Senate Distinguished Teaching Award
 Stacey Harmer, Ph.D., Professor (Plant Biology)
 Kentaro Inoue, Ph.D., Professor (Plant Sciences)
 Marie Jasienuik, Ph.D., Associate Professor (Plant Sciences)
 Judy Jermeida, Ph.D., Professor (Plant Sciences)
 Daniel Klenbenstein, Ph.D. Professor (Plant Sciences)
 John Labavitch, Ph.D., Professor (Plant Sciences)
 Clark Lagarias, Ph.D., Professor (Molecular and Cellular Biology)
 J. Heiner Lieth, Ph.D., Professor (Plant Sciences)
 William Lucas, Ph.D., Professor/Chair (Plant Biology)
 Julin Maloo, Ph.D., Professor (Plant Biology)
 Naresh Marathe, Ph.D., Professor (Plant Sciences)
 Marcel Rejmanek, Ph.D., Professor (Evolution and Ecology)
 Elisa Rejmankova, Ph.D., Professor (Environmental Science and Policy)
 Pamela Ronald, Ph.D., Professor (Plant Pathology)
 J. Heiner Lieth, Ph.D., Professor (Plant Sciences)
 Terence Murphy, Ph.D., Professor (Plant Biology)
 David Neal, Ph.D., Professor (Plant Sciences)
 Sharan O'Neill, Ph.D., Professor (Plant Biology)
 Kyau Tha Paw, Ph.D., Professor (Land, Air and Water Resources)
 Anne Powell, Ph.D., Associate Researcher (Plant Sciences)
 Carlos Quiros, Ph.D., Professor (Plant Sciences)
 Marcel Rejmanek, Ph.D., Professor (Evolution and Ecology)
 Elisa Rejmankova, Ph.D., Professor (Environmental Science and Policy)
 Pamela Ronald, Ph.D., Professor (Plant Pathology)
 Terence Murphy, Ph.D., Professor (Plant Biology)
 Alan Rose, Ph.D., Project Scientist (Molecular and Cellular Biology)
 Jeffery Ross-Babie, Ph.D., Assistant Professor (Plant Sciences)
 Ken Shackle, Ph.D., Professor (Plant Sciences)
 Neelima Sinha, Ph.D., Professor (Plant Biology)
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 Yin Jia, Ph.D., Professor (Plant Sciences)
 Venkatesan Sundaresan, Ph.D., Professor (Plant Biology)
 Thomas Tai, Ph.D., Associate in the Agricultural Experiment Station (Plant Scientist)
 Steve Thag, Ph.D., Professor (Plant Biology)
 Li Tran, Ph.D., Assistant Professor (Plant Sciences)
 Alan Van Deynze, Ph.D., Professional Researcher (Plant Sciences)
 M. Andrew Walker, Ph.D., Professor (Viticulture and Enology)
 John Yoder, Ph.D., Professor (Plant Sciences)
 Florence Zakharov, Ph.D., Assistant Professor (Plant Sciences)

Emeriti Faculty
Don Durzan, Ph.D., Professor (Plant Sciences)
David Gilchrist, Ph.D., Professor Emeritus (Plant Sciences)
Donald J. Nevins, Ph.D., Professor (Plant Sciences)
Donald Phillips, Ph.D., Professor (Plant Sciences)
Carlos Quiros, Ph.D., Professor (Plant Sciences)
Michael Reid, Ph.D., Professor (Plant Sciences)
M W Silk, Ph.D., Professor Emeritus (Land, Air and Water Resources)
T Hsiao, Ph.D., Professor Emeritus (Land Air and Water Resources)

Affiliated Faculty
John Bowman, Ph.D., Professor (Plant Biology)

Quarter Offered: Fall—II; Winter—III; Spring—IV; Summer—IV

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACH—American Cultures; DD—Domestic Diversity; Wrt—Writing Experience

Plant Biology (A Graduate Group) 473
200C. PBGG Core Course Series—Spring quarter (5)

Lecture—3 hours; discussion—2 hours. Prerequisite: course 200A and 200B. The third of three PBGG core graduate courses. Coverage includes (1) plant water relations, (2) cellular & long distance transport processes, (3) mineral nutrition, (4) environmental impacts on growth & development, (5) stress perception & responses, (6) canopy processes, and (7) plant interactions with other organisms. III. (Ill.) Blumwald, Silk.

203N. Biology of the Plant Cell (4)

Lecture—3 hours. Discussion/laboratory—2 hours. Prerequisite: Plant Biology 111 or Biological Sciences 104, or the equivalent. Recent progresses in plant cell biology. Intracellular mobility in plant cells. Common techniques associated with the progress of plant cell biology. Open to senior undergraduate students in Plant Biology major. Offered in alternate years. (S/U grading only.)

210. Plant Ecophysiology (3)

Lecture—3 hours. Prerequisite: Plant Biology 111, 112, 117. Study of the mechanisms of physiological adaptation of plants to their environment. Offered in alternate years. —I.

212. Physiology of Herbicidal Action (3)

Lecture—3 hours. Prerequisite: Plant Biology 112, 117. Study of the fundamental processes involved in the physiological action of herbicides. Detailed consideration of the fate of herbicides in plants. Offered in alternate years. —I.

214. Higher Plant Cell Walls (3)

Lecture—2 hours; discussion—1 hour. Prerequisite: Plant Biology 112, and a course in biochemistry. Lectures focus on the structure, analysis, synthesis, and development, and metabolism of cell wall polysaccharides. Discussions center on analysis of scientific papers related to lecture topics. Offered in alternate years. —I. Labavitch.

220. Plant Developmental Biology (4)

Lecture—3 hours; discussion—1 hour; term paper. Prerequisite: plant anatomy, physiology, and biochemistry. A survey of the concepts of plant development and organization. Examines plant cells, tissues, and organs with an understanding of the genetic and environmental factors that control development. Offered in alternate years. —Sinha

223. Special Topics in Scientific Method (2)

Discussion—2 hours. Examine the historical and philosophical background of the scientific method. Analyze the rational, perceptual, causal, and social aspects of scientific knowledge. Clarify the roles of reason, experimentation and creativity in scientific research. (S/U grading only.)—I. Bradford

227. Plant Molecular Biology (4)

Lecture/discussion—4 hours. Prerequisite: Molecular and Cellular Biology 121 or 161. Molecular aspects of higher plant biology with emphasis on gene expression. Plant nuclear and organelle genome organization, gene structure, mechanisms of gene regulation, gene transfer, and special topics related to development and response to environmental stimuli. Offered in alternate years. —Britt, Sinha

229. Molecular Biology of Plant Reproduction (3)

Lecture—3 hours. Molecular genetic basis of plant reproduction. Emphasis on understanding developmentally regulated gene expression as it relates to the major changes that occur during plant reproduction and on the genetic control of flowering. Offered in alternate years. —O'Neill

290A. Faculty Seminar (1)

Discussion—1 hour. Discussion of research area of seminar speakers in Plant Biology Graduate Group Seminar Series. Restricted to Plant Biology graduate students (PBGG). May be repeated six times for credit. (S/U grading only.)—I, II, III, (I, II, III).

290B. Seminar (1)

Seminar—1 hour. Seminars presented by visiting scientists on research topics of current interest. (S/U grading only.)—I, II, III, (I, II, III).
Emeriti Faculty
George Bruning, Ph.D., Professor Emeritus
Edward B. Buller, Ph.D., Professor Emeritus
Robert N. Campbell, Ph.D., Professor Emeritus
James E. DeVoy, Ph.D., Professor Emeritus
Raymond G. Grogan, Ph.D., Professor Emeritus
Clarence I. Kado, Ph.D., Professor Emeritus
Sredek John M. Miricelich, Ph.D., Lecturer (USDA)
Emeritus
Jerry K. Uyemoto, Ph.D., Lecturer (USDA) Emeritus
Robert K. Webster, Ph.D., Professor Emeritus

Affiliated Faculty
Kendra Baumgartner, Ph.D. (USDA)
Greg Browne, Ph.D. (USDA)
Daniel Kluetpel, Ph.D. (USDA)
Deborah A. Golino, Ph.D., Lecturer and Specialist in Cooperative Extension
W. Douglas Gubler, Ph.D., Lecturer and Specialist in Cooperative Extension

Thems Michailidis, Ph.D., Lecturer and Plant Pathologist
Adlb Rowhani, Ph.D., Lecturer
Krishna Subbarao, Ph.D., Lecturer and Specialist in Cooperative Extension
Myeore Sudarshanova, Ph.D. (USDA)
Tsakao Kasuga, Ph.D., Lecturer (USDA)

Related Major Programs. See the major in Plant Biology, p. 47.

Graduate Study. The Department of Plant Pathology offers programs of study and research leading to the M.S. and Ph.D. degrees. Information can be obtained from the graduate adviser. See also the Graduate section, page 111.

Graduate Advisers. R.M. Davis, G.L. Coaker, R.M. Bostock

Courses in Plant Pathology (PLP)

Lower Division

10. Edible Mushroom Cultivation (2)
Lecture—1 hour; laboratory/conversation—3 hours. Prerequisite: Biological Sciences 10 or Microbiology 20 recommended. Principles and practices of growing edible mushrooms, including cultivation maintenance, basic mushroom substrate preparation, composting, spawn generation techniques, inoculation methods, harvesting, and pests and pest management. — II. (II) Davis

120. Introduction to Plant Pathology (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1A, 1B, 1C. Systematics, ecology, evolution, and morphology of fungi. Importance of fungi to humans. (Same course as Plant Biology 146.) GE credit: SciEng, Wrt | SL.—I, III. (I, III.) Cook, Newell-McGloughlin

140. Agricultural Biotechnology and Public Policy (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: high school level biology, including genetics; Biological Sciences 10 recommended. Examination of the development and deployment of agricultural biotechnologies, particularly transgenic crop plants, microorganisms, and animals, with consideration of conventional agriculture, public perceptions of technologies, food safety, environmental impact, public policies and regulations. GE credit: SciEng, Wrt | SL.—III. (III.) Cook, Newell-McGloughlin

184. Introductory Mycology (4)
Lecture—2 hours; laboratory—8 hours. Prerequisite: Biological Sciences 1A, 1B, 1C. Systematics, ecology, evolution, and morphology of fungi. Importance of fungi to humans. (Same course as Plant Biology 146.) GE credit: SciEng, Wrt | SL.—III. (III.) Gordon

185. Advanced Mushroom Taxonomy (2)
Laboratory/discussion—3 hours; fieldwork—1 hour. Prerequisite: course 135 or 148, and Biological Sciences 101 or the equivalent. Microscopic and molecular methods used in the identification of mushroom species; molecular characterization including PCR-amplification of ribosomal nuclear DNA, digestion of the product with restriction enzymes, and DNA sequencing, a one-day field trip is required. Offered in alternate years.— I. Davis

189D. Global Disease Biology Research Discussion (1)
Discussion—1 hour. Prerequisite: junior standing, courses 90, 187, Science and Society 23; course 189 required concurrently. Restricted to Global Disease Biology majors only. Course helps prevent or solve problems the students’ research activity. Independent advising and assistance on research proposal. (P/NP grading only)—I, II, III. (I, II, III.) Kirkpatrick

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: course 120 and consent of instructor. Experience off and on campus, supervised by a member of the faculty. (P/NP grading only.)

198. Directed Group Study (1-5)
P/NP grading only.

199. Special Study for Advanced Undergraduates (1-15)
(P/NP grading only.

Graduate

201A. Impacts, Mechanisms and Control of Plant Disease (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 120, graduate student status in the Plant Pathology Graduate Program, or consent of instructor. A case-studies approach to analysis of plant diseases caused by bacteria, fungi, oomycetes, and viruses, including impacts, etiology, pathogen taxonomy and epidemiology, biotechnological and genetic aspects of pathogen-host interactions, virulence and resistance, and approaches to disease control. —II. (II) Gordon

201B. Impacts, Mechanisms and Control of Plant Disease (5)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 120, course 201A, and graduate student status in the Plant Pathology Graduate Program, or consent of instructor. A case-studies approach to analysis of plant diseases, including emerging dis-

205A. Diseases of Vegetable and Field Crops (3)
Lecture—discussion—3 hours; fieldwork—3 hours. Prerequisite: course 120. Clinical study of diseases of vegetable and field crops with emphasis on etiology, epidemiology, diagnosis, and control. Field trips required. Offered in alternate years.—III. Davis

205B. Diseases of Vegetable and Field Crops—Summer Field Trip (1)
Fieldwork—3 hours. Prerequisites: courses 120 and 205A. Continuation of course 205A—four-day field trip investigating diseases of vegetable and field crops (Deferred grading only, pending completion of sequence. S/U grading only.)—IV. (IV) Davis

206A-206B, Diseases of Fruit, Nut, and Vine Crops (3-1)
Lecture—2 hours, laboratory—6 hours. Prerequisite: course 120; Plant Biology 119. Course 205 may be taken concurrently. Clinical study of fruit, nut, and vine crops diseases with emphasis on etiology, epidemiology, diagnosis, and control. Offered in alternate years. (Deferred grading only, pending completion of sequence.)—III-IV. (III-IV) Kirkpatrick

210. Biochemistry and Molecular Biology of Plant-Pathogen Interactions (4)
Lecture—discussion—4 hours. Prerequisite: Biological Sciences 101, 102, 103, and 104, or the equivalent. Discussion of plant-microbe interactions, focused on the understanding of the interactions, microbial and molecular events that determine the disease state. Offered in alternate years.— I. Bostock, Coaker

217. Molecular Genetics of Fungi (3)
Lecture—2 hours. Prerequisite: standing in a biological science, Biological Sciences 101, 102, Molecular and Cellular Biology 161, Plant Biology 119, courses 130, 215X; Microbiology 215 recommended. Advanced treatment of molecular biology and genetics of filamentous fungi, yeasts, and molds; genomics, gene manipulation. Offered in alternate years. (Same course as Biological Chemistry 217.)—II.

224. Advanced Mycology (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 148 or Plant Biology 148 or consent of instructor. Systematics, ecology, evolution, and behavior of the fungi. Topics include modern techniques and theories on classification of fungal species, concepts, sexual compatibility and vegetative compatibility. Laboratories emphasize various approaches to fungal identification. Offered in alternate years.—III. Epstein, Rizzo

228. Plant Bacteriology (5)
Lecture—2 hours; laboratory—9 hours. Prerequisite: course 120; Microbiology 101 or the equivalent; Biological Sciences 102, 103. Study of bacteria which have a saprophytic, symbiotic, or parasitic association with higher and lower plants. Clinical and molecular methods for identification and classification of these bacteria. Offered in alternate years.—(I.) Kirkpatrick, Gilberston

230. Plant Virology (3)
Lecture—3 hours. Prerequisite: upper division or graduate course in molecular biology or graduate student in plant pathology. Viruses as causal agents of plant disease and as tools for manipulating plants; structures of virus particles; mechanisms of transmission, replication, and propagation in the plant; cytopathology and molecular biology in susceptible and resistant reactions to virus infection; virus disease control. Only 2 units of credit to students who have completed Microbiology 262. Not open for credit to students who have completed course 226. Offered in alternate years.— II. Bruneng, Falke
Plant Physiology


290C. Advanced Research Conference (1) Seminar—1 hour. Prerequisite: course 210 or consent of instructor. Presentation, evaluation, and critical discussions of research activities in the area of advanced research primarily designed for graduate students. (S/U grading only).—I, II, III (II, III).

291. Seminar in Molecular Plant Pathology (1) Seminar—1 hour. Prerequisite: course 210 or consent of instructor. Review and evaluation of current literature and research in biochemistry and molecular biology of plant microbe interactions. May be repeated for credit. (S/U grading only).—I, II, III (II, III). Rizzo

298. Special Group Study (1-5) (S/U grading only)

299. Research (1-12)

Plant Sciences

See Plant Biology, on page 471; and Plant Biology (A Graduate Group), on page 473.

Plant Sciences

[College of Agricultural and Environmental Sciences]

Chris van Kessel, Ph.D., Chairperson of the Department

Department Office, 1210 Plant and Environmental Sciences 530-752-1703;
http://www.plantsciences.ucdavis.edu/

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Alison M. Berry, Ph.D., Professor
Arnold J. Bloom, Ph.D., Professor
Eduardo Blumwald, Ph.D., Professor
Kent J. Bradford, Ph.D., Distinguished Professor
Patrick H. Brown, Ph.D., Professor
Mary Cadenasso, Ph.D., Associate Professor
Abhaya M. Dandekar, Ph.D., Professor
Theodore M. Delang, Ph.D., Distinguished Professor
Georgia Drakakaki, Ph.D., Assistant Professor
Jorge Dubcovsky, Ph.D., Professor
Jan Dvorak, Ph.D., Distinguished Professor
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Albert J. Fischer, Ph.D., Professor
Paul L. Gepts, Ph.D., Professor
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Richard W. Michelmore, Ph.D., Professor
Michelle S. Keel, Ph.D., Professor Emeritus
Kevin J. Rice, Ph.D., Professor
Jeffrey S. Ross-Ibarra, Ph.D., Associate Professor
Dina St. Clair, Ph.D., Professor
Mikal E. Salveit, Ph.D., Professor
Kenneth A. Shackel, Ph.D., Professor
Douglas V. Schmid, Ph.D., Professor
Venkatasesan Sundareshan, Ph.D., Professor (Plant Biology)
Kenneth R. Tate, Ph.D., Professor
Larry R. Teuber, Ph.D., Professor
Li Tian, Ph.D., Assistant Professor
Chris van Kessel, Ph.D., Professor
Astrid Volder, Ph.D., Assistant Professor
John I. Yoder, Ph.D., Professor
Truman P. Young, Ph.D., Professor
Florence Zakharov, Ph.D., Associate Professor
Maciej Zwieniecki, Ph.D., Associate Professor

Emeriti Faculty

Stefan Abel, Ph.D., Professor Emeritus
Huseyn Ajwa, Ph.D., Specialist in Cooperative Extension, Emeritus
David E. Bayer, Ph.D., Professor Emeritus
Michael G. Barbour, Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award
Frederick A. Bliss, Ph.D., Professor Emeritus
R. William Breidenbach, Ph.D., Lecturer Emeritus
Ivan W. Buddenhagen, Ph.D., Professor Emeritus
David W. Burger, Ph.D., Professor Emeritus
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William J. Clawson, M.S., Specialist in Cooperative Extension, Emeritus
Montague W. Dement, Ph.D., Professor Emeritus
Don J. Durzan, Ph.D., Professor Emeritus
Clyde L. Elmore, Ph.D., Specialist in Cooperative Extension, Emeritus
Theodore C. Foin, Jr., Ph.D., Professor Emeritus
Shu Geng, Ph.D., Professor Emeritus
William H. Griggs, Ph.D., Professor Emeritus
James A. Harding, Ph.D., Professor Emeritus
Charles E. Hess, Ph.D., Professor Emeritus
Ray C. Huffaker, Ph.D., Professor Emeritus
Subodh K. Jain, Ph.D., Professor Emeritus
R. Scott Johnson, Ph.D., Specialist in Cooperative Extension, Emeritus
Milan B. Jones, Ph.D., Lecturer Emeritus
W. Thomas Lanini, Ph.D., Lecturer Emeritus
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George C. Martin, Ph.D., Professor Emeritus
Warren C. Mickel, M.S., Specialist in Cooperative Extension, Emeritus
Donald J. Nevin, Ph.D., Professor Emeritus
Robert F. Norris, Ph.D., Professor Emeritus
Jack L. Paul, Ph.D., Professor Emeritus
Donald A. Phillips, Ph.D., Professor Emeritus
Richard E. Plant, Ph.D., Professor Emeritus
Vito S. Polito, Ph.D., Professor Emeritus
Calvin O. Quaile, Ph.D., Professor Emeritus
Carlos F. Reynolds, Ph.D., Professor Emeritus
Charles A. Raguse, Ph.D., Professor Emeritus
D. William Raines, Ph.D., Professor Emeritus
David E. Ramos, Ph.D., Professor Emeritus
Lawrence Rappaport, Ph.D., Professor Emeritus
Michael S. Reid, Ph.D., Professor Emeritus
Kevin J. Rice, Ph.D., Professor Emeritus
Roger J. Romani, Ph.D., Professor Emeritus
Vincent Rubatzky, Ph.D., Specialist in Cooperative Extension, Emeritus
Kay Ryugo, Ph.D., Professor Emeritus
Charles W. Schaller, Ph.D., Professor Emeritus
Herman Timm, Ph.D., Specialist, Emeritus
Robert L. Travis, Ph.D., Professor Emeritus
Raymond C. Volkman, Ph.D., Specialist, Emeritus
Ronald E. Voss, Ph.D., Specialist in Cooperative Extension, Emeritus
Barbara D. Webster, Ph.D., Professor Emeritus
Steven A. Weinkauf, Ph.D., Professor Emeritus
Lin L. Wu, Ph.D., Professor Emeritus
Masatoshi Yamaguchi, Ph.D., Professor Emeritus

Affiliated Faculty

Marita Cantwell, Ph.D., Lecturer and Specialist in Cooperative Extension
Roger T. Chetelat, Ph.D., Lecturer and Agronomist
Carlos H. Crixusto, Ph.D., Lecturer and Specialist in Cooperative Extension
Joseph M. DiTomaso, Ph.D., Lecturer and Specialist in Cooperative Extension
Richard Y. Evans, Ph.D., Lecturer and Specialist in Cooperative Extension
Steven A. Fenimore, Ph.D., Lecturer and Specialist in Cooperative Extension
Louise Ferguson, Ph.D., Lecturer and Specialist in Cooperative Extension
Bradley Hanson, Ph.D., Associate Specialist in Cooperative Extension
Timothy K. Hartz, Ph.D., Lecturer, Agronomist and Specialist in Cooperative Extension
James E. Hill, Ph.D., Lecturer and Specialist in Cooperative Extension
Robert F. Humphreys, Ph.D., Agronomist and Specialist in Cooperative Extension
Stephen R. Kafka, Ph.D., Lecturer and Specialist in Cooperative Extension
Bruce Lampinen, Ph.D., Lecturer and Specialist in Cooperative Extension
Kirk Larson, Ph.D., Pomologist and Specialist in Cooperative Extension
Muhammad Marrash, Ph.D., Continuing Lecturer in Cooperative Extension
Elizabeth J. Mitcham, Ph.D., Lecturer, Pomologist and Specialist in Cooperative Extension
Jeffrey F. Mitchell, Ph.D., Lecturer, Horticulturist and Specialist in Cooperative Extension
Lorenzo R. Oki, Ph.D., Lecturer and Associate Specialist in Cooperative Extension
(Plant Sciences, Human Ecology)
Don E. Parfit, Ph.D., Lecturer, Pomologist and Specialist in Cooperative Extension
Daniel H. Putnam, Ph.D., Lecturer, Agronomist and Specialist in Cooperative Extension
Johan W. Six, Ph.D., Adjunct Professor
Trevor V. Sislow, Ph.D., Lecturer, Postharvest Horticulturist and Specialist in Cooperative Extension
Allen Van Deynze, Ph.D., Lecturer and Researcher

Major Programs. See Biotechnology, on page 475; Ecological Management and Restoration, on page 297; Environmental Horticulture and Urban Forestry, on page 297, and Plant Sciences, on page 476.

Related Courses. See the Biotechnology, Environmental Horticulture, Horticulture and Agronomy, and Plant Biology course listings.

Graduate Study. For related graduate study, see the M.S. degree program in International Agricultural Development, and the M.S. and Ph.D. degree programs in the graduate groups of Horticulture and Agronomy, Plant Biology, Ecology, Genetics, Geog- raphy, and Soils and Biochemistry. See also Graduate Studies, on page 111.

The Major Program

The Plant Sciences major is designed for students who are interested in a scientific understanding of how plants grow and develop in managed agricultural ecosystems and how plant products are utilized for food, fiber and environmental enhancement. Advances in science and technology have provided new insights and options for using plants to address the issues associated with providing renewable food, fiber and energy resources for a growing global population while minimizing adverse impacts on the natural environment. Graduates in Plant Sciences are able to apply their skills and knowledge to a diverse range of agricultural and environmental goals or pursue advanced degrees in plant sciences.

The Program. The curriculum provides depth in the biological and physical sciences and a broad understanding of how plants obtain and utilize resources from their environment to sustain their growth and development. The influences of genetics, management systems and environmental inputs on crop development and productivity are emphasized along with the postharvest preservation and marketing of plant products. Students will develop an area of specialization in one of the following areas of concentration: Plant Biology, Plant Pathology, Ecological Management and Restoration, and Environmental Horticulture. Pre-Fall 2011 General Education (GE): Arts and Humanities; Science and Engineering; Social Sciences; American Cultures; Domestic Diversity; Oral Skills; Quantitative; Scientific; Visual; World Cultures; Writing Experience; Fall 2011 and on Revised General Education (GE): Arts and Humanities; Science and Engineering; Social Sciences; American Cultures; Domestic Diversity; Oral Skills; Quantitative; Scientific; Visual; World Cultures; Writing Experience; Quarter Offered: Fall, Winter, Spring, Summer 2011-2012 offering in parentheses.
Plant Breeding and Genetics Option

Agronomy, biotechnology, ecology, environmental sciences, including plant biology, genetics, breeding, horticulture, agriculture, biotechnology, ecology, environmental studies, pest management, education, or business management.

B.S. Major Requirements:

<table>
<thead>
<tr>
<th>Category</th>
<th>Units</th>
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<tr>
<td>Plant Sciences 1A, 1B, or 2A, 2B</td>
<td>14-15</td>
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<tr>
<td>Chemistry 2A, 2B, 2C</td>
<td>15</td>
</tr>
<tr>
<td>Chemistry 8A, 8B, 118A, 118B, 118C</td>
<td>6-12</td>
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<tr>
<td>Plant Sciences 1A, 1B, 1C</td>
<td>10</td>
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<tr>
<td>Evolution and Ecology 100 or Plant Biology 102 or 108 or 143</td>
<td>3-5</td>
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<tr>
<td>Plant Biology 117 or 147 or Plant Sciences 142 or Environmental Horticulture 160 and 160L</td>
<td>6-12</td>
</tr>
<tr>
<td>Two courses chosen from: Plant Pathology 120, Entomology 110, Nematology 100, Plant Sciences 101, 105, 106, Plant Sciences 171, 172, 175, 176, Plant and Environmental Sciences 177</td>
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<tr>
<td>Plant Sciences 196</td>
<td>3</td>
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<tr>
<td>Program 1</td>
<td>25</td>
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<tr>
<td>Program 2</td>
<td>26</td>
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</table>

Course Selection

A minimum of 25 upper division units, approved by an advisor or program coordinator, is required for the major. Honors option: Students may fulfill the program requirement through an Honors thesis in their senior year. Students may also pursue an Honors thesis in their senior year.

Graduates from this program are prepared to pursue a wide range of career alternatives. Graduates are qualified to pursue graduate study in plant biology, genetics, breeding, horticulture, agriculture, biotechnology, ecology, environmental studies, pest management, education, or business management.

Career Alternatives

Graduates are qualified to pursue graduate study in plant biology, genetics, breeding, horticulture, agriculture, biotechnology, ecology, environmental studies, pest management, education, or business management. Graduates are also prepared to pursue a wide range of career alternatives. Graduates are qualified to pursue graduate study in plant biology, genetics, breeding, horticulture, agriculture, biotechnology, ecology, environmental studies, pest management, education, or business management. Graduates are also prepared to pursue a wide range of career alternatives. Graduates are qualified to pursue graduate study in plant biology, genetics, breeding, horticulture, agriculture, biotechnology, ecology, environmental studies, pest management, education, or business management.

Areas of Specialization (choose one)

Crop Production Option

Development 170, Agrcultural and Resource Economics 100A, 130, 138, Biotechnology 150, Hydrobiology 175, Postharvest Biology and Technology Option:

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
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<tbody>
<tr>
<td>Plant Sciences 172</td>
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<tr>
<td>Plant Sciences 173</td>
<td>4</td>
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<td>Plant Sciences 174</td>
<td>3</td>
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<tr>
<td>Plant Sciences 196</td>
<td>3</td>
</tr>
<tr>
<td>Restricted Electives</td>
<td>12</td>
</tr>
<tr>
<td>Select from: Agricultural and Resource Economics 100A, 130, Food Science and Technology 107/109, 131, Plant Sciences 151, 212</td>
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</tbody>
</table>

Individual Option

It is recommended that students maintain an average grade of at least B- in their major courses. Students are encouraged to explore a variety of career options, including graduate study in plant biology, genetics, breeding, horticulture, agriculture, biotechnology, ecology, environmental studies, pest management, education, or business management. Graduates are also prepared to pursue a wide range of career alternatives. Graduates are qualified to pursue graduate study in plant biology, genetics, breeding, horticulture, agriculture, biotechnology, ecology, environmental studies, pest management, education, or business management. Graduates are also prepared to pursue a wide range of career alternatives. Graduates are qualified to pursue graduate study in plant biology, genetics, breeding, horticulture, agriculture, biotechnology, ecology, environmental studies, pest management, education, or business management.

Total Units for the Major: 118-147

Major Adviser: A.B. Bennett

Advising Center for the major is located in 1220 Plant and Environmental Sciences 530-752-1713.

Courses in Plant Sciences (PLS)

Formerly Plant and Environmental Sciences 530-752-1715.

<table>
<thead>
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<th>Course</th>
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<td>Plant Sciences 100A, 100B, 100C</td>
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<tr>
<td>Plant Sciences 100A, 100BL, 100CL</td>
<td>6</td>
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<tr>
<td>Plant Sciences 152</td>
<td>4</td>
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<tr>
<td>Evolution and Ecology 100 or Plant Biology 102 or 108 or 143</td>
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<tr>
<td>Two courses chosen from: Plant Pathology 120, Entomology 110, Nematology 100, Plant Sciences 101, 105, 106, Plant Sciences 171, 172, 175, 176, Plant and Environmental Sciences 177</td>
<td>3</td>
</tr>
<tr>
<td>Plant Sciences 196</td>
<td>3</td>
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Cultivated Plants (4)

Lecture—3 hours; discussion/lab—3 hours. Prerequisite: high school course in biology and chemistry recommended. A holistic introduction to the underlying ecological and physiological principles of cultivated plants and their response to the environment. Includes concepts behind plant selection, cultivation, and pest management. Laboratories include discussion and interactive demonstrations.

Diverse agricultural systems and practices and their relative sustainability. Laboratories provide direct experiences in the selected agricultural practices and systems. GE credit: SciEng | SE | I, II, III | Van Horn, Williams

5. Plants for Garden, Orchard and Landscape (2)

Lecture—1 hour; laboratory—3 hours. Prerequisite: for non-majors. Hands-on experience with plants cultivated for food, environmental enhancement and personal satisfaction. Topics include vegetable propagation and growth activities, flowers and ornamental plants, and the role of plants in human health and well-being. Not open for credit to students who have completed Plant Biology 1 or Plant Sciences 2. (Former course Plant Biology 1) GE credit: SciEng | SE | I, II, III | Drakakaki, Fischer, Jasieniuk, Tian

6. Power Flowers—Art and Science of Flowers and Their Uses (2)

Lecture/discussion—2 hours. Prerequisite: high school biology. Introduction to the art and science of using and growing flowers to harness the power that is represented by their aesthetic beauty. Handling, production, arranging, breeding and marketing of flowers. Emphasis on potted plants and cutflowers. (P/NP grading only) I, III | Lieb

8. Fruits and Nuts of California and the World (3)

Lecture—4 hours. Field trip seventh week of quarter. Biological and environmental principles of tree crop agriculture emphasizing California production. Topics include temperate and subtropical species, biotechnology and genetic improvement, environmental physics, pest, plant and water management, consumer issues. Not open for credit to students who have completed Plant Sciences 10. (Former course Plant Sciences 10) GE credit: SciEng | I, II, III | Polito

12. Plants and Society (4)

Lecture—3 hours; extensive writing—3 hours. Prerequisite: high school biology. Dependence of human societies on plant and plant products. Plants as resources for food, fiber, health, enjoyment and environmental services. Sustainable uses of plants for food production, raw materials, bioenergy, and environmental conservation. Global population growth and future food supplies. Not open for credit to students who have completed Plant Biology 12. (Former course Science and Society 12) GE credit: SciEng or SocSci, Div, Wrt | SE or SS, WE | I, II, III, IV | Drakakaki, Fischer, Jasieniuk, Tian

14. Introduction to Current Topics in Plant Biology (4)

Discussion—3 hours; term paper. Introduction to scientific methods and current understanding of genetics, metabolism, and cellular structure in plants, with special emphasis on topics related to societal issues, such as herbal medicine and genetically modified organisms. Designed for students not specializing in biology. Not open for credit to students who have completed Plant Biology 11. GE credit: SciEng, Wrt | SE, SL | Van Horn, Williams

21. Application of Computers in Technology (3)

Lecture—2 hours; laboratory/discussion—2 hours. Prerequisite: high school algebra. Concepts of computing and applications using personal computers, spreadsheets, database management, word processing, and communications. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 21. (Former course Agricultural Management and Rangeland Resources 2) GE credit: SciEng | SE | I, II, III, IV | Van Horn, Williams

49. Organic Crop Production Practices (3)

Lecture—1 hour; discussion—1 hour; laboratory—3 hours. Principles and practices of organic production of annual crops. Including organic crops, soil, and pest management, cover cropping, composting, seeding, transplanting, harvesting, and marketing. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 49. (Former course Agricultural Management and Rangeland Resources 49) (P/NP grading only) GE credit: SE | I, II, III, IV | Van Horn

98. Directed Group Study (1-5)

Prerequisite: consent of instructor; primarily for lower division students. (P/NP grading only) I, II, III, IV | I, II, III, IV

Quarter Offered: Autumn, Winter; Pre-Fall 2011 and on Revised General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; ACGN—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
100A. Metabolic Processes of Cultivated Plants (3) Lecture—3 hours. Prerequisite: course 2 or Biological Sciences 1C, 2C, or equivalent. Metabolic processes, including water relations, respiration, photosynthesis, enzyme kinetics, immunology, and nitrogen fixation. Quantitative methods, problem solving, and practical applications are emphasized. GE credit: SciEng | SE — III. (III.) Fischer, Zakharov

100AL. Metabolic Processes of Cultivated Plants Laboratory (2) Lecture/discussion—3 hours. Prerequisite: course 100A or the equivalent (may be taken concurrently). Techniques and instruments used to study plant metabolic processes, including water relations, respiration, photosynthesis, enzyme kinetics, immunology, and nitrogen fixation. Quantitative methods, problem solving, and practical applications are emphasized. GE credit: SciEng | SE — III. (III.) Blumwald

100B. Growth and Yield of Cultivated Plants (3) Lecture—3 hours. Prerequisite: course 100A or consent of instructor. Principles of plant interactions with their physical and biological environments and their acquisition of the resources needed for growth and reproduction. An emphasis on how management practices and environmental conditions affect crop productivity and quality. GE credit: SciEng | SE — II. (II.) Bradford, Solovet

100BL. Growth and Yield of Cultivated Plants Laboratory (2) Lecture/discussion—3 hours. Prerequisite: course 100A or may be taken concurrently. Laboratory exercises in plant growth and development and their regulation, including photomorphogenesis, plant growth regulators, plant anatomy, seed germination, fruit ripening and senescence. Includes field trips to illustrate relationships to cropping and marketing systems. GE credit: SciEng | SE — II. (II.) Bradford

100C. Environmental Interactions of Cultivated Plants (3) Lecture—2 hours. Prerequisite: course 100A or consent of instructor. Principles of plant interactions with their physical and biological environments and their acquisition of the resources needed for growth and reproduction. An emphasis on how management practices and environmental conditions affect crop productivity and quality. GE credit: SciEng | SE — III. (III.) Brown

100CL. Environmental Interactions of Cultivated Plants Laboratory (2) Lecture—2 hours. Prerequisite: course 100C or may be taken concurrently. Techniques and instruments used to study plant interactions with their physical and biological environments, including light response, transport, photosynthesis, nitrate availability and utilization, biomass accumulation. Quantitative methods and modeling are emphasized. GE credit: SciEng | SE — III. (III.) Shackel

101. Agriculture and the Environment (3) Lecture—2 hours. Prerequisite: course 2 or consent of instructor. Interaction between agriculture and the environment. Focus on the interaction between agriculture and the environment to address the principles required to move the agriculture and development solutions to complex problems facing society. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 101. Former course 102. GE credit: SciEng | SE — II. (II.) Tate

102. California Flora (5) Lecture—3 hours; laboratory—8 hours. Prerequisite: course 2, Biological Sciences 1C, 2C, or equivalent. Survey of the flora of California, emphasizing recognition of important vascular plant families and genera and use of taxonomic keys for species identification. Current understanding of relationships of plant families. Principles of plant taxonomy and phylogenetic systematics. One Saturday field trip. (Same course as Plant Biology 102.) GE credit. SciEng | SE, VL — III. (III.) Potter

105. Concepts in Pest Management (3) Lecture—2 hours, laboratory/discussion—3 hours. Prerequisite: Biological Sciences 1C or course 2, Chemistry 88B. Introduction to the ecological principles of integrated pest management, biology of different classes of pests, losses they cause, population assessment, evaluation of advantages and disadvantages of different techniques used for pest management, IPM programs. Not open for credit to students who have completed Plant Biology 105. GE credit: SciEng | SE — III. (III.) Aitken, Flint

110A. Principles of Agronomic Crop Production in Temperate and Tropical Systems (3) Lecture—3 hours. Prerequisite: course in general botany or course 2 recommended. Fundamentals of field crop production in temperate and tropical climates. Resource utilization and economic, political and social problems are considered in relation to technical and economic considerations of agricultural production and use. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 105. GE credit: SciEng | SE — I. (I.) Aitken, Flint

110C. Crop Management Systems for Vegetable Production (4) Lecture—2 hours, laboratory—3 hours; discussion—1 hour. Prerequisite: course 2; course 110A recommended. Horticultural principles applied to production and management systems for vegetable crops. Laboratory and discussion lab required. Efficient field management and resource use practices. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 110C. GE credit: SciEng | SE — II. (II.) Mitchell

110L. Principles of Agronomy Laboratory (1) Laboratory—3 hours. Prerequisite: course 110B or may be taken concurrently. Introduction to principles of agronomic crop production. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 110L. GE credit: SciEng | SE — II. (II.) Mitchell

110F. Forage Crop Ecology (3) Lecture—3 hours. Prerequisite: course 2, Biological Sciences 1C, 2C, or consent of instructor. Forages as a world resource in food production. Ecological principles governing the adaptation, establishment, growth and management of perennial and annual forages, including pastures, rangelands and hay; aspects of forage yields, quality, and nutritional value to livestock. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 110F. GE credit: SciEng | SE — III. Teuber

111. Biological Applications in Fruit Tree Management (2) Lecture—4 hours, laboratory—3 hours. Prerequisite: course 2, Biological Sciences 1C, 2C, or equivalent. Physiology, growth, development and environmental requirements of fruit trees and the cultural practices used to maintain them. Emphasis on the application of biological principles in the culture of commercially important temperate zone fruit tree species. Not open for credit to students that have completed Plant Biology 173. Former course Plant Biology 173.) GE credit: SciEng | SE

114. Biological Applications in Fruit Production (2) Lecture—1 hour; laboratory—3 hours. Prerequisite: course 2, Biological Sciences 1C or course 120. Introductory biology and ecosystem principles of fruit production, tree nutrition and orchard management for optimizing cropping. Laboratories emphasize hands-on work with orchard tree systems that are done specifically to produce the crop. Not open for credit to students who have completed Plant Biology 174. Former course Plant Biology 174.) GE credit: SciEng | SE — II. (II.) DeLong

120. Applied Statistics in Agricultural Sciences (4) Lecture—3 hours; discussion/laboratory—3 hours. Prerequisite: upper division standing. Application of statistical methods to design and analysis of experiments for plant, animal, behavioral, nutritional, and consumer sciences. Basic concepts and statistical methods are presented in lectures, laboratories emphasize data processing techniques, problem solving, and interpretation in specialized fields. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 120. Former course Agricultural Management and Rangeland Resources 120. GE credit: SciEng | QL — I. (I.) Laca, Medrano, Teuber

130. Rangelands: Ecology, Conservation and Restoration (3) Lecture—3 hours. Prerequisite: Biological Sciences 1C or equivalent or course 2 recommended. Horticultural principles applied to production and management systems for vegetable crops. Laboratory and discussion lab required. Efficient field management and resource use practices. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 130. GE credit: SciEng | SE — II. (II.) Tate

131. Identification and Ecology of Grasses (2) Lecture—7.5 hours; laboratory—20 hours; discussion—5 hours. Prerequisite: Biological Sciences 1C or course 2, Plant Biology 102 and junior standing recommended. Taxonomy and identification of western grasses. Development of skills in using plant identification keys. Ecology and evolution of grasses in grazing ecosystems. Given the week following spring quarter. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 131. Former course Agricultural Management and Rangeland Resources 131.) Offered in alternate years. GE credit: SciEng | SE, VL

135. Ecology and Community Structure of Grassland and Savannah Herbivores (3) Lecture—3 hours. Prerequisite: Biological Sciences 1A or 1B and course 2, or Biological Sciences 1C, general ecology course (Environmental Science and Policy 100) recommended. Feeding ecology of grassland herbivores and its importance in determining biomass partitioning and productivity. Optimal foraging, interspecific interactions, and primary productivity are considered as factors structuring natural and managed grassland and savannah systems. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 135. Former course Agricultural Management and Rangeland Resources 135.)

140. Culinary and Medicinal Herbs (3) Lecture/discussion—3 hours. Prerequisite: Plant Sciences 2. Culinary and Medicinal Herbs 2. Growth, identification, cultivation and use of common culinary and medicinal herbs; herbal plant families; effects of climate and soil on herb crops; herbal medicine; ecology and geography of herbs; herb garden design; secondary chemistry of active compounds. (Same course as Environmental Science
150. Sustainability and Agroecosystem Management (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: Soil Science 101, Chemistry 2A, and course 2, Biological Sciences 1C or 2C. Interdisciplinary analysis of agricultural production and food systems with primary emphasis on biophysical processes. Concepts governing the function of temperate and tropical agroecosystems in relation to resource availability, ecological sustainability, and socioeconomic viability. Comparative ecological analyses of agroecosystems. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 150. (Former course Agricultural Management and Rangeland Resources 150.) GE credit: SciEng | OL, SE, SL—III. (III) Six
152. Plant Genetics (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: Biological Sciences 1A or 2A or consent of instructor. Basic principles of transmission genetics, crossovers, quantitative genetics, and molecular genetics. Practical aspects of genetic crosses and analysis of segregating populations. Not open for credit to students who have completed Plant Biology 152. (Former course Plant Biology 152.) GE credit: SciEng | SE. —II. (II) Beckles

153. Plant, Cell, Tissue and Organ Culture (4)
Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: course 2 or Biological Sciences 1C or 2C. Basic and applied aspects of plant tissue culture including media preparation, micropropagation, organogenesis, somatic embryogenesis, and plant regeneration. Protocols and culture transcription. Not open for credit to students who have completed Plant Biology 153. (Former course Plant Biology 153.) GE credit: SciEng | SE. —II. (II) Cadenasso

154. Introduction to Plant Breeding (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 152, Biological Sciences 101 or consent of instructor. The principles, methods, and applications of plant breeding and genetics to the improvement of crops. Illustration of how plant breeding is a dynamic, multidisciplinary, constantly-evolving science. Laboratory emphasizes hands-on experience in the basics of plant breeding and plant improvement. Not open for credit to students who have completed Plant Biology 154. (Former course Plant Biology 154.) GE credit: SciEng | SE. —II. (II) St. Clair

157. Physiology of Environmental Stresses in Plants (4)
Lecture—2 hours; discussion—2 hours. Prerequisite: course 100C or Plant Biology 111 or 112 or Environmental Horticulture 102 or Viticulture and Enology 110. Stress,Steven L. Sheehy. Molecular, physiological, developmental and morphological characteristics enabling plants to avoid or tolerate environmental stresses; stress acclimation and adaptation processes; responses of wild and cultivated species to drought, flooding, nutrient deficiencies, salinity, toxic ions, extreme temperatures, etc. Not open for credit to students who have completed Plant Biology 157. (Former course Plant Biology 157.) GE credit: SciEng | SE.

158. Mineral Nutrition of Plants (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 100A or Plant Biology 111 or Environmental Horticulture 110 or Evolution and scope of plant nutrition; essential elements; mechanisms of absorption and membrane transporters; translocation and allocation processes; mineral metabolism and toxicities; genetic variation in plant nutrition; applications to management and understanding ecological effects of nutrient availability or deficiency. Not open for credit to students who have completed Plant Biology 158. (Former course Plant Biology 158.) GE credit: SciEng | SE. —III. Brown

160. Agroforestry: Global and Local Perspectives (3)
Lecture—3 hours; discussion—2 hours. Prerequisite: Plant Sciences 2 or Biological Sciences 1C or 2C; Plant Sciences 142 or 150 or Biological Sciences 28 or a general ecology course. Traditional and evolving uses of trees in agricultural ecosystems; their multiple roles in environmental stability and production of food, fuel, and fiber; and socioeconomic barriers to the adoption and implementation of agroforestry practices. Not open for credit to students who have previously taken AgriCulture and Rangeland Resources 160. (Former course AgriCulture and Rangeland Resources 160.) (Same course as International Agricultural Development 160.) Offered in alternate years. GE credit: SciEng | SE. —I. (I) Gradziel

162. Urban Ecology (3)

170A. Fruit and Nut Crop Systems (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 2, Biological Sciences 1C, or consent of instructor. Overview of production and handling systems of major horticultural and nut crops. Current cultural and harvesting problems and concerns associated with commercial fruit growing. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 170A. (Former course Agricultural Management and RangeLand Resources 170A.) Offered in alternate years. GE credit: SciEng | SE. —II. (II) Gradziel

170B. Fruit and Nut Crop Systems (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 2, Biological Sciences 1C, or consent of instructor. Overview of production and handling systems of major horticultural and nut crops. Current cultural and harvesting problems and concerns associated with commercial fruit growing. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 170B. (Former course Agricultural Management and Rangeland Resources 170B.) Offered in alternate years. GE credit: SciEng | SE. —II. (II) Cadondo

171. Principles and Practices of Plant Propagation (4)
Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: course 2, Biological Sciences 1C or 2C. Principles and practices of propagating plants covering anatomical, physiological, and practical aspects. Not open for credit to students who have completed Plant Biology 171. (Former course Plant Biology 171.) GE credit: SciEng | SE. —III. (III) Burger

172. Postharvest Physiology and Technology (4)
Lecture—3 hours; laboratory/discussion—2 hours. Prerequisite: general plant science background (e.g., courses 2, 12); course 196 recommended. Overview of physiological processes related to maturation and senescence of plant products and their responses to postharvest stresses. Targeted approaches and technologies to maintain product quality and limit postharvest disorders. Not open for credit to students who have completed Plant Biology 172. (Former course Plant Biology 172.) GE credit: SciEng | SE. —I. (I) Salweit, Zakharov
173. Molecular and Cellular Aspects of Postharvest Biology (3)
Lecture/discussion—4 hours. Prerequisite: course 2, Biological Sciences 1C or 2C or equivalent. Basic concepts and current knowledge of issues relevant to postharvest biology. Mechanisms of fruit ripening, senescence and ultimate death. Metabolism and functions of phytohormones, carbohydrates, lipids, pigments, flavor compounds, and phytotoxicants at molecular and cellular levels. GE credit: SciEng | SE. 

174. Microbiology and Safety of Fresh Fruits and Vegetables (3)
Lecture—3 hours. Prerequisite: course 2 or Biological Sciences 1C or 2C or equivalent. Overview of microorganisms on fresh produce, pre- and postharvest factors influencing risk of microbial contamination, attachment of microorganisms to produce, multiplication during postharvest handling and storage, and detection. Mock outbreak trial and presentation of science-based forensic diagnosis. GE credit: SciEng | SE. 

176. Introduction to Weed Science (4)
Lecture—2 hours; laboratory/discussion—4 hours. Prerequisite: SE—I. Anderson. Lecture—2 course 2 or Biological Sciences 1C or 2C. Weed biology, ecology, management, environmental control, chemical and mechanical control, herbicides and herbicide resistance. Weed control in managed and natural ecosystems. Legal and regulatory applications. Herbicide safety. Identification of weeds and eradication planning. GE credit: SciEng | SE—III. Zakharchov. 

178. Biology and Management of Aquatic Plants (3)
Lecture—3 hours. Prerequisite: course 2, Biological Sciences 1C or 2C; Chemistry 8C or 118B; course 100C, Plant Biology 111, Environmental Horticulture 102, or Hydrologic Science 122 recommended. Lecture—brief survey of common and invasive fresh water plants and macroalgae, their reproductive modes, physiology, growth (photosynthesis, nutrient utilization), development (meroplanktonic interactions), ecology, modes and impacts of invasion, and management. Two Saturday field trips required. Offered in alternate years. Not open for credit to students who have completed course Plant Biology 178. (Former course Plant Biology 178.) GE credit: SciEng | SE. 

188. Undergraduate Research Proposal (3)
Lecture/discussion—3 hours. Prerequisite: upper division standing. Preparation and review of a scientific proposal. Problem definition, identification of objectives, literature survey, hypothesis generation, design of experiments, data analysis planning, proposal outline and preparation. Same course as Biological Technology 188. GE credit: SciEng, WRT | OL, SE, WE—III. Kliebenstein. 

189L. Laboratory Research in Plant Sciences (2-5)
Laboratory—3-12 hours; discussion—1 hour. Prerequisite: course 188 and consent of instructor. Formulating experimental approaches to current questions in Plant Sciences; presentation of proposed experiments. May be repeated up to 12 units for credit. [P/NP grading only.]—I, II, III, IV (I, II, III). 

190. Seminar on Alternatives in Agriculture (2)
Seminar—2 hours. Prerequisite: upper division standing. Seminar on topics related to alternative theories, practices and systems of agriculture and the relationship of agriculture to the environment and society. Scientific, technological, social, political and economic perspectives. May be repeated for credit. (Former course Agricultural Management and Rangeland Resources 190.) [P/NP grading only.] GE credit: SE—II. [I, II] Van Horn. 

190C. Research Group Conference (1)
Discussion—1 hour. Prerequisite: advanced standing; consent of instructor. Weekly conference on research projects, general class projects, and techniques in the plant sciences. May be repeated for credit. [P/NP grading only.]—I, II, III, IV (I, II, III). 

192. Internship—1-2 hours.
Internship—3-36 hours. Prerequisite: completion of 84 units and consent of instructor. Work experience on or off campus in subject areas pertaining to plant and environmental sciences. Internship supervised by a faculty member. [P/NP grading only; deferred grading only, pending completion of thesis.] GE credit: SE. 

196. Postharvest Technology of Horticultural Crops (3)
Lecture/discussion—45 hours; fieldwork—45 hours. Prerequisite: upper division or graduate student standing. Intensive study of postharvest considerations and current challenges in postharvest handling for fruits, nuts, vegetables, and ornamentals in California. Scheduled first two weeks immediately following last day of spring quarter. Not open for credit to students who have completed Plant Biology 196. (Former course Plant Biology 196.) [P/NP grading only.] GE credit: SE. 

197T. Tutoring in Plant Science (1-5)
Discussion—1 hour. Prerequisite: upper division standing, completion of a course or the equivalent, consent of instructor. Leading small voluntary discussion or lab groups affiliated with one of the department's regular courses. May be repeated for up to eight units of credit at cumulative maximum of 18 units. [S/U grading only.] 

198. Directed Group Study—1-5 hours.
Directed study (upper division) oriented toward the student's major area of interest. May be repeated for credit. Not open for credit to students who have completed Plant Biology 178. (Former course Plant Biology 178.) GE credit: SciEng, WRT | OL, SE, WE—III. (I, II) DiTomaso, Fischer. 

199. Special Study for Advanced Undergraduates—1-5 hours.
Prerequisite: consent of instructor. [P/NP grading only.]—I, II, III, IV. GE credit: SciEng | SE. 

Graduate

202. Experimental Design and Analysis (5)
Lecture—3 hours; discussion/laboratory—2 hours. Prerequisite: course 120 or equivalent. Introduction to the research process and statistical methods to plan, conduct and interpret experiments. Not open for credit to students who have completed Agricultural and Environmental Sciences 205. (Former course Agronomy 205.)—II. (I) Dubcovsky. 

206. Applied Multivariate Modeling in Agricultural and Environmental Sciences (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one of course 120, Statistics 106, 108, course 205 or equivalent. Multivariate linear and nonlinear models. Model selection and parameter estimation. Analysis of manipulative and observational agroecological experiments. Discriminant, principal component, and path analyses. Logistic and biased regression. Bootstrapping. Exercises based on actual research by UCD graduate students. Not open for credit to students who have completed Agricultural and Environmental Sciences 206. (Former course Agronomy 206.)—I. (I) Laca. 

211. Principles and Practices of HPLC (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: undergraduate physics and chemistry; Biological Sciences 102, 103 recommended. Principles and theory of HPLC involving various modes of separation and detection. Optimization of separation using isocratic and gradient elution. Develop practical knowledge about the use, maintenance and troubleshooting of HPLC equipment, including HPLC columns. Development of new HPLC methods. Not open for credit to students who have completed Agricultural and Environmental Sciences 211. (Former course Agronomy 211.) 

212. Postharvest Biology and Biotechnology of Fruits and Nuts (3)
Lecture—3 hours. Prerequisite: course 172. Review of postharvest biology of fruits and nuts and biotechnological approaches to address postharvest challenges. Morphology, biology and postharvest handling of fruits and nuts are presented along with current research, including biotechnology, and discussion of future research needs and approaches. Offered in alternate years. Not open for credit to students who have completed Pomology 212. (Former course Vice Crops 212.) Offered in alternate years. (III) Salvesen. 

220. Genomics and Biotechnology of Plant Improvement (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101 or the equivalent. Integration of modern biotechnology and classical plant breeding including the impact of structural, comparative and functional genomics on gene discovery, characterization and exploitation. Also covers molecular markers, plant transformation, hybrid production, disease resistance, and novel outcomes. Not open for credit to students who have completed Vegetable Crops 220. (Former course Vegetable Crops 220.) (Same course as Genetics 222.)—I. (I) Neale. 

221. Genomics and Breeding of Vegetable Crops (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101 or equivalent. Preview of genome structure, mapping, gene tagging and development of other genetic resources applied to improvement of major vegetables. For graduate students contemplating a career in modern vegetable breeding and biotechnology. Not open for credit to students who have completed Vegetable Crops 221. (Former course Vegetable Crops 221.) 

222. Advanced Plant Breeding (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 154 and 205; Genetics 201 or Animal Genetics 107 recommended. Philosophy, methods, and problems in developing improved plant species. Topics include: inbreeding, heterosis, progeny testing, breeding methodology, index selection, germplasm conservation, and indices to measure stress resistance. Laboratories include tours of breeding facilities and calculation and interpretation of quantitative data. Offered in alternate years. (III) Feuerbacher. 

290. Seminar—1-2 hours.
Topics of current interest related to Plant Sciences. (S/U grading only.)—I, II, III. 

290C. Research Conference (1)
Discussion or laboratory—1 hour. Prerequisite: consent of instructor. (S/U grading only.)—I, II, III, IV (I, II, III). 

297T. Tutoring in Plant Science (1-5)
Tutoring—1-5 hours. Prerequisite: graduate standing; consent of instructor; completion of course to be tutored or the equivalent. Designed for graduate students who desire teaching experience but are not teaching assistants. May be repeated for credit for a total of five units. Same course may not be tutored more than once. (S/U grading only.) 

299 Group Study—1-5 hours.
Prerequisite: consent of instructor. (S/U grading only.)—I, II, III, IV (I, II, III, IV)
Political Science

The Department of Political Science offers two major programs: political science and international affairs.

Fields of Concentration

American Politics (4)
American National Government (4)
Comparative Politics (2)
International Relations (7)
International Relations 3 as a prerequisite: Political Science 120, 124, 126, 129, 130-132, 134-137, 139, 190, 196C, International Relations 131
Political Theory (4)
Political Theory as a prerequisite: Political Science 110, 112-117, 118A, 118C, 119, 187, 192D

Total Units for the Major: 72-73

Political Science—Public Service

A.B. Major Requirements:

Preparatory Subject Matter: 20

Political Science 1
Two courses from: Political Science 2, 3, 4, 5 or 7
Statistics 13 (or equivalent)
Political Science 51

Core program: 12

A.CGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

Three courses chosen from Political Science 100, 102, 104, 105, 106, 108, 109, 113, 114, 116; Internship, Political Science 192A, 192B, or 192W
Research paper, Political Science 193

Fields of concentration

Select six upper division courses from two or three fields of concentration listed below with at least two courses in each field selected; at least 16 of the units must be in political science; Core Program courses may not be counted toward this requirement.

Total Units for the Major: 64-66

Major Advisers. Consult Department office.

Minor Program Requirements:

Students electing a minor in Political Science may choose one of two plans.

UNITS

Political Science: 24

Six upper division courses: Three courses in one of the fields of concentration and three courses outside of that field.

Public Affairs Internship Program: This program is open to upper division students in any major who want to obtain an internship in the area of government and public service. Information and application forms are available from the Political Science Department in 1273 Social Sciences and Humanities Building.

Graduate Study: The Department of Political Science offers a program of graduate study and research leading to a Ph.D. degree or an M.A./J.D. joint degree. The M.A./J.D. joint degree is only available in conjunction with UC Davis School of Law. Information concerning admission to these programs and requirements for completion are available in the Graduate Program Coordinator office.

Graduate Adviser. Consult Graduate Program Coordinator office.

American History and Institutions. This University requirement may be satisfied by passing any one of the following Political Science courses: 1, 5, 100, 102, 104, 105, 106, 108, 109, 113, 130, 131, 160, 163; see also under University requirements.

Courses in Political Science (POL) Lower Division

1. American National Government (4)
Lecture—3 hours; discussion—1 hour. Survey of American national government, including the constitutional system, political culture, parties, elections, the presidency, Congress, and the courts. GE credit: SocSci, Wrt | ACGH, SS, WE

Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
2. Introduction to Comparative Politics (4)  
Lecture—3 hours; discussion—1 hour. Introduction to basic concepts in political analysis and application of them in comparative studies of selected countries. Coverage is given to cultural and other informal dimensions of politics as well as to more formal political analytic approaches and theoretical structures. GE credit: SocSci, Wrt | SS, WC, WE.

3. International Relations (4)  
Lecture—3 hours; discussion—1 hour. International conflict and cooperation, including the Cold War, nuclear weapons, and new techniques for understanding international politics. GE credit: SocSci, Wrt | SS, WC, WE.

4. Basic Concepts in Political Theory (4)  
Lecture—3 hours; discussion—1 hour. Analysis of such concepts as the individual, community, liberty, equality, justice, and natural law as developed in the works of the major political philosophers. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE.

5. Contemporary Problems of the American Political System (4)  
Lecture—3 hours; discussion—1 hour. In-depth treatment of selected problems and issues of American politics, governmental institutions, and policies. GE credit: SocSci, Wrt | ACGH, SS, WE.

6. Contemporary Issues in Law and Politics (4)  
Seminar—4 hours. A seminar which focuses on the political dimensions of American law and institutions. Examines the role of courts in resolving contemporary issues of law and politics, including abortion, capital punishment, and civil rights. Limited enrollment. Open to students having no more than 40.1 units. GE credit: SocSci, Wrt | ACGH, SS, WE.

51. Scientific Study of Politics (4)  
Lecture—3 hours; discussion—1 hour. Introduction to the basic principles of the scientific study of politics. Research design and empirical analysis of data with applications to different methodological approaches and different substantive areas in political science. GE credit: ArtHum or SocSci | AH or SS, QL, SE, WC.

90X. Lower Division Seminar (4)  
Seminar—4 hours. Prerequisite: lower division standing and consent of instructor. Examines fundamental issues and concepts that shape the study and practice of politics. Students will read, discuss and write about some of the most significant texts in political science in order to develop a foundation for the study of politics. Limited enrollment.

99. Special Study for Undergraduates (1-5)  
Prerequisite: consent of instructor. (P/N grading only)

Upper Division

100. Local Government and Politics (4)  
Lecture—3 hours; paper or discussion—1 hour. Prerequisite: course 1 and upper division standing or consent of instructor. Politics and government of local communities in the United States, including cities, counties and special districts. Emphasizes sources and varieties of community conflict, legislative and executive patterns, expertise, decision making and the politics of structure. Observation of local governing bodies. GE credit: SocSci, Wrt | ACGH, SS, WE.

102. Urban Public Policy (4)  
Lecture—3 hours; paper or discussion—1 hour. Prerequisite: course 1, upper division standing in Political Science or consent of instructor. Political and economic relationships among central cities, suburbs, and regional, state, and federal governments. Focuses upon policy areas such as poverty, transportation, housing, and upon who governs and who benefits from the policies in these areas. GE credit: SocSci, Wrt | ACGH, DD, QL, SS, WE.

104. California State Government and Politics (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1 and upper division standing or consent of instructor. The California political system. Political culture, constitution, elections and parties, direct democracy, legislation, executive branch, courts, finances, state-local relations and policy issues. Offered irregularly. GE credit: SocSci, Wrt | ACGH, SS, WE.

105. The Legislative Process (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1. The legislative process with an emphasis on the United States Congress; legislative organization and procedures, legislative leadership and policy making, legislators and constituents, relations between Congress and other agencies. GE credit: SocSci, Wrt | ACGH, SS, WE.

106. The Presidency (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1. The American presidencies origins and development; presidential power and influence as manifest in relationships with Congress, courts, parties, and the public in the formulation and administration of foreign and domestic policy; nominations, campaigns, and elections. GE credit: SocSci, Wrt | ACGH, SS, WE.

107. Environmental Politics and Administration (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or consent of instructor. Introduction to the environment as a political issue in the United States and to the development of administrative mechanisms for handling environmental problems. Changing role of Congress, the bureaucracy, and the courts in environmental policy formulation and implementation. GE credit: SocSci, Wrt | ACGH, SS.

108. Policy Making in the Public Sector (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1 and upper division standing or consent of instructor. Theoretical rationale for government activity, program evaluation, PPBS, positive theories of policy making, the quantitative study of policy determinants, implementation, and proposals for improved decision making. Offered irregularly. GE credit: SocSci, Wrt | ACGH, QL, SS, WE.

109. Public Policy and the Governmental Process (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1. The processes of formulating public policy, including individual and collective decision making, and policy change. GE credit: SocSci, Wrt | ACGH, SS, WE.

110. The State and the Masses (4)  
Lecture—3 hours; term paper or discussion—1 hour. Introduction to game theory. Explanation of the behavior of individuals in strategic interaction. Rational and behavioral approaches. Applications to political science and other fields. GE credit: SocSci, Wrt | QL, SS, WE.

112. Contemporary Democratic Theory (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. Major contemporary attempts to reformulate traditional democratic theory, attempts to replace traditional theory by conceptual models derived from modern social science findings. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE.

113. American Political Thought (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. Origins and nature of American political thought. Principles of American thought as they emerge from the American tradition. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, WE.

114. Quantitative Analysis of Political Data (4)  
Lecture—3 hours; term paper or discussion—1 hour. Logic and methods of analyzing quantitative data. Topics covered include central tendency, probability, correlation, and non-parametric statistics. Particular emphasis will be upon the use of statistics in political science research. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt | AH or SS or SE, QL, VL, WE.

115. Medieval Political Thought (4)  
Lecture—3 hours; term paper. Prerequisite: course 118A. Examination of the medieval political thinking. Emphasis will be upon the thoughts of the major political thinkers of the period, rather than upon political history. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE.

116. Foundations of Political Thought (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. Analysis and evaluation of the seminal works of a major political philosopher or of a major problem in political philosophy. May be repeated one time for credit when topic differs. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE.

117. Topics in the History of Political Thought (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. The political thought of a specific historical period. Topics may include: Ancient Athens, the Italian Renaissance, the Enlightenment, or Nineteenth Century Germany. May be repeated one time for credit. GE credit: SocSci, Wrt | SS, WE.

118A. History of Political Theory: Ancient (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. Critical analyses of classical and medieval political philosophers such as Plato, Aristotle, Cicero and St. Thomas. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE.

118B. History of Political Theory: Early Modern (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. Critical analyses of the works of late modern political philosophers such as Rousseau, Kant, Hegel, Tocqueville, Mill, Marx and Nietzsche. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE.

119. Contemporary Political Thought (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 4. Contemporary political thought from the end of the nineteenth century to the present. Emphasis upon an individual philosopher, concept, or philosophical movement; e.g., Nietzsche, Continental political thought, Rawls and critics, theories of distributive justice, feminist theory. Offered irregularly. GE credit: ArtHum or SocSci, Wrt | AH or SS, WE.

120. Theories of International Politics (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 3. Contemporary approaches to the study of international politics, including balance of power, game theory, Marxist-Leninist theory, systems theory, and decision-making analysis. GE credit: SocSci, Wrt | SS, WE.

121. Scientific Study of War (4)  
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 3. Upper division standing or consent of instructor. Major contemporary approaches to the study of international politics, including balance of power, game theory, Marxist-Leninist theory, systems theory, and decision-making analysis. GE credit: SocSci, Wrt | QL, SS, WE.
122. International Law (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2. Selected topics in interna-
tional law, territory, sovereignty, immunity, responsi-
bility, the peaceful settlement or nonsettlement of
international disputes. GE credit: SocSci, Wrt | SS,
WE.
123. The Politics of Interdependence (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 3, upper division standing or
consent of instructor. In the past several decades,
growing economic interdependence has generated
new political relations. Course deals with difficulties in managing complex interde-
pendence and its implication on national policies
and politics. GE credit: SocSci, Wrt | SS, W
124. The Politics of Global Inequality (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 3, upper division standing;
course 123 recommended. Analysis of current econ-
omic and political international relations resulting
from a long standing division of the global system
into rich and poor regions. GE credit: SocSci, Div,
Wrt | SS, WE.
126. Ethnic Self-Determination and
International Salience (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 3. Compares the claims of the
state and ethnic peoples in countries undergoing
internal conflicts; e.g., South Africa, Northern Ire-
land. Analyzes the international community in
fostering the peaceful resolution of conflicts.
GE credit: SocSci, Div, Wrt | SS, WC, WE.
129. Special Studies in International Politics
(4)
Lecture—3 hours; term paper. Prerequisite: course 3,
upper division standing. Intensive examination of
one or more special problems in international poli-
tics. May be repeated one time for credit when dif-
dent topic is studied. GE credit: SocSci, Wrt | SS,
WE.—II.
130. Recent U.S. Foreign Policy (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 3, upper division standing or
consent of instructor. Broad survey of the develop-
ment of U.S. foreign policy in twentieth century with
emphasis on transformation of policy during and
after World War II, and the introduction to analytic
tools and concepts useful for understanding of cur-
rent foreign policy issues. GE credit: SocSci,
Wrt | AGCH, SS, WE.
131. Analysis of U.S. Foreign Policy (4)
Lecture—3 hours; term paper. Prerequisite: course 3,
upper division standing or consent of instructor. Detailed presentation and examination of the formu-
lation of execution of U.S. foreign policy. Survey of
numerous factors influencing policy outcomes and
how such determinants vary according to policy
issue areas. GE credit: SocSci, Wrt | SS, WE.
132. National Security Policy (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 3, upper division standing.
Development of national security policies since
1945. Analysis of deterrence and assumptions upon
which it is based. Effects of nuclear weapons upon
conduct of war, alliance systems, and the interna-

tional politics of the Middle East as a microcosm of world politics. The Middle East as a regional system. Domestic and International Politics in the Middle East. Changing Political Structures in the Middle East. Superpower involvement in the Middle East. GE credit: SocSci, Wrt | SS, WE.
136. The Arab-Israeli Conflict (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 3 or International Relations 1.
Restricted to upper division standing. Causes, course,
137. International Relations in Western
Europe (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 3, upper division standing.
Analysis of European unity, problems of the Atlantic
alliance, Atlantic political economy, East-West rela-
tions, communism in Western Europe and the rela-
tionship between domestic politics and foreign
politics. GE credit: SocSci, Wrt | SS, WC, WE.
140A. Comparative Political Institutions:
Electoral Systems (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2. Workings of electoral institu-
tions, focusing on systems used to elect presidents
and assemblies, pass laws, and generally make
decisions. Examples from throughout the world,
including cases from both the advanced industrial
and developing worlds. Offered in alter-
ate years. GE credit: SocSci, Div, Wrt | QL, SS,
WE.
140B. Comparative Political Institutions:
Parties (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor.
Restricted to upper division standing. The factors
shaping political parties and their role in democratic
representation. Offered in alternate years. GE credit:
SocSci, Div, Wrt | SS, WE.
140C. Comparative Political Institutions:
Legislatures (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor; upper
division standing. Examination of legislatures from a
comparative perspective. Offered in alternate years.
GE credit: SocSci, Div, Wrt | SS, WE.
140D. When Institutions Fail (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2. Pass One open to upper divi-
sion Political Science & International Relations
majors. Examination of factors contributing to the
success and failure of political institutions. Offered in
alternate years. GE credit: QL, SS, WE,—I, III.
140E. Policy-Making Processes (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor; upper
division standing. Examination of policy-making in the
U.S. and other countries. Offered irregularly. GE
credit: QL, SS, WE.—I, III.
142A. Comparative Development: Political
Development in Modernizing Societies (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor; upper
division standing. Nature and sequence of political
development; its economic and social concomitants;
role of elites, military, bureaucracy, and party sys-
tems; social stratification and group politics; social mobilization and politics; instability, violence, and the politics of integration. Offered in
alternate years. GE credit: SocSci, Wrt | SS, WC,
WE.
142B. Comparative Development: Politics
and Inequality (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor; upper
division standing. Linkages between politics and the
distribution of income, wealth, and power. Impacts of
civil rights legislation, the politics of welfare states,
and the effects of political participation on the distri-
bution of goods. Offered in alternate years. GE
credit: SocSci, Wrt | SS, WC, WE.
142C. Comparative Political Development:
Democracy and Democratization (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor. Pass
One open to upper division Political Science & Inter-
national Relations majors. Examination of conditions
promoting democratization and democratic stability.
Offered irregularly. GE credit: SS, WE,—I, III.
143A. Latin American Politics (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2. Issues related to democratic
consolidation in Latin America, with a regional focus
on South America. Topics include transitions to
democracy, the role of the military, political econ-
omics, and political behavior. GE credit: SocSci,
Div, Wrt | SS, WC, WE.
143B. Mexican Politics (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2. Introduction to the politics of
temporary Mexico. Focus on rise, fall, and after-
math of Mexico’s one-party dominant system. GE
credit: SocSci, Div, Wrt | SS, WC, WE.
144A. Politics of Post-Communist Countries:
East European Politics (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor;
restricted to upper division standing. Democratiza-
tion, state-building and economic reform in East European states. GE credit: SocSci, Wrt | SS, WC, WE.
144B. Politics of Post-Communist Countries:
Russia (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor;
restricted to upper division standing. Democratiza-
tion, state-building and economic reform in East European states. GE credit: SocSci, Wrt | SS, WC, WE.
146A. Politics of Africa: Issues in
Contemporary African Politics (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor; course
134 recommended; upper division standing. African
politics since the end of the Cold War. Topics include:
Strategic Security Approach, Democratization,
Human Rights, HIV/AIDS, African Peacekeep-
ing, Terrorism, Religious and Ethnic Conflict, Debt
and Stalled Development. Offered in alternate years.
GE credit: SocSci, Div, Wrt | SS, WC, WE.
146B. Politics of Africa: Development
in Africa (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor; course
134 recommended; upper division standing. Politi-
cal and economic development within Sub-Saharan
Africa. States and institutions, democracy, party sys-
tems, military coups/rule, bureaucracy/corruption,
race/ethnicity, national/regional integrations, trade
unions, economic development strategies, class for-
mation, and women’s roles and ideology. Offered in
alternate years. GE credit: SocSci, Div, Wrt | SS,
WC, WE.
147A. West European Politics (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor; upper
division standing. The evolution, politics, and con-
temporary problems of Western countries. System
of Western Europe. Offered in alternate years. GE
credit: SocSci, Wrt | SS, WC, WE.
147B. West European Politics: British
Politics (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor; upper
division standing. The evolution, politics, and con-
temporary problems of Britain’s political system. GE
credit: SocSci, Wrt | SS, WC, WE.
147C. West European Politics: French
Politics (4)
Lecture—3 hours; term paper or discussion—1 hour.
Prerequisite: course 2 or consent of instructor; upper
division standing. The evolution, politics and contem-

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; Wrt—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

Political Science
porary problems of France’s political system. Offered in alternate years. GE credit: SocSci, Wrt | SS, WC, WE.

147D. West European Politics: German Politics (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 2 or consent of instructor; upper division standing. Analysis of the behavior of judges and courts in the political process. Techniques of judicial decision making. Relationships among courts and other decision making bodies. Offered irregularly. GE credit: SocSci, Wrt | SS, WE.

155. Judicial Process and Behavior (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1, upper division standing. Analysis of the nature of judges and courts in the political process. Techniques of judicial decision making. Relationships among courts and other decision making bodies. Offered in alternate years. GE credit: SocSci, Wrt | ACGH, SS, WE.

160. American Political Parties (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1, upper division standing or consent of instructor. Analysis of the structured operations of the party system in the United States; party functions and organizations, nomination processes, campaigns and elections, party trends and reforms. GE credit: SocSci, Wrt | ACGH, DD, QL, WE.

162. Election and Voting Behavior (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1, upper division standing or consent of instructor. Analysis of American elections and partisan behavior; political socialization, political participation, party and individual and group determinants of voting. Offered irregularly. GE credit: SocSci, Wrt | ACGH, DD, SS, WE.

163. Group Politics (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1, upper division standing or consent of instructor. Groups, institutions and individuals, especially in American politics. Historical and analytical treatment of group theories as applied to interest groups (expenditures, access, legislation, science, military); to racial, ethnic and sectional groups; to parties, public and legislative groups, bureaucracies. GE credit: SocSci, Wrt | ACGH, DD, SS, WE.

164. Public Opinion (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: upper division standing and course 1 or 5, or consent of instructor. Nature of public opinion in America as it is supposed to be and as it is; Distribution of opinions among different publics and the significance of that distribution for system stability and institutions. Opinion polling and its problems. GE credit: SocSci, Wrt | ACGH, DD, SS, WE.

165. Mass Media and Politics (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1. Organization of and decision making within the media; media audiences and the effect of the media upon political behavior; the relationship of the government to the media (censorship, secrecy, freedom of the press, government regulation); the media in election campaigns. GE credit: SocSci, Wrt | ACGH, DD, SS, WE.

166. Women in Politics (4)
Lecture—3 hours; discussion—1 hour or seminar—1 hour. Prerequisite: course 1. The role of women in American politics. Historical experiences; contemporary organizations and attitudes; areas of legislative concern; the impact of differences in social class, race, and ethnicity upon the involvement of women in politics. GE credit: SocSci, Wrt | ACGH, DD, SS, WE.

168. Chicano Politics (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1. Political aspects of Chicano life in America; examines the Chicano political role as it has been historically played by different groups in society and the Chicanos responses to his/her political environment. GE credit: SocSci, Wrt | ACGH, DD, SS, WE.

170. Political Psychology (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 51 or consent of instructor; upper division standing. Emphasizes the importance of the scientific literature on political psychology. Introduction to how psychological concepts (personality, attitudes, stereotypes, heuristics, affect, identity, group dynamics) help us understand how we think about politics. GE credit: SocSci, Wrt | SS, WE.

171. The Politics of Energy (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1, upper division standing. Nature and performance of political processes for making energy choices at the international, national and state levels. Interaction of energy policy with other political goals and the ability of governmental institutions to overcome constraints on policy innovation. GE credit: SocSci, Wrt | SS, WE.

172. American Political Development (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1, some background in American politics and institutions. Systematic analysis of contemporary issues in American political development: historical determinants of political change; the timing and character of institutional development; conditions for successful political action. Democratization, cultural change, party formation, state-building, constitutionalism, race relations. GE credit: SocSci, Wrt | ACGH, DD, SS, WE.

146C. Government and Politics in East Asia: Southeast Asia (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 2 or consent of instructor; upper division standing. Evolution of political institutions and political culture in China with emphasis on the post-1949 period. Primary attention to nationalism, modernization and political efficacy. Offered in alternate years. GE credit: SocSci, Wrt | SS, WC, WE.

150. Judicial Politics and Constitutional Interpretation (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1 and upper division standing or consent of instructor. Politics of judicial policy making, issues surrounding constitutional interpretation and decision making, prerequisite for courses on the politics of constitutional law. GE credit: SocSci, Wrt | ACGH, DD, SS, WE.

151. The Constitutional Politics of the First Amendment and the Right to Privacy (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: courses 1 and 150 with upper division standing or consent of instructor. The constitutional politics surrounding such issues as the right to free expression, associational rights, the right to free exercise of religion, and the right to privacy. GE credit: SocSci, Wrt | ACGH, DD, SS, WE.

152. The Constitutional Politics of Equality (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: courses 1 and 150 with upper division standing or consent of instructor. Constitutional politics of equality in the American political system; issues surrounding constitutional doctrine and judicial politics; special attention on racial and sexual equality. Offered in alternate years. GE credit: SocSci, Wrt | ACGH, DD, SS, WE.

153. The Constitutional Politics of the Justice System (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 150 with upper division standing or consent of instructor. Constitutional politics of the American criminal justice system. Issues surrounding criminal law and judicial policy making on issues such as search and seizure, arrest, trial, incarceration and other issues of due process. Offered in alternate years. GE credit: SocSci, Wrt | ACGH, DD, SS, WE.

154. Legal Philosophy (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1 or 4, upper division standing or consent of instructor. Analysis of the behavior of judges and courts in the political process. Techniques of judicial decision making. Relationships among courts and other decision making bodies. Offered irregularly. GE credit: SocSci, Wrt | SS, WE.

175. Social Policy (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1, upper division standing. The role of women in American politics. Historical experiences; contemporary organizations and attitudes; areas of legislative concern; the impact of differences in social class, race, and ethnicity upon the involvement of women in politics. GE credit: SocSci, Wrt | ACGH, DD, SS, WE.

180. Bureaucracy in Modern Society (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1 or 2, upper division standing in Political Science or consent of instructor. Role of bureaucracy in a complex society; the relationship of science to technological development, science and developed countries, and non-democratic, democratic, and democratizing countries. May be repeated once for credit. GE credit: SocSci, Wrt | SS, WE.

183. Administrative Behavior (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1 and upper division standing or consent of instructor. The implications for Ameri-
can public administration of evolving concepts about behavior in organizations. Offered irregularly. GE credit: SocSci | GH, SS, WE.

187. Administrative Theory (4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1 and upper division standing or consent of instructor. Historical and critical analysis of the principal theories of organization and management of public agencies in light of such concepts as decision making, bureaucracy, authority and power, communication and control; examination of role of government bureaucracies in the total society. GE credit: SocSci, Writ | SS, WE.

190. International Relations (4) Lecture—3 hours; term paper or discussion—1 hour. Open to majors in International Relations, or consent of instructor. Analysis and evaluation of substantive issues in contemporary international relations. Readings drawn from current academic and non-academic periodicals. GE credit: SocSci, Writ | SS, WE.

192A. Internship in Public Affairs (5) Prerequisite: enrollment dependent on availability of intern positions with highest priority assigned to students with Political Science—Public Service major; upper division standing. Supervised internship and study in public, governmental, or related organizations. (P/NP grading only.) GE credit: ACGH, SS, WE.

192B. Internship in Public Affairs (5) Prerequisite: concurrent 192A; enrollment dependent on availability of intern positions with highest priority assigned to students with Political Science—Public Service major; upper division standing. Supervised internship and study in public, governmental, or related organizations. (P/NP grading only.) GE credit: ACGH, SS, WE.

193. Research in Practical Politics (2) Research project—6 hours. Prerequisite: courses 192A, 192B; open only to Political Science—Public Service majors; upper division standing. Supervised preparation of an extensive paper relating internship experience to concepts, literature, and theory of political science. GE credit: SocSci | SS, WE.

193W. Washington Center Research Seminar (4) Lecture/discussion—1 hour; independent study—3 hours; tutorial—0.5 hour. Prerequisite: course 192W concurrently. Core academic component of Wash. Program in Washington, DC. can be coordinated with internships. Research draws on resources uniquely available in Washington, DC. Supervised preparation of extensive paper. Open to majors in Wash. Center. GE credit: SocSci, Writ | OL, SS, WE.

194HA-194HB. Special Study for Honors Students (4-4) Seminar—2 hours; independent study—2 hours. Prerequisite: major in Political Science with upper division standing and a GPA of 3.500 in the major. Directed reading, research and writing culminating in preparation of a senior honors thesis under the direction of faculty adviser. (Deferred grading only, pending completion of sequence.) GE credit: SocSci | OL, SS, VL, WE.

195. Special Studies in American Politics (4) Seminar—4 hours. Prerequisite: consent of instructor and upper division standing. Intensive examination of one or more of the problems appropriate to American politics. May be repeated one time for credit when topic differs. GE credit; SocSci | SS, WE.

196A. Seminar in American Politics (4) Seminar—3 hours; term paper. Prerequisite: upper division political science major or consent of instructor. Intensive reading, discussion, research, writing in comparative politics. Topics may include one country or geographical area, political institutions or behavior across countries, political development, or other topics that are more specialized than normal course offerings. May be repeated one time for credit when topic differs. GE credit: SocSci | SS, WE.

196C. Seminar in International Relations (4) Seminar—3 hours; term paper. Prerequisite: upper division political science major or consent of instructor. Intensive reading, discussion, research, writing in international relations including study of international political institutions (UN, E.U., NATO) or interstate relations (war, trade, immigration) and other topics with more specialized content than normal course offerings. May be repeated one time for credit when topic differs. GE credit: SocSci | SS, WE.

196D. Seminar in Political Theory (4) Seminar—3 hours; term paper. Prerequisite: upper division political science major or consent of instructor. Intensive reading, discussion, research, writing in political theory. Topics may include study of a single political thinker, or development of political concepts, or other topics with more specialized content than normal course offerings. May be repeated one time for credit when topic differs. GE credit: SocSci | SS, WE.

196E. Seminar in Research Methods (4) Seminar—3 hours; term paper. Prerequisite: upper division political science major or consent of instructor. Intensive reading, discussion, research, and writing in selected methods such as research design, statistics, game theory. May be repeated one time for credit when topic differs. GE credit: SocSci | OL, SS, VL, WE.

198. Directed Group Study (1-5) Prerequisite: consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.)

Graduate

201. Urban Government and Politics (4) Seminar—4 hours. Survey and analysis of the literature in the field of local government and politics in the United States. Study of political reform, local autonomy, community power, representation, expertise, service delivery, policymaking and political change. Offered in alternate years.

202. American State Government and Politics (4) Seminar—4 hours. Survey and analysis of the literature in the field of state government, politics, and policy. Approaches to the study of the American states as political systems, including their governing institutions and processes and their role in the Federal system. Offered in alternate years.

203A. American Government: The Presidency (4) Seminar—3 hours; term paper. Restricted to graduate students only. Thorough review of the current research on political executives, with particular emphasis on the American presidency. Two principal goals: the development of important and innovative student research programs; and adequate preparation for qualifying examinations.

203B. American Government: Congress (4) Seminar—3 hours; term paper. Restricted to graduate students only. Thorough review of the current research on Congress, with particular emphasis on political representation. Two principal goals: the development of important and innovative student research programs; and adequate preparation for qualifying examinations.

203C. American Government: Courts (4) Seminar—4 hours. Survey and analysis of the literature in the field of American government with a focus on Congress. Emphasis on the development and testing of theories of behavior and processes.

207. Environmental Public Policy (4) Seminar—4 hours. Analysis of the interface between the world of academic reflection about ecological and environmental problems and the world of political action. Evaluation of alternative approaches to policy analysis and recommendation. Individual research, including field research, will parallel discussion of the literature.

208. Policy Analysis (4) Seminar—4 hours. Social science techniques applied to public policy formation and evaluation.

209. The American Political System (4) Seminar—3 hours; term paper. Restricted to graduate students only. Analysis of selected theoretical and empirical issues posed by contemporary research in American government and politics.

210. Research Design in Political Science (4) Seminar—3 hours; discussion/laboratory—1 hour. Prerequisite: graduate standing. Introduction to philosophical and research design for political science. Topics include logic of empirical research, overview of research design approaches for political science.

211. Research Methods in Political Science (4) Seminar—3 hours; term paper. Prerequisite: graduate standing. Pass One open to graduate majors; Pass 2 open to graduate students. Introductory seminar introducing data analysis methods critical to basic empirical investigations in political science.

212. Quantitative Analysis in Political Science (4) Seminar—3 hours; term paper. Prerequisite: course 211. Pass One open to graduate majors; Pass 2 open to graduate students. Introductory statistics course with an emphasis on applications in political science. Topics include descriptive statistics for samples, probability and probability distributions, hypothesis testing, ANOVA, bivariate regression, and introduction to multiple regression.

213. Quantitative Analysis in Political Science II (4) Seminar—3 hours; term paper. Prerequisite: courses 211, 212. Pass One open to graduate majors; Pass 2 open to graduate students. More advanced topics in the use of statistical methods with an emphasis on political applications. Topics include: properties of least squares estimates, problems in multiple regression, and advanced topics (probit analysis, simultaneous models, time-series analysis, etc.).

214A. Research in Political Science (4) Discussion—2 hours; lecture—1 hour; term paper. Prerequisite: course 213. Research seminar sequence required of all Ph.D. students. Design, execution, and defense of an original piece of research in political science, culminating in a paper of publishable quality. (Deferred grading only, pending completion of sequence.)

214B. Research in Political Science (4) Discussion—2 hours; lecture—1 hour; term paper. Prerequisite: courses 212 and 214A; advanced level graduate students in the Department of Political Science only. Research seminar sequence required of all Ph.D. students. Design, execution, and defense of an original piece of research in political science, culminating in a paper of publishable quality. (Deferred grading only, pending completion of sequence.)

215. Introduction to Modeling Political Behavior (4) Seminar—3 hours; term paper. Prerequisite: courses 211, 212. Pass One open to graduate majors; Pass 2 open to graduate students. Introduction to modeling and empirical modeling of political behavior. Students will learn basic game theory and modeling skills. We
216. Qualitative Research Methods (4)
Seminar—3 hours; term paper. Methodology for uti-
lying theoretically-oriented case studies and con-
trolled comparison of a small number of cases to
develop and test theories. Examination of how the
case study method compliments experimental, statis-
tical and deductive modes of research. Offered in
alternate years.
217. Social Choice Theory and Spatial
dependent events: relationship between
Seminar—4 hours. Introduction to social choice the-
ory and formal spatial modeling including Arrow’s
Theorem, the paradox of voting, cycling and agenda
control. Focus on mastering modeling tech-
niques as well as interpretation of classic works.
Offered in alternate years.
218. Topics in Political Theory (4)
Seminar—3 hours; term paper. Topics vary and may be
the work of single to a series of political
Seminar—3 hours; term paper. Survey of the great
works in early modern to contemporary political the-
ory including such writers as Machiavelli, Hobbes,
Locke, Rousseau, Marx, Mill, Nietzsche, and Rawls.
Discussion of various interpretations of these authors.
Offered in alternate years.
219A. Political Theory Sequence (4)
Seminar—3 hours; term paper. Survey of the great
works in early modern to contemporary political the-
ory including such writers as Plato, Aristotle, Cicero, St.
Augustine, Aquinas, Alfarabi and Marsilius. Discus-
sion of various interpretations of these authors.
Offered in alternate years.
219B. Political Theory Sequence (4)
Seminar—3 hours; term paper. Survey of the great
works in early modern to contemporary political the-
ory including such writers as Machiavelli, Hobbes,
Locke, Rousseau, Marx, Mill, Nietzsche, and Rawls.
Discussion of various interpretations of these authors.
Offered in alternate years.
219C. Contemporary Political Theory (4)
Seminar—3 hours; term paper. Survey of important
works in contemporary political theory including
such writers as Nietzsche, Heidegger, Arendt,
Rawls, Nozick, Sandler. May be repeated for credit
if topic differs.
220. Seminar in Political Theory (4)
Seminar—3 hours; term paper. Prerequisite: gradu-
ate standing. Introduction to political theory and cur-
rent debates over its study. Readings from and
interpretations of political theory including the
Federalist Papers and major works by thinkers
such as Machiavelli, Hobbes, Locke, Rousseau, and
Rawls. Other readings addressing issues of textual
interpretation.
223. International Relations (4)
Seminar—3 hours; term paper.
225. The International System (4)
Seminar—3 hours; term paper. Analysis of the inter-
national system by means of theory formulation and
integration; critique of research designs; use of vari-
ous techniques of data generation and analysis.
226. Seminar in International Political
Economy (4)
Seminar—3 hours; term paper. Restricted to gradu-
ate students. Research in international political econ-
omy. Structure of the global economy, as well as
specific international economic relations,
including trade, capital flows, global produc-
tion structures, and migration. Offered in alternate
years.
229. Theories of International Relations (4)
Seminar—3 hours; term paper. Central concepts,
debates, and paradigms in international relations;
overview of research in international security and
international political economy; interstate and intra-
state war; arbitration and conflict resolution; trade
and finance; relationship between domestic and
international politics, norms and institutions. Open
to political science graduate students only unless con-
sent of instructor. Offered in alternate years.
230. American Foreign Policy (4)
Seminar—3 hours, term paper.
231. U.S. Political Culture and Foreign
Relations (4)
Seminar—3 hours; term paper. Relates U.S. political
culture to formulation of foreign policy: Analyzes
American ideological preferences in historical per-
spective, contemporary public opinion, decision
making and implementation. Concludes by examin-
ing linkages between Domestic and foreign policy
and political process. Offered in alternate years.
241. Communist Political Systems (4)
Seminar—4 hours. Prerequisite: course 141 or the
equivalent, or consent of instructor. Systematic analy-
sis of selected topics dealing with the political pro-
cess of communist political systems.
242. Seminar in Comparative Politics (4)
Seminar—3 hours; term paper. Prerequisite: gradu-
ate standing or consent of instructor. Systematic sur-
vey of theories and methods used in the study of
comparative politics.
243. Comparative Institutional Change (4)
Seminar—3 hours; term paper. Restricted to gradu-
ate students. Comparison of institutional changes in
countries of the former Soviet Union and Eastern
Europe during the period of transition to democracy.
Special attention to institutions of mass representa-
tion—electoral and party systems and national legis-
latures. Offered in alternate years.
246. Policymaking in Third-World Societies
(4)
Seminar—3 hours. Prerequisite: graduate standing
or consent of instructor. Included in an analysis of
policy making in the Third World countries there are
such topics as political resources, institutional
resources, decision making, resource allocations,
planning, and budgeting, implementation, and distri-
bution of world resources. Offered in alternate
years.
250. Policy Development and Impact in
U.S. Courts (4)
Seminar—3 hours; term paper. Prerequisite: gradu-
ate standing. Theoretical and empirical review of the
literature regarding courts as policymaking institutions of
government, with emphasis on the formation and imple-
mentation of judicial policy. Differences and
similarities across the judicial, congressional, and
executive branch policy processes. Offered in alter-
ate years.
260. Political Parties (4)
Seminar—3 hours; term paper. Survey of selected
topics in American and comparative parties.
261. Political Behavior (4)
Seminar—3 hours; term paper. Survey of selected
topics in political behavior and public opinion. May
be repeated three times for credit if topic differs.
274. Political Economy (4)
Seminar—3 hours; term paper. Restricted to gradu-
ate students. Politics of economic policy as reflected
in taxation, spending and regulation; impact of
prices, employment, and growth on political
demands; government and economic condi-
tions; electoral politics and the political business
cycle. Offered in alternate years.
279. Political Networks: Methods and
Applications (4)
Seminar—3 hours; term paper. Prerequisite: gradu-
ate standing. Structure of political networks, socio-
matic networks and affiliation networks; general networks
characteristics: density, centralization, polarization,
interdependence; dyadic characteristics: structural and role equivalence; subsets of networks:
cliques, blocks and bloc modeling; characteristics of
individuals in networks: centrality and prestige.
280. Bayesian Methods for Social and
Behavioral Sciences (4)
Seminar—3 hours; term paper. Prerequisite: course
212 or equivalent. Pass One open to graduate majors only; pass 2 open to graduate students.
Methodology seminar introducing Bayesian statisti-
cal approaches to issues and problems in political
science and other social and behavioral sciences.
Offered in alternate years.
281. Statistical Computing Issues in Political
Science (4)
Seminar—3 hours; discussion/laboratory—1 hour.
Prerequisite: course 213 or equivalent; graduate
standing. Methodology seminar introducing comput-
ing issues in empirical models for political science
and other social and behavioral sciences. Offered in
alternate years.
282. Advanced Modeling of Political
Behavior (4)
Seminar—3 hours; term paper. Prerequisite: course
215 or equivalent; graduate standing or consent of
instructor. Applications of formal models in political
science. Review of relevant contributions in other
social sciences. Consideration of advanced tech-
niques in game theory. Rational and behavioral
approaches.
283. Organizational Behavior (4)
Seminar—4 hours. Organizational behavior as it
relates to public sector decision making.
284. Advanced Network Analysis (4)
Seminar—3 hours; term paper. Prerequisite: course
211, 212, 279. Exponential Random Graph Mod-
els (ERGMS) of networks, game theoretic models of
network formation and network dynamics, diffusion
processes, shocks and network collapse, percola-
tion, cross-network spillover processes, social and
political applications of advanced network models.
Offered in alternate years. — Maoz, Zeev
290A. Research in American Government
and Public Policy (4)
Seminar—3 hours; term paper. Restricted to gradu-
ate students. Special research seminar on problems
and issues in the study of American government and
public policy. May be repeated up to 6 times for
credit if topic differs.
290B. Research in Political Theory (4)
Seminar—3 hours; term paper. Restricted to gradu-
ate students only. Special research seminar on problems
and issues in the study of political theory. May
be repeated six times for credit if topic varies.
290C. Research in International Relations
(4)
Seminar—3 hours; term paper. Restricted to gradu-
ate students only. Special research seminar on selec-
t topics and issues in the study of international rela-
tions. May be repeated six times for credit if topic varies.
290D. Research in Judicial Politics (4)
Seminar—4 hours. Prerequisite: graduate standing
in political science or consent of instructor. Contem-
oporary research on judicial politics, judicial institu-
tions, jurisprudence, and judicial behavior.
290E. Research in Political Parties, Politics,
and Political Behavior (4)
Seminar—4 hours. Special research seminar on selec-
t problems and issues in the study of political parties,
politics, and political behavior.
290F. Research in Comparative
Government and Policy (4)
Seminar—3 hours; term paper. Restricted to graduate
students only. Special research seminar on select
problems and issues in the study of comparative gov-
ernment and policy. May be repeated six times for
credit if topic varies.
290G. Research in Methodology (4)
Seminar—3 hours; term paper. Prerequisite: course
212. Special research seminar on selected problems
and issues in methods in political science. May be
repeated three times for credit if topic varies.
297. Internships in Political Science (2)
Seminar—2 hours. Prerequisite: open only to peo-
s who have internships or other positions in gov-
ernmental agencies, political parties, etc. Application
and evaluation of theoretical concepts through work
experience or systematic observation in public and
political agencies. May be repeated for credit. (S/U grading only.)
298. Group Study (1-5)
(S/U grading only.)
299. Research (1-12)  
(S/U grading only.)

299D. Directed Reading (1-12)  
(S/U grading only.)

Professional

390. The Teaching of Political Science (1)  
Seminar—1 hour. Prerequisite: graduate student standing in Political Science. Methods and problems of teaching political science at the undergraduate level. (S/U grading only.)

396. Teaching Assistant Training Practicum  
(1-4)  
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)

Pomology

See Plant Sciences, on page 476.

Population Biology (A Graduate Group)

David J. Begun, Ph.D., Chairperson of the Group  
Group Office. 2320 Storer Hall  
530-752-1274;  
Faculty

See Plant Sciences, on page 476.

Jay Rosenheim, Ph.D., Professor (Entomology)  
Academic Senate Distinguished Teaching Award

Jeffrey Ross-Ross, Ph.D., Associate Professor (Plant Sciences)

Eric D. Sanford, Ph.D., Professor (Evolution and Ecology)

Johanna Schreiber, Ph.D., Professor (Evolution and Ecology)

Thomas W. Schoener, Ph.D., Professor (Evolution and Ecology)

Sebastian Schreiber, Ph.D., Professor (Evolution and Ecology)

Mark W. Schwartz, Ph.D., Professor (Environmental Science and Policy)  
Academic Senate Distinguished Teaching Award

Arthur M. Shapiro, Ph.D., Professor (Evolution and Ecology)  
Academic Senate Distinguished Teaching Award

Andrew Sih, Ph.D., Professor (Environmental Science and Policy)

John J. Stachowicz, Ph.D., Professor (Evolution and Ecology)  
Academic Senate Distinguished Teaching Award

Maureen L. Stanton, Ph.D., Professor (Evolution and Ecology)  
UC Davis Prize for Teaching and Scholarly Achievement

Sharon Y. Strauss, Ph.D., Professor (Evolution and Ecology)

Donald R. Strong, Ph.D., Professor (Evolution and Ecology)

Michael Turelli, Ph.D., Professor (Evolution and Ecology)

Geerat J. Vermeij, Ph.D., Professor (Department of Earth and Planetary Sciences)

Peter C. Wainwright, Ph.D., Professor (Evolution and Ecology)  
Academic Senate Distinguished Teaching Award

Philip S. Ward, Ph.D., Professor (Entomology)

Andrew Whitehead, Ph.D., Assistant Professor (Environmental Toxicology)

Louise H. Yang, Ph.D., Assistant Professor (Entomology)

Truman P. Young, Ph.D., Professor (Plant Sciences)

Emeriti Faculty

Hugh Dingle, Ph.D., Professor Emeritus

John H. Gillespie, Ph.D., Professor Emeritus  
Kevin J. Rice, Ph.D., Professor Emeritus

Judy A. Stamps, Ph.D., Professor Emeritus

Graduate Study. The Graduate Group in Population Biology emphasizes programs of study and research leading to the Ph.D. degree. The Group concentrates on population biology as the broad discipline that blends ecology, evolution, population genetics and systematics into a unified field. The course curriculum ends in the first-year core courses offered by the Group faculty, seminars, and advanced courses in population biology, and related disciplines, chosen in consultation with a guiding committee.

Graduate Adviser. Consult the Population Biology Graduate Group office or website.

Courses in Population Biology (PBG)

Graduate

200A. Principles of Population Biology (5)  
Lecture—3 hours; discussion—2 hours. Prerequisite: course 231 concurrently and consent of instructor. Principles of single-species ecology and evolution. Topics include ecology of individuals, population growth models, structured populations, life history strategies, stochastic populations, basic population genetics theory, deleterious alleles in natural populations, and molecular population genetics. —I. (I)

200B. Principles of Population Biology (5)  
Lecture—3 hours; discussion—2 hours. Prerequisite: course 200A, or consent of instructor. Principles of multi-species communities. Topics include competition, mutualism, metapopulations, food webs and trophic cascades, interactions between simple ecological communities, island biogeography, succession, and large-scale patterns. —II. (II)

200C. Principles of Population Biology (6)  
Lecture—5 hours; discussion—1 hour. Prerequisite: course 200A. Topics include evolutionary quantitative genetics, analysis of hybrid zones, speciation, the fossil record, biogeography, and phylogeny reconstruction. —III.

203. Advanced Evolution (3)  
Lecture—1 hour; discussion—2 hours. Prerequisite: graduate standing. Adaptation and speciation, and biochemical and morphological evolution in plants and animals with emphasis on the appropriateness of different methods of analysis. Offered in alternate years.

206. Ecology of Insect Parasitoids (4)  
Lecture—2 hours; seminar—1 hour. Prerequisite: introductory animal ecology or behavior. Insect parasitoids will be investigated as model systems to address current topics in behavioral, population, and evolutionary ecology. Theory will be synthesized and critical empirical tests of ecological hypotheses or the equivalent, graduate standing, and consent of instructor. (Same course as Entomol. 206.) Offered in alternate years.

207. Plant Population Biology (3)  
Lecture—2 hours; laboratory/discussion—1 hour. Prerequisite: advanced undergraduate ecology course and/or Environmental Science and Policy 100, Evolution and Ecology 101, Entomology 104, Plant Biology 117, and advanced undergraduate course in genetics and/or evolution (e.g., Biological Sciences 101 or Evolution and Ecology 100). Introduction to theoretical and empirical research in plant population biology. Emphasis placed on linking ecological and genetic approaches to plant population biology. (Same course as Ecology 207.) Offered in alternate years. —II. Rice

212. Topics in Invertebrate Evolution (2)  
Seminar—2 hours. Prerequisite: graduate standing or consent of instructor and Evolution and Ecology 112 (Lecture only). Offered in alternate years. —II. Rice

212. Topics in Invertebrate Evolution (2)  
Seminar—2 hours. Prerequisite: graduate standing or consent of instructor and Evolution and Ecology 112 (Lecture only). Offered in alternate years. —II. Rice

220. Spatio-Temporal Ecology (2)  
Lecture/discussion—2 hours. Prerequisite: course 208 or Ecology 204 or Evolution and Ecology 104 or Environmental Science and Policy 121 or consent of instructor. Spatiotemporal ecological theory focusing on population persistence and stability, predator-prey and host-parasitoid interactions, species coexistence and diversity maintenance, including effects of environmental variation, spatial and temporal scale, life-history traits and nonlinear dynamics. Topics vary. (Same course as Ecology 220.) May be repeated for credit up to 12 units. —II. Grossberg

221. Animal Behavior, Ecology and Evolution (3)  
Lecture—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 102, Evolution and Ecology 104, or the equivalent, graduate standing, and consent of instructor. The interface between animal behavior, ecology and evolution. New developments in behavioral ecology and development and testing of hypotheses in this discipline. (Same course as Animal Behavior 221.)

224. Field Reconnaissance for Population Biologists (2)  
Fieldwork—6 hours. Prerequisite: graduate student in Population Biology, or consent of instructor. Biweekly field trips to acquire students with plant and animal communities, biodiversity, and ecological and evolutionary research opportunities in northern and central California. (May be repeated for credit. S/U grading only.)

225. Terrestrial Field Ecology (4)  
Seminar—1 hour; field work—12 hours. Prerequisite: introductory animal ecology and introductory statistics, or consent of instructor. A field course conducted over spring break and four weekends at Bodega Bay emphasizing student projects. Ecological hypothesis testing, data gathering, analysis, and
written and oral presentation of results will be stressed. (Same course as Ecology/Entomology 225.)—III. (III.) Karban

231. Mathematical Methods in Population Biology (3)
Lecture—3 hours. Prerequisite: Mathematics 16C or 21C or the equivalent. Mathematical methods used in population biology: Linear and nonlinear difference equation and differential equation models are studied, using stability analysis and qualitative methods. Partial differential equation models are introduced. Applications to population biology models are stressed. (Same course as Ecology 231.)—I. (I.) Hastings

233. Computational Methods in Population Biology (3)
Lecture/laboratory—2 hours: discussion/lab—1 hour. Prerequisite: a course in theoretical ecology (e.g., Ecology 231) or an equivalent to Environmental Science and Policy 121 from your undergraduate institution; or consent of instructor; programming experience required. Numerical methods for simulating population dynamics using the computational software package R. Emphasis placed on model formulation and development, theoretical concepts and philosophical principles to guide simulation efforts, model parameterization, and implementing simulations with R. (Same course as Ecology 223.) Offered in alternate years. (S/U grading only)—II. (II.) Basket, Schreiber

250A. Interdisciplinary Approaches to Biological Invasions (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing. An integrative consideration of biological invasions, including an overview of concepts from ecology, ecological theory, evolution, genetics, philosophy, and other areas. Emphasis on potential contributions of each area for interdisciplinary problem solving.—I. (I.)

250B. Interdisciplinary Approaches to Biological Invasions (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing. An integrative consideration of biological invasions, including an overview of concepts from ecology, ecological theory, evolution, genetics, philosophy, and other areas. Emphasis on potential contributions of each area for interdisciplinary problem solving.—II. (II.)

251. Collaborative Project in Biological Invasions (3)
Project—discussion—1 hour. Prerequisite: course 250A, 250B, or equivalent; and consent of instructor. A year-long interdisciplinary collaborative project focusing on biological invasions, resulting in a paper or other suitable product presented at a symposium or the conclusion of the project. May be repeated up to five times. (S/U grading only)—I, II, III, (I, II, III.)

271. Research Conference in Ecology (1)
Seminar—1 hour. Prerequisite: graduate standing. Seminar presented by visiting lecturers, UC Davis faculty and graduate students. May be repeated for credit. (Same course as Ecology 296.) (S/U grading only)—I, II, III, (I, II, III.)

290. Seminar in Geographical Ecology (1)
Seminar—1 hour. Prerequisite: consent of instructor. Seminar presented by visiting lecturers, UC Davis faculty and graduate students. May be repeated for credit. (Same course as Ecology 290.) (S/U grading only)—I, II, III, (I, II, III.)

292. Topics in Ecology and Evolution (1)
Seminar—1 hour. Prerequisite: graduate standing. Seminar presented by visiting lecturers, UC Davis faculty and graduate students. May be repeated for credit. (Same course as Ecology 292.) (S/U grading only)—I, II, III, (I, II, III.)

296. Seminar in Geographical Ecology (2)
Seminar—2 hours. Prerequisite: Evolution and Ecology 100 or 101 or consent of instructor. Recent developments in theoretical and experimental biogeography, historical biogeography and related themes in systematics, the biology of colonizing species, and related topics. (Same course as Geography 214.) (S/U grading only)—I, III, (I, II, III.) Shapiro

298. Group Study (1-5)
Prerequisite: graduate standing and consent of instructor. (S/U grading only)

299. Research (1-12)
Prerequisite: graduate standing and consent of instructor. (S/U grading only)

Population Health and Reproduction

See Veterinary Medicine, School of, on page 539.

Precision Agriculture

[College of Agricultural and Environmental Sciences]
The Department of Biological and Agricultural Engineering offers a minor in Precision Agriculture, the latest farming concept that optimizes fertilizer, pesticide and water use, while minimizing environmental concerns.

Minor Program Requirements:
This minor acquaints students with recent developments and their applications to agriculture, in geographic information systems (GIS), global positioning systems (GPS), variable rate technologies (VRT), crop and soil sensors, and remote sensing. The minor prepares students for challenging positions in site-specific crop management as we enter the “information age” in agriculture. UNITS

Precision Agriculture........................................ 18

Applied Biological Systems Technology/Landscape Architecture 150 and Environmental remote Sensing 186 and 186L. .................................................................................... 9
Select 9 or more units from: Applied Biological Systems Technology 181N, 182, Plant Sciences 100A, 100AL, 100B, 100BL, 100C, 100CL, 110A, 110B, 110BL, 110C, Plant Sciences 120, Environmental and Resource Sciences 186, Soil Science 109. .................................................................................... 9

Minor Advisers, S.K. Upadhyaya, D.K. Giles

Preventive Veterinary Medicine

See Veterinary Medicine, School of, on page 539.

Psychiatry

See Medicine, School of, on page 396.

Psychology

[College of Letters and Science]
Paul Hastings, Ph.D., Chairperson of the Department

Department Office. 135 Young Hall
530-752-1880, http://psychology.ucdavis.edu

Faculty
Karen L. Bailes, Ph.D., Professor
Shelley A. Blazis, Ph.D., Associate Professor
Cameron S. Carter, M.D., Professor
Psychiatry and Behavioral Sciences
Rand D. Conger, Ph.D., Professor (Human Ecology)
David P. Corrino, Ph.D., Professor (Linguistics)
Richard G. Coss, Ph.D., Professor
Victoria L. Cross, Ph.D., Lecturer
Arne D. Ekstrom, Ph.D., Associate Professor
Robert A. Emmons, Ph.D., Professor
Emilio Ferrer-Caja, Ph.D., Professor
Joy Geng, Ph.D., Associate Professor
Simona Ghetti, Ph.D., Professor
Katherine W. Gibbs, Ph.D., Lecturer
Gail S. Goodman, Ph.D., Professor
Katharine Graf Estes, Ph.D., Assistant Professor
Kevin J. Grimm, Ph.D., Associate Professor
Paul D. Hastings, Ph.D., Professor
Gregory M. Herek, Ph.D., Professor
Petri Janata, Ph.D., Professor
Leah A. Krubitzer, Ph.D., Professor
Kristin H. Lagattuta, Ph.D., Associate Professor
Alison M. Ledgerwood, Ph.D., Associate Professor
Debra L. Long, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Steven J. Luck, Ph.D., Professor
George R. Mangun, Ph.D., Professor
Wesley G. Moons, Ph.D., Assistant Professor
Lisa M. Oakes, Ph.D., Professor
Cynthia Pickett, Ph.D. Associate Professor
Elizabeth A. Post, Ph.D., Lecturer
Charan Ranganath, Ph.D., Professor
Susan M. Rivera, Ph.D., Professor
Richard W. Robbins, Ph.D., Professor
Jeffrey C. Schank, Ph.D., Professor
Eva Schepeler, Ph.D., Lecturer
Phillip R. Shaver, Ph.D., Professor
Jeffrey W. Sherman, Ph.D., Professor
Dean K. Simonton, Ph.D., Professor
UC Davis Prize for Teaching and Scholarship
Achievement
Danielle S. Stolzenberg, Ph.D. Assistant Professor
Tamaoro Y. Swaab, Ph.D., Associate Professor
Ross A. Thompson, Ph.D., Professor
Brian C. Trainor, Ph.D., Associate Professor
Matthew J. Traxler, Ph.D., Professor
Keith F. Widaman, Ph.D., Professor
Andrew P. Yonelinas, Ph.D., Professor
Nolon W. Zane, Ph.D., Professor
Emeriti Faculty
Linda P. Acredolo, Professor Emerita
Jarvis R. Bastian, Ph.D., Professor Emeritus
Alan C. Elms, Ph.D., Professor Emeritus
Karen P. Erickson, Ph.D., Professor Emerita
Albert A. Harrison, Ph.D., Professor Emeritus

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2015-2016 offering in parentheses

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; Div—Diversity；Wrt—Writing Experience

Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Diversity；Wrt—Writing Experience

ACGH=American Cultures, DD=Diversity, DL=Oral Skills, GL=Quantitative, SL=Scientific, VL=Visual, WC=World Cultures, WE=Writing Experience
The psychology program at UC Davis is broad and includes students and faculty with a variety of interests. The department has developed around five major areas of emphasis: Developmental Psychology, involves the study of changes in behavioral, cognitive, emotional, and social abilities that occur throughout the lifespan. Typical and atypical development are examined using a variety of research methods including behavioral, neuroimaging, and physiological assessments.

Perception, Cognition, and Cognitive Neuroscience (PCCN) involves the study of awareness and thought, and includes such topics as perception, learning, memory, language, and cognition. Biological Psychology covers a broad spectrum of topics including evolutionary, neurobiological, and molecular mechanisms of behavior.

Social-Personality Psychology involves the study of the individual in his or her social environment and includes such topics as personality and individual differences, social perception and prejudice, intergroup relations, the psychology of religion and psychological health and dysfunction.

Quantitative Psychology involves the study of linear and nonlinear models, psychometrics, mixed-effects models, and dynamic models, including experimental design, analysis of variance, regression, multivariate analysis, latent growth models, time series models, and factor analytic models.

The department offers the Bachelor of Arts (B.A.) program for students interested in the liberal arts and the Bachelor of Science (B.S.) program geared for students with an interest in either biology or mathematics. The main objective of both programs is to provide a broad introduction to the scope of contemporary psychology. In addition to completing a number of core courses for their degree, students may take specialty courses on such far-ranging topics as sex differences, genius and creativity, and environmental psychology. The department strongly encourages students to become involved in individual research projects under the direction of faculty members and to participate in our internship program to broaden their experiences and understanding of the field of psychology.

Preparatory Requirements. Before declaring a major in psychology, students must complete the following with a combined grade point average of at least 2.500. All courses must be taken for a letter grade. (Students in the Bachelor of Science, Biology program must complete Biological Sciences 2A, 2B, 2C, 2D, and 2E.)

**Psychology 1, 41** .......................... 8
Statistics 13 or 100 or 102 .......................... 4
Biological Sciences 2A .......................... 5 or 7.8

Career Alternatives. A degree in psychology provides broad intellectual foundations which are useful to the graduate for the development of careers in a variety of areas, including social work, the ministry, teaching, business, and counseling. An undergraduate education in psychology also provides excellent preparation for graduate study. Individuals with degrees in psychology may enter graduate programs to prepare for teaching, research, or clinical/counseling careers in psychology, or may go on to professional schools for training in veterinary and human medicine, law, and many other professions.

A.B. Major Requirements:

<table>
<thead>
<tr>
<th>Preparatory Subject Matter</th>
<th>UNITS</th>
</tr>
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<tbody>
<tr>
<td>Psychology 1 or the equivalent</td>
<td>4</td>
</tr>
<tr>
<td>Psychology 41</td>
<td>4</td>
</tr>
<tr>
<td>Statistics 13 or 102</td>
<td>2</td>
</tr>
</tbody>
</table>

**Depth Subject Matter**

Two courses from the following two groups and one course from the remaining numbered courses:

Group A: Psychology 100 or 103, 130, 131, 132, 135, 136
Group B: Psychology 101, 113, 121, 122, 124, 125, 126, 129, 159
Group C: Psychology 151, 152, 154, 158, 161, 162, 168
Group D: Psychology 140; or Human Development (HDE) 100A or 100B, Psychology 141/HDE 101, Psychology 142/142HDE 102, Psychology 143, 146, 148

Additional units to achieve a total of 40 upper division units in psychology (must include Psychology 103A or both Statistics 13 and 102):

A maximum of 2 approved upper division Human Development units can be credited toward satisfaction of the 40-unit requirement.

**Total Units for the Major**

**Biological Emphasis**

B.S. Major Requirements:

**Preparatory Subject Matter**

<table>
<thead>
<tr>
<th>Preparatory Subject Matter</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychology 1 or the equivalent</td>
<td>4</td>
</tr>
<tr>
<td>Psychology 41</td>
<td>4</td>
</tr>
<tr>
<td>Statistics 13 or 102</td>
<td>2</td>
</tr>
</tbody>
</table>

**Depth Subject Matter**

Seven Psychology courses distributed as specified:

Group A: Two courses from: Psychology 100 or 100Y, 130, 131, 132, 133, 136
Group B: Three courses from: Psychology 101, 113, 121, 122/, 123/, 126, 127, 129, 159
Group C: One course from: Psychology 151, 152, 154, 158, 161, 162, 168
Group D: One course from: Psychology 140; or Human Development (HDE) 100A or 100B, Psychology 141/HDE 101, Psychology 142/142HDE 102, Psychology 143, 146, 148

Additional units to achieve a total of 40 upper division units in psychology (must include Psychology 103A or both Statistics 13 and 102):

A maximum of 12 approved upper division Human Development units can be credited toward satisfaction of the 40-unit requirement.

**Total Units for the Major**

**Mathematics Emphasis**

**B.S. Major Requirements:**

**Preparatory Subject Matter**

<table>
<thead>
<tr>
<th>Preparatory Subject Matter</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychology 1 or the equivalent</td>
<td>4</td>
</tr>
<tr>
<td>Psychology 41</td>
<td>4</td>
</tr>
<tr>
<td>Statistics 13 or 102</td>
<td>2</td>
</tr>
</tbody>
</table>

**Depth Subject Matter**

Five Psychology courses, distributed as specified:

Group A: Two courses from: 100, 130, 131, 132, 135, 136
Group B: Two courses from: Psychology 101, 113, 121, 122/, 123/, 126, 127, 129, 159
Group C: One course from: Psychology 151, 152, 154, 158, 161, 162, 168
Group D: One course from: Psychology 140; or Human Development (HDE) 100A or 100B, Psychology 141/HDE 101, Psychology 142/142HDE 102, Psychology 143, 146, 148

**Total Units for the Major**

A maximum of 12 approved upper division Human Development units can be credited toward satisfaction of the 40-unit requirement.

**Total Units for All Majors**

Students who plan to do graduate work in any area of psychology are strongly encouraged to complete Psychology 103A or both Statistics 13 and 102. Psychology 41 is a prerequisite for most upper division courses. Psychology 41 and Statistics 13 or 102 should be completed in the first year.


**Human Development course credit.** Human Development 100A, 100B, 100C, 101, 102, 120, and 121 can be used to toward satisfying the 40-unit requirement.
upper division major requirement to a maximum of 12 units. Students who have completed Human Development 100A or 100B will receive 2 units of credit for Psychology 140.

Minor Program Requirements:

Psychology 1 or the equivalent......... 4 One course from each of the following four groups

Group A: Psychology 100, 130, 131, 132, 135, 136
Group B: Psychology 101, 113, 121, 122, 123, 126, 127, 129, 159
Group C: Psychology 151, 152, 154, 158, 161, 162, 168
Group D: Psychology 140, 141 142, 143, 146, 148

Additional units to achieve a total of 20 upper division units..................................... 4-5 One course selected from: Human Development 100A, 100B, 100C, 101, 102, 120, 121 can be used toward satisfying the minor upper division unit requirement.

Honors and Honors Programs. In order to be eligible for high or highest honors in Psychology, the student must have completed the college criteria for honors and complete a research project involving a mini-mum of six units of course work over at least two quarters which represents an original analysis of data on psychological phenomena. Course 194HA, 194HB or other approved courses can be used to satisfy the unit requirement. This project is to be written in thesis form and approved by the department. The quality of the thesis work will be the primary determinant for designating high or highest honors at graduation.

Graduate Study. The Department offers programs of study and research leading to the Ph.D. degree in psychology. Detailed information regarding graduate study may be obtained at the Department Office or on our website.

Graduate Adviser. See http://gradstudies.ucdavis.edu/programs/program-detail.cfm?id=79

Courses in Psychology (PSY)

Lower Division

1. General Psychology (PSY)

Lecture—4 hours. Introduction emphasizing empirical approaches. Focus on perception, cognition, problem-solving, learning, and behavioral aspects. Only two units allowed to those who have taken course 15 or 16; no credit allowed to those who have taken both courses 15 and 16. GE credit: SS — II, III, I; II, II, III, E; Post, Simonot, Thompson, Traxler

20. Freshman Psychology Seminar (PSY)

Seminar—4 hours. Prerequisites: freshman standing. Instructor will acquaint students with his or her program of research, the development of scientific questions from the literature, and the application of research methods to examine these questions. Critical thinking will be encouraged via expository writing and oral presentations. GE credit: SS — II, III, I; II, II, III; Cross, E. Post

41. Research Methods in Psychology (PSY)

Lecture—3 hours; autotutorial. Prerequisite: course 1 or the equivalent; Statistics 13 or 102 recommended. Introduction to experimental design, interviews, questionnaires, observational research, qualitative approaches, case studies, content analy-sis, sampling, descriptive statistics, and statistical inference. Not open for credit to students who have taken course 41.

90X. Lower Division Seminar (1-2)

Seminar—1-2 hours. Prerequisite: lower division standing and consent of instructor. Limited enrollment. Examination of a special topic in Psychology through shared readings, written assignments, or special activities such as fieldwork or laboratory work. May not be repeated for credit. Offered irregularly.

98. Directed Group Study (1-5)

Primary for lower division students. [P/NP grading only]

99. Special Study for Lower Division Students (1-5)

[P/NP grading only]

Upper Division

100. Introduction to Cognitive Psychology (PSY)

Lecture—4 hours. Prerequisite: courses 1 and 41. Introduction to human information processing, mental representation and transformation, imagery, attention, memory, language processing, concept formation, problem solving, and computer simulation. Not open for credit to those who have completed course 136.—I, II, III, [I, II, III, v] v, Ekstrom, Gibbs, Long, Luck

100Y. Introduction to Cognitive Psychology (PSY)

Web virtual lecture—3 hours; discussion—1 hour; lecture—1 hour. Prerequisite: courses 1, 41; Introduction to human information processing, mental representation and transformation, imagery, attention, memory, language processing, concept formation, problem solving, and computer simulation. Not open for credit to students who have completed former course 136 or current course 100.—I, II, III, I, Luck

101. Introduction to Psychology (PSY)

Lecture—4 hours. Prerequisite: courses 1, 41; Survey and integration of the relationships between behavior and biological processes, including physiology, genetics, development, ecology, and evolution.—I, II, III, I, II, III, Coss, Krubitzer, Schank, Stolzenberg, Trainer

103A. Statistical Analysis of Psychological Data (PSY)

Lecture—4 hours, laboratory—2 hours; term paper. Prerequisite: course 1, 41 and Statistics 13 or 102. Pass Open to Psychology majors. Design and statistical analysis of psychological investigations and the interpretation of quantitative data in psychology. Not open for credit to students who have completed course 103 GE credit: QL—II, II, II, Blazos, Grimm, Widaman

103B. Statistical Analysis of Psychological Data (PSY)

Lecture—4 hours, laboratory—2 hours. Prerequisite: course 103A; Statistics 13 or 102. Pass Open to Psychology majors. Probability theory, sampling distributions, statistical inference, and hypothesis testing using standard parametric and correlational approaches. Simple regression analysis, multiple regression analysis, non-parametric statistics, introduction to multivariate statistics, with applications in psychology. Not open for credit to students who have completed course 103 GE credit: QL—II, II, II, II, Blazos, Ferrer, Grimm, Widaman

104. Applied Biometrics: An Introduction to Measurement Theory (PSY)

Lecture—4 hours. Prerequisite: upper division standing in Psychology, courses 41 and 103, Statistics 13. Examination of the basic principles and applications of classical and modern test theory. Topics include test construction, reliability theory, validity theory, factor analysis and latent trait theory. Offered irregularly. GE credit: QL—Grimm, Wida-man

107. Questionnaire and Survey Research Methods (PSY)

Lecture/discussion—2 hours; laboratory/discussion—2 hours. Prerequisite: consent of instructor; course 1, course 41 or an equivalent course on social or behavioral research methods. Limited enrollment. Introduction to survey and questionnaire research methods with emphasis to ask questions. Social and psychological factors that influence survey response. Practical aspects of fielding survey and questionnaire research. Limited enrollment. Offered irregularly. GE credit: QL —H. Schank

113. Developmental Psychology (PSY)

Lecture—3 hours; laboratory—2 hours. Prerequisite: course 101. The biology of behavioral development; survey and integration of the organismic and environmental processes that regulate the development of behavior.—I, II, III, I, III, Schank

120. Agent-Based Modeling (PSY)

Lecture/laboratory—4 hours. Prerequisite: course 100 or 101. Introduction to agent-based computer simulation and analysis with emphasis on learning how to model animals, including humans, to achieve insight into social and group behavior. Limited enrollment. GE credit: QL —(I) Schank

121. Physiological Psychology (PSY)

Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 1, 41, 101. Pass Open to Psychology majors. Relationship of brain structure and function to behavior, motivation, emotion, language, and learning in humans and other animals. Methodology of physiological psychology and neuroscience. Not open for credit to students who have completed course 108. (Former course 108.)—I, II, III, I, III, III, Bales, Krubitzer

122. Advanced Animal Behavior (PSY)

Lecture—3 hours; laboratory—3 hours. Prerequisite: course 101 or Neurobiology, Physiology, and Behavior 102. Pass Open to Psychology majors. Advanced integrative survey of biological principles of behavioral organization, emphasizing historical roots, current research directions, conceptual issues and controversies. Laboratory exercises on the description and analysis of the behavior of captive and free living animals. (Same course as Neurobiology, Physiology, and Behavior 150.) Not open for credit to students who have completed course 150. (Former course 150.) Offered irregularly.

123. Hormones and Behavior (3)

Lecture—3 hours. Prerequisite: Neuroscience, Physiology, and Behavior 101 and either course 101 or Neurobiology, Physiology, and Behavior 102. Pass Open to Psychology majors. Advanced integrative survey of biological principles of behavioral organization, emphasizing historical roots, current research directions, conceptual issues and controversies. Laboratory exercises on the description and analysis of the behavior of captive and free living animals. (Same course as Neuroscience, Physiology, and Behavior 152.) Not open for credit to students who have completed course 152. (Former course 152.)—II—III, I, III, Bales, Trainer

124. Comparative Neuroanatomy (PSY)

Lecture—3 hours; laboratory—2 hours. Prerequisite: course 101 or Neurobiology, Physiology, and Behavior 100 or 101. Overview of the neuroanat-omy of the nervous system in a variety of mammalian and non-mammal vertebrates. Examine changes or modifications to neural structures as a result of morphological or behavioral specializa-tions. (Same course as Neuroscience, Physiology, and Behavior 124.) GE credit. SL—II, I, II, Krubitzer, Recanzone

125. Behavioral Genetics and Epigenetics (3)

Lecture—3 hours. Prerequisite: course 101. Review of basic principles in genetics and select topics in epigenetics with emphasis on behavior. Use of modern molecular methods to outline complex relationships between genes, environment, and behavior.—I, II, III, I, III, Stolzenberg, Trainer
126. Health Psychology (4) Lecture—4 hours. Prerequisite: course 1, 41, 101. Pass One open to Psychology majors. Psycho- logical factors and health and illness. Topics include stress and coping, personality and health, symptom perception and reporting, heart disease, cancer, and mental health maintenance and promotion. Not open for credit to students who have completed course 160.—II, III. (II, III.) Emmons, Moons

127. Animal Cognition (4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 111, 101. Pass One open to Psychology majors. Integrative review of the historical backdrop, theoretical issues, and scientific methods addressing animal cognition in a wide range of species. Emphasis on learning processes, pattern recognition, and the neurobiology of learning and memory. Not open for credit to students who have completed course 134. (Former course 134.) Offered irregularly.—Case

130. Human Learning and Memory (4) Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1, 41, 100, and either Statistics 13 or 102; consent of instructor. Consideration of major theo- ries of information storage and memory with critical examination of relevant experimental data.—I, II, III. (I, II, III.) Ranganath, Yonelinas

131. Perception (4) Lecture—3 hours; independent library work. Prereq- uisite: course 1, 41. Cognitive and neuropsychological processes related to measurable physical energy changes mediated through sensory channels. The perception of objects, space, motion, events.—II. (II.) Geng

132. Social Cognition (4) Lecture—3 hours; term paper. Prerequisite: courses 1, 41, 100; or consent of instructor. Introduction to the cognitive processes involved in language comprehension and production. Topics include the biological foundations of language, speech perception, word recognition, syntax, reading ability, and pragmat- ics. GE credit: WE.—I, II, III. (II, III, III.) Long, Swaab, Trahan

135. Neuroimaging: The Biological Foundations of the Mind (4) Lecture—4 hours; Prerequisite: course 1, 41, or con- sent of instructor; course 101, 121, or 129 recom- mended. Neuroscientific foundations of higher mental processes including attention, memory, lan- guage, higher-level perceptual and motor processes, and consciousness. Emphasis on the neural mecha- nisms which form the substrates of human cognition and consciousness and their neural correlates.—I, II, III. (I, II, III.) Ekstrom, Geng, Janata, Mangun, Ranganath

136. Psychology of Music (4) Lecture/discussion—3 hours; term paper. Prereq- uisite: courses 1, 41, and either 100 or 131 or Music 5C; consent of instructor. Introduction to the mental and neural representations of musical structures and processes involved in perceiving, remembering, and performing music. Music and emotion. GE credit: WE.—II. (III.) Janata

137. Neuropsychology of Learning & Memory (4) Lecture—4 hours. Prerequisite: courses 1, 41, 101. Overview of the neural basis of learning and mem- ory or consent of instructor. Emphasis on research on animal learning and memory with animals. Topics include consolidation, neural plasticity, cellular competition for memory storage, and the role of neurogenesis in learning.—II. (I, II, III.) Wiltgen

140. Developmental Psychology (4) Lecture—4 hours. Prerequisite: courses 1, 41. Pass One open to Psychology majors. Ontogenetic account of human behavior through adolescence with focus on developmental, biological, and cognitive development. Special emphasis is placed on research in early childhood and infancy. GE credit: WE.—II. (III.) Janata


143. Infant Development (4) Lecture—3 hours; extensive writing. Prerequisite: courses 1 and 41. Human development from infancy through childhood. Lecture—4 hours. Prerequisite: course 1. Pass One open to Psychology majors. Theory and research on memory development with focus on infancy and childhood. Not open for credit to students who have completed course 153. (Former course 133.) GE credit: WE.—II. (III.) Gheit, Rivera

146. The Development of Memory (4) Lecture—3 hours; term paper. Prerequisite: courses 1, 41. Pass One open to Psychology majors. Theory and research on memory development with focus on infancy and childhood. Not open for credit to students who have completed course 153. (Former course 133.) GE credit: SocSci, Wrt | WE.—II. (III.) Gheit, Rivera

148. Developmental Disorders (4) Lecture/discussion—3 hours; term paper. Prerequisite: courses 1, 41, and either 140 or 141 or Human Development 100A or 100B. Current scientific knowledge of the influences of biological, cogni- tive, and environmental factors on the emergence of disorders with onset in childhood. Examples include autism spectrum disorders and anxiety and dyscircu- laria. Emphasis placed on understanding these dis- orders, their causes and their treatments.—II, III. (II, II, III.) Rivera

151. Social Psychology (4) Lecture—4 hours. Prerequisite: courses 1, 41. Pass One open to Psychology majors. Behavior of the individual in the group. Examination of basic psy- chological processes in social situations, surveying variables of social dynamics; group dynam- ics, norm-development, attitudes, values, public opinion, status. Not open for credit to students who have completed course 145. (Former course 145.) —II, III. (I, II, III.) Ledgerwood, Moons, Sherman

152. Social Cognition (4) Lecture—4 hours. Prerequisite: courses 1 and 41. Examines how social factors influence how we attend to, encode, and process information and how these mental processes influence judgments and behavior.—II, III. (II, III.) Pickett, Sherman

153. Psychology and Law (4) Prerequisite: courses 1, 41. Pass One open to Psychology majors. Current theoretical and empirical issues in the study of psychology and law. Topics include eyewitness testimony, child abuse, jury deci- sion making, juvenile delinquency and criminality, prediction of violence, insanity defense, and mem- ory for traumatic events. Not open for credit to stu- dents who have completed course 115. (Former course 115.) Offered in alternate years.—II, III, chapman

154. Psychology of Emotion (4) Lecture—4 hours. Prerequisite: course 1, 41. Pass One open to Psychology majors. Introduction to cur- rent theories and research in psychology on emotions and their relationship to health, risk factors, and feelings with special reference to self-knowledge. Not open for credit to students who have completed course 143. (Former course 143.) —II, III, (I, II, III.) Moons, Shaver

155. Environmental Awareness (4) Lecture—4 hours. Prerequisite: course 1. Pass One open to Psychology majors. Interactions of people and the environment. They construct. Research meth- ods for evaluating designing and reviewing current research in environmental psychology. Not open for credit to students who have completed course 144. (Former course 144.) Offered irregularly. GE credit: SciSOC | SS.—Coss

157. Stereotyping, Prejudice, and Stigma (4) Lecture/discussion—4 hours. Prerequisite: course 151. Social psychological underpinnings of stereo- typy, prejudice, and stigmatization. Topics include: origins, maintenance, change, effects on person perception and memory, and the automatic- ity/controllability of stereotyping and prejudice. GE credit: Div.—II. (II.) Sherman

158. Sexual Orientation and Prejudice (4) Lecture/discussion—4 hours. Prerequisite: course 1, 41. Pass One open to Psychology majors. Current scientific knowledge about sexual orientation and prejudice based on sexual orientation. Emphasis on learning the skills necessary for a critical understand- ing of scientific and public policy issues relevant to sexuality. GE credit: SciSOC, Div, Wrt | ACGH, DD, SS, WE.—II. (III.) Herek

159. Gender and Human Reproduction (4) Lecture—4 hours. Prerequisite: course 1 and 41. Pass One open to Psychology majors. Psychology of reproduction. Reproductive events over the course of an individual’s life, including sexual development, mate choice, relationships, and reproduction. Bio- logical and social psychological explanations at the levels of mechanism and evolutionary function. Not open for credit to students who have completed for- mer course 149. (Formally course 149)—II. (III.) Scheib

161. Psychology of the Self (4) Lecture—4 hours. Prerequisite: courses 1 and 41. Psychological theory and research on the self. Topics include: self-knowledge, self-esteem, self-regulation, self-presentation, cognitive and emotional aspects of the self, and the role of the self in shaping social interaction.—I. (I.) Pickett

162. Introduction to Personality Psychology (4) Lecture—3 hours; term paper. Prerequisite: course 1, 41. Pass One open to Psychology majors. General study of the scientific study of personality. Overview of current research and theory in the field of personality psychology. Not open for credit to students who have completed former course 147. GE credit: SocSci, Wrt | SS.—II, III, (II, III.) Robins, Shaver

165. Introduction to Clinical Psychology (4) Lecture—4 hours. Prerequisite: courses 1, 41, 168, and either 140 or 151. Major theoretical formula- tions in the history of clinical psychology, from classi- cal psychoanalysis to contemporary existentialism and behavior modification. A survey, based on lec- tures, films, and tapes, of what clinical psychologists do, including methods of appraisal, professional roles, and approaches to treatment.—II. (III.) Zane

170. Psychology of Religion (4)
Lecture—4 hours. Prerequisite: courses 1 and 41. Major theories, issues, data, and research methodologies of psychology of religion. Religious experience and expression; religious development in childhood, adolescence, and adulthood; conversion; religious issues in physical and mental health, cross-cultural perspectives. GE credit: Div. Wrt | WE.—II. (III) Emmons

175. Genius, Creativity, and Leadership (4)
Lecture—3 hours; term paper. Prerequisite: course 1 and 41 or the equivalent or consent of instructor. The phenomenon of genius is examined from a diversity of theoretical, methodological, and disciplinary perspectives, with an emphasis on outstanding creativity and leadership in art, music, literature, philosophy, science, war, and politics. GE credit: SocSci, Div | SciEng | VL | Writing Experience

180A. Research in Cognitive and Perceptual Psychology (4)
Lecture—2 hours; laboratory—4 hours. Prerequisite: course 41, and four upper division Psychology courses and consent of instructor. Empirical research on selected topics in general experimental psychology (general research design and analysis, perception, cognition, cognitive development, etc.). Specific content will vary from quarter to quarter. May be repeated one time for credit when content differs. Offered irregularly.

180B. Research in Psychology (4)
Lecture—2 hours; laboratory—4 hours. Prerequisite: course 101, three additional upper division courses in Psychology, and consent of instructor. Empirical research on selected topics in psychology (animal learning, physiological and sensory psychology, developmental psychology, computer modeling of neural systems). Content varies. May be repeated one time for credit when content differs. Offered irregularly.

180C. Research in Personality and Social Psychology (4)
Lecture—2 hours; laboratory—4 hours. Prerequisite: course 41, and four upper division Psychology courses and consent of instructor. Empirical research on selected topics in personality and social psychology (personality, social psychology, organizational psychology, etc.). Content will vary from quarter to quarter. May be repeated one time for credit when specific content differs. Offered irregularly.

185. History of Psychology (4)
Lecture—3 hours; term paper. Prerequisite: courses 1, 41, upper division standing or consent of instructor. Past and present in psychology. majors. Development of philosophical thought and research in context of history of philosophy and science. Not open for credit to students who have completed course 120. GE credit: Div, SciEng | VL. Wrt | SocSci | SS, WE.—II. (III) Simonton

190. Seminar in Psychology (4)
Seminar—4 hours. Prerequisite: junior or senior standing, major in psychology or consent of instructor. Intensive treatment of a special topic or problem of psychological interest. May be repeated for credit in different subject area. —I, II, III, (I, II, III)

190X. Upper Division Seminar (1-2)
Seminar—1-2 hours. Prerequisite: upper division standing and consent of instructor. In-depth examination at an upper division level of a special topic in Psychology. Emphasis on student participation in learning. May not be repeated for credit. Limited enrollment.

192. Fieldwork in Psychology (1-6)
Fieldwork—1-6 hours. Prerequisite: upper division standing in psychology and consent of instructor. Supervisor arranged internship off and on campus, in community agencies, and/or research laboratories. Maximum of four units may be used toward satisfaction of upper division major requirement. May be repeated one time for credit. Limited enrollment (P/NP grading only).

194HA-194HB. Special Study for Honors Students (3-3)
Independent study—9 hours. Prerequisite: senior standing in Psychology and qualifications for admission into college honors program, and consent of instructor; at least one course from 180A, 180B, 180C or 199 strongly recommended. Directed research. Supervision and research leading to submission of a Senior Honors thesis under the direction of faculty sponsor. (Deferred grading only; pending completion of sequence.) GE credit: Div | WE.—II. (III) Emmons

197T. Tutoring in Psychology (1-3)
Independent study—9 hours. Prerequisite: upper division standing and consent of instructor. Intended for advanced undergraduate students who will lead discussion sections in Psychology courses. May be repeated for credit for a total of 8 units. (P/NP grading only)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only)

Graduate

200. Proseminar in Psychology (3)
Seminar—2 hours; independent study—1 hour. Prerequisite: graduate standing in Psychology or consent of instructor. Introduces matriculating graduate students to research activities of departmental faculty. (S/U grading only).—I. (I)

201. Research Preceptory (4)
Laboratory—3-4 hours; discussion—3.5 hours. Prerequisite: consent of instructor. May be repeated for credit. (S/U grading only).—I, II, III. (I, II, III)

202. Research Seminar (1)
Seminar—1 hour. Prerequisite: graduate standing in psychology. Presentation of graduate research to program faculty and graduate students. May be repeated for credit. (S/U grading only).—I, II, III. (I, II, III)

204A. Statistical Analysis of Psychological Experiments (5)
Lecture—4 hours; laboratory—2 hours. Prerequisite: Statistics 102 or equivalent; graduate standing in Probability theory, sampling distributions, statistical inference, and hypothesis testing using standard parametric and correlational approaches. Analysis of variance, factorial and repeated measures, and tests of trends. Not open for credit to students who have completed course 206.—I. (I) Ferrer, Widaman

204B. Causal Modeling of Correlational Data (4)
Lecture—4 hours. Prerequisite: course 204A or the equivalent or consent of instructor. Examination of how to make causal inferences from correlational data in the behavioral sciences. Emphasis on testing rival causal models using correlations among observed variables. Beginning with multiple regression analysis, discussion advances to path analysis and related techniques. —II, III. (I, II, III)

204D. Advanced Statistical Inference from Psychological Experiments (5)
Lecture—4 hours; laboratory—2 hours. Prerequisite: course 204A or consent of instructor. Advanced topics in statistical inference, which may include probability theory, sampling distributions, statistical inference and hypothesis testing, nonparametric statistics, Bayesian approaches, and advanced issues in analysis of variance. Not open for credit to students who have completed course 205.—I, II. (III) Blozis

205. Applied Multivariate Analysis of Psychological Data (4)
Lecture—4 hours. Prerequisite: three courses from 204A, 204B, 204C, 204D or the equivalents, or consent of instructor. Review of the major methods of multivariate data analysis for psychological data. Statistical routines using a linear algebra-based computer

putting language. Topics include multivariate analysis of variance, discriminant analysis, canonical analysis, factor analysis, and canonical correlation. Not open for credit to students who have completed course 207B. (Former course 207B.) Offered in alternate years.—II. Ferrer

205B. Factor Analysis (4)
Lecture—4 hours. Prerequisite: graduate standing, course 204A and 204B or the equivalent or consent of instructor. Theory and methods of factor analysis, including exploratory factor analysis, confirmatory factor analysis, and principal component analysis. Offered in alternate years.—II. Widaman

205C. Structural Equation Modeling (4)
Lecture—3 hours; term paper. Prerequisite: graduate standing; course 204A and 204B or the equivalent or consent of instructor. Theory and methods of struc- tural equation modeling, including path analysis, confirmatory factor analysis, multiple-group modeling and latent growth curve modeling. Offered in alternate years.—II. Ferrer, Grimm, Widaman

205D. Multilevel Models (4)
Lecture—4 hours. Prerequisite: course 204A, graduate standing or consent of instructor. Introduction to statistical techniques for the analysis of normal, hierarchically structured data, such as clustered data or repeated-measures data. Topics include hierarchical linear models, latent growth curve models, and how these models handle unbalanced and/or missing data. Offered in alternate years.—II. Grimm

205E. Applied Psychometrics and Measurement Theory (4)
Lecture—4 hours. Prerequisite: course 204A or equivalent; graduate standing in Psychology or consent of instructor. Examination of basic statistical models and applications of classical and modern test theory. Topics include test construction, reliability theory, validity theory, factor analysis, and latent trait theory. Not open for credit to students who have completed course 204 or 204C. Offered in alternate years. —III. Widaman

205F. Item Response Theory (4)
Lecture—3 hours; term paper. Prerequisite: course 204A or the equivalent; graduate standing in Psychology or consent of instructor. Item response theory allows for the creation of precise measurement instruments in psychological testing. Review Classical Test Theory, and then cover basic IRT models through advanced applications. Offered in alternate years. —III. Grimm

206.A. Theoretical Foundations: Research Methods in Psychology (4)
Lecture/discussion—3 hours; term paper. Restricted to graduate student status. Examines the philosophy and research practices underlying experimental psychology. Topics to be covered include philosophy of science/epistemology, research design, sampling bias and bias in research, theory development, validity, the social context of research, and critical thinking about research. Offered irregularly. —III. (III) Pickett, Shaver

206.B. Research Methods in Psychology: Applications in Social-Personality Research (4)
Lecture/discussion—3 hours; term paper. Restricted to graduate student status. Examines the philosophy and research practices underlying experimental psychology. Topics to be covered include philosophy of science/epistemology, research design, sampling bias and bias in research, theory development, validity, the social context of research, and critical thinking about research. Offered irregularly. —III. (III) Pickett, Shaver

207. Survey and Questionnaire Research Methods (4)
Lecture/discussion—4 hours. Prerequisite: completion of a course on social or behavioral research methods, graduate standing. Survey and questionnaire research methods with emphasis on how to ask questions. Cognitive, motivational, and social processes that influence how respondents answer questions; sampling techniques; Internet resources, and practical aspects of fielding survey and questionnaire research. Offered irregularly.—I. Herk

Quarter Offered: Ti-Fall; II-Winter; III-Spring; IV-Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Domestic Diversity; Wrt—Writing Experience
Fall 2011 and on Revised General Education (GE): AHH—Arts and Humanities; SE—Science and Engineering, SS—Social Sciences; ACGH—American Cultures, DD—Domestic Diversity, OL—Oral Skills, QL—Quantitative, SL—Scientific, VL—Visual, WC—World Cultures; WE—Writing Experience
208. Physiological Psychology (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. A conceptual analysis of the search for neural, neurophysiology, and neurochemistry to an understanding of animal and human behavior.—III. Bales

208A. Fundamentals of Human Electroencephalography (4)
Lecture/discussion—1.5 hours; laboratory—3 hours; extensive problem solving—1.5 hours; project—3 hours. Restricted to 15 students. In-depth introduction and hands-on experience with the event-related potential (ERP) method in the study of attention, executive control, memory, language and social cognitive neuroscience.—II. (III) Luck, Swaab

209A. Introduction to Programming: Matlab (4)
Lecture/laboratory—3 hours. Prerequisite: graduate standing or consent of instructor. The Matlab programming environment as a means of organizing, analyzing, and visualizing scientific data. Basic programming concepts such as variables, loops, conditional branching, and efficient programming techniques will be emphasized. Offered irregularly.

210. Fundamentals of Cognitive Neuroimaging (3)
Lecture/discussion—3 hours. Prerequisite: basic knowledge of inferential statistics and experimental psychology. Introduction to empirical Foundations and methodology of neuroimaging, emphasizing pragmatics of functional magnetic resonance imaging (fMRI) for study cognition. Topics include: MR physiology, the relationship between neural activity and the BOLD signal, cognitive and mental design, and analysis of fMRI data.—Ranganath

211. Advanced Topics in Neuroimaging (2)
Seminar—2 hours. Prerequisite: course 210 or consent of instructor. Restricted to 16 students. Critical presentation and discussion of the most influential advanced issues in neuroimaging, emphasizing MRI design/analysis and the integration of MRI with EEG/MEG. (Same course as Neuroscience 211, Psychology, Physiology, and Behavior 211) S/U grading only.—II. (III) Miller

212A. Developmental Psychology: Cognitive and Perceptual Development (4)
Seminar—4 hours. Prerequisite: graduate standing or consent of instructor, completion of undergraduate or graduate course on developmental psychology or human development. Theories and empirical findings concerning human cognitive and perceptual development. Study of development of perception, memory, concepts (e.g., theory of mind, concepts about number), problem solving, and language from infancy to adolescence.—I. Gheetti, Goodman, Graf Estes, Laplatah, Utz

212B. Developmental Psychology: Social, Emotional, and Personality Development (4)
Seminar—4 hours. Prerequisite: graduate standing or consent of instructor, completion of undergraduate or graduate course on developmental psychology or human development. Theories and empirical findings concerning human social, emotional, and personality development. Development of emotions, moral reasoning and behavior, personality, self-concept, and social cognition from infancy to adolescence (may include adulthood).—Thompson

216 Behavioral Genetics (4)
Lecture—3 hours; laboratory/discussion—1 hours; term paper. Prerequisite: graduate standing. Restricted to 20 students. Review basic principles in genetics and select topics in molecular genetics with emphasis on behavior. Use of modern molecular methods to outline complex relationships between genes, environment, and behavior. Not open for credit to students who have completed course 221.—II. (III) Trainer

218A. Fundamentals of Animal Behavior (5)
Lecture/discussion—4 hours; discussion—1 hour. Prerequisite: consent of instructor; upper-division undergraduate introduction to the biology of behavior, such as course 101, 122, 123, Neurobiology, Physiology, and Behavior 102, 151, 152, Wildlife, Fish, and Conservation Biology 141, Entomology 104, or Animal Science 105. Survey of the phenomena and theory of animal behavior from the perspectives of multiple biological disciplines, including evolution, ecology, genetics, neurobiology, endocrinology, and animal science. (Same course as Animal Behavior 218A).—I. (II) Sih

218B. Fundamentals of Animal Behavior (5)
Lecture/discussion—4 hours; discussion—1 hour. Prerequisite: consent of instructor; course 209A. Survey of the phenomena and theory of animal behavior from the perspectives of multiple biological disciplines, including evolution, ecology, genetics, neurobiology, endocrinology, and animal science. (Same course as Animal Behavior 218B).—II. (III) Sih

220. History of Psychology (4)
Lecture—2 hours; seminar—2 hours. Prerequisite: graduate standing in psychology or consent of instructor. A lecture-seminar on the history of psychology and on the applicability of early psychological theory and research to contemporary investigations. Offered in alternate years.—Simonton

221. Academic Writing in Psychology (4)
Lecture/discussion—3 hours, term paper. Prerequisite: consent of instructor. Class size limited to 10. Strategies for developing and honing academic writing skills and writing productivity, with a particular focus on how to produce a clear and compelling empirical journal article in psychology. May be repeated four times for credit with consent of instructor if student chooses to focus on a substantially different writing project. Offered irregularly.—I. Ledgerwood

230. Cognitive Psychology (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Analysis of the mental processes by which knowledge is acquired, manipulated, stored, retrieved and used. Offered in alternate years.—I. Long, Mangun

231. Sensation and Perception (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Analysis of the role of sensory processes and perception in experience and their effects on behavior. Offered in alternate years.—II.

241. Attitudes and Social Influence (4)
Lecture/discussion—3 hours; term paper. Prerequisite: consent of instructor. Survey of theory and research in the field of social influence. Topics include attitude definition and measurement, major theories of attitude formation and change, the interpersonal consequences of those attitudes, and theory and empirical research on a specialized topic in the psychology of language. May be repeated for credit when topic differs. Offered in alternate years.

245. Social Psychology (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Theory and research in social psychology.—III. (III) Johnson, Pickett, Rabin

247. Personality (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Theory and research in human personality.—II. (III) Rabin

250. Comparative Psychology (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. The study of animal behavior in an evolutionary and comparative framework.—II.

251. Topics in Genetic Correlates of Behavior (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Theory and research in the genetic contributions to animal and human behavior. May be repeated for credit when topic differs. Offered in alternate years.

252. Topics in Psychobiology (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Critical study in a selected area of psychobiology. May be repeated for credit when content differs. Offered in alternate years.

261. Cognitive Neuroscience (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: graduate student standing in Psychology or Neuroscience or consent of instructor. Graduate core course for neuroscience. Neurobiological bases of sensory, motor, and cognitive functions. Offered in alternate years. (Same course as Neuroscience 223).—II. (III) Ranganath, Swaab

263. Topics in Cognitive Psychology (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Selected topics in language processing, memory, perception, problem solving, and thinking, with an emphasis on the common underlying cognitive processes. May be repeated for credit when content differs. Offered in alternate years.

264. Topics in Psycholinguistics (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Discussion of fundamental issues in the psychology of language. May be repeated for credit when content differs. Offered in alternate years.

270. Topics in Personality and Social Psychology (4)
Seminar—4 hours. Prerequisite: graduate standing or consent of instructor. Critical study of a selected area of personality or social psychology. May be repeated for credit when content differs.

272. Topics in Developmental Psychology (4)
Seminar—4 hours. Prerequisite: graduate standing in Psychology or consent of instructor. Selected topics in developmental psychology, including developmental neuroscience, memory development, infant, cognitive development, social development, child maltreatment, children and law, perceptual development, emotional development, children's critical, and adolescence, with emphasis on developmental processes and developmental theory. May be repeated for credit. Offered irregularly.

289A. Current Research in Psychology (2)
Seminar—2 hours. Prerequisite: graduate standing in Psychology or consent of instructor. Contemporary theory and empirical research in specialized topics in psychology. Topics include developmental attachment, developmental neuroscience, social, emotional, sexual orientation and identity. May be repeated for credit if topic differs. (Deferred grading only, pending completion of sequence.)

289B. Current Research in Psychology (2)
Discussion—2 hours. Prerequisite: course 289A; graduate standing in Psychology or consent of instructor. Intensive examination of contemporary theory and empirical research on a specialized topic.
in psychology. Sample topics include developmental attachment, social neuroscience, culture and mental health, electroencephalography and cognitive neurosci-
ence, emotion, implicit cognitive processes, sexual orientation and identity, and attention. May be repeated for credit if content differs. (Deferred grade-
ing only, pending completion of sequence.)

290. Seminar (A) — 4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Seminar devoted to a highly specific research topic in any area of basic psychology. Special topic selected for a quarter will vary depending on interests of instruc-
tors and students.—I, III. (II, III.)

298. Group Study (1-5) (S/U grading only)

299. Research (2-9) (S/U grading only)

299D. Dissertation Research (1-12) Prerequisite: consent of instructor. (S/U grading only.)

Professional

390A-390B. The Teaching of Psychology (6-4) Discussion, lecture, practice. Prerequisite: advanced graduate standing in psychology or a closely related discipline and consent of instructor. Methods and problems of teaching psychology at the undergradu-
ate and graduate levels; curriculum design and eval-
uation. Practical experience in the preparation and presentation of material. (S/U grading only; deferred grading only, pending completion of sequence.)—I, II, III. (II, III.)

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only)—I, II, III. (II, III.)

Quantitative Biology and Bioinformatics

[College of Biological Sciences]
The interdisciplinary minor in Quantitative Biology and Bioinformatics is an integrative program that introduces students to the quantitative and computa-
tional approaches that are redefining all disciplines in the biological sciences, from molecular and cell biology, through genomics and physiology, to ecol-
yogy and evolutionary biology. Students in this minor will learn research tools that apply mathematical and computational methods, increase their insight into the strengths and limitations of quantitative approaches, and develop the interdisciplinary per-
pective that is now the foundation of modern bio-
logical research and training.
The minor in Quantitative Biology and Bioinformatics is open to all undergraduates regardless of major and is sponsored by the College of Biological Sci-
ences.

Minor Program Requirements: UNITS

Quantitative Biology and Bioinformatics ................................. 18-24

Core Courses ................................. 8-12
Programming: Computer Science Engineering 10 or 30 or the

equivalent* ........................................ 4
Quantitative Biology: Biological Sciences 132 or Mathematics 124
Bioinformatics: Computer Science Engineering 124 or 129 ............ 4
Quantitative and Computational
Preparation .................................................. 4

Complete one course from the following: Applied Science Engineering 115; Biomedical Engineering 103; Computer Science Engineering 122, 130;

Mathematics 128A, 128B, 128C, 135A;
Statistics 130A, 131A, 141A

*The program requirement may be satisfied by previous experience and therefore may not entail college course credit. Please see your minor adviser for this determination and its possible impact on your unit requirements for the minor.

Restricted Electives .............................. 6-8 Complete two or more courses from the following list to achieve a total of 18-24 units: Biological Sciences 134, 180L, 181, 183; Biomedical Engineering 102, 117, 140, 141, 151; Biotechnology 150; Computer Science Engineering 165A, 166; Evolution and Ecology 102, 103, 104, 175; Microbiology 105; Molecular and Cellular Biology 123, 143, 182; Neurobiology, Physiology, and Behavior 166, 167; one course from: Environmental Science and Policy 121 or Wildlife, Fish, and Conservation Biology 122

Restrictions. No more than two upper division courses from any single department may be offered in satisfaction of the minor requirements. Only one course used to satisfy a requirement for the minor may be applied toward a student's major.

Minor Adviser. Consult the Biology Academic Success Center (BASC), 1023 Sciences Laboratory Building; 530-752-0410; http://www.biosci.ucdavis.edu/BASC

Radiation Oncology

See Medicine, School of, on page 396.

Radiology

See Medicine, School of, on page 396.

Range Science

[College of Agricultural and Environmental Sciences] Faculty. See Plant Sciences, on page 476.

Related Program. See Ecological Management and Restoration, on page 229.

Related Courses. See Plant Sciences 101, 112, 130, 131, 135; Nutrition 115; Soil Science 105, 120; Wildlife, Fish, and Conservation Biology 151.

Religious Studies

[College of Letters and Science]

Naomi Janowitz, Ph.D., Chair
Program Office. 213 Sproul Hall 530-752-1219; http://religions.ucdavis.edu

Faculty

Catherine Chin, Ph.D., Associate Professor
Allison Coudert, Ph.D., Professor
Mark Elmore, Ph.D., Assistant Professor
Naomi Janowitz, Ph.D., Professor
Meaghan O’Keefe, Ph.D., Assistant Professor
W. Flogg Miller, Ph.D., Associate Professor
Mairaj Syed, Ph.D., Assistant Professor
Baki Tezcan, Ph.D., Associate Professor
Archana Venkatesan, Ph.D., Assistant Professor
Keith Waterpaugh, Ph.D., Associate Professor

Emeriti Faculty
Whalen W. Lai, Ph.D., Professor Emeritus

The Major Program
Religion is a major force in human experience. It has shaped the world’s history, literature, art, culture, politics, ethics, and economics. In addition to offer-
ning courses in all the major religious traditions (Juda-
ism, Christianity, Islam, Hinduism, and Chinese and Japanese religions), the Religious Studies Program has developed cross-cultural courses dealing with religious symbols, myths, and rituals in written texts, art, theater, and film, and the Internet, as well as thematic courses dealing with such topics as religion and the body, the rise of fundamentalism, religion and science, and religion and violence.
The Program. The major introduces students to the academic study of religion. Students can choose from a broad range of courses both in the program itself and in other departments and programs—history, philosophy, psychology, sociology, anthropology, American studies, classics, and medieval studies. In addition to studying religious thought per se, stu-
dents in the major can also study the way religion has shaped human behavior in such matters as fam-
ily life, gender roles, ethnicity, artistic life, concepts of individual freedom, the pursuit of science, and eco-
nomics. For some students, Religious Studies is an appropriate second major and combines well with anything from philosophy to international agricul-
tural development, political science, and the physi-
cal sciences.

Career Alternatives. Because of the program’s focus on developing critical thinking, writing, and reading skills, students who major in Religious Stud-
ies are well prepared to enter a variety of careers, including teaching, the health professions, law, busi-
ess, and government. In an increasingly global society, knowledge of the world’s religious traditions and practices has become an essential part of a stu-
dent’s education.

A.B. Major Requirements: UNITS

Preparatory Subject Matter ...................... 20

(A) One course from the Religious Studies 1 series .................................................. 4
(B) Four courses from other Religious Studies lower division offerings ........................................ 16

Depth Subject Matter .......................... 40

Religious Studies 100 .......................... 4
Nine upper division Religious Studies courses * ........................................................................ 36
* Four of these courses must be upper division courses related to religion that are offered by other departments and taken with the approval of a Religious Studies adviser.

Total Units for the Major ........................ 60

Recommended. A reading knowledge of a for-

ences language is highly recommended.

Course Equivalents. The major advisers have a list of lower and upper division courses that can be substituted for courses suggested above.

Major Advisers. Consult the Program office.

Minor Program Requirements: UNITS

Religious Studies .......................... 20

Lower division course ........................ 4
Upper division courses .......................... 16
Religious Studies 100 (or 70) required. Some substitutions from other departments or programs allowed with consent of adviser.

Minor Advisers. Same as major advisers.

Honors and Honors Program. A student be-
comes eligible for graduation with honors by meeting the minimum GPA and course requirements established by the College of Letters and Science. Upon successful completion of the additional require-
ments of the College of Letters and Science Honors Program, individual students may be recommended
Courses in Religious Studies (RST)

Lower Division

1. Survey of Religion (4)
Lecture—3 hours; discussion—1 hour. Basic concepts introduced through readings of the primary religious scriptures. Discussion of central ideas (creation, history, war, prophecy, suffering, mysticism, asceticism, karma, reincarnation, moksha, etc.); readings from the Bible, Bhagavad Gita, the Koran, selections from Plato and early Buddhist writings.

GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, OL, VL, WE.—II. (II.)

1A. Pilgrimage (4)
Lecture—3 hours; discussion—1 hour. Introduction to comparative religion, focusing on the theme of pilgrimage in different religious traditions. Not open to students who have taken course 3A. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, VL, WE.—II. (II.)

1B. Death and Afterlife (4)
Lecture—3 hours; discussion—1 hour. Introduction to comparative religion, focusing on the theme of death and the afterlife in different religious traditions. Not open to students who have taken course 3B. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, OL, VL, WE.—I, II, III, IV. (I, II, III, IV.)

1C. Sacrifice (4)
Lecture—3 hours; discussion—1 hour. Introduction to comparative religion, focusing on the theme of sacrifice in different religious traditions. Not available to those who have taken course 3C. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, OL, VL, WE.—I, II, III, IV. (I, II, III, IV.)

1D. Conversion (4)
Lecture—3 hours; discussion—1 hour. Introduction to comparative religion, focusing on the theme of conversion in different religious traditions. Not available to those who have taken course 3D. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WC, WE.—I, II, III, IV. (I, II, III, IV.)

1E. Fundamentalism (4)
Lecture—3 hours; discussion—1 hour. Introduction to comparative religion, focusing on the theme of fundamentalism in different religious traditions. Not available to those who have taken course 3E. Offered irregularly. GE credit: ArtHum or SacSci, Div, Wrt | AH or SS, OL, VL, WE.—II, III, IV. (I, II, III, IV.)

1F. Myth, Ritual, and Symbolism (4)
Lecture—3 hours; discussion—1 hour. Myths, rituals and religious symbols found in a variety of religious traditions including examples from ancient and contemporary religious life. Variety of religious phenomena; validity of different approaches to the study of religion. Not open to students who have taken and received unit credit for course 2. GE credit: ArtHum, Div, Wrt | AH, OL, VL, WE.—I, II, III, IV. (I, II, III, IV.)

1H. Religion and Law (4)
Lecture—3 hours; discussion—1 hour. Methods used in the study of religion, focusing on a particular theme in a number of religious traditions. Offered in alternate years. GE credit: ArtHum | AH, OL, VL, WE.—Vidacs

10. Contemporary Ethical Issues (2)
Lecture—2 hours. Presents challenging, contemporary ethical issues from a multicultural perspective. Rotating topics will include Ethical Eating, Capital Punishment, Environmentalism, Poverty, and Animal Rights. May be repeated for credit. GE credit: ArtHum, Wrt | AH, WE.—III. (III.)

10A. Contemporary Ethical Issues (2)
Discussion—1 hour; extensive writing. Prerequisite: consent of instructor.

2. Survey of Religion (4)
Lecture—3 hours; discussion—1 hour. Introduction to the complex and varied ethical, religious, and cultural meanings that food has had across the centuries and globe. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, OL, VL, WE, WC, WE.—Coudert

12. The Emergence of Judaism, Christianity, and Islam (4)
Lecture—3 hours; discussion—1 hour. History of religion in the ancient Near East and Mediterranean, from the Persian period through the rise of Islam. Emphasis on historical and social contexts of the formation of new traditions, in particular Judaism, Christianity, and Islam. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, OL, VL, WE.—I, III. (III.)

15Y. Reading War/Fighting War (4)
Lecture—2 hours; web electronic discussion—1 hour; extensive writing. Introduction to both religious texts and the effects of war through the lens of literature. Course pays particular attention to Christianity in China, India, Africa, the Middle East and Latin America. Offered in alternate years. GE credit: ArtHum | AH, VL, WE.—II, III, IV. (II, III, IV.)

16. Hebrew Scriptures (4)
Lecture—3 hours; term paper or discussion. Selected texts from the Hebrew Scriptures (Genesis II Chronicles) and review of modern scholarship on the texts from a variety of perspectives (historical, literary, sociological, psychological). Course work is based on an English translation and no knowledge of Hebrew is required. GE credit: ArtHum, Div, Wrt | AH, OL, WE.—I, II. (II.)

23. Introduction to Judaism (4)
Lecture/discussion—3 hours; term paper. Introduction to the study of Judaism using examples from the ritual, art and literature. No prior knowledge of either Judaism or the study of religion is necessary. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, WC, WE.—II. (II.)

30. Religions of South Asia (4)
Lecture—3 hours; discussion—1 hour. Introduction to South Asian religions, including Hinduism, Buddhism, Islam, Jainism and Sikhism. Travels historical developments from Vedics and their ascetic reformulation of Jainavakya, Siddhartha Gautama, and Mahavira into our global present. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, VL, WE.—I, II, III. (II.)

40. New Testament (4)

42. Religion and Science Fiction (4)
Lecture—3 hours; term paper. Representations of actual and fictional religious movements in science fiction and fantasy writing and film. Examination of the characteristics of religion and religiosity in fictional religious movements; the relationship between religion, science, and technology in modern speculative fiction. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, VL, WE.—I, II, III, IV. (II, III, IV.)

53. Christianity (4)
Lecture/discussion—3 hours; term paper or discussion. Major concepts and practices in the Christian tradition. Survey of the history of Christianity and Christian expansion from antiquity to modern times. Course pays particular attention to Christianity in China, India, Africa, the Middle East and Latin America. Offered in alternate years. GE credit: ArtHum | AH, VL, WE.—II, III, IV. (II, III, IV.)

56. The Qur’an and Its Interpretation (4)
Lecture/discussion—3 hours; extensive writing. The Qur’an, its history, its various functions in the lives of Muslims, and its different interpretations. Quranic themes such as God and humankind, nature and revelation, eschatology and Satan. Islam and other religions; women, gender, and sexuality. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, WE.—II, III. (II, III.)

67. Modern Hinduism (4)
Lecture—3 hours; term paper. Historical survey of modern Hinduisms from the early nineteenth century to the present. Topics include Ram Mohun Roy, Sir William Jones, and Mahatma Gandhi, nationalism, post-colonialism and diasporic issues. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, VL, WE.—II. Elmore, Venkatesan

68. Hinduism (4)
Lecture—3 hours; writing. Hindu tradition from ancient to modern times. Multiplicity of religious forms within Hinduism with mention of Jainism, Buddhism, and Sikhism and their relation to the mainstream of Hindu religion. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, VL, WE.—II. Elmore, Venkatesan

69. Introduction to Hindu Mythology (4)
Lecture/discussion—3 hours; term paper or discussion—1 hour. Survey of the major narrative traditions within Hinduism, including epic literature and local stories in oral, textual, visual and performative forms. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, VL, WE.—I.

70. Religion and Language (4)
Lecture/discussion—3 hours; term paper or discussion. Basic tool-kit for studying religious discourse in a variety of traditions. Concentration on the sacred and profane, the wondrous and ordinary, and the mystical and reasonable. GE credit: ArtHum, Div, Wrt | AH, VL, WE.—WC. (WC.) Miller

75. Introduction to Chinese Philosophy (4)
Lecture—4 hours. Introduction to Chinese philosophy from classical pre-modern times; emphasis on basic concepts and analytical and logical conduct; the Age of Philosophers, the Han synthesis, the medieval Buddhist contribution. Offered irregularly.
Lecture/discussion—3 hours; term paper. Constructions of gender and sexuality within one or more religious traditions, premodern and modern. Emphasis on the interaction between religious, medical, and ethical definitions of the human body and sexual behavior. Offered every other year. GE credit: AH, WE. — I, II. (I) Chin

110. Mysticism (4)
Lecture—3 hours; term paper. Prerequisite: one lower division Religious Studies course (except 10, 98, or 99). Historical and descriptive analysis of selected key figures and writings and readings of representative mystical texts. Analytic term paper. Offered every three-four years. GE credit: AH, Wrt | AH, OL, VL, WE. — III. (III) Watenpaugh

112. Christian Origins (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 40. Development of Christianity from the end of the first century through the major controversies of the fifth century. Emphasis on the relationship between the religious movement and the Roman Empire, and issues of early Christian identity and diversity. Offered irregularly. GE credit: ArHum, Div, Wrt | AH, VL, WE. — Chin

113. Dead Sea Scrolls, Apocrypha, and Pseudepigrapha (4)
Lecture—3 hours; term paper. Prerequisite: course 21 or 40 or consent of instructor. Survey of the Dead Sea Scrolls, apocryphal and pseudepigraphical writings of Judaism and Christianity and their historical, social, and religious importance. GE credit: ArHum, Wrt | AH, VL, WE. — II. (III) Vidas

115. The Formation of the Rabbinic Tradition (4)
Lecture/discussion—3 hours; term paper. Prerequisite: courses 21, 40, or 125. Study of the classical rabbinic Jewish texts such as the Talmud and of the social and historical contexts of their production in Palestine and Babylonia. Offered in alternate years. GE credit: Wrt | VL, WE. — II. (III) Chin

122. Christian and Jewish Traditions (4)
Lecture—3 hours; term paper. Prerequisite: courses 40 or 45. Christianity in Europe and the Near East from the year 600 to 1450. Focus on the development of Catholic and Orthodox traditions in ritual, art, and thought, with attention to interactions between regional groups, and Christian interaction with Islam. Offered irregularly. GE credit: ArHum, Div, Wrt | AH, VL, WE. — I, II. Chin

126. The Formation of the Rabbinic Tradition (4)
Lecture/discussion—3 hours; term paper. Prerequisite: courses 21, 40, or 125. Study of the classical rabbinic Jewish texts such as the Talmud and of the social and historical contexts of their production in Palestine and Babylonia. Offered in alternate years. GE credit: Wrt | VL, WE. — II. (III) Vidas

130. Topics in Religious Studies (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 1 or courses 21, 40, or consent of instructor. Thematic study of a phenomenon in more than one religious tradition or of the relationship between religion and another cultural phenomenon. Topics may include archaeology and the Bible, women and religion, religion and violence. May be repeated for credit when topic differs. GE credit: Wrt, WE. — II. (III) Chin

132. Topics in Mediterranean Ancient Religion (4)
Lecture/discussion—3 hours; term paper. Prerequisite: courses 21, 40, or consent of instructor. Theorized study of specific sociological, literary or theological theme through the religious traditions of the ancient Mediterranean/Near East: Greek and Roman religions, Judaism, Christianity, Manichaeism, Manichaicism, etc. Topics may include creation, sacrifice, priesthoods, prophecies, holy books, the afterlife. Offered in alternate years. May be repeated twice for credit when topic differs. GE credit: ArHum, Div, Wrt | AH, VL, WE. — III. (III) Watenpaugh

136. Life, Meaning and Identity (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 1 or 2 or upper division standing. Study of the nature and structure of dreams, myths, and ideals. Offered in alternate years. GE credit: AH, WE. — II. (II) Chin

141A. New Testament Literature: Sympotic Gospels (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 40. Life and thought of the early Church as reflected by the Syoptic Tradition—Matthew, Mark, Luke and Acts. Offered every third year to alternate with 141B, 141C. GE credit: ArHum, Wrt | AH, VL, WE. — I. (II) Chin

141B. New Testament Literature: John (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 40. Life and thought of the early Church as reflected by the Johannine Tradition—the Gospel and letters of John. Offered every third year to alternate with 141A, 141C. GE credit: ArHum, Wrt | AH, VL, WE. — III. (II) Chin

141C. New Testament Literature: Paul (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 40. Life and thought of the early Church as reflected by the Pauline tradition—the letters of Paul. Offered every third year to alternate with 141A, 141B. GE credit: ArHum, Wrt | AH, VL, WE. — II. (II) Chin

143. History of the Bible (4)
Lecture—3 hours; term paper. Prerequisite: course 21 or 40. History of the formation of the Christian biblical canon, with emphasis on differences between Christian traditions; survey of translations and adaptations of biblical narrative in Christianity, Judaism, and Islam, as well as in contemporary culture. Offered irregularly. GE credit: ArHum, Div, Wrt | AH, VL, WE. — II, III. (II, III) Chin

150. Religious Ethics (4)
Lecture/discussion—3 hours; term paper or discussion—1 hour. Prerequisite: upper division standing. Comparative and critical study of the modern phenomena of genocide from ethical, religious and historical perspectives. [Same course as Human Rights 131.] Offered in alternate years. GE credit: ArHum or SocSci, Div, Wrt | AH or SS, VL, WE. — I. (II) Watenpaugh

152. The Bible and Film (4)
Lecture—2 hours; term paper; film-viewing—3 hours. Prerequisite: Humanities 10 recommended. Examination of the uses of biblical narratives in film. Topics include dramatic depictions of biblical stories, the tension between science and religion, allegorical treatment of biblical themes, and the problems of religious conviction. — III. Watenpaugh
156. Religion and the Performing Arts in India (4) Lecture—3 hours; term paper. Prerequisite: course 30, 68, or consent of the instructor. Survey of religion and performing arts in India. Emphasis on the influence of colonialism, nationalism, and regionalism on religious and performing arts. Offered in alternate years. GE credit: ArtHum, Div. Writ | AH, WC, WE.—II. Venkatesan


160. Introduction to Islamic Thought (4) Lecture—3 hours; extensive writing. Prerequisite: course 60 recommended. The development of Islamic thought from the first centuries of Islam to the eighteenth century. Theology, philosophy, ethics, Sufism, historiography, politics, law, historical realism, sectarianism, al-Farabi, al-Ghazali, Ibl Rushd, Tusi, Ibn al-Arabi, Rumi, Molla Sadra, Ibn Khaledun, Ibn Abd al-Wahhab. Offered in alternate years. GE credit: ArtHum or SocSci, Div. Writ | AH, WC, WE.—II. Tezcan


161B. Modern Islam: Authority and Tradition in Process (4) Lecture/discussion—3 hours; term paper. Survey of Islamic thought, social organization, politics from eighteenth century through present. Focus on changing conceptions of authority and tradition. Concentration on Middle East and South Asia with sustained treatment of North American engagements with the Islamic world. Offered in alternate years. GE credit: ArtHum or SocSci, Div. Writ | AH or SS, OL, WC, WE.—II. Miller, Watenpaugh

162. Introduction to Islamic Law (4) Lecture—3 hours; extensive writing. Prerequisite: course 60 recommended. The development of Islamic law in the formative centuries of Islam, ca. 600-1000, as well as its adaptation to changing economic, social, and political conditions in subsequent periods. The role of legal theory, the Shari’a, reformist movements, human rights. Offered in alternate years. GE credit: ArtHum or SocSci, Div. Writ | AH, WC, WE.—I, II. Tezcan

163. The Social Life of Islam (4) Lecture—3 hours; term paper. Introduction to culture and social life in Islamic societies. Focus on the plurality of traditions in Muslim faith, reason, and everyday practice. Special attention to Muslim rituals, values, practices, family life, sexuality, and veiling, and youth culture. Offered in alternate years.—II. Miller

165. Islam in Asia (4) Lecture/discussion—3 hours; extensive writing. Islam as a lived religion in the Indian subcontinent, Central Asia, China, and Southeast Asia. Emphasis on primary sources studied comparatively and historically. GE credit: ArtHum, Div. Writ.—III. Miller

167. Israel (4) Seminar—3 hours; term paper. Origins, causes and ethical challenges of conditions in Israel: larger historical, cultural and ethical dimensions of mass violence, war, liberation, neocolonialism, terrorism and resistance.—III. IV. Watenpaugh

170. Buddhism (4) Lecture—3 hours; term paper. Buddhism in its pan-Asian manifestations, from its beginning in India to its development in Sri Lanka and Southeast Asia, Central Asia, China and Japan; teachings and practices, socio-political and cultural impact. Offered in alternate years. GE credit: ArtHum | AH, VL, WC.—III. Elmore

172. Ch’an (Zen) Buddhism (4) Lecture/discussion—3 hours; term paper. Doctrines and methods of the Ch’an Buddhism, both ancient and modern. Review of ritual techniques, including meditation.—II.

175A. Chinese Intellectual Traditions: Daoist Traditions (4) Lecture/discussion—4 hours. Prerequisite: Chinese 11 or a course in Chinese history recommended. English-language survey of key Daoist texts and scholarship. Topics include Daoist concepts of the cosmos, the natural world, scripture, the body, and immortality; Daoist divinities; Daoism and the state. Offered in alternate years. (Same course as Chinese 100A) GE credit: ArtHum, Div. Writ | AH, WC.—II. Halperin

189. Senior Colloquium (4) Seminar—3 hours; term paper. Prerequisite: consent of instructor. Primarily for seniors in Religious Studies. Discussion in depth of a problem in religion which requires the methods of several disciplines and is important in the encounter between religions.—II. (II.)

190. Seminar (4) Seminar—3 hours; term paper. Prerequisite: consent of instructor; required of all Religious Studies majors. Allows majors to integrate their disciplined study of the field. Emphasis on current or contemporary debates about the methods for analyzing and comparing diverse religious traditions.—II.

194HA-194HB. Special Study for Honors Students (1-5) Independent study. Open only to majors of senior standing who qualify for honors program. Guided research, under the direction of a faculty member approved by the Program Director, leading to a senior honors thesis on a religious studies topic. (P/NP grading only.)

198. Directed Group Study (1-5) Prerequisite: upper division standing and consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.)

Graduate

201. Methods and Issues in Religious Studies (4) Seminar—3 hours; term paper. Prerequisite: graduate standing. Focuses on controversies in the study of religious thought. How is religion best defined? Are there methods or a unique to the study of religion? What does the study of religion contribute to the study of society in general? May be repeated two times for credit when topic differs. Offered in alternate years. (III.)

205. Religion and Media (4) Lecture/discussion—3 hours; term paper. Many communities are finding global media technologies useful for religious practice. This course examines how religious revitalization is historically situated. A phenomenological approach will enable students to situate media and religion within the social and material world of practitioners.—IV. (IV.) Miller

210. Religion and Postcoloniality, or Savages, Civilization, and Spirituality (4) Seminar—3 hours; term paper. Prerequisite: graduate standing. This course examines relations between religion and colonialism. Using specific historical situations it explores some of our theorist theological problems. Students acquire a solid understanding of postcolonial theory and the historical tools to critically engage religion in the present.—III. (III.) Elmore

212. Religion and Violence (4) Seminar—3 hours; term paper. Comparative and critical study of the ideological, cultural, and theoretical relationship between forms of violence and religion and religious practice. Offered in alternate years.—II. (II.) Watenpaugh

215. Topics in the History of Christianity (4) Seminar—3 terms; term paper. Prerequisite: graduate standing. Selected topics in the history of Christianity. May cover issues in Christian thought from antiquity, the Middle Ages, the early modern or modern period. May be repeated for credit when topic differs. Offered irregularly.—I, II, III. (I, II, III) Chin, Coudert

299. Directed Research (1-12) (S/U grading only.)

Professional

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III. (I, II, III.)

Russian

(College of Letters and Science)
Elisabeth Krimmer, Ph.D., Program Director
Program Office, 213 Sproul Hall
530-752-1219; http://russian.ucdavis.edu

Committee in Charge
Carlee Arnett, Ph.D. (German and Russian)
Jenny Kaminer, Ph.D. (German and Russian)
Olga Stuchebrukhov, Ph.D. (German and Russian)

Faculty
Jenny Kaminer, Ph.D. (German and Russian)
Olga Stuchebrukhov, Ph.D. (German and Russian)

Emeriti Faculty
James Gallant, Ph.D., Lecturer Emeritus
Daniel Rancour-Laferriere, Ph.D., Professor Emeritus
Valerie A. Turnis, Ph.D., Professor Emerita

The Major Program
The Russian major introduces students to a culture rich in art, music, theater, film, language, and literature. The major offers an opportunity to learn skills needed to enter the fields of foreign affairs, world politics, and international trade, or to begin graduate work in literature, history, cultural studies and international relations.

The Program. The major program instructs students in speaking, understanding, reading, and writing the Russian language. The program also acquaints students with the intellectual and cultural contributions of the Russian world through the study of its literature, traditions, and institutions.

Internships and Career Alternatives. Russian majors may participate in internships where they can serve as translators and interpreters for schools and business firms throughout Northern California. Upon graduation, many Russian majors enter the business world or enter graduate programs in Slavic studies and international relations. The program encourages students to supplement their Russian studies with courses in related fields such as international relations, political science, computer science, cultural studies, or economics in order to maximize their career possibilities.

A.B. Major Requirements:

Preparatory Subject Matter.............0-27

Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Domestic Diversity; Writ—Writing Experience
Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACHG—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2015-2016 offering in parentheses

Russian 101A, 101B, 101C.............36

Units

0-27

Russian 1-6; or the equivalent.............0-27

Depth Subject Matter...................40-47

Russian 101A, 101B, 101C.............12

497

Russian
498 Russian

Russian 102 or 103 or 104 or 105………. 4
Additional upper division units chosen in consultation from the following selection of Literature and Culture courses taught in Russian and English……………….. 20
Russian 122, 124, 126, 127, 129, 130, 133, 139A, 141, 142, 143, 150
The elective upper-division courses in English can be satisfied in part by one or more courses in History, Political Science, Comparative Literature and other departments after consultation with, and prior approval of, the major advisor. The total of 36 upper-division units may include units earned in the Education Abroad Program.

Total Units for the Major………………….. 36-63

Major Adviser, Olga Stucheburkhov

Minor Program Requirements:

UNITS Russian …………………………………. 20
Russian 101A, 101B, 101C………………….. 12
Other upper division Russian courses……….. 8

Honors and Honors Program. The honors program comprises at least one quarter of study under course 194H, which include a research paper. For details consult the major advisor.

Study Abroad. Students who have completed one or two years of Russian language study can participate in the Education Abroad Program (EAP) in Moscow. Many of our students also participate in summer, semester, and year-long programs sponsored by CIEE and ACTR in St. Petersburg and Moscow.

Prerequisite Credit. Credit normally will not be given for a course if that course is the prerequisite for a course already completed.

Courses in Russian (RUS)

Lower Division

Course Placement. Students who have learned Russian at home must consult the department for placement instructions. Students with two years of Russian in high school normally continue in Russian 2; those with three years, Russian 3; those with four years, Russian 4.

1. Elementary Russian (5)
Discussion—5 hours; laboratory—1 hour. Introduction to Russian grammar and development of all language skills in a cultural context with special emphasis on communication. (Students who have successfully completed Russian 2 or 3 in the 10th or higher grade in high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student’s record, no unit credit will be allowed if the P/NP grade is filed.) GE credit: ArtHum | AH, WC.—I. (II.)

1A. Accelerated Intensive Elementary Russian (15)
Lecture/discussion—15 hours. Special 12 week accelerated, intense summer session course that combines the work of courses 1, 2, and 3. Introduction to Russian grammar and development of all language skills in a cultural context with emphasis on communication. Not open to students who have completed course 1, 2, or 3—IV. (IV.) Arnett

2. Elementary Russian (5)
Discussion—5 hours; laboratory—1 hour. Prerequisite: course 1. Continuation of grammar and language skills developed in course 1. GE credit: ArtHum | AH, WC.—I. (II.)

3. Elementary Russian (5)
Discussion—5 hours; laboratory—1 hour. Prerequisite: course 2. Continuation of grammar and language skills developed in course 2. GE credit: ArtHum | AH, WC.—III. (III.)

4. Intermediate Russian (4)
Discussion—4 hours; laboratory—1 hour. Prerequisite: courses 1 and 2. Grammar review and conversational practice. GE credit: ArtHum | AH, WC.—I. (II.)

5. Intermediate Russian (4)
Discussion—4 hours; laboratory—1 hour. Prerequisite: course 4. Grammar review. Introduction to literature. GE credit: ArtHum | AH, WC.—III. (III.)

6. Intermediate Russian (4)
Discussion—4 hours; laboratory—1 hour. Prerequisite: course 5. Grammar review. Intermediate conversation and continued reading of literature. GE credit: ArtHum | AH, WC.—III. (III.)

98. Directed Group Study (1-5)
Discussion—1-5 hours. [P/NP grading only.]

99. Special Study for Undergraduates (1-5)
[P/NP grading only.]

Upper Division

101A. Advanced Russian (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 6 or consent of instructor. Topics in Russian grammar. GE credit: ArtHum | AH, WC.—I. (II.)

101B. Advanced Russian (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 101A or consent of instructor. Continuation of course 101A. GE credit: ArtHum | AH, WC.—II. (III.)

101C. Advanced Russian (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 101B. Continuation of course 101B. Topics in Russian grammar for the advanced student. GE credit: ArtHum | AH, WC.—II. (III.)

102. Russian Composition (4)
Lecture/discussion—3 hours; tutorial—1 hour. Prerequisite: course 6 or consent of instructor. Practice in writing Russian on a different topic each week. Topics include history, geography, politics, and literature of Russia; comparison of Russian and American lifestyles; current events. Conducted in Russian. GE credit: ArtHum | AH, WC.—II. (III.)

103. Literary Translation (4)
Discussion—3 hours. Prerequisite: course 101C. Translation of Russian literary texts into stylistically equivalent idiomatic English. Offered in alternate years. (III.)

105. Advanced Russian Conversation (4)
Recitation—3 hours; practice—1 hour. Prerequisite: course 6. Intensive conversational practice and discussion based on current events and contemporary topics. Offered in alternate years. GE credit: ArtHum | AH, OL.—II.

122. 19th-Century Russian Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 102. Russian literature from the period between 1800 and the end of the 19th century. Includes Pushkin's verse, poetry of the early 1820s; and the mature period. GE credit: ArtHum | AH, WC.—I. (II.)

124. Twentieth-Century Russian Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 101C when offered in Russian; no prerequisite when offered in English. Study of Russian literature (prose, drama, poetry) from the period between 1900 and the end of the 20th century. May include authors like Y. Olesha, M. Bulgakov, D. Kharns, and L. Petrushevskaia. Offered alternately in English or Russian. Not open for credit to students who have taken courses 123 and 128. GE credit: ArtHum | AH, WC.—I, II, III, (II, III.) Kaminker

126. The Russian Theater (4)
Lecture—3 hours; term paper. Prerequisite: course 101C or consent of instructor. The main works of Russian dramatists from Fontane to the present, including Gogol, Turgenev, Tolstoy, Ostrovsky, Chekhov, Blak, Mayakovsky, Kharns. Conducted in Russian. Offered in alternate years. GE credit: ArtHum | AH, WC.—I.

129. Russian Film (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: completion of Subject A Requirement. History of Russian film; film and social revolution, the cult of Stalin, dissident visions; film and the collapse of the Soviet empire; gender and the nation in Russian film. Course taught in English; films are in Russian with English subtitles. Offered in alternate years. GE credit: ArtHum | AH, WC.—I. (II.)

130. Contemporary Russian Culture (4)
Lecture—3 hours; term paper. Current trends in Russian culture and the relationship between artists and the government. Topics include recent changes in the cultural scene, postmodernism in literature, visual art, film, and theater. Offered in alternate years. GE credit: ArtHum | AH, WC.—I. (II.)

133. Past-Soviet Literature (4)

139. Pushkin (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 101C or consent of instructor. The course covers three major periods of Pushkin’s poetic and dramatic works, his early Lyceum verse, his poetry of the early 1820s, and the mature period. The course also includes Pushkin’s prose fiction, drama, and journalism. GE credit: ArtHum, Wrt | AH, WC.—I. (II.)

140. Dostoevsky (in English) (4)
Lecture—3 hours. Reading and analysis of Dostoevsky’s principal works such as Crime and Punishment, The Idiot, The Brothers Karamazov, and The Diary. Study of social and political views as reflected in Dostoevsky’s works. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC.—I. (II.)

141. Tolstoy (in English) (4)
Lecture—3 hours. Study of Leo Tolstoy’s literary evolution and moral quest. Readings include his Confessions, a major novel such as War and Peace or Anna Karenina, and representative works of the late 1870s and early 1880s. Offered in alternate years. GE credit: ArtHum, Wrt | AH, WC.—I. (II.)

142. Women in Russian Culture (4)
Lecture/discussion—3 hours; term paper. Prerequisite: any introductory course in literature. Study of the representation of (and by) women in contemporary Russian fiction and film. Exploration of issues such as family dynamics/maternality, sexuality, work, and women’s relationships to the state. Offered in English. Offered in alternate years. GE credit: ArtHum | AH, WC.—I. (II.)

143. Chekhov (in English) (4)
Lecture/discussion—3 hours; extensive writing. Examination of Chekhov’s major plays, such as The Seagull, Uncle Vanya, The Three
Science and Society

(College of Agricultural and Environmental Sciences)

David M. Rizzo, Ph.D., Program Director

Program Office, 152 Hutchison Hall
530-754-4277

Faculty
Arnold Bloom, Ph.D., Professor (Plant Sciences)
Richard M. Bostock, Ph.D., Professor (Plant Pathology)
James Carey, Ph.D., Professor (Entomology)
Gita Cooker, Ph.D., Assistant Professor (Plant Pathology)
Edward Caswell-Chen, Ph.D., Professor (Nematology)
Douglas R. Cook, Ph.D., Professor (Plant Pathology)
Randy Dahlgren, Ph.D., Professor (Land, Air and Water Resources) Academia Senior Distinguished Teaching Award
R. Michael Davis, Ph.D., Professor and Specialist in Plant Pathology
Deborah Epstein, Ph.D., Professor (Plant Pathology)
Albert Fischer, Ph.D., Professor (Plant Sciences)
Graham Fogg, Ph.D., Professor (Land, Air and Water Resources)
David Gilchrist, Ph.D., Professor (Plant Pathology)
Thomas R. Gordon, Ph.D., Professor (Plant Pathology)
John Harada, Ph.D., Professor (Plant Biology)
Academic Senate Distinguished Teaching Award
Peter Hermes, Ph.D., Associate Professor (Land, Air and Water Resources)
William R. Honeycutt, Ph.D., Professor (Land, Air and Water Resources)
Benjamin Z. Houlton, Ph.D., Assistant Professor (Land, Air and Water Resources)
Lovel Javits, Ph.D., Professor (Agricultural & Resource Economics)
Marie Jasieniuk, Ph.D., Assistant Professor (Plant Sciences)
Annie King, Ph.D., Professor (Animal Science)
Johan Leveen, Ph.D., Assistant Professor (Plant Pathology)
James D. Murray, Ph.D., Professor (Animal Science)
Terrence Nathan, Ph.D., Professor (Land, Air and Water Resources)
Sanjai Parikh, Ph.D., Assistant Professor (Land, Air and Water Resources)
Gregory Pasternak, Ph.D., Professor (Land, Air and Water Resources)
James H. Richards, Ph.D., Professor (Land, Air and Water Resources)
David Rizzo, Ph.D., Professor (Plant Pathology)
Pamela C. Ronald, Ph.D., Professor (Plant Pathology)
Wendy Silk, Ph.D., Professor (Land, Air and Water Resources)
Li Tan, Ph.D., Professor (Plant Sciences)

The Program.
Science and Society is an interdisciplinary program administered by the College of Agricultural and Environmental Sciences that offers students throughout the campus the opportunity to discover the connections that link the social, biological, and physical sciences with societal issues and cultural discourses. Course work examines discovery processes in relation to societal values, public policy and ethics, including issues associated with cultural diversity. Whenever possible, opportunities outside the classroom are included as part of the learning experience.

The Science and Society teaching program serves students of all majors and interests. It can allow lower division students who have not yet declared a major a meaningful context for exploring diverse subject matters. The minor for the program includes, in addition to Social Sciences courses, upper division courses from both the College of Agricultural and Environmental Sciences and the College of Letters and Science in the areas of history and philosophy of science, policy and decision making, communication of science, and culture, ethics and applications.

Minor Program Requirements:

UNITS
Science and Society..........................22-27
Science and Society 1, 2, 5, 15, 20, 30.............2-4

One course from each of the four following areas:

History and Philosophy of Science: Community and Regional Development 118, 162, 163; CS 165; History and Philosophy of Science 150, Nature and Culture 100, Philosophy 107, 108, or 109...........................................4
Policy and Society: Science and Society 120, 147, 150, Consumer Science 100, Environmental Science 120, 160, 165, Policy Sciences 175, Sociology 155, or 181.................................3-4

Communication of Science: Agricultural Education 172, Agricultural Management and Rangeland Resources 101, Community and Regional Development 142, Environmental Science and Policy 126, 128, Fiber and Polymer Science 110, International Agricultural Development 104, Plant Biology 151, Plant Pathology 140, or Sociology 144.................3-4

Regional Development 174, Linguistics 163, Political Science 165............3-4

Culture, Ethics and Applications: Agricultural Management and Rangeland Resources 101, Community and Regional Development 142, Environmental Science and Policy 126, 128, Fiber and Polymer Science 110, International Agricultural Development 104, Plant Biology 151, Plant Pathology 140, or Sociology 144.................3-4

Society and Science...........3

Minor Adviser: D. M. Rizzo

Related Courses.

1. Critical Inquiry into Contemporary Issues

Lecture/discussion—3 hours; discussion—1 hour. Contemporary issues, including global population trends, economic and environmental changes, cultural diversity and biodiversity, nutrition and food safety, fiber and textiles, changing consumer cultures. Inquiry processes emphasize ethics, multiple disciplines, and multiple perspectives. GE credit: SciEng or SocSci, Div Wrt | SE or SS, WS—II. (I.) Caswell-Chen

2. Feeding the Planet: Influences on the Global Food Supply

Lecture/discussion—3 hours. Scientific principles and dynamic interrelationships involved in food production, food processing, nutrition, shelf life and marketing from differing viewpoints. Physical, biological and social science issues influencing the availability and safety of the food supply worldwide. GE credit: SciEng or SocSci, Wrt | SE or SS, SL—II. (II.) Bos-tock, Davis

3. Science, Technology and Society

Lecture—4 hours. Impact of developments in science and technology on the interdependent world and how economics, politics, culture and values affect technological development. Not open for credit to students who have completed Introductory course. Applied Behavioral Sciences 18. Offered irregularly. GE credit: SciEng or SocSci, Wrt | SE or SS.

4. Water in Popular Culture

Film viewing—2 hours; discussion—1 hour. Lecture—1 hour. Importance of water in many aspects of society as revealed in the popular depictions in film. GE credit: SciEng or SocSci, Wrt | SE or SS, SL—II. (I.) Pasternak

5. Pathways to Discovery: Science and Society

Lecture/discussion—3 hours. Highlights a current issue and/or controversy found in contemporary society and looks at how this problem impacts and is affected by the physical, social and biological sciences. Course varies. May be repeated two times for credit. Course not offered every year. GE credit: SciEng or SocSci, Wrt | SE or SS.

7. Terrorism and War

Lecture—3 hours; discussion—1 hour; term paper. Exploration of terrorism and war from science and social sciences perspectives. Terrorist cells and networks; biological, chemical, nuclear, and environmental terrorism; intelligence gathering and espionage; military strategy; genocide; epochal wars; clash of civilizations; nation building; and future global scenarios. GE credit: SciEng or SocSci, Div, Wrt | SE or SS, WE—II. (II.) Carey
7V. Terrorism and War (4)
Web Virtual Lecture—3 hours, tutotial—5 hours, web electronic discussion—1 hour, extensive writing—term paper or discussion. Prerequisite: consent of instructor. Terrorism and war from science and social sciences perspectives: terrorism (terrorist cells, WMD’s, religious extremism), warfare (military strategy, genocide), and statecraft (diplomacy, clash of civilizations, epochal wars). GE credit: SocSci, Wrt | SS, WC, WE.—Carey

8. Water Quality at Risk (3)
Lecture—2 hours, discussion—1 hour. Natural and human activities that impact the quality of water. Quality and water contamination. (Same course as Environment- al and Resource Sciences 8.) GE credit: SciEng or SocSci, Wrt | SE or SS, SL, WE.—II. (II.) Hennes

9. Crisis in the Environment (3)
Lecture—3 hours. Explores contemporary environmental issues by examining the causes, effects and solutions to a wide range of environmental problems facing the global ecosystem. Integrated discussion of political, societal and economic linkages with environmental problems. GE credit: SciEng or SocSci, Wrt | SE or SS, WE.—III. (III.) Dahlgren, Houlton

10. Water, Power, Society (3)
Lecture—2 hours, discussion—1 hour. Water resources issues. How water has been used to gain and win power. Water resources development in California as related to current and future sustainability of water quality and quantity. Roles of science and technology in water problems. (Same course as Hydrologic Science 10.) GE credit: SciEng or SocSci, Wrt | SE or SS, SL—III. (III.) Fogg

11. California Geography (3)
Lecture—2 hours, discussion—1 hour, term paper. Introduction to cultural and physical patterns of California and their relationship to natural resources, biomes, geomorphology, and physiography. Focus on diversity of California’s environments and their impacts on and alterations by human activities. Environmental issues in the State. GE credit: SciEng or SocSci, Wrt | SE or SS, WE.—I. (I.) Richards

12. Plants and Society (4)
Lecture—2 hours, extensive writing—3 hours. Prerequisite: high school biology. Dependence of human societies on plant and plant products. Plants as resources for food, fiber, health, enjoyment and environmental services. Sustainable uses of plants for food, beverages, fuels, fiber, cosmetics, and environmental conservation. Global population growth and future food supplies. Not open for credit to students who have completed Plant Biology 12. GE credit: SciEng or SocSci, Wrt | SE or SS, SL—II. (II.) Arnold

13. Disease and Society (3)
Lecture—3 hours. Limited enrollment. Introduction to the concept of disease, the societal and personal impacts of past, present and future diseases, and the science behind disease discoveries, causes, evolution, diagnosis, treatment, prevention. GE credit: SciEng or SocSci | SE or SS, SL.—II. (II.) Leveau

14. AIDS and Society (4)
Lecture—3 hours, limited enrollment—1 hour. Biology of HIV transmission and AIDS and how a biological agent acts on and influences the structure of contemporary society. Includes the psychology of risk and stigma, gender issues, changes in social relationships and public policy, global implications. GE credit: SciEng or SocSci, Div | Wrt | SE or SS—III. (III.) Radke

18. GIS and Society (3)
Lecture—2 hours, laboratory—3 hours; term paper or discussion—0.5 hours. Geographic Information Systems (GIS): concepts, software and a tool for change in society. Evaluate physical, biological and social impact of GIS in the context of case studies such as land, water and community planning. GE credit: SciEng or SocSci, Wrt | QL, SE or SS, SL, VL—III. (III.) Wallender

20. Genetics and Society (4)
Lecture—3 hours, discussion—1 hour. Not open for credit to students who have completed course 140. Basic concepts and methods of biotechnology, the process of scientific discovery and the public perception of the process; present and future impact of genetics on society. GE credit: SciEng or SocSci, Wrt | QL, SE or SS, SL, WE.—I. (I.), II. (II.) Coaker, Cook, Epstein, Ronald

25. Global Climate Change: Convergence of Biological, Geophysical, & Social Sciences (3)

25V. Global Climate Change: Convergence of Biological, Geophysical, & Social Sciences (3)
Web virtual lecture; web electronic discussion—2 hours, autotutorial—5 hours, extensive writing—2 hours. Causes of global climate change and the biological, geophysical, and social consequences of such change. Methods used by different scientists for predicting future events of global affairs. Decision making under uncertainty. Students cannot take both course 025 and 025V for credit. GE credit: SciEng or SocSci | SE or SS, DD, OI, QL, SL, VL, WC, WE.—I. (I.), II. (II.), III. (III.)

30. Mushrooms, Molds, and Society (3)
Lecture/discussion—3 hours. Fungi as organisms with which humans interact daily, societal issues arising from these interactions. Fungi in medicine, religion, agriculture, and industry, as well as cultural perceptions of fungi. GE credit: SciEng or SocSci, Wrt | SE or SS—II. (II.), II. (II.) Gilchrist, Gordon, Rizza

40. Photography: Bridging Art and Science (3)
Lecture/discussion—2 hours, studio—2 hours. Photography is used to explore the common ground between art and science. Photographic processes, creativity and aesthetics, chaos and order, principles of space, time and light. Photographic interpretation and documentation of materials, and documentation of environment. GE credit: ArtHum or SciEng or SocSci, Div, Wrt | AH or SE or SS, SL, VL, WE—III. (III.) Nathan

42. Earth, Water, Science, Song (3)
Lecture—2 hours, studio—3 hours. Fusion of water and soil science with performing arts. Creative media, computer, and visual arts to communicate scientific concepts and facts through exercises in song writing and poetry. Design, discuss and conduct public performances related to the functioning of the natural world. GE credit: ArtHum or SciEng | AH or SE, SL, VL—III. (III.) Silk

70A. Genetic Engineering in Medicine, Agriculture, and Law (5)
Lecture—5 hours. Historical and scientific study of the impact of genetic engineering in medicine, agriculture, and law, including examination of social, ethical, and legal issues raised. Offered in a distance-learning format. Not open to students who have taken Biological Sciences 2A or equivalent, or course 20. Concurrent enrollment in a two unit seminar course, Plant Biology 98, is required. GE credit: SciEng or SocSci | SE or SS, SL—II. (II.) Harada

90A. Issues in Environmental and Resource Sciences (2)
Seminar—2 hours; two Saturday field trips. Prerequi- site: two years of lower division students. Discussion of historical and current issues in environmental and resource sciences. Lectures, reading and field trips will provide background for selected topics.—I., II. (II.)

90B. Observing and Writing in Biology (2)
Seminar—1 hour; laboratory—1 hour; term paper. Students will observe the interactions between micro- scopic organisms, conduct simple laboratory experi- ments, describe and analyze observations, and discuss scientific observations and writing.

90C. Herbal Medicine: Relevance for the 21st Century (2)
Seminar—2 hours. Medicinal usage of plants from botanical, historical, and cultural perspectives. Broad contexts of holistic and scientific paradigms for understanding herbal medicine. Saturday field trip to teach herb identification.—II. (II.)

90D. Saving Endangered Plant Species: Problems and Prospects (2)
Seminar—2 hours. Endangered plant species illustrate the value of conservation biology. Topics include societal issues and plant germplasm conser- vation, comparisons to animal conservation issues, and the economics of and justification for preserving endangered plants.—I. (I.) Parfitt

90E. Biotechnology—a New Era, a New Challenge (2)
Seminar—2 hours. Animal biotechnology and its applications. Discussion topics include potential soci- etal impacts of various technologies, factors shaping public opinion, and ethical and moral questions aris- ing from new biotechnology applications.—I. (I.) Murray

90F. Food Distribution in a Hungry World (2)
Seminar—2 hours. The biological, technological, environmental, and socioeconomic factors related to food distribution systems at local, regional, national, and international levels. The potential for increasing world food supply by reducing losses between har- vesting and consumption.—I. (I.)

90G. Science, Society, and the Environment (2)
Seminar—2 hours. Contemporary environmental issues, scientific approaches to addressing these issues, and accompanying societal and ethical con- siderations.—II. (II.) Wilson

90X. Lower Division Seminar (1-4)
Seminar—1-4 hours. Prerequisite: lower division standing and consent of instructor. Examination of a special topic in Science and or Engineering; required readings, discussions, written assignments, or special activities such as fieldwork, laboratory work, etc. May be repeated for credit. Limited enrollment—I. (I.), II. (II.), III. (III.)

91A. Explorations in Science and Society: Cultures and Identities (2)
Seminar—1 hour, extensive writing or discussion—1 hour. Prerequisite: participation in the summer Spe- cialized Transfer Enrichment Program (STEP) or con- sent of instructor; course 1 concurrently. Exploration of linkages among identity and culture, multi-disci- plinary inquiry, and agricultural and environmental science issues.—I. (I.)

91B. Explorations in Science and Society: Leadership and Collaboration (2)
Seminar—1 hour, extensive writing or discussion—1 hour. Prerequisite: course 91A or consent of instruc- tor. Extends understanding of culture and identity to issues of leadership, collaboration, and social action in science and society. Includes a mandatory two and half day retreat.—II. (II.)

91C. Explorations in Science and Society: Engagement (2)
Seminar—1 hour; internship—3 hours. Prerequisite: course 91B or consent of instructor. Explorations of the concept of engagement in science and society from philosophical and practical perspectives. Expla-
rational of the concept of engagement based on lectures, self-reflection, discussions and three hours of K-12 school internships per week. (III, III)

92. Internship in Science and Society (1-12)
Internship—3-36 hours. Prerequisite: lower division standing and consent of instructor. Supervised internship on and off campus, in the community, or in institutional settings. (P/NP grading only.)

97. Tutoring in Science and Society (2-3)
Discussion/lecture—6.9 hours. Prerequisite: lower division standing; completion of course being tutored; consent of instructor. Tutoring in undergraduate Science and Society courses. Assisting with leading discussion groups under supervision of instructor(s) and teaching assistants. Acting as liaison between the students and course instructor(s) to facilitate completion of the course. May not be repeated. (P/NP grading only)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

99. Special Study for Undergraduates (1-5)
Discussion—3-15 hours. Prerequisite: lower division standing and consent of instructor. (P/NP grading only)

Upper Division

110. Applications of Evolution in Medicine, Human Behavior, and Agriculture (4)
Lecture—2 hours; discussion—1 hour; term paper. Prerequisite: Biological Sciences 2A, 2B, and 2C. Class limited to 150 students. Applications of evolutionary biology in medicine, human behavior, and agriculture. Examination of the imprint of evolution on the human life cycle from conception to death. GE credit: SciEng or SocSci, Wrt | SE or SS.—II. Wilt; III. (III) Rosenheim

120. Science and Contemporary Societal Issues (3)
Lecture/discussion—3 hours. Prerequisite: upper division standing. Study of a contemporary societal issue/problem emphasizing critical thinking with information drawn from several disciplines. Multiple instructors illustrate the necessity of an interdisciplinary and cooperative approach in solving important issues. Topic will vary. May be repeated one time for credit. Course not offered every year. GE credit: SciEng or SocSci, Wrt | SE or SS.—III. (III)

121. Global Poverty: Critical Thinking and Taking Action (4)
Lecture—3 hours; discussion—1 hour. Social science and engineering analysis of causes and effects of world poverty and of policies to reduce it via economic growth, aid, and community-level interventions, e.g., in potable water, sanitation, lighting, small scale energy, irrigation, health and micronutrient. GE credit: SocSci | SS, WC.—II. (II) Jarvis, Kornbluh

130. Contemporary Leadership (4)
Lecture—3 hours; seminar—1 hour. Prerequisite: consent of instructor. Leadership, including issues, skills, and practices as they relate to individuals, organizations, diverse social settings and communities. Written and verbal communications, personality styles for collaborative work, and ethics. Limited enrollment. GE credit: OL—II, III. (II, III) King

125S. Biodiversity and Society in South Africa (4)
Lecture/discussion—3 hours; term paper or discussion—2 hours; fieldwork—2 hours. Prerequisite: acceptance into the quarter abroad program “Biodiversity & Conservation in South Africa” and attendance in South Africa. Biodiversity in social context of South Africa: race, politics and conservation; use of indigenous plants and animals, weeds, water issues, nature conservation and other field trips. Offered irregularly. GE credit: SciEng or SocSci, Div, Wrt | SE or SS.—II. Cranston, Gullan

140. Genetics and Social Issues (4)
Lecture/discussion—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1A, 1B, 1C. Social issues arising from the development and use of modern methods of biotechnology. Presentation, evaluation, and critical discussions of the present and future impact of genetechnocultures on society. Not open for credit to students who have completed course 20. GE credit: SocSci, Wrt.—II. (II) Epstein

190X. Science & Society Seminar (1-4)
Seminar—1-4 hours. Prerequisite: upper division standing and consent of instructor. In-depth examination at an upper division level of a special topic in Science and Society. Emphasis upon student participation in learning. Emphasis upon student participation in learning. May be repeated for credit. Limited enrollment. (P/NP grading only)—I, II, III. (II, III)

192. Internship in Science and Society (1-12)
Internship—3-36 hours. Prerequisite: upper division standing and consent of instructor. Supervised internship on or off campus, in the community, or in institutional settings. (P/NP grading only)

197. Tutoring in Science and Society (1-5)
Tutoring—3-15 hours. Prerequisite: upper division standing; completion of course being tutored or the equivalent. Tutoring of students in Science and Society courses. Assistance with discussion groups and laboratory sections under supervision of instructor. May be repeated for credit. GE credit: SciEng or SocSci, Div, Wrt.—II. (II, III)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

199. Special Study in Science and Society (1-5)
Prerequisite: upper division standing and consent of instructor. (P/NP grading only)

Graduate

298. Group Study (1-5)
Prerequisite: consent of instructor. May be repeated for credit when topic differs. (S/U grading only)

299. Graduate Research (1-12)
Prerequisite: graduate student and consent of instructor. May be repeated for credit. (S/U grading only)

Professional

390. Teaching Methods in Science and Society (1)
Discussion—1 hour. Prerequisite: graduate level and consent of instructor. Practical experience in methods and problems related to teaching Science and Society courses. Designed for credit if tutoring another Science and Society course. (P/NP grading only)

Programs

Science and Technology Studies

(College of Letters and Science)
Joseph Dumit, Ph.D., Program Director
Program Office. 1240 Social Sciences and Humanities Building 530-725-0703; http://sts.ucsd.edu

Committee in Charge
Thomas Beaumont, Ph.D. (Sociology)
Mario Biagioli, Ph.D. (History and Philosophy of Science and Technology Studies; School of Law)
Patrick Carroll, Ph.D. (Sociology)
Timothy Chay, Ph.D. (Anthropology, Science and Technology Studies; Science of Society)
Marisol de la Cadena, Ph.D. (Anthropology)
Joseph Dumit, Ph.D. (Anthropology, Science and Technology Studies)
James Griesemer, Ph.D. (Philosophy)
Caren Kaplan, Ph.D. (American Studies)
Colin Milburn, Ph.D. (English, Science and Technology Studies)

Science and Technology Studies

Roberta Millstein, Ph.D. (Philosophy)
Kris Ravetto-Biggioli, Ph.D. (Cinema and Technocultural Studies, Science & Technology Studies)
Daniel Stolzenberg, Ph.D. (History)
Madhavi Sunder, J.D. (School of Law)

The Major Program

The Science and Technology Studies (STS) major is designed to facilitate the analysis and synthesis of science, technology, and medicine in a way that actively creates connections between the varieties of perspectives and concerns in the humanities and the sciences. The STS major takes science, technology, medicine, and their social, political, economic, and cultural contexts as its objects of study. As such, the STS major draws on the research programs of faculty in a wide range of departments, including American Studies, Anthropology, Art and Visual Arts, Environmental Science and Policy, History, Philosophy, Political Science, Science and Technology Studies, and Sociology. Students in STS pursue a broader understanding of science than is available within traditional science majors and is also suitable for students in the social sciences interested in interpreting science, technology and medicine as part of society and culture.

The Program

Graduation with a degree in Science and Technology Studies requires completion of introductory courses in the social sciences and humanities, in the natural sciences, and introductory, laboratory and seminar courses in STS. Upper division work includes twenty units from each of two different, complementing areas of concentration ("modules") and twelve units (plus prerequisites) providing depth, concentration and field work opportunities in the sciences. The modules are: (1) Cultural Studies of Science and Technology; (2) Ethics, Values, and Science Policy; (3) History and Philosophy of Science; IV. Medicine, Science, Society, and Culture. Courses in the modules require careful selection to make the best use of the STS major. Prerequisites for courses in the sciences can be extensive and require substantial advance planning. Students are encouraged to take advantage of faculty and staff advising to plan their course of study.

Career Alternatives

The STS major will create an opportunity to analyze science and allied practices from historical, philosophical, sociological, political, anthropological, and cultural perspectives. STS prepares students for careers that must address the broader social, cultural and political ramifications of science, technology, and medicine such as law, journalism, public policy, economics, government, and science education. Careers that students of STS from many universities nationwide have pursued, in addition to academic careers in STS, include employment in: systems engineering, web design, science museums, non-profit health organizations, government service, libraries, law, medicine, veterinary medicine, dentistry, nursing, teaching, public health administration, media companies, management consultant practice, and the Peace Corps.

A.B. Major Requirements

Preparatory Subject Matter ............ 16
Science and Technology Studies 1 ............. 4
Science and Technology Studies 20 ....... 4
Eight units selected from American Studies 1A, 1E, 5; Environmental Studies 1; Humanities 3; Philosophy 30, 31, 32; Science and Society 1, 2, 5; Science and Technology Studies 32; Lower-division science courses from the Approved Science Electives list below........... 8

Depth Subject Matter ...............44-46
Twelve units each from two of the following modules: .... 4
(1) Cultural Studies of Science and Technology; American Studies 101G, 158; Cinema and Technocultural Studies 151; ACHN—American Cultures, DD—Domestic Diversity, DL—Diverse Literatures, DL—Domestic Diversity, Div—Domestic Diversity; Wrt—Writing Experience
Pre-Fall 2011 General Education (GE): ACHN—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Domestic Diversity; Wrt—Writing Experience
Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACHN—American Cultures; DD—Domestic Diversity; OL—Oral Skills;QL—Quantitative, SL—Scientific, VL—Visual, WC—World Cultures, WE—Writing Experience

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer, 2015-2016 offering in parentheses
Courses in Science and Technology Studies (STS)

Lower Division

1. Introduction to Science, Technology, and Medicine Studies (4)
   Lecture—3 hours; discussion—1 hour. History, philoso-
   phy, sociology, politics, and cultural studies of science,
   technology, medicine. Emphasis on history and its
   impact on the development of science. GE credit: SocSci
   or SciEng. Wrt | SS, WE. —Carroll

   Lecture/discussion—3 hours; extensive writing. Pre-
   requisite: course 1 recommended. Methodological issues
   concerning the historical, philosophical, scientific,
   logical, ethical, and political analysis of science, tech-
   nology, and medicine. Illustrated with case studies to
   demonstrate different methods of analysis. GE credit:
   SciEng or SocSci, Wrt | SS, WE. —Carroll

32. Drugs, Science and Culture (4)
   Lecture—3 hours; discussion—1 hour. Drugs, politi-
   cs, science, and society in a cultural context. Emphasis
   on roles of science, government and the media in
   shifting attitudes toward alcohol, mari-
   juana, prozac and other pharmaceuticals, drug
   laws, war on drugs and global trade in sugar,
   opium, cocaine. [Same course as Anthropology 32.] GE
   credit: SciEng, Div, Wrt | SS, VL, —Dumit

92. Internship (1-12)
   Internship—3.36 hours. Prerequisite: consent of
   instructor. Work experience off and on campus in all
   subject areas offered in the program in Science &
   Technology Studies under the supervision of a mem-
   ber of the faculty. May be repeated up to 12 units for
   credit. (P/NP grading only.) GE credit: SS.

99. Special Study for Undergraduates (1-5)
   Prerequisite: consent of instructor (P/NP grading
   only.) GE credit: SS.

Upper Division

108. Intellectual Property in Science (4)
   Lecture/discussion—4 hours. Prerequisite: course 1,
   or other Social Science or Humanities writing course.
   Historical and conceptual framework for con-
   temporary debates about intellectual property and
   science. Topics include US patent system and copy-
   right law, intellectual property and industrial
   policy, credit in academic and industrial science,
   role of IP in global knowledge. GE credit: SocSci,
   Wrt | ACGH, SS.

109. Visualization in Science (4)
   Lecture—3 hours; extensive writing or discussion—1
   hour. Prerequisite: course 1 or 20 or Anthropology
   2. Anthropological approaches to scientific visual-
   ization techniques, informatics, simulations. Exam-
   ining the difficulty of understanding the work involved in
   producing them, critical assessment of their power and
   limits, espe-
   cially when visualized in a reduced socio-
   nomic context. Offered in alternate years. [Same course
   as Anthropology 109.] GE credit: SocSci, Wrt | SS,
   VL, WE. —Dumit

120. Religion, Magic and Science (4)
   Lecture—3 hours; extensive writing. Religion, magic,
   and science from the Middle Ages to the present. Ac-
   knowledged the Native American roots to the present.
   (Same course as Anthropology 121.) GE credit: SocSci,
   Div, Wrt | ACGH, DD, SS.

121. Special Topics in Medical Anthropology (4)
   Lecture/discussion—4 hours. Prerequisite: course 1 or
   Anthropology 2. Introduction to medical anthropo-
   logical topics. Topics include anthropological analy-
   sis of bio-medicine, psychiatry, systems of knowl-
   edge and healing, the body, emotions, and clinical
   encounters in a cross-cultural perspective. [Same course
   as Anthropology 121.] GE credit: SocSci, Div,
   Wrt | SS, WE.

129. Health and Medicine in a Global Context (4)
   Lecture/discussion—4 hours; term paper. Prerequi-
   site: course 1 or Anthropology 2. Recent works in
   medical anthropology and medical studies of
   medicine dealing with global health issues such as
   AIDS, pandemics, clinical trials, cultural differences
   in illnesses, diabetes, organ trafficking, medical tech-
   nology and delivery, illusory narratives, and oth-
   ers. [Same course as Anthropology 129.] GE credit:
   SocSci, Div, Wrt | SS. —Dumit

130A. From Natural History to the History of Nature (4)
   Lecture/discussion—3 hours; term paper. Prerequi-
   site: History 135A recommended. Evolution and
descent of natural history as a discipline from Aristo-
   tile to Linnaeus. Considers ancient views of nature
   and human nature and the development of modern
   science and technology. GE credit: ArtHum or SciEng,
   Wrt | AH or SE, WE.

130B. History of Modern Biology (4)
   Lecture/discussion—3 hours; term paper. Prerequi-
   site: course 130A recommended. Development of modern
   biological thought from pre-Darwinian roots to the
   present. Considers emerging scientific specialties and
   consolidation of biological theory around evolutionary
   ideas. History of allied fields such as genetics, paleon-
   tology, embryology, ecol-
   ogy, systems and molecular biology. GE credit:
   ArtHum or SciEng, Wrt | AH or SE, WE.

131. Darwin (4)
   Lecture—3 hours; term paper. Prerequisite: upper
   division standing or consent of instructor. Students
   will explore the life and works of Charles Darwin.
   Students will trace the development of evolutionary
   thinking before and after the Origin of Species to
   appreciate its place in Victorian society and in the corpus
   of Darwin’s thought. GE credit: ArtHum or SciEng,
   Wrt | AH or SE, WE. —Griesemer

151. Media Theory (5)
   Lecture—2 hours; discussion—1 hour; film view-
   ing—3 hours; extensive writing. Critical and theoret-
   ical approaches to the emergence of new
   technologies since the invention of photography.
   Examine various approaches to media (formalist, semiotic, structuralist, Frankfurt School, cybernetics,
   visual and gamer theory). (Same course as Cinema
   and Technocultural Studies 150.) GE credit: AH
   or SS, OL, VL, WE.

150. Gender and Science (4)
   Lecture/discussion—3 hours; term paper. An inter-
   disciplinary approach to the relations between gen-
   der and science. Topics include the biological and
   cultural construction of sexual difference, the role
   of women as practitioners of science, and feminist
   approaches to science. GE credit: SocSci, Div,
   Wrt | ACGH, DD, SS.

   Lecture—3 hours; extensive writing or discussion—1
   hour. Historical, aesthetic, and critical approaches to
   how information technologies produced ghost effects
   or a sense of terror in response to new media like
   the photograph, gramophone, film, typewriter, com-
   puter, Turing Machine. Focus on technological
   media transforms sense perception. Offered in alternate
   years. [Same course as Technocultural Studies
   160.] GE credit: ArtHum or SocSci | ACGH, AH or SS,
   VL, WE. —Rawito-Bogdan

161. Time: Measurement and Mechanism (4)
   Lecture/discussion—3 hours; term paper. Prerequi-
   site: course 1. Cultural concepts of time; units and
   instruments of time measures; historical differen-
   ces in the social organization of time; time measurement in pre-20th century science. GE credit:
   SocSci, Wrt | SS, WE.
162. Surveillance Technologies and Social Media (4)
Lecture—3 hours; film viewing—3 hours; term paper. Preerequisite: Technocultural Studies 1 or course 20. Study of the ubiquitous presence of CCTV, face recognition software, global tracking systems, biosensors, and data mining practices that have made surveillance part of our daily life. Exploration of the boundary between security and control, information and spying. [Same course as Cinema & Technocultural Studies 162.] Offered in alternate years. GE credit: AGGH, AH or SS, OL, VL, WE—Ravotto

163. History of Communication Technologies (4)
Lecture/discussion—3 hours; term paper. History of communication technologies from the late Middle Ages to the 20th century. Questions of technology, knowledge, power and culture. Particular attention to questions about information and truth. Offered in alternate years. GE credit: SacSci SS, WE.

164. Writing Science (4)
Lecture/discussion—3 hours; extensive writing. Pre-requisite: English 3 or course 1, or equivalent. Texts and writing practices in the production of scientific knowledge. Surveys the literary structure of scientific arguments; history of scientific genres; rhetoric and semiotics in scientific culture; graphical systems in the experimental laboratory; narratives of science, including science fiction. [Same course as English 164.] Offered in alternate years. GE credit: ArtHum, Wrt | AH, SL, WE—Milburn

165. Built Environments (4)
Lecture—3 hours; extensive writing. Built environments, which are designed to support forms of life. Their role as carriers of cultural memory and in turning knowledge of nature into social assets. Historical constellations of knowledge, social order, and power. Offered in alternate years. GE credit: SocSci, Wrt | SS.

173. Science Fiction (4)
Lecture/discussion—3 hours; extensive writing. Pre-requisite: course 3 or Science and Technology Studies 1, or equivalent. The literary modes and methods of science fiction. Representative texts, authors, and themes of the genre—e.g., time travel, alternative universes, and utopias. Relations of science fiction to science, philosophy, and culture. [Same course as English 173.] GE credit: ArtHum, Wrt | AH, WE.

175. Laboratory Studies Lab (4)
Lecture/discussion—4 hours. Pre-requisite: upper division standing or consent of instructor. Hands-on training in Science and Technology Studies fieldwork, interviewing, archival research and data analysis. Review of laboratory studies literature, informed consent procedures, ethics, and care of the data. Individual and group projects possible. GE credit: SocSci SS, WE.

176. Sociology of Knowledge, Science, and Scientific Knowledge (4)
Lecture—3 hours; term paper or discussion—1 hour. Pre-requisite: upper division standing preferred. Social, cultural, and historical dimensions of knowledge, especially scientific knowledge. Problems, methods, and theory in sociology of scientific knowledge: laboratory and historical case studies. Scientific and technical knowledge in institutional and organizational contexts. [Same course as Sociology 176.] GE credit: SocSci SS, WE—Carroll

180. Topics in History and Philosophy of Science (4)
Seminar—3 hours; term paper. Pre-requisite: course in History and Philosophy of Science or other course work relevant to topic. In depth treatment of selected topics in the history and philosophy of science. Possible topics include history of modern physics, history of molecular biology, science and society, science and power, scientific explanation, technology and culture, theory testing. May be repeated for credit with consent of instructor.

190. Seminar in Science, Technology and Medicine Studies (4)
Lecture/discussion—3 hours; term paper. Prerequisite: open to junior and senior Science and Technology Studies majors only. Intensive reading, discussion, research and writing by small groups in selected topics of science, technology, and medicine studies scholarship. Emphasis on individual research projects.

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: consent of instructor. Work experience off and on campus in all subject areas offered in the program in Science & Technology Studies under the supervision of a member of the faculty. May be repeated three times for up to 12 units for credit. [P/NP grading only.]

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. [P/NP grading only.]

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. [P/NP grading only.]

Graduate

250. History and Philosophy of Science (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Interdisciplinary seminar in the history and philosophy of science. Focuses on issues such as historiography, methodology, and the conceptual foundations of science. May be repeated for credit with consent of instructor.

298. Group Study (1-5)
Prerequisite: consent of instructor. [S/U grading only.]

299. Research (1-12)
Prerequisite: consent of instructor. [S/U grading only.]

Professional

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. [S/U grading only.]

Sexuality Studies

[College of Letters and Science]
http://wgs.ucdavis.edu/sexualitystudies

The interdisciplinary minor in Sexuality Studies offers students a unique opportunity to study the human-made aspects of sexual identities, desires, and practices, which differ across cultures and historical moments, and into biology or anatomy. The minor in Sexuality Studies core and elective courses have sexuality at their center. Additional courses invite students to integrate their study of sexuality with issues of gender; race and ethnicity; class; politics and activism; literature and popular culture; law; and other domains. The minor is sponsored by the Program in Women and Gender Studies.

Minor Program Requirements:

Sexuality Studies ........................................ 18-20

One Core Course: Various

Two Elective courses from the following:
- Anthropology 139 BN, English 180, Epidemiology and Preventative Medicine

163, History 184, Human Development (College of Letters and Science), Sociology 15, Women and Gender Studies 7, 7B

Two Elective courses from Field B [below] or seminars/individual study by petition to achieve a total of 18-20 units.

American Studies 115, Asian American Studies 112, Chicano/a Studies 160, English 166, German 145, History 132, Political Science 152, Sociology 120, Women and Gender Studies 140, Women and Gender Studies 179

Restrictions.

(A) Students may take no more than one lower division course to satisfy requirements for the minor.

(B) To satisfy the interdisciplinary component of the minor, students must either split their coursework roughly equally between two programs/departments or take coursework in at least three programs/departments.

(C) Students may petition the minor adviser to accept Special Topics courses and Capstone/Senior Seminars as additional courses, as long as their course of study follows the minor’s lower-division restriction and interdisciplinary requirements.

(D) Students may petition the minor adviser to accept up to four units of registered individual study, group study or internship towards the minor program, as long as their course of study follows the minor’s lower-division restriction and interdisciplinary requirements.

Advising.
Program in Women and Gender Studies, 2222 Hart Hall 530-752-6429

Social and Ethnic Relations

[College of Letters and Science]

The interdisciplinary minor in Social and Ethnic Relations explores the racial, ethnic, class and gender aspects of human relations in the modern world. Students study human societies and cultures from a multi-ethnic perspective and across established academic departmental lines. The minor is jointly sponsored by African American and African Studies, Asian American Studies, Native American Studies, and Women and Gender Studies.

Minor Program Requirements:

Social and Ethnic Relations.......................... 24

Select one course from each of the following six groups to total 24 units:

(A) African American and African Studies 100, Anthropology/Native American Studies 134, Women’s Studies 102

(B) African American and African Studies 123, 133, 145A

(C) Asian American Studies 1, 2, 100, 110, 130

(D) Chicana/o Studies 130, 132

(E) Native American Studies 1, 10, 115, 119, 130A, 130B, 130C, 157, 180

(F) Women’s Studies 103, 104, 180

Restrictions. (A) Courses applied toward the satisfaction of a major may not also be offered in satisfaction of the minor. (B) No more than four units (one course) may be lower division.

Advising. Contact the Program in Women and Gender Studies in 2222 Hart Hall 530-752-4686.

Contact the Program in Asian American Studies, 3131 Hart Hall, ethnicstudies@ucdavis.edu.
Social Sciences (College of Letters and Science)

Program Office, 469 Kerr Hall; 530-752-0741

Committee in Charge
Michael Kurlaender, Ph.D. (School of Education)
Dina Okamoto, Ph.D. (Sociology)
Marianne Page, Ph.D. (Economics)
Heather Rose, Ph.D. (School of Education)
Kimberlee Shauman, Ph.D. (Sociology)
Ann Stevens, Ph.D. (Economics)

Emeriti Faculty
Nigel Allan, Ph.D. Professor Emeritus
Dennis J. Dingemans, Ph.D., Senior Lecturer Emeritus
Howard F. Gregor, Ph.D., Professor Emeritus
Frederick J. Simoons, Ph.D., Professor Emeritus
Kenneth Thompson, Ph.D., Professor Emeritus

The Program of Study
The Program in Social Sciences promotes the development of innovative curricular initiatives across the social sciences, including offering broadly conceived, integrative undergraduate-level and graduate-level courses. Faculty affiliated with the program are often engaged in interdepartmental teaching and research.

Social Theory and Comparative History (STH)

Graduate

250. Research in Social Theory and Comparative History (4)
Seminar—3 hours, term paper. Prerequisite: admission to Social Theory and Comparative History Designated Emphasis. Theoretically informed research in comparative history. Students read exemplary works and learn to frame their own research projects. Presentations include Center for History, Society, and Culture faculty and visitors discussing current research. —III. (I.)

290. Advanced Topics in Social Theory and Comparative History (4)
Seminar—2 hours, term paper. Prerequisite: admission to Social Theory and Comparative History Designated Emphasis. Theoretically informed research in comparative history. Students read exemplary works and learn to frame their own research projects. Presentations include Center for History, Society, and Culture faculty and visitors discussing current research. —II, III. (I.)

295. Advanced Group Research in Social Theory and Comparative History (1)
Discussion—1 hour. Prerequisite: consent of instructor and History 204 or Sociology 242A. Interdisciplinary study of particular substantive problems in social science, including comparative history. Topics vary. —II, III. (I., II, III.)

296. Theory and Society Journal Editorial Workshop
Workshop—1 hour, independent study—3 hours. Reading and offering workshop critiques of papers submitted for publication. Reading and discussion of other relevant work in history and the social sciences. May be repeated for credit up to 36 units or with consent of instructor. (S/U grading only)—I, II, III. (I., II, III.)

Sociology (College of Letters and Science)
Vicki Smith, Ph.D., Chairperson of the Department

Department Office. 1283 Social Sciences and Humanities Building; 530-752-0782; http://sociology.ucdavis.edu

Faculty
Thomas D. Beamish, Ph.D., Associate Professor
Patrick Carroll, Ph.D., Associate Professor
Robert Faris, Ph.D., Associate Professor
Ryan Finnigan, Ph.D., Assistant Professor
T. Ryken Grattet, Ph.D., Professor
Laura Grindstaff, Ph.D., Professor
Drew Halfmann, Ph.D., Associate Professor
John R. Hall, Ph.D., Distinguished Professor
Erin R. Hamilton, Ph.D., Assistant Professor
Bruce D. Haynes, Ph.D., Associate Professor
Jacob Hibbel, Ph.D., Assistant Professor
Mary R. Jackman, Ph.D., Professor
David J. Kyle, Ph.D., Associate Professor
Ming-Cheng Lo, Ph.D., Professor
Bill McCarthy, Ph.D., Professor
David McCourt, Ph.D., Assistant Professor
Stephanie L. Muza, Independent Pricing Professor
Dina G. Okamoto, Ph.D., Associate Professor
Kimberlee A. Shauman, Ph.D., Professor
Xiaoling Shu, Ph.D., Professor
Vicki Smith, Ph.D., Professor
Eddy U., Ph.D., Associate Professor
Diane L. Wolf, Ph.D., Professor

Emeriti Faculty
Fred Block, Ph.D., Research Professor and Professor Emeritus
Lawrence E. Cohen, Ph.D., Professor Emeritus
James C. Cramer, Ph.D., Professor Emeritus
Diane L. Felamlee, Ph.D., Professor Emerita
Carole E. Joffe, Ph.D., Professor Emerita
Carl C. Jorgensen, Ph.D., Professor Emeritus
John F. Lofland, Ph.D., Professor Emeritus
Lyn H. Lofland, Ph.D., Research Professor and Professor Emerita
John T. Walton, Ph.D., Professor Emeritus

Affiliated Faculty
Lala Kiburi, Ph.D., Lecturer
Debra Paterniti, Ph.D., Associate Adjunct Professor

The Major Programs
Sociology is the study of human society in all its manifestations. Its aim is to discover the process and structure of human interaction, to identify the main forces that sustain or weaken social groups, and to determine the conditions that transform social life. Sociology, like any science, is a disciplined, integrative perspective, but incorporates a multidisciplinary field of study. The major introduces students to a range of theories and methods that social scientists use in the analysis of organizations.

Career Opportunities. In the Sociology major, the General option is for students desiring a solid liberal arts education as well as those interested in graduate work in the social sciences. Options in Law and Society and Social Services prepare students for careers in such areas as law, corrections, social work, or counseling. The Comparative Studies and World Development emphasis prepares students for graduate training leading to careers in international fields. Majors in Sociology–Organizational Studies will be prepared for a variety of career options, particularly in the field of management. The major specifically meets entry requirements for programs of professional training leading to a Master’s degree in public or private management, and may also lead to further study in any of the disciplinary areas incorporated in the major.

Sociology

A.B. Degree Requirements:
General emphasis:

Preparatory Subject Matter............ 29-30
Sociology 1, 46A, and 46B............. 14
Sociology 3, 4, 5, 11, 25, 30A, or 30B... 13
Anthropology 2 or 20................. 4
Select from History 4A, 4B, 6, 7A, 7B, 7C, 7, 9, 9B, 10C, 15, 17A, 17B............... 4
Select from Philosophy 5, 14, 24, 25... 4

Depth Subject Matter................. 44
(A) Sociology 100....................... 4
(B) Select one course from each of the following four categories:

1. Individual, Culture and Society: Sociology 125, 126, 135
2. Stratification and Social Differentiation: Sociology 130, 132, 140
3. Organizations and Institutions: Sociology 118, 131, 146, 180A
4. Social Dynamics: Sociology 104, 141, 143A, 170
(C) Select three upper division courses from one of the following clusters, not counting courses taken to fulfill requirement B: 12

(2) Stratification and Social Differentiation: Sociology 118, 128, 129, 130, 132, 133, 134, 140, 145A, 145B, 171, 172, 185, 188, and not more than one of the following courses: African American and African Studies 123; Asian American Studies 100; Chicana/o Studies 110; or Native American Studies 115
(3) Organizations and Institutions: Sociology 118, 124, 131, 133, 139, 144, 146, 149, 150, 151, 154, 155, 159, 160, 180A, 180B, 181, 182, 183, 185
(4) Social Dynamics: Sociology 104, 123, 125, 138, 141, 143A, 145A, 145B, 147, 148, 156, 157, 158, 170
(D) Student-initiated Thematic Cluster—developed with a faculty advisor and approved by the Sociology Undergraduate Curriculum Committee
(E) One additional elective upper division Sociology course not already used to fulfill requirement C

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer. 2015-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; DivD=Diverse Domesticity; Wri=Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; ACH=American Cultures; DD=Diverse Domesticity; OL=Oral Skills; QL=Quantitative; SL= Scientific; VL=Visual; WC=World Cultures; Wri=Writing Experience
Sociology
other major requirements. May use Sociology
190X, 191, 192/193, 194H, 195.......... 4
Total Units for the Major .................. 73-74

Law and Society emphasis:
Preparatory Subject Matter................... 30
Sociology 1; 3, 4, or 11; 46A & 46B .... 18
Select from Anthropology 2, 20; Political
Science 1, 3, 4, 7.................................. 4
Select from History 4A, 4B, 4C, 6, 7A, 7B,
7C, 8, 9A, 9B, 10C, 15, 17A, 17B......... 4
Philosophy 5, 14, or 24.......................... 4
Depth Subject Matter ....................... 43-44
Sociology 100 and 155 ......................... 8
Select courses from the following categories:
Individual Culture and Society: Sociology
125, 126, 135................................... 4
Stratification and Social Differentiation:
Sociology 130, 132, 140.................... 4
Organizations and Institutions: Sociology
118, 131, 146, 160, 180A ................ 4
Crime and Social Dynamics: Sociology
120, 150, 151, 152, 171................. 12
Stratifications and Social Dynamics:
Sociology 118, 137, 148, 156, 157, 158;
African American and African Studies 123,
145A, 145B; Chicana/o Studies 130,
132; Native American Studies 117,
118................................................... 4
Legal Studies: Asian American Studies 155;
Chicana/o Studies 182; English 107;
Environmental Science and Policy 161;
Environmental Toxicology 138; Hydrology
150; Philosophy 119; Political Science
122, 150, 151, 152, 154; Psychology
153; Women's Studies 140............... 3-4
One additional elective upper division
Sociology course not already used to fulfill
other major requirements. May use
Sociology 190X, 191, 192/193, 194H,
195................................................... 4
Total Units for the Major .................. 73-74

Social Services emphasis:
Preparatory Subject Matter.............. 27-29
Sociology 2; 3; 46A and 46B ............... 17
Psychology 1 ......................................... 4
Select from African American and African
Studies 10, 15; Asian American Studies 1, 2;
Chicana/o Studies 10, 50; Native American
Studies 1, 10; Sociology 4, 11, 30A, or
30B................................................... 6-8
Depth Subject Matter ............................ 44
Sociology 131, 140, 185..................... 12
Psychology 140, 142, 151, or 168 ......... 4
Select courses from the following categories:
Social Issues: Sociology 104, 120, 122,
124, 139, 143A, 144, 146, 149, 150,
152, 153, 154, 155, 156, 158, 160,
170, 171........................................... 8
Social Interaction: Sociology 126, 127,
128, 143B, 148, 157 ......................... 4
Race and Ethnicity: African American and
African Studies 100; Asian American
Studies 110, 111, 150; Chicana/o Studies
110; Community and Regional
Development 176; Native American
Studies 115; Sociology 129, 130, 134,
137, 172........................................... 4
Gender: Sociology 132, 133, 145B,
172................................................... 4
Organizational Behavior: Sociology 139,
146, 151, 154, 159, 180A, 180B, 181,
182, 183........................................... 4
One additional elective upper division
Sociology course not already used to fulfill
other major requirements. May use
Sociology 190X, 191, 192/193, 194H,
195................................................... 4

Total Units for the Major .................. 71-73

Comparative Studies and World
Development emphasis:
Preparatory Subject Matter.............. 30-60
Sociology 1; 5; 46A and 46B ............... 18
Economics 1B........................................ 4
Anthropology 2 or 20 ............................ 4
History 10C or Political Science 2............ 4
Course work in one modern foreign language
at the two-year level or provide proof of
proficiency ......................................27-30
Depth Subject Matter ............................ 48
Sociology 100, 104, 141, 145A,
170 ................................................... 20
Anthropology 126A, 126B, or Economics
115A .................................................. 4
Anthropology 127; Sociology 118, 130,
131, 143A, 144, 145B, 156, 158 ....... 12
Regional focus, three courses from one of the
following groups .................................. 12
(1) Africa: African American and African
Studies 110, 111, 162; Anthropology
140A, 140B; History 115A, 115B, 115C,
116; Political Science 134, 149
(2) Latin America: African American and
African Studies 107A, 180; Anthropology
144, 146; History 159, 161A, 161B, 162,
163A, 163B, 164, 165, 166A, 166B,
167, 168; Native American Studies 120,
133; Political Science 143; Sociology 158;
Spanish 170, 172, 173
(3) Middle East: Anthropology 142; History
112A, 112B, 113, 190A, 190B, 190C,
193A, 193B; Jewish Studies (see an
advisor); Middle Eastern Studies (see an
advisor); Religious Studies 162; Women's
Studies 184
(4) Asia-China & Japan: African American
and African Studies 107C; Anthropology
148A, 148B, 148C, 149A, 149B; East
Asian Studies 113; Economics 171; History
191 (series), 194A, 194B, 194C; Political
Science 148A, 148B; Religious Studies
165, 170, 172; Sociology 147, 188
(5) Southeast Asia/Pacific: Anthropology
143A, 143B, 145, 147; Economics 171;
History 191 (series), 195B, 196A, 196B;
Political Science 148B, 148C; Religious
Studies 165, 170, 172
Total Units for the Major ................ 78-108

Sociology—Organizational Studies
A.B. Degree Requirements:
UNITS
Preparatory Subject Matter................... 30
Sociology 1; 2; 5 or 11; 46A & 46B ..... 22
Economics 1A and 1B ............................ 8
Depth Subject Matter ............................ 44
Sociology 100 ...................................... 4
Sociology 180A .................................... 4
Sociology 106 (or its equivalent) ............. 4
Select from Communication 134, 136, 172;
Sociology 126 ...................................... 4
Select five courses from below; at least three
courses from Sociology:........................ 20
Agricultural and Resource Economics 112,
130; American Studies 125; Community
and Regional Development 151, 152, 154,
156, 158, 162, 164, 168; Economics
116, 121A, 121B, 151A, 151B; History
185B, 194D; Political Science 107, 180,
187; Sociology 103, 124, 138, 139, 141,
154, 159, 160, 180B, 181, 183, 185
Select from Sociology 128, 130, 132,
134, 140, 145A, 145B, 172 ................. 4
One additional elective upper division
Sociology course not already used to fulfill

505

other major requirements. May use Sociology
190X, 191, 192/193, 194H, 195 ..........4
Total Units for the Major .......................74
Major Advisers. Consult the Departmental Advising office in 1282 Social Sciences and Humanities
Building.

Minor Program Requirements:
UNITS
Sociology..............................................20
Choose any five upper division courses in
Sociology, except the following: SOC190X,
191, 192/193, 194H, 195, 197T, 198,
199
Minor Advisers. Consult the departmental Advising office in 1282 Social Sciences and Humanities
Building.
Honors Program. An Honors Program is available to Sociology and Sociology-Organizational
Studies majors who have demonstrated excellence in
their field of study. To be eligible for the program,
students must have a grade-point average of 3.500
in the major and the recommendation of a faculty
sponsor familiar with their work. In addition to meeting the standard major requirements, students are
encouraged to take a 199 course with their sponsor
in the spring of their third year, prior to the seminar
courses. Honors students write an honors thesis and
take two quarters (8 units) of Honors coursework
(SOC194H). Successful completion of the Honors
Program, when combined with College GPA requirements, enables the student to graduate with High or
Highest Honors. Students should apply for the program before they begin their fourth year.
Graduate Study. The Department offers programs
of study and research leading to the M.A. and Ph.D.
degrees in sociology. Further information regarding
graduate study may be obtained at the Department
office or on our website.
Graduate students in Sociology have the opportunity
to pursue designated emphases in Critical Theory,
Social Theory and Comparative History, Native
American Studies, Economy, Justice and Society, or
Feminist Theory and Research. See these headings
for further details on these interdisciplinary programs.
Graduate Advisers. Consult the Graduate Program Coordinator in 327 Young Hall.

Courses in Sociology (SOC)
Lower Division
1. Introduction to Sociology (5)
Lecture—4 hours; discussion—1 hour. Principles and
basic concepts of sociology. The study of groups,
culture, collective behavior, classes and caste, community and ecology, role, status, and personality. GE
credit: SocSci | ACGH, DD, SS.)
2. Self and Society (4)
Lecture—3 hours; discussion—1 hour. Principles and
basic concepts of sociological social psychology.
Includes the study of the character of the self, identity, roles, socialization, identity change, emotion
and social interaction. GE credit: SocSci,
Wrt | ACGH, DD, SS.
3. Social Problems (4)
Lecture—3 hours; discussion—1 hour. General
sociological consideration of contemporary social
problems in relation to sociocultural change and programs for improvement. GE credit: SocSci,
Wrt | ACGH, DD, SS.
4. Immigration and Opportunity (4)
Lecture—3 hours; discussion—1 hour or term paper.
Social and demographic analysis of immigration:
motives and experiences of immigrants; immigration
and social mobility; immigration, assimilation, and
social change; multicultural societies. Detailed study
of immigration into the U.S., with comparative studies of Europe, Australia, and other host countries.
GE credit: SocSci, Div, Wrt | ACGH, DD, SS, WC.

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Domestic Diversity; Wrt=Writing Experience
Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences;
ACGH=American Cultures; DD=Domestic Diversity; OL=Oral Skills; QL=Quantitative; SL=Scientific; VL=Visual; WC=World Cultures; WE=Writing Experience


5. Global Social Change: An Introduction to Macrosociology (4)
Lecture—3 hours; discussion—1 hour. An introduction to change and stability in the world, including the United States. Examine population and change, technological change and economic development, power and status, culture and identity. GE credit: SocSci, Div, Wrt | AGCH, SS, WC.

11. Sociology of Labor and Employment (4)
Lecture—3 hours; discussion—1 hour. Labor and employment issues in the United States with some use of historical and comparative materials. Topics will include strategies pursued by employers and employees, labor market discrimination, and the role of social policies in shaping labor markets. GE credit: SocSci, Div, Wrt | SS.

25. Sociology of Popular Culture (4)
Lecture—3 hours; discussion—1 hour. Social mechanisms that shape modern popular culture. High, folk, and mass culture: historical emergence of popular culture. Mass media, commercialization, ideology, and cultural consumption. Methods and means for analyzing cultural expressions in pop music, street art, film, television, and advertising. GE credit: SocSci, Wrt | SS.

30A. Intercultural Relations in Multicultural Societies (3)
Lecture—1.5 hours; discussion—1.5 hours. Macrostructural analysis of contemporary multicultural societies, immigration and assimilation in comparative perspective, social construction of racial and ethnic group identities; ethnicity and gender; group conflict and cooperation; controversies surrounding multiculturalism. First course in a two-course Multicultural Immersion Program. GE credit: SocSci, Div | AGCH, DD, SS.

30B. Intercultural Relations in Multicultural Societies (3)
Lecture—1.5 hours; discussion—1.5 hours. Prerequisite: course 30A or consent of instructor. Social psychological analysis of personal experiences in a multicultural society, conforming to or rejecting group identity or stereotypes; managing and reducing conflict; cross-cultural communication; promises and problems of diversity at UC Davis. Second course in a two-course Multicultural Immersion Program. GE credit: SocSci, Div | AGCH, DD, SS.

46A. Introduction to Social Research (4)
Lecture—3 hours; discussion—1 hour; term paper. Examination of the methodological problems of social research. Selection and definition of problems of investigation, data-gathering techniques, and sampling. GE credit: SocSci | SS.

46B. Introduction to Social Research (5)
Lecture—4 hours; discussion—1 hour. Data-analysis techniques, measurement, scaling, multivariate analysis, and quantitative measures of association. GE credit: SocSci | QL, SS, Wrt | II.

90X. Lower Division Seminar (1-2)
Seminar—1.2 hours. Prerequisite: lower division standing and consent of instructor. Examination of a special topic in sociology through shared readings, discussions, written assignments, or special activities such as fieldwork, laboratory work, etc. May not be repeated for credit. Limited enrollment. GE credit: SocSci | SS.

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. Primarily intended for lower division students. [P/NP grading only]

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. [P/NP grading only]

Upper Division

100. Origins of Modern Sociological Theory (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1; consent of instructor; restricted to upper division standing. The origins of modern sociological thought. Special emphasis on three major theorists from the classical tradition of nineteenth century European social thought: Karl Marx, Max Weber, and Emile Durkheim. GE credit: SocSci | SS, Sl, QL.

102. Society and Culture of California (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: introductory course in Sociology recommended. California’s distinctive sociocultural context; sociological analysis of social problems concerning diversity, environment, cities. GE credit: SocSci | AGCH, DD, SS.

103. Evaluation Research Methods (4)
Lecture—3 hours; discussion—1 hour; term paper; project. Prerequisite: course 46A and 46B, or Statistics 13 or the equivalent. Surveys applications of research methods to the evaluation of social programs, primarily emphasizing methodological issues, e.g., research design; collection; use of evaluation research are also discussed and placed in theoretical context. Participation in an evaluation project. GE credit: SocSci | SL, SS.

104. The Political Economy of International Migration (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: upper division standing. Analysis of worldwide migration patterns, and social scientific theories of international and transnational migration. Focus in economical, political, and social impact of immigration and potential for international and regional cooperation. (Same course as International Relations 104A.) GE credit: SocSci, Div | AGCH, DD, SS.

106. Intermediate Social Statistics (5)
Lecture—4 hours; discussion—1 hour. Prerequisite: course 46B or Statistics 13 or the equivalent. Intermediate level course in statistical analysis of social data, emphasis on logic and use of statistical measure, procedures, and mathematical models especially relevant to sociological analysis. GE credit: SocSci | QL, SS.

118. Political Sociology (4)
Lecture—3 hours; discussion—1 hour; term paper; project. Relation of social cleavages and social cohesion to the functioning of political institutions; the social bases of local and national power structures; social stratification and social movement; analysis of concepts of alienation, revolution, ideology, ruling class, and elite. GE credit: SocSci | SS.

120. Deviance (4)
Lecture—3 hours; term paper or discussion. Social structural sources, institutional practices and microprocesses associated with deviant, evil, disease, immorality, disability, racial and class differences, citizenship, and the body. Special emphasis on expert knowledge and the production and management of social difference. GE credit: SocSci, Wrt | SS.

122. Sociology of Adolescence (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Chronological age and social status, analysis of social processes bearing upon the socialization of children and adolescents. The emergence of “youth cultures.” Generational succession as a cultural problem. GE credit: SocSci, Wrt | SS.

124. Education and Inequality in the U S (4)
Lecture—3 hours; term paper or discussion—1 hour. Functions of schooling in contemporary U.S. society. Racial, ethnic, social class, and gender inequalities in student outcomes. Consideration of classic and current controversies in the field of education and education policy. GE credit: SocSci | SS.

124. Sociology of Education (4)
Lecture—3 hours; discussion—1 hour; term paper; project. Education and the social structure. Class size, curriculum, and economics of scale. Relations between families and schools in socialization; familial ascription and educational achievement. Education and industrialization. Organizational and occupational structures of schools. Discussion of selected controversies. GE credit: SocSci | SS.

126. Social Interaction (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 2. Everyday interaction in natural settings, ethnographic approaches to the understanding of social meanings, situations, personal identity and human relationships. Particular attention to the work of Erving Goffman, and to studies of face-to-face interaction as a ground for the development of self and community. GE credit: SocSci, Wrt | SS.

127. Sociology of Death (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1 or the equivalent or consent of instructor. Overview of ethnocultural, structural, and historical aspects of death and dying, to death occupations, and to death rituals in various cultures. GE credit: SocSci, Wrt | SS.

128. Interracial Interpersonal Dynamics (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: one course from courses 1, 2, 3, African American Studies 10, Asian American Studies 1, 2, Chicano Studies 10, Native American Studies 1, 2. Analysis of the influences of cultural differences and racial stratification on interpersonal interaction in multicultural settings (e.g., work, education, political action) and intimate settings (e.g., friendship, love, marriage, family). Minority/majority relationships. GE credit: SocSci, Wrt | SS.

129. Sociology of Black Experience in America (4)
Lecture—3 hours; discussion—1 hour; term paper; project. Survey of historical and contemporary theoretical sociological perspectives on the Black experience in the United States. Emphasis on Black sociological perspectives and mainstream perspectives of specific sociologists. GE credit: SocSci, Div | AGCH, DD, SS.

130. Race Relations (4)
Lecture—3 hours; term paper or discussion—1 hour. Functions of the social definitions of race and racial groups. Analysis of racial conflict, oppression, and other forms of ethnic stratification. Models of ethnic interaction and social change. Emphasis on race relations within the U.S. GE credit: SocSci, Div | AGCH, DD, SS.

131. The Family (4)
Lecture—3 hours; discussion—1 hour. Contempora- family life in historical and cross-cultural perspective. How different family forms arise, their significance today and prospects for future family change. Attention to power relations within and beyond the family and to the social implications of family transformation. GE credit: SocSci, Div, Wrt | AGCH, DD, SS.

132. The Sociology of Gender (4)
Lecture—3 hours; discussion—1 hour. Analysis of biological, psychological, and structural conditions underlying the status and roles of men and women in contemporary society, focusing on a his- torical and comparative perspective. GE credit: SocSci, Div | AGCH, DD, SS.

133. Sexual Stratification and Politics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 132 or the equivalent or consent of instructor. Analysis of origins, dynamics, and social implica- tions of sexual stratification. Examination of classical and contemporary theorists such as Engels, Freud, J.S. Mill, de Beauvoir, Juliet Mitchell, D. Dinnerstein. Attention to selected issues in sexual movements for and against sexual equality. GE credit: SocSci, Div | SS.

134. Sociology of Racial Ethnic Families (4)
Lecture—3 hours; discussion—1 hour or term paper. Asian American, Black, Chicano, and Native Ameri- can family life in comparative perspective. Family structure and gender roles are considered in relation to sociohistorical dynamics. Offered in alter- nate years. GE credit: SocSci, Div, Wrt | AGCH, DD, SS.

135. Social Relationships (4)
Lecture—3 hours; discussion—1 hour or term paper. Prerequisite: course 1, 2, or 3, and upper division standing. Social and cultural factors influencing friendships and intimate relationships. Topics include...
relationship development, relationship maintenance, and relationship loss. GE credit: Div, SocSci, Wrt | SS.

137. African American Society and Culture 1790-1990 (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1. Political and social transfor-
mations of the African community between 1790 and 1990, as seen through film, literature, and music. Topics include: Black consciousness, Afro-Slave culture, The Harlem Renaissance, and contemporary Hip Hop. GE credit: SocSci | ACGH, DD, SS.

138. Economic Sociology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A or 1B and upper division standing in the social sciences. Overview of the rapidly growing field of economic sociology. Focus on variations in the ways that markets are organized. The relationship between individual and collective rationality will also be emphasized. GE credit: SocSci | ACGH, SS, WC.

139. Corporations and Society (4)
Lecture—3 hours; discussion—1 hour; term paper. Prerequisite: course 1 or 2 or 3, and upper division standing. The study of the history and power of the modern corporation; corporate organization; poli-
tics, the state, and the corporation; labor unions and the labor process; competition, regulation and inter-
nationalization of the international and conglomer-
tor; corporate and mass markets; and consumerism. GE credit: SocSci | ACGH, SS.

140. Social Stratification (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Factors that contribute to social stratification. Social mobility and its consequences for social structure. GE credit: SocSci | ACGH, DD, SS.

141. Industrialization and Social Change (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Selected technological and social factors. Preconditions of economic development and industrialization. Social, political, and cul-
tural issues at various levels of economic development. Major historical differences and major current trends. Emphasis either on highly industrial- ized countries or on less developed countries. GE credit: SocSci, Wrt | SS.

143A. Urban Society (4)
Lecture—3 hours; discussion—1 hour or term paper or research project (instructor’s option). Prerequisite: course 1 or the equivalent. Theories of city origins. Analysis of the historic process of urbanization and of varying city types. Comparison of American and European experiences of urbanization, counterurbaniza-
tion, and neighborhood change. Consideration of competing theories of urban growth and change and competing visions of the urban future. Offered in alternate years. GE credit: SocSci | SS.

143B. Sociology of City Life (4)
Lecture—3 hours; discussion—1 hour or term paper or research project (instructor’s option). Prerequisite: course 1 or the equivalent; course 143A recommended. Critical 
capital conditions of the term “community”. Analy-
ysis of the organization of primary ties in the city, of the culture of urban public life and of the learning of city skills. Offered in alternate years. GE credit: SocSci, Wrt | SS.

144. Agriculture and Society (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Prerequisite: advanced standing in the social sciences or one year of course work in agricultural and environmental sciences. Development of agriculture as a major enterprise in modern society with the concomitant reduction in the labor force and family farms. Analysis of issues including mechanization, migration, corporate farming, and public resource policy. Offered in alternate years. GE credit: SocSci | SS.

145A. Sociology of Third World Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1; upper division standing. Introduction to theories and contemporary issues in the sociology of development. Topics such as urbanization, rural/
grarian change, class, status groups, international division of labor, sectoral shifts, international capital, informal economy, gender, and political processes are analyzed within a comparative-historical frame-
work. GE credit: SocSci, Div, Wrt | SS, WC.

145B. Gender, Environment, Rural Development in the Third World (4)
Seminar—4 hours. Prerequisite: course 1; upper division standing. Political-economic analysis of women and work during the process of socioeco-

148. Collective Behavior (4)
Lecture—3 hours; discussion—1 hour or term paper or project (instructor’s option). Prerequisite: course 1 or the equivalent. Study of behavior of human crowds and masses in extraordinary circumstances, including crowds and mass actions, collective pro-
tests, riots, revolutionary situations, ecstatic and revivalist gatherings, crazes, fads, and fashions. GE credit: SocSci | SS.

149. Religion and American Society (4)
Lecture—3 hours; class project. Historical, contem-
porary survey of religious traditions and organiza-
tions and their relationship to U.S. social and cultural patterns. Religion, religious pluralism, minority and diverse communities, religious migration, U.S. religion as a social institution, and religion, politics, and social stratification. Offered in alternate years. GE credit: SocSci | DD, SS, WC.

150. Criminology (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Sociological analysis of criminal behavior in relation to social structure and the crimi-

151. The State in the Modern System (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 150 and upper division standing. Sociological analysis of the different compo-
ents of the criminal justice system including the environment and interpretation of criminal laws, the contemporary roles and functions of the police, crim-

152. Juvenile Delinquency (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Study of juvenile delinquency in relation to the family, peer groups, community, and institutional structures. Consideration of the delinquency of official agencies of control. GE credit: SocSci | SS.

153. The Sociology of Childhood (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Contemporary childhood in historical, cross-cultural, and global perspectives. Examination in understanding of the nature of childhood and “best interests of the child” by class, race, gen-

154. Sociology of Health Care (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Overview of sociological research in medicine and health care, with emphasis on the organization and social psycholog-

155. Sociology of Law (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Law considered as social control, relation of legal institutions to effecting judicial decision making and administration of justice. Lawyers as an occupational group. Legal reform. GE credit: SocSci | SS.

157. Social Conflict (4)
Lecture—3 hours; discussion—1 hour or term paper or project. Analysis of the causes, dynamics, and regu-

159. Sociology of Work and Employment (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: Sociology 145B or research project. Analysis of the ways that markets are organized. Contemporary women’s social movements in Latin America, focusing on Honduras, El Salvador, Brazil, and Nicaragua. Examination of exploitation and oppression in Latin America. GE credit: Div, SS, Wrt | DD, SS, WC.

160. Sociology of the Environment (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: Sociology 145B or research project. Sociology strongly recommended. Production, consumption, and urban expansion. Basic social logics surround-

161. The Civil Justice System (4)
Lecture—3 hours; term paper. Prerequisite: course 155; upper division standing. Pass One open to upper division and graduate Sociology & Sociology Organizational Studies majors. Empirical studies of the different aspects of the civil justice system in the United States and Global Society including the litigation, juries, civil rights, and international laws relating to crime, the environment, and human rights. —II.

171. Sociology of Violence and Inequality (4)
Lecture/discussion—4 hours. Prerequisite: upper-

172. Ideology of Class, Race and Gender (4)
Lecture—4 hours. Examination of popular belief sys-

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses.
Pre-Fall 2011 General Education (GE): AH—Arts and Humanities; SC—Science and Engineering; SE—Social Sciences; AGCH—American Cultures; DD—Diverse Diversity; Wrt—Writing Experience
Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Diverse Diversity; OL—Oral Skills, QL—Quantitative, SL—Scientific, VL—Visual, WC—World Cultures, WE—Writing Experience

Sociology 507

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2015-2016 offering in parentheses.
Pre-Fall 2011 General Education (GE): AH—Arts and Humanities; SC—Science and Engineering; SE—Social Sciences; AGCH—American Cultures; DD—Diverse Diversity; Wrt—Writing Experience
Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Diverse Diversity; OL—Oral Skills, QL—Quantitative, SL—Scientific, VL—Visual, WC—World Cultures, WE—Writing Experience

Sociology 507
174. American Jewish Identities and Communities (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1 or 2. Examines the historical development and contemporary trends in Jewish American identity and community. GE credit: SocSci | SS.

175. Mass Communication (4)
Lecture—3 hours; term paper. Prerequisite: course 1 or 2. Examines the relationship between the media and social structures. History of media—state relations. Media as reflector and shaper of values. Emphasis on current European and Marxist and pluralist theories rather than on content analysis. Offered in alternate years. GE credit: SocSci | SS.

176. Sociology of Knowledge, Science, and Scientific Knowledge (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: upper division standing preferred. Social, cultural, and historical dimensions of knowledge, especially scientific knowledge. Problems, methods, and theory in sociology of scientific knowledge. Laboratories and historical case studies. Scientific and technical knowledge in institutional and organizational contexts. [Same course as Science and Technology Studies 176.] GE credit: SocSci | SS.

180A. Complex Organizations (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Prerequisite: course 1; Economics 1A and 1B recommended. Develops a sociological approach to organizations. Deals with the issues of organizational decision making, design, and survival. Emphasis on relations between organizations and the effects of those relations in both the public and private sectors. GE credit: SocSci | SS.

180B. Complex Organizations (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Prerequisite: course 180A or consent of instructor. Builds on concepts and skills developed in course 180A. GE credit: SocSci | SS.

181. Social Change Organizations (4)
Lecture—3 hours; discussion—1 hour or term paper. Prerequisite: course 1. Analysis of organizations with social change and improvement goals and programs. Phylogenies and cyclic patterns of social change. Social change organizations and grassroots citizen groups. Topics treated include for-profit and nonprofit. GE credit: SocSci | SS.

182. Experimental and Utopian Communities (4)
Lecture—3 hours; discussion—1 hour. The social structure of intentional, experimental or Utopian settlements and communal movements, including comparison with other small settlement forms: villages, neighborhoods, monasteries, encampments and nonsite settlements. Geographically based on occupancy, ethnicity, and religion.

183. Comparative Organizations (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 180A or 180B; upper division standing. Examination of formal and political organizations of major industrial nations. Discussion of historical, cultural, social, and political influences on industrial patterns and practices; alternative theoretical models for explaining organizational development. Societies may include Sweden, Japan, Germany, Taiwan, and South Korea. Offered in alternate years. GE credit: SocSci, ACGH, SS, WC.

185. Sociology of Social Welfare (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Sociological analysis of the evolution and current organization of welfare functions in modern societies. GE credit: SocSci | SS.

188. Social Stratification in China (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Social and political systems and patterns of stratification in China since 1949. Offered in alternate years. GE credit: SocSci | SS.

189. Social Science Writing (4)
Lecture—3 hours; discussion—1 hour or term paper. Prerequisite: course 46A, upper division standing, and 12 units of social science. Improved analytic writing and methods for reporting social science research to a wider public. Sociological analysis of the conditions of good and bad writing. GE credit: SocSci | SS.

190X. Seminar in Sociological Analysis (4)
Seminar—3 hours; term paper. Prerequisite: upper division standing and course 100 (former course 165A). In-depth examination at an upper division level of a special topic in Sociology.emphasis on student participation in learning. May not be repeated for credit. (Limited enrollment.)

191. Workshop in Contemporary Sociological Theory (4)
Lecture—2 hours; workshop—1 hour; term paper. Prerequisite: course 100 (former 165A) and senior standing. Workshop sociological theory that allows students to explore the uses of theory in empirical inquiry on problems of interest to students. Contemporary theory considered in relation to classical sociological writings, sociological problems, and social change. Emphasis on student participation in learning. May not be repeated for credit. (Limited enrollment.)

192. Internship and Research Practicum (2-6)
Internship—6-18 hours. Prerequisite: course 46A, upper division standing, approval of proposed internship and course 193 concurrently or consent of instructor. Supervised internship and study in an agency, organization, or institution; application of sociological concepts to the work experience. May be repeated for credit with consent of instructor. Maximum of 4 units may be counted toward the major. (P/NP grading only.)

193. Workshop in Field Research (2)
Lecture/discussion—2 hours. Prerequisite: course 46A, course 192 or 199 concurrently for two-four units, senior standing. Overview of the process of collecting, recording, analyzing, and reporting qualitative social data. Emphasis on application of principles; each participant completes an original research project. Not open for credit to students who have completed course 194HA. GE credit: SocSci | SS, WE.

194H. Special Study for Honors Students (1-5)
Prerequisite: senior standing and admission to the Honors Program. Independent study of a sociological problem involving the writing of an Honors thesis. [P/NP grading only, deferred grading only, pending completion of sequence.] GE credit: SocSci | SS.

194HB. Special Study for Honors Students (4)
Seminar—3 hours; term paper. Prerequisite: senior standing and admission to the Honors Program. Directed reading, research and writing culminating in the preparation of a Senior Honors Thesis under the direction of faculty adviser. (Deferred grading only, pending completion of sequence.) GE credit: SocSci | SS.

195. Special Topics in Sociological Analysis (4)
Seminar—3 hours; term paper. Prerequisite: upper division standing and consent of instructor. In-depth examination of topics in sociology. Emphasis on student research and writing. May be repeated for credit when topic differs. GE credit: SocSci | SS.

197T. Tutoring in Sociology (1-4)
Tutorial—3-12 hours. Prerequisite: upper division standing, completion of appropriate course with distinction. Activities vary depending on the nature of the course assignment. May include (but not limited to) tutoring on course material, advising on projects and papers, and leading discussion groups. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. [P/NP grading only.]

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: open to seniors only. (P/NP grading only.)

Graduate

201. Social Research (4)
Lecture/discussion—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative survey of sociological inquiry, taught as a practicum. Philosophy of social science; values and research; research agendas and research problem formulations; research process; explanations. Interpretation; study design, concept formation, measure, sampling, data acquisition, inference; rhetoric and presentation of findings.

206. Quantitative Analysis in Sociology (4)
Lecture—4 hours. Prerequisite: course 106. Survey of the statistical models and methods that serve as a foundation for quantitative analysis in sociology, with an emphasis on multivariate regression analysis, as well as measurement theory and time series analysis. (S/U grading only)—II. (III.)

207A. Methods of Quantitative Research (4)
Lecture—3 hours; term paper. Prerequisite: course 106 or the equivalent. Principles of study design, examination of measurement, survey research methods and multivariate analysis. Course will stress actual practice of techniques. Students will carry out quantitative data analysis using packaged computer programs. (I—I.)

208. Topics in Advanced Quantitative Methods in Social Science (4)
Seminar—3 hours; term paper. Prerequisite: course 206 or the equivalent and graduate standing; major graduate student. Analysis of the logic and application of an advanced statistical model, the particular model chosen may vary. Emphasis on the model’s assumptions, its strengths and weaknesses, its application for social science inquiry, and the relationship between methods and social theory. May be repeated up to 12 units for credit. Offered in alternate years.

215. Economy, Polity, and Society (4)
Seminar—3 hours; paper. Prerequisite: consent of instructor. Open to graduate students in sociology and related disciplines. Course introduces students to topics and selected issues in the related fields of economic and political sociology and political economy.

220. Deviance, Law, and Social Control (4)
Seminar—3 hours; projects. Prerequisite: course 120 or consent of instructor. Report and discussions of literature on selected forms of deviance in relation to law and formal social control, agency contacts and exploratory research projects.

224. Sociology of Education (4)
Seminar—3 hours; term paper. Prerequisite: course 206 or the equivalent recommended. Overview of sociological theories accounting for the form, role, and evolution of educational systems. Emphasis on empirical research on education and social stratification and application to educational policy. Topics include tracking, racial/ethnic achievement inequalities, school organization, and the immigrant experience.

225. Cultural Sociology (4)
Seminar—3 hours, term paper. Explores the varied ways in which culture is thought about in the social sciences and the research questions that follow from
contrasting viewpoints. The approach is historically informed and focused on changing cultural forms in relation to industrialization and post-modernism. Offered in alternate years.

226. Sociological Social Psychology (4) Seminar—3 hours; seminar paper—1 hour. Prerequisite: graduate standing or consent of instructor. Advanced study of approaches, methods, issues and topical concerns of sociological social psychology. Analysis of current and representative historical and contemporary works.

227. Sociology of Reproduction (4) Lecture—3 hours; seminar paper—1 hour. Recent social science scholarship in such areas as teenage pregnancy, family planning, abortion, adoption, AIDS, and new reproductive technologies; focus on the current situation in the United States. Offered in alternate years.

230. Ethnic (Race) Relations (4) Lecture—3 hours; term paper. Advanced study of the determinants of ethnic groupings and their interrelationships. Major theme will be the patterns of ethnic stratification and causes of ethnic conflict. Specific focus upon dominance and resistance to dominance. Influence of social science research.

233. Gender, Culture, and Local/Global Transformation (4) Seminar—3 hours; term paper. Focus on critical approach to women and development; analyze local transformations with global connections within specific cultural settings. Course covers theory, methodological issues, and relationship between theory and practice. Offered in alternate years.

234. Gender, Family, and Society (4) Seminar—3 hours; seminar paper. Prerequisite: graduate standing or consent of instructor. The major theoretical traditions and concerns in family sociology and gender. Analysis of selected classical and contemporary works representative of functionalist, Marxist, psychoanalytic, feminist, and critical theoretical approaches to these subjects (e.g., Engels, Parsons, Freud, Horkheimer, Goode, Lasch, Mitchell). Emphasis on macro and historical questions.

242A. Comparative Methods in Historical Sociology (4-4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative approaches to major historical phenomena such as nationalism, revolution, feudalism, and capitalism; the relevance of psychological and sociological theories to historical interpretation; the verification of hypotheses; the meaning of analogy, correspondence and causality.

243. Urban Society (4) Seminar—3 hours; term paper. Broad overview of the issues and concerns of the field of urban sociology. Special emphasis on the human experience of urban living in contemporary, cross-cultural or historical settings.

245. Developing Societies (4) Seminar—3 hours; term paper or project. Prerequisite: graduate student status or familiarity with problems of developing societies. Analysis of social and economic problems of developing societies from the standpoint of theory and research on modernization and underdevelopment. Nature of third world dependency and its consequences in the global political economy. Offered in alternate years.

248. Social Movements (4) Seminar—3 hours; term paper. Analysis of current issues and contributions to the study of collective behavior and social movements; particular focus upon the strategies and tactics of social movements.

254. Sociological Issues in Health Care (4) Seminar—3 hours; term paper. Prerequisite: open to graduate or professional students. Sociological perspectives and contributions to health care issues. Students select topics for supervised research. The course will have a theme (described in advance) each time it is offered. Paper on research will be required. (S/U grading only.)

255. Sociology of Law (4) Seminar—4 hours. Prerequisite: consent of instructor. Analysis of the nature of the legal process and its impact on social behavior. Will discuss (1) nature and functions of law, (2) the organization and administration of law, and (3) the capacity of law to affect social behavior.

265A. Classical Sociological Theory (4) Lecture—3 hours; discussion—1 hour. Introduces graduate students to the work of the main classical thinkers in the tradition of social theory, such as Marx, Durkheim, Weber, Simmel, Freud, G.H. Mead, and Parsons, locating them within the historical, cultural, and philosophical milieu in which their ideas originated.

265B. Theory in Contemporary Sociology (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 265A. Explores the uses of theories in contemporary sociology by tracing their connections with classical sociological writings and their relations to broader theoretical concerns of contemporary social thought, with particular emphasis on relevance to the current historical, cultural and social milieu.

270. Social Demography (4) Seminar—4 hours. Prerequisite: course 170 or consent of instructor. How social institutions affect and are affected by the level and variation of mortality, migration, and fertility. Special emphasis on the determinants of anti-fertility attitudes and behavior, on less-developed countries, and on contemporary empirical studies.

280. Organizations and Institutions (4) Seminar—4 hours. Theory of formal organizations and bureaucracy. Methods of research in organizational and institutional studies. Historical and comparative analysis of political, religious, educational, military, and economic structure.

290. Seminar (4) Seminar—3 hours; term paper. (S/U grading only.)

292A. Field Research (4-4) Seminar—3 hours; field trips. Prerequisite: graduate standing in Sociology or consent of instructor. The process of collecting, analyzing and reporting qualitative social data. Techniques of intensive interviewing, participant-observation and document analysis; generating, developing, and evaluating analytic frameworks; recording, storing, retrieving, and writing up qualitative data. Emphasis on application of principles; each participant completes a fieldwork project.

293. Proseminar in Sociology (2) Seminar—2 hours. Prerequisite: first-year Sociology graduate students. Open to graduate students with the consent of instructor. Introduction to graduate training in sociology. A seminar designed to introduce students entering graduate work in the department to its ongoing research activities. (S/U grading only.)

295. Special Topics Seminar. (4) Lecture/discussion—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Research topics in Sociology. Specific topic will vary according to faculty interest and student demand. May be repeated for credit when topic differs.—II, III, (I, II, III.)

298. Group Study (1-5) Prerequisite: consent of instructor. (S/U grading only.)

299. Individual Study (1-12) (S/U grading only.)

Professional

390A. The Teaching of Sociology (2) Lecture—1 hour; discussion—1 hour. Prerequisite: graduate standing; required for first-time teaching assistants. Practical instruction in teaching methods for qualitative and quantitative courses. Pedagogical issues involved in critical sociological analysis. (S/U grading only.)—II, (I.)

390B. The Teaching of Sociology (2) Lecture—1 hour; discussion—1 hour. Prerequisite: graduate standing. Practical instruction in devising course syllabi, lectures and assignments for Associate-Teachers and others interested in college teaching. Discussion of pedagogical methods of teaching qualitative and quantitative courses. (S/U grading only.)—II, (I.)

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III, (I, II, III.)

Professional

466. Research Paper Workshop (2) Workshop—1.5 hours; discussion—0.5 hours. Prerequisite: Master of Arts or senior standing. Workshop to assist advanced graduate students in the preparation of an original research paper. Students present their research papers and discuss issues in theory, research design, data, empirical inference, and verbal and written presentation of a professional research paper. (S/U grading only.)

Soil Science

See Earth and Planetary Sciences, on page 223; Soil Science, on page 509; Soils and Biogeochemistry (A Graduate Group), on page 510; and Soil and Water Science, on page 511.

Soil Science

[College of Agricultural and Environmental Sciences]

Faculty. See Land, Air and Water Resources, on page 364.

Major Programs. See the Soils and Biogeochemistry track in Environmental Science and Management, on page 298.

Minor Program Requirements:

The Department of Land, Air and Water Resources, Soils and Biogeochemistry Program, offers a minor program in soil science. The minor is especially geared toward students in the environmental sciences including Hydrologic Science, Environmental Science and Management, Environmental Toxicology, Ecological Management and Restoration, International Agricultural Development, Crop Science and Management, Environmental Horticulture and Urban Forestry, Geology, and Plant Biology.

Soil Science

Requirements

M.S. and Ph.D. degrees in Soils and Biogeochemistry (A Graduate Group), on page 509; Soils and Biogeochemistry Program, offers a minor program in soil science. The minor is especially geared toward students in the environmental sciences including Hydrologic Science, Environmental Science and Management, Environmental Toxicology, Ecological Management and Restoration, International Agricultural Development, Crop Science and Management, Environmental Horticulture and Urban Forestry, Geology, and Plant Biology.

Soil Science

UNITs

Soil Science.............................................21
Soil Science 100......................................5
Soils and Biogeochemistry 124..................................................16
Minor Adviser. R.J. Southard (Land, Air and Water Resources)

Graduate Study. Programs of study leading to the M.S. and Ph.D. degrees in Soils and Biogeochemistry are available. Information regarding these programs can be obtained from the graduate advisers, at http://soils.ucdavis.edu/ and in the Graduate Announcement. See also Graduate Studies, on page 111.

Graduate Advisers, Randy Dahlgren and Sanjai Parikh (Land, Air and Water Resources)

Courses in Soil Science (SSC)

Questions pertaining to the following courses should be directed to the instructor, to the Resource
Soils and Biogeochemistry (A Graduate Group)

A. Toby O’Gren, Ph.D., Chairperson of the Group

Group Office. 1152 Plant & Environmental Sciences Building
530-752-1669; http://soils.ucdavis.edu/;
http://lawr.ucdavis.edu/graduate_sbg.htm

Faculty

Patrick Brown, Ph.D., Professor (Plant Sciences)
William Casey, Ph.D., Professor (Chemistry)
Sanjai Parikh, Ph.D., Assistant Professor
Jan Hopmans, Ph.D., Professor
Graham Fogg, Ph.D., Professor
Mark Grismer, Ph.D., Professor
Peter Hernes, Ph.D., Associate Professor
Jan Hnatyuk, Ph.D., Professor
William Horwath, Ph.D., Professor
Ben Houlton, Ph.D., Assistant Professor
Louise Jackson, Ph.D., Professor
Sanjai Parikh, Ph.D., Directions Professor
Eliska Rejmanova, Ph.D., Professor
Eliska Rejmanova, Ph.D., Professor

Soils and Biogeochemistry

(4) Lecture—3 hours; laboratory/discussion—2 hours. Prerequisite: introductory courses in ecology/botany and soils recommended; undergraduates accepted with consent of instructor. Multidisciplinary analysis of energy and nutrient transfers within terrestrial ecosystems. Examination of processes and interactions between the atmosphere, biosphere, lithosphere and hydrosphere. Laboratory section uses biogeochemical simulation models to examine case studies. (Same course as Ecol 219)—III. (III.) Houlton

2020. Pedology (3) Lecture—3 hours. Prerequisite: consent of instructor; course 120 recommended. Topics selected from studies of soil-forming processes, soil-geomorphic relations, mineral weathering, new developments in soil classification, and development of pedologic theory. Topics vary from year to year. May be repeated one time for credit. Offered in alternate years. —III. (III.)

222. Global Carbon Cycle (3) Lecture—3 hours. Prerequisite: Chemistry 8A, 8B, Mathematics 16A, 16B, course 100 or the equivalent. Global carbon cycle from Phanerozoic epoch to modern times. Examination of long- and short-term carbon cycles. Transfer of carbon among ocean, land and life with emphasis on humic substance formation, methods of characterization, reactions with organic and soil carbon stabilization. Offered in alternate years. —II. (II.) Horwath

290. Special Topics in Soil Science (1-4) Seminar—1–4 hours. Prerequisite: graduate standing. Seminars and critical review of problems, issues, and research in soil science. May be repeated for credit. (S/U grading only)—I, II, III, IV. (I, II, III, IV.)

298. Group Study (1-5) Prerequisite: consent of instructor. May be repeated for credit when topic differs. (S/U grading only)—I, II, III, IV. (I, II, III, IV.)

299. Research (1-12) (S/U grading only)—I, II, III, IV. (I, II, III, IV.)

Professional

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only)—I, II, III, IV. (I, II, III, IV.)

Pre-Fall 2011 General Education (GE) = American Cultures; Div = Domestic Diversity; WR = Writing Experience.
Spanish and Portuguese

(College of Letters and Science)
Cecilia Coombes, Ph.D., Chairperson of the Department

Department Office. 215 Sproul Hall; 530-752-0835; http://spanish.ucdavis.edu

Faculty

Marta E. Allsint, Ph.D., Professor
Emilio Bejel, Ph.D., Professor
Leopoldo Bernardi, Ph.D., Professor
Robert Blake, Ph.D., Professor
Travis Bradly, Ph.D., Associate Professor
Cecilia Coombes, Ph.D., Associate Professor
Linda Egan, Ph.D., Professor
Cristina Gonzalez, Ph.D., Professor
Robert Irwin, Ph.D., Professor
Michael Lazzara, Ph.D., Associate Professor
Adrienne Martin, Ph.D., Professor
Cristina Martinez-Carazo, Associate Professor
Robert Newcomb, Ph.D., Associate Professor
Ana Peluffo, Ph.D., Associate Professor
John Slater, Ph.D., Associate Professor

Emeriti Faculty

Zunilda Gertel, Ph.D., Professor Emerita
Fabian A. Samaniego, M.A., Senior Lecturer
Hugo J. Verani, Ph.D., Professor Emeritus

Affiliated Faculty

Francisco Alarcon, M.A., Lecturer
Norma Lopez-Burton, M.A., Lecturer
Charles Oriel, Ph.D., Lecturer

The Major Program

The Spanish major program assures proficiency in all four language skills: understanding, reading, and writing—acquaints students with the intellectual and cultural contributions of the Spanish-speaking world through a study of its language, literature, and cultural productions.

The Program. The department’s lower division program gives students a solid foundation in the Spanish language, either through the traditional elementary and intermediate language series or through an accelerated three-course sequence of Spanish for native speakers. Linguistics introduces students to a systematic study of language in general and serves as an introduction to upper division courses in Spanish linguistics. At the upper division level, students receive a broad introduction to basic concepts and the practice of literary and cultural criticism and to the four areas of study represented in the department’s curriculum: Spanish linguistics, Spanish literature and culture, Latin-American literature and culture, and Latino literatures and cultures in the United States. Students are encouraged to work closely with the department’s academic advisers in designing a program of studies tailored to their individual needs and interests. Many students combine the Spanish major with another major in the humanities or social sciences.

Student Learning Outcomes. Educational Objectives:

- Linguistics. Demonstrate knowledge of the Spanish-speaking world’s linguistic diversity through the comprehension of Spanish in a variety of situations, discursive modes and historical, regional or social variations. Demonstrates analytical, interpretative, and critical thinking skills: Spanish 111N, 113, 115/S, 116, 117, 118, 180.
- Literature. Demonstrate analytic, interpretative and critical thinking skills with respect to literary texts from Latin America, Spain, the United States and other countries in which there is a literary production in Spanish; Spanish 100/S, 130, 131N, 134A/B, 142 (Spain); 150N, 151, 157, 159/S (Latin America); 174, 175, 176, 177 (United States).
- Culture. Demonstrate cultural awareness with respect to the diversity of cultural products and manifestations produced in the Spanish-speaking world (Latin America, Spain, the United States and other countries in which there is a cultural production in Spanish; Spanish 100/S, 141/S, 170/S, 174.
- Film and Art. Demonstrate analytic interpretative and critical thinking skills with respect to linguistics, literature and cultural studies.

Career Alternatives. The program, alone or in combination with other major programs, may lead to advanced study of the language or literature and culture of Spain and Spanish America, and to careers not only in teaching, but also in other professions such as library science, law, medicine, and in government, social service, business, or international relations.

A.B. Major Requirements:

Preparatory Subject Matter..................................4-37

Spanish 1, 2, 3, 4, 21 or 21S, 22 or 22S, 23 or 23S, 24 or 24S..................................................0-33
or Spanish 31, 32, 33..............................................0-15

Linguistics 1....................................................4

In consultation with a departmental adviser and with the consent of the department chairperson, Linguistics 1 may be taken concurrently with upper division courses.

Depth Subject Matter..................................45-48

One course in each of the following five areas: ..................................................4-19

Spanish 100, 100S, 140, 141, 141S, 170, or 170S ..................................................4
Spanish 111N, 115, or 116...........................................3-4
Spanish 130, 131N, 134A or 142 ...........................................4
Spanish 150N, 151, 157, 159 or 159S .................................4
Spanish 117, 174, 176, or 177 ...........................................4
Students planning to take Spanish 110 should do so at the beginning of the upper division sequence or concurrently with Spanish 100, 100S, 141, 141S, 170 or 170S.

Seven elective courses to be chosen in consultation with the student’s major adviser..................................................26-28

Students may, with the approval of their adviser, take up to two electives outside the Spanish department in such programs as: African American and African Studies: African American and African Studies 107A, 180

Anthropology: Anthropology 144

Art History: Art History 151

Comparative Literature: Comparative Literature 152

Education: Education 151, 152


Linguistics: Linguistics 166

Native American Studies: Native American Studies 120, 133A/B, 184

A maximum of six units of course 199 may be counted toward the major.

Course 199 cannot be used to replace regular departmental courses.

Total Units for the Major..................................49-85

Major Advisers. Student Affairs Officer/Undergraduate Academic Coordinator, Laura Barrera, jlbarrera@ucdavis.edu.

Advising. Given the great flexibility in the Spanish major, it is important that students design their programs in close consultation with their major adviser. This is especially important for students who intend...
Learn about Portuguese courses.

Courses in Portuguese (POR)

Lower Division

1. Elementary Portuguese (5)
   Lecture/discussion—5 hours; laboratory—1 hour.
   Introduction to Portuguese grammar and development of all language skills in a cultural context with special emphasis on communication. Students who have successfully completed Portuguese 2 or 3 in the 10th or higher grade of high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be awarded to the student's P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed. GE credit: WC.—I. (I)

2. Intermediate Portuguese (5)
   Lecture/discussion—5 hours; laboratory—1 hour.
   Prerequisite: course 1. Continuation of course 1 in the areas of grammar and development of all basic language skills in a cultural context with special emphasis on communication. GE credit: WC.—II. (II)

3. Elementary Portuguese (5)
   Lecture/discussion—5 hours; laboratory—1 hour.
   Prerequisite: course 1. Review and develop the grammar, vocabulary, and composition acquired in first year Portuguese through exercises and reading of modern texts. GE credit: WC.—I Bernucci, Newcomb

22. Intermediate Portuguese (5)
   Lecture/discussion—5 hours; laboratory—1 hour.
   Prerequisite: course 21. Continuation of course 21. Focus on more difficult grammar concepts and further composition practice. Development of all language skills through exercises and reading of modern texts. GE credit: WC.—I Bernucci

23. Portuguese Composition I (4)
   Lecture—3 hours; extensive writing. Prerequisite: course 22. Development of writing skills by way of reading, discussion, and analysis of authentic materials, literary texts, and videos. Selective review of grammar. Class activities include composition, journals, letters, individual and group projects. GE credit: WC, WE.—III. (III)

31. Intermediate Portuguese for Spanish Speakers (4)
   Lecture/discussion—3 hours, laboratory—1 hour.
   Prerequisite: course 2 or the equivalent, or consent of instructor. Development of linguistic and learning skills required for Spanish-speaking students in upper-division courses in Portuguese.—I. (I)

98. Directed Group Study (1-5)
   Prerequisite: consent of instructor and Department Chairperson. Directed group study primarily for lower division students.—I. (I)

Upper Division

100. Principles of Luso-Brazilian Literature and Criticism (4)
   Lecture—3 hours, term paper. Prerequisite: course 3 or Spanish 24, 24S or 33. Principles of literary criticism applied to the study of fiction, poetry, and essays of major literary writers of the Luso-Brazilian world. GE credit: ArtHist | AH, WC, WE.—I (I)

111. The Structure of Portuguese: Sounds and Words (3)
   Lecture/discussion—3 hours. Prerequisite: course 22 or 23. Linguistic description of sound patterns of Portuguese and how those sounds can be used to form larger units, such as morphemes and words. Theoretical and practical comparisons with English and with other Romance languages. GE credit: AH, WC.—II. (II)

132. Portuguese Literature: Medieval and Renaissance (4)
   Lecture/discussion—3 hours; term paper. Prerequisite: course 22 or 31. Overview of the origins of the Portuguese literature, spanning from the 13th C to the 16th C. Studies of lyrical and epic poetry, drama, and travel narratives. GE credit: AH, WC.—II. (II)

134. Luis de Camões (4)
   Lecture/discussion—3 hours; term paper. Prerequisite: course 22 or 31. Overview of the origins of the Portuguese literature, spanning from the 13th C to the 16th C. Studies of lyrical and epic poetry, drama, and travel narratives. GE credit: AH, WC.—II. (II)

141. Introduction to Luso-Brazilian Culture (4)
   Lecture/discussion—3 hours; extensive writing. Prerequisite: course 23. Introduction to history, geography, and culture of Portugal and Brazil. Art, history of ideas, and everyday culture; introduction to critical reading and textual analysis. Taught in Portuguese. GE credit: ArtHist, Div. Wrt | AH, WC.—I. (I)

159. Special Topics in Luso-Brazilian Literature and Culture (4)
   Lecture—3 hours; term paper. Prerequisite: course 3 or Spanish 24, 24S or 33. Special Topics in Luso-Brazilian Literature and Culture. May be repeated one time for credit. GE credit: ArtHist | AH, WC, WE.—I, II, III. (I, II, III)

161. Luso-Brazilian Literature and Culture (4)
   Lecture/discussion—3 hours; term paper. Prerequisite: first year Portuguese or the equivalent. Colonial Brazilian literature survey. Readings include 16th-18th centuries manuscripts and books of cultural importance in a society dominated by censorship and with no printing presses. Study of the role Literary Academies played in the so called "culture of manuscripts." GE credit: ArtHist | AH, WC, WE.—I, II, III Bernucci, Newcomb

162. Introduction to Brazilian Literature (4)
   Lecture/discussion—3 hours; term paper. Prerequisite: first year Portuguese or the equivalent. Narrative and poetic texts of the 19th and 20th centuries in Brazil. In-depth and comparative study of Romantic and [Neo]Naturalist movements as a forum for discussion about literary tradition and modernity in Latin America. GE credit: ArtHist | AH, WE.—I. (I) Bernucci, Newcomb

163. 20th C Masters in Brazilian Literature (4)
   Lecture/discussion—3 hours; term paper. Prerequisite: first year Portuguese or the equivalent. Overview of modern Brazilian literature from early 20th C. The poetry by João Cabral de Melo Neto and the Concretists (1960s), including European avant-garde movements and literary and cultural manifestations leading to a revolutionary body of literature. GE credit: ArtHist | AH, WC, WE.—I, II, III Bernucci, Newcomb

198. Directed Group Study (1-5)
   Prerequisite: consent of instructor and Department Chairperson. (P/NP grading only) GE credit: AH, WC, WE.—I, II, III Bernucci

199. Special Study for Advanced Undergraduates (1-5)
   Independent study with professor for advanced undergraduate students, or honor thesis students. (P/NP grading only) Offered irregularly. GE credit: AH, WC, WE.—I, II, III Bernucci

Spanish and Portuguese

to use their major as preparation for graduate study, for those who are planning a teaching career, and for those who wish to take advantage of our Education Abroad Program options.

Minor Program Requirements:

Spanish................................. 23-24
   One course in each of the following five areas:
   Spanish 100, 100S, 141, 141S, 170, or 170S........ 4
   Spanish 111N, 115, or 116 .................. 3-4
   Spanish 130, 131N, 134A, or 142 ......... 4
   Spanish 150N, 151, 157, 159 or 159S........ 4
   Spanish 117, 174, 176, or 177......... 4
   One upper division elective in Spanish ......................... 4
   Consult a departmental advisor if any of these courses are to be taken abroad.

Honors Program. Candidates for high or highest honors in Spanish must write a senior thesis under the direction of a faculty member. For this purpose, honors candidates must enroll in at least six units of Spanish 194H distributed over two quarters. Normally, a student will undertake the honors project during the first two quarters of the senior year; other arrangements must be authorized by the department chair. Only students who, at the end of their junior year (135 units), have attained a cumulative GPA of 3.500 in courses required for the major will be eligible for the honors program. The requirements for earning high and highest honors in Spanish are in addition to the regular requirements for the major in Spanish.

Education Abroad Program Options. The department encourages majors to consider study in a Spanish-speaking country with our Education Abroad Program (EAP). It is now possible for our students to complete significant portions of the Spanish major and minor or the lower (Preparatory Subject Matter) and upper division levels through newly introduced options.

UC Davis Quarter Abroad. The Quarter Abroad Program offers programs in Mendoza, Argentina (fall quarter) and in Madrid, Spain (spring quarter). These programs aim at providing students with opportunities to increase their knowledge of the Spanish language and cultures by experiencing the life-threatening challenges of living and studying abroad.

Students may earn 15-22 UC Davis units toward the Spanish major, minor, or foreign language requirement. Each program may offer an upper division course taught by the UC Davis Program Director focusing on history, culture and society.

For more information, contact C. Colombi or C. Martinez-Carazo or see http://studyabroad.ucdavis.edu/programs/quarterabroad/.

Teaching Credential Subject Representative. C. Colombi; see the Teaching Credential/M.A. Program on page 115.

Graduate Study. The Department offers courses leading to the M.A. degree in Spanish to students who have completed with distinction the A.B. degree in Spanish, or the equivalent. Candidates will be recommended for admission to graduate studies in Spanish provided they meet the requirements of the Graduate Chairman and the Department of Spanish. The Department also offers programs of study and research leading to the Ph.D. degree. Detailed information may be obtained by writing to the Chairperson or the Graduate Director of the Spanish Department.

Graduate Adviser, Mandy Bachman, mbachman@ucdavis.edu.

Prerequisite Credit. Credit normally will not be given for a course if that course is the prerequisite of a course already successfully completed. Exceptions can be made by the Department Chairperson only.

Quarter Offered: Fall, Winter, Spring, Summer; 2015-16 offering in parentheses

Pre-Fall 2011 General Education (GE): ArtHist—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Domestic Diversity; Wrt—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACHG—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; Wrt—Writing Experience
Courses in Spanish (SPA)

Course placement. Students with two years of high school Spanish normally take Spanish 2, those with three years take Spanish 3, and those with four years take Spanish 21. It is recommended that transfer students who have successfully completed a two-year sequence at the junior college level continue their study by taking Spanish 24, 24S, 100, 100S, 141, 141S, 170, or 170S. Consult a departmental adviser.

Lower Division

1. Elementary Spanish (5)
Lecture/discussion—5 hours; laboratory—1 hour. Introduction to Spanish grammar and development of all language skills in a cultural context with special emphasis on communication. Not open for credit to students who have completed course 1S. Students who have successfully completed Spanish 2 or 3 in the 10th or higher grade of high school may receive unit credit for this course on a P/NP grading basis only. Although a passing grade will be charged to the student’s P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed. GE credit: WC.—I, II, III, IV.

2. Elementary Spanish (5)
Lecture/discussion—5 hours; laboratory—1 hour. Introduction to Spanish grammar and development of all language skills in a cultural context with special emphasis on communication. Offered in a Spanishspeaking country under the supervision of a UC Davis faculty/lecturer. Not open for credit to students who have completed course 1, 2S, 2, 2S, 3 or 3S. GE credit: WC.—IV. (Ivori) López-Burton

25. Elementary Spanish (5)
Lecture/discussion—5 hours; laboratory—1 hour. Continuation of course 2, 2S, 2V, or 2Y. Continuation of course 2, 2S, 2V or 2Y. Online format combining synchronous chatting with technologically based materials. Not open to students who have taken course 3, 3S, 3Y, or higher. GE credit: WC.—II, IV, IV, IV. Blake

3. Elementary Spanish (5)
Lecture/discussion—5 hours; laboratory—1 hour. Prerequisite: course 2 or 2S. Completion of grammar and continuation of all language skills using cultural texts. Not open for credit to students who have completed course 3S. GE credit: WC.—III.

35. Elementary Spanish (5)
Lecture/discussion—5 hours; laboratory—1 hour. Prerequisite: course 2 or 2S. Completion of grammar and continuation of all language skills using cultural texts. Offered in a Spanishspeaking country under the supervision of UC Davis faculty. Not open for credit to students who have completed course 3. GE credit: WC.—III.

3Y. Elementary Spanish (5)
Lecture—3 hours; web electronic discussion—2 hours. Prerequisite: course 2, 2S, 2V, or 2Y. Continuation of course 2, 2S, 2V or 2Y. Online format combining synchronous chatting with technologically based materials. Not open to students who have completed courses 3 or 3S. GE credit: WC.—II, II, III, IV. (Ii, Ii, Iii, Iv) Blake

3V. Elementary Spanish (5)
Lecture—3 hours; web electronic discussion—2 hours. Prerequisite: course 2, 2S, 2V, or 2Y. Continuation of course 2, 2S, 2V or 2Y. Online format combining synchronous chatting with technologically based materials. Not open to students who have completed courses 3 or 3S. GE credit: WC.—II, II, III, IV. (Ii, Ii, Iii, Iv)

8. Elementary Spanish Conversation (2)
Discussion—3 hours. Prerequisite: course 3; course 21 (concurrently) recommended. Designed to develop oral communication skills. Emphasis on increasing vocabulary, improving listening comprehension, pronunciation, accuracy and grammar. Practice of everyday situations. Not open to native speakers or to other division students. GE credit: OL, WC.—II, III, III. (Ii, Iii, Iii)

21. Intermediate Spanish (5)
Lecture/discussion—5 hours; laboratory—1 hour. Continuation of course 21, 21S, or 21V in the areas of grammar and basic language skills. Not open for credit to students who have completed course 21S. GE credit: WC.—II, III, III. (Ii, Iii, Iii)

215. Intermediate Spanish (5)
Lecture/discussion—5 hours; laboratory—1 hour. Prerequisite: course 21 or 21S. Review and develop the grammar, vocabulary and composition acquired in the first year through exercises and reading of modern texts. Students transferring from other institutions are recommended to start the second year program at this point. Not open for credit to students who have completed course 215. GE credit: WC.—II, III, III. (Ii, Iii, Iii)

22. Intermediate Spanish (5)
Lecture/discussion—5 hours; laboratory—1 hour. Prerequisite: course 21 or 21S. Continuation of course 21 and 21S. Focus on more difficult grammar and composition. Development of all language skills through exercises and reading of modern texts. Not open for credit to students who have completed course 21S. GE credit: WC.—II, III, III. (Ii, Iii, Iii)

22S. Intermediate Spanish (5)
Lecture/discussion—3 hours; laboratory—1 hour. Prerequisite: course 21 or 21S. Continuation of course 21 and 21S. Focus on more difficult grammar concepts and further practice on composition. Development of all language skills through exercises and reading of modern texts. Offered in a Spanishspeaking country under the supervision of UC Davis faculty. Not open for credit to students who have completed course 222. GE credit: WC.—III, IV. (Iii, Iv)

21V. Intermediate Spanish (5)
Lecture/discussion—3 hours; web electronic discussion—2 hours. Prerequisite: course 21 or 21S. Continuation of course 21, 21S, or 21V in the areas of grammar and basic language skills. Offered in a Spanishspeaking country under the supervision of UC Davis faculty. Not open for credit to students who have completed courses 221 or 222. Offered irregularly. GE credit: WC.—II, II, III, IV. (Ii, Ii, Iii, Iv) Blake, Bradley

23. Spanish Composition I (4)
Lecture—3 hours; extensive writing. Prerequisite: course 22 or 222. Development of writing skills by way of reading, discussion, and analysis of authentic materials, literary texts, and videos. Selective reading of grammar. Composition, journals, individual and group projects. Not open for credit to students who have completed 223. GE credit: WC, WE.—II, III, III. (Ii, Iii, Iii)

225. Spanish Composition I (4)
Lecture—3 hours; extensive writing. Prerequisite: course 22. Development of advanced level writing skills, with emphasis on how to write argumentative prose, essays, and research papers. Introduction to the analysis of literary genres. Compositions, journals, individual and group projects. Not open for credit to students who have completed course 225. GE credit: WC, WE.—II, III, IV. (Ii, Iii, Iv)

24. Spanish Composition II (4)
Lecture—3 hours; extensive writing. Prerequisite: course 22 or 222. Development of advanced level writing skills, with particular emphasis on how to write argumentative prose, essays, and research papers. Introduction to the analysis of literary genres. Compositions, journals, individual and group projects. Course is taught in a Spanishspeaking country. Not open for credit to students who have completed course 224. GE credit: WC, WE.—II, III, IV. (Ii, Iii, Iv)

24S. Spanish Composition II (4)
Lecture—3 hours; extensive writing. Prerequisite: course 22. Development of advanced level writing skills, with particular emphasis on how to write oral communication skills at a more advanced level. Practice in more complex situations. Former course 9. GE credit: OL, WC.—I. (I.)

31. Intermediate Spanish for Native Speakers I (5)
Lecture/discussion—3 hours; tutorial—1 hour; frequent writing assignments. Prerequisite: course 3 or the equivalent, or consent of instructor. First course of a three-quarter series designed to provide bilingual students whose native language is Spanish with the linguistic and learning skills required for successfully completing upper division courses in Spanish. Intensive review of grammar and composition. GE credit: OL, WC, WE.—I. (I.)

32. Intermediate Spanish for Native Speakers II (5)
Lecture/discussion—3 hours; tutorial—1 hour; frequent writing assignments. Prerequisite: course 31 or consent of instructor. Continuation of intensive review of grammar and composition. Development of all language skills through reading of modern...
100. Principles of Hispanic Literature and Criticism (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 24 or 24S or 33. Prerequisites of literary criticism applied to the study of fiction, drama, poetry, and essay of major literary writers of the Hispanic world. Not open for credit to students who have completed course 100S. GE credit: ArtHum | AH, OL, WC, WE.—II, III. (II, III.)

105S. Principles of Hispanic Literature and Criticism (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 24 or 24S or 33. Principles of literary criticism applied to the study of fiction, drama, poetry, and essay of major literary writers of the Hispanic world. Offered in a Spanish speaking country under the supervision of a UC Davis faculty/lecturer. Not open for credit to students who have completed course 100. GE credit: ArtHum | AH, OL, WC, WE.—II, III, II, III, III.

110. Advanced Spanish Composition (4)
Lecture—3 hours; frequent writing assignments. Prerequisite: course 24 or 33. Practice in expository writing with emphasis on clarity and idiomatic expression. Practical application and review of selected grammar topics. (Part of former courses 110A and 110B.) GE credit: WE.—II, II, III, II, II, III.

111N. The Structure of Spanish: Sounds and Words (3)
Lecture—3 hours. Prerequisite: Linguistics 1 and course 24 or 33, or consent of instructor. A linguistic description of the sound patterns of Spanish and how those sounds can be used to form larger units, such as morphemes and words. Theoretical and practical comparisons with English and with other Romance languages. (Former course 132.) GE credit: ScoSci | SS.—II, III, II, II, II, III.

112N. The Structure of Spanish: Words and Phrases (3)
Lecture—3 hours. Prerequisite: course 111N. A study of Spanish word and phrase structure, with special emphasis on the constituent structure of noun and verb phrases. Theoretical and practical comparisons with English and with the Romance languages. (Former course 131.) GE credit: ScoSci | SS.—II, II, III, II, III.

113. Spanish Pronunciation (4)
Lecture—3 hours; term paper. Prerequisite: Linguistics 1 and course 24 or 33. The sound structure of modern Spanish; theoretical analysis of selection problems in pronunciation. Strongly recommended for prospective teachers of Spanish. GE credit: ScoSci | SS.—II, III, III.

114N. Contrastive Analysis of English and Spanish (4)
Lecture—3 hours; extensive writing. Prerequisite: Linguistics 1 and course 24 or 33, or consent of instructor; courses 111N and 112N recommended. Contrastive analysis of English and Spanish, error analysis, introduction to structuralist and transformational linguistics. Individual and group conferences. (Former course 137.) GE credit: ScoSci | SS.—II, III, III.

115. History of the Spanish Language (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 24 or 24S or 33 and Linguistics 1 or consent of instructor. The Spanish language from its roots in spoken Latin to modernity. Emphasis on the close relationship between historical events and language change, and the role that literature plays in language standardization. Not open for credit to students who have completed course 115S. GE credit: ArtHum or ScoSci | AH or SS.—II, III, III, III, III.

116. Applied Spanish Linguistics (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: Linguistics 1 and course 24, 24S or 33, or consent of instructor. Exploration of the major theoretical and practical issues concerning learning Spanish as a second language. For students interested in teaching Spanish as a career. Not open to students who have taken course 116S. Offered irregularly. GE credit: ScoSci | SS.—I, II, III, II, II, II, II, II, III.

116S. Applied Spanish Linguistics (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: Linguistics 1 and course 24, 24S or 33, or consent of instructor. Exploration of the major theoretical and practical issues concerning learning Spanish as a second language. Not open for credit to students who have taken course 116S. Offered irregularly. GE credit: ScoSci | SS.—I, II, III, II, II, II, III.

117. Teaching Spanish as a Native Tongue in the U.S.: Praxis and Theory (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: Linguistics 1; course 24, 24S or 33 or consent of instructor. Designed for students interested in teaching Spanish to native speakers. Focus on cultural diversity of the Spanish speaking population in the United States; applied language teaching methodologies in the context of teaching Spanish to native speakers at different levels. Offered in alternate years. GE credit: OL.—II, II, III, III.

118. Topics in Spanish Linguistics (4)
Lecture—3 hours; term paper. Prerequisite: courses 111 and 112. A study of specialized topics in Spanish linguistics, for example, language and use, text and context; language and society; bilingualism; Spanish dialectology; syntax and semantics. May be repeated one time for credit when topics differ. GE credit: ScoSci | SS.—II, III, III.

123. Creative Writing in Spanish (4)
Discussion—4 hours. Prerequisite: course 24 or 33, or consent of instructor. Intensive writing of poetry or fiction in Spanish or in a bilingual (Spanish/English) format. Students will write both in prescribed forms and in experimental forms of their own choosing. Offered in alternate years. GE credit: WE.—II, III.

130. Survey of Spanish Literature to 1700 (4)
Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Survey of Spanish literature from its origins in spoken Latin to modernity. Emphasis on the role of literature in shaping the political and cultural development of Spain, the role of literature in promoting national identity, and the role that literature plays in language standardization. GE credit: ArtHum | AH, WC.—I, II, III, III.

131N. Survey of Spanish Literature: 1700 to Present (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Survey of modern Spanish literature, providing an overview of the field of literary movements in Spanish literature, emphasizing the role of literature in promoting national identity, and the role that literature plays in shaping the political and cultural development of Spain, the role of literature in promoting national identity, and the role that literature plays in language standardization. GE credit: ArtHum | AH, WC.—II, III, III.

132. Golden Age Drama and Performance (4)
Lecture—1.5 hours; performance instruction—1.5 hours. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Focus on performance art. Close reading of plays and related aspects of seventeenth-century theater: the plays as a whole, the actors, the director, the sets and costumes. Final project is performance of a play. May be repeated twice for credit. GE credit: ArtHum | AH, WC, WE.—II, III.

133N. Golden Age Literature of Spain (4)
Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Critical interpretation of Don Quijote Part One by Cervantes. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—II, III, III.

134A. Don Quijote I (4)
Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Critical interpretation of Don Quijote Part One by Cervantes. Focus on key elements within the socio-cultural context of Golden Age Spain. Don Quijote as prototype for the modern novel. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—II, III.

134B. Don Quijote II (4)
Lecture—3 hours; term paper. Prerequisite: course 134A. Critical interpretation of Don Quijote Part Two by Cervantes. Focus on key elements within the socio-cultural context of Golden Age Spain. Don Quijote as prototype for the modern novel. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—II, III.

135N. Spanish Romanticism (4)
Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Romanticism as a philosophical concept, and as a literary movement in Spain, with emphasis on the distinctive, specific “romantic” qualities and its literary expression in five leading authors of the early nineteenth century. (Former course 154.) GE credit: ArtHum | AH, WC.—II, III.

136N. The Spanish Novel of the 19th Century (4)
Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Literary realism in Spain, focusing on two distinct authors: Emilia Pardo Bazán and Benito Pérez Galdós. GE credit: ArtHum | AH, WC.—II, III.
147. Anglos, Latinos, and the Spanish Black Legend: The Origins and Educational Implications of Prejudice (4) Lecture—3 hours; field work; term paper. Prerequisite: upper-division standing or consent of instructor. Examination of Anti-Hispanic prejudice in the United States focusing on the “Black Legend,” a 16th Century and subsequent myth underlying the doctrine of “Manifest Destiny.” Exploration of the Legend’s presence in contemporary American society through interviews and analysis of school textbooks. (Same course as Education 147.) Credit: ArtHum, Div. W | ACGH, AH, DD, WE.—González

148. Cinema in the Spanish-Speaking World in Translation (4) Lecture—3 hours; film viewing—3 hours. Prerequisite: course 24 or 24S or 33. Analysis of the culture of the Spanish-speaking world through film in translation. Emphasis on the cultural information illustrated by the films; no prior knowledge of cinematography required. Films with subtitles. Offered in a Spanish speaking country, in Spanish, under the supervision of UC Davis faculty. Credit to students who have completed course 148. GE credit: ArtHum, Div | AH, VI, LC.—III (III) Martínez-Carazo

1485. Cinema in the Spanish-Speaking World in Translation (4) Lecture—3 hours; film viewing—3 hours. Prerequisite: course 24 or 24S or 33. Analysis of the culture of the Spanish-speaking world through film in translation. Emphasis on the cultural information illustrated by the films; no prior knowledge of cinematography required. Films with subtitles. Offered in a Spanish speaking country, in Spanish, under the supervision of UC Davis faculty. Credit to students who have completed course 148. GE credit: ArtHum, Div | AH, VI, LC.—III (III) Martínez-Carazo

149. Latin-American Literature in Translation (4) Lecture/discussion—3 hours; term paper. Prerequisite: English 3 or the equivalent. Reading, lectures and discussions in English of works by Borges, Cortázar, Fuentes, García Márquez, Paz and others. May be repeated two times for credit. Offered in alternate years. GE credit: ArtHum | AH, WC.—II (II) Egan, Peluffo

150N. Survey of Latin American Literature to 1900 (4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Latin American literature from 1530 to 1900. Emphasis on the cultural information illustrated by the films; no prior knowledge of cinematography required. Films with subtitles. Offered in a Spanish speaking country, in Spanish, under the supervision of UC Davis faculty. Credit to students who have completed course 148. GE credit: ArtHum, Div | AH, VI, LC.—III (III) Martínez-Carazo

151. Survey of Latin American Literature from 1900 to Present (4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Latin American literature from 1900 to the present. Readings include fiction, poetry, drama, essays, memoirs, etc. GE credit: ArtHum | AH, WC.—II (II) Bejel, Bermucci, Egan

151N. Survey of Spanish-American Literature 1900 to Present (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Latin American literature from 1900 to the present. Readings include fiction, poetry, drama, essays, memoirs, etc. GE credit: ArtHum | AH, WC.—II (II) Bejel, Bermucci, Egan

152. Special Topics in Spanish Cultural and Literary Studies (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Special topics in the study of Spanish literature and culture. May be repeated two times for credit. GE credit: ArtHum | AH, OL, WC, 170—II, III, IV (III) Alls- ent, Arnieead, González, Martín, Martínez-Carazo

153. Spanish Art (4) Lecture—3 hours; term paper or discussion—1 hour. Spanish art and the different historical, sociological and political manifestations that frame it. History of art, including Paleolithic, Roman, Visigothic, Romanesque, Gothic, Renaissance, Baroque, Neoclassical and Contemporary art. GE credit: ArtHum | AH, VI, LC.—IV (IV) Martínez-Carazo

154. Topics in Spanish Cultural Studies (4) Lecture—3 hours; project. Prerequisite: course 24, 24S, or 33. Study of specific historical tendencies in Spanish culture(s) from the Romans to the present. Sources may include literature, film, art, journalism, and performance. Approaches to material may address issues of aesthetics, politics, identity, and globalization. May be repeated one time for credit. GE credit: ArtHum | AH, WC.—II (II) González, Martínez-Carazo

155. Mexican Novel (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Evolution of the Mexican novel from the 19th century to the present. Emphasis on significant contemporary works. Offered in alternate years. GE credit: ArtHum | AH, WC.—III (III) Bermucci, Egan

156. Latin American Literature of the Turn of the 20th Century (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Modernism as an authentic expression of Latin American literature and its influence on 20th-century poetry and prose. In depth analysis of the works of Darío and other major writers of the era. Offered in alternate years. GE credit: ArtHum | AH, WC.—III (III) Egan, Peluffo

157. Great Works of Latin American Literature/Culture (4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Study of major works of Latin American literature and culture and their cultural milieu. May include novels, poetry, film, etc. Works may be analyzed in terms of style, influence, cultural significance, political importance, and/or commercial success. Offered in alternate years. GE credit: ArtHum | AH, WC.—II (II) Bejel, Bermucci, Egan, Irwin, Lazzara, Peluffo

158. Latin American Poetry: From Vanguardism to Surrealism and Beyond (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Study of vanguardism, surrealism, and more recent movements of Latin American poetry. An in-depth analysis of the works of such major poets as Neruda, Vallejo, and Paz. Offered in alternate years. GE credit: ArtHum | AH, WC.—II (II) Bejel, Bermucci, Egan

159. Special Topics in Latin American Literature and Culture (4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Special topics in the study of Latin American literature and culture. May be repeated two times for credit when topic differs. Offered in alternate years. GE credit: ArtHum | AH, WC.—II (II), III, IV (II, III, IV) Bejel, Bermucci, Egan, Irwin, Lazzara, Peluffo

160. Latin American Women Writers in Translation (4) Lecture—discussion—3 hours; term paper. Prerequisite: upper-division standing or consent of instructor. Latin American women writers from the 19th and 20th centuries. Recent theoretical approaches to literary and cultural studies. Discussion in English of works by Matto de Turner, Avellaneda, Stam, Ocampo, Agustini, Mistral, Castellanos, and others. Offered in alternate years. GE credit: ArtHum, Div. W | AH, WC.—III (III) Lazzara, Peluffo

161. Introduction to Latin American Culture (4) Lecture—3 hours; term paper. Prerequisite: course 24, 24S or 33. Introduction to history, geography and culture of Latin America. Discussions in English of works by Matto de Turner, Avellaneda, Stam, Ocampo, Agustini, Mistral, Castellanos, and others. Offered in alternate years. GE credit: ArtHum | AH, WC.—III (III) Lazzara, Peluffo

162. Implications of Anti-Hispanic Prejudice (4) Lecture—3 hours; term paper. Prerequisite: course 100, 100S, 141, 141S, 170 or 170S. Study of the roots and consequences of anti-Hispanic prejudice. Offered in alternate years. GE credit: ArtHum | AH, WC, WE.—III (III) Altisent
1705. Introduction to Latin American Culture (4) Lecture—3 hours; project. Prerequisite: course 24, 24S, or 33. Introduction to history, geography, and culture of Latin America. Multiple genres of cultural production and representation, with a focus on cultural diversity and regional difference. Introduction to critical reading and textual analysis. Not open for credit for students who have completed course 170. GE credit: ArtHum, Div | AH, VI, WC, WE.—III. (III.) Alarcón, Lazzara, Peluffo

171. Music from Latin America (4) Lecture—3 hours; discussion—1 hour. Prerequisite: consent of instructor. Examination of music from Latin America. Characteristic music (i.e. tango, bossa nova, salsa, motaola, musica andina) as well as its implications in other musical genres. Taught in Spanish. Not open to students who have taken course 171S or Music 127. (Same course as Music 127) May be repeated one time for credit when content differs. Offered in alternate years. GE credit: ArtHum | AH, WC.—II. Irwin, Ortiz

172. Mexican Culture (4) Lecture—3 hours; term paper or discussion—1 hour or term paper. Prerequisite: course 24, 24S or 33. Study of Mexican culture through a diversity of cultural expressions, including elite, popular and mass media culture. Focus on national icons and archetypes, multiculturalism. May be repeated once for credit. GE credit: ArtHum, Div | AH, VI, WC.—III. (III.) Egan, Irwin

173. Cinema and Latin American Culture (4) Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 24, 24S, or 33. Understanding Latin American Cinema. History and critical analysis of Latin American film. Focus on a national cinematic tradition. Comparative experiences in different parts of Latin America and/or a particular era. Conducted entirely in Spanish. May be repeated one time for credit. GE credit: ArtHum, Div | AH, VI, WC.—Irwin

174. Chicano Culture (4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 24 or 33. An interdisciplinary survey of Chicano culture. Topics include literature, art, folklore, oral tradition, music, politics, as well as everyday cultural phenomena. Conducted in Spanish. (Former course 124.) GE credit: ArtHum, Div | AGCH, AH, DD.—II. (II.) Alarcón

175. Topics in Spanish American Cultural Studies (4) Lecture—3 hours; project—1 hour. Prerequisite: course 24, 24S, or 33. Specific historical tendencies and issues in Latin American culture(s) from pre-Columbian times to present. Studies of literature, film, art, journalism and performance. Focus on issues of aesthetic, political, and globalization. May be repeated once for credit if content differs. GE credit: ArtHum, Div | AH, VI, WC, WE.—III. (III.) Bejel, Irwin, Lazzara, Peluffo

176. Literature in Spanish Written in the United States (4) Lecture—3 hours; term paper. Prerequisite: course 24 or 33. Survey of the literary and cultural contributions of the main Spanish-speaking populations present in the U.S. (i.e. Chicanos, Puerto Ricans, Cubans, Americans, Central Americans, and others). GE credit: ArtHum, Div | AGCH, AH, DD.—III. (III.) Alarcón

177. California and Latin America (4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 24, 24S or 33. Interdisciplinary survey on the relationship between California and Latin America (1500s-present). Latin American representation in California, L.A. Chicano, and California representations of Latin America, as well as borders texts, with a special focus on Mexican-American perspectives. Conducted in Spanish. GE credit: AGCH, DD.—Irwin

180. Senior Seminar in Spanish Linguistics (4) Seminar—3 hours; term paper. Prerequisite: senior standing; a major in Spanish or consent of instructor. Group study of a special topic drawn from Spanish linguistics. Limited enrollment. May be repeated one time for credit. GE credit: ArtHum, Div | AH or SS, OL, WE.—I. (I.) Blake, Bradley, Colombi

181. Senior Seminar in Spanish Literature/Culture (4) Seminar—3 hours; term paper—1 hour. Prerequisite: senior standing; a major in Spanish or consent of instructor. Group study of a special topic drawn from Spanish literature or cultural studies. Independent research project. May be repeated one time for credit if content differs. Limited enrollment. GE credit: ArtHum | AH, OL, WE.—II. (II.) Aliscens, González, Martín, Martínez-Corazo

182. Senior Seminar in Latin American Literature/Culture (4) Seminar—3 hours; term paper—1 hour. Prerequisite: senior standing; a major in Spanish or consent of instructor. Group study of a special topic drawn from Latin American literature or cultural studies. Independent research project. May be repeated one time for credit if content differs. GE credit: ArtHum, Div | AH, OL, WC, WE.—III. (III.) Bejel, Egan, Irwin, Lazzara, Peluffo

1921. Internship in Spanish (1-12) Independent study—3-36 hours. Prerequisite: course 23; junior standing or consent of instructor. Internship in Spanish. Limited to 8 units. Units will not count toward the Spanish major. (P/NP grading only)

194H. Special Study for Honors Students (1-5) Independent Study—3-15 hours. Prerequisite: senior standing and qualification for the Spanish honors program. Guided research, under the direction of a faculty member, leading to a senior honors thesis on a topic in Spanish literature, civilization, or language studies. May be repeated for up to 8 units of credit. (P/NP grading only; GE credit: AH, WC, WE)

197T. Tutoring in Spanish (1-4) Tutorial—1-4 hours. Prerequisite: upper division standing and permission of the chair. Tutoring in undergraduate courses including leadership in small voluntary discussion groups affiliated with departmental courses. May be repeated for credit for a total of 6 units. (P/NP grading only)

197TC. Tutoring in the Community (2-4) Tutorial—2-4 hours. Prerequisite: upper division standing and permission of the chair. Tutoring in public schools under the guidance of a regular teacher and supervision by a departmental faculty member. May be repeated for credit for a total of 6 units. (P/NP grading only)

199. Directed Research Study (1-5) Prerequisite: consent of instructor and Department Chairperson. (P/NP grading only) GE credit: AH, WC, WE

199 Special Study for Advanced Undergraduates May be repeated for up to 6 units of credit (P/NP grading only). GE credit: AH, WC, WE

Graduate

201. Literary Theory I (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Basic theories and practical approaches to modern and contemporary Hispanic literature. Formalism, poststructuralism, socio-cultural discourses, and ideologies. (Offered in alternate years) I (II.) Bejel

202. Literary Theory II (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Major contemporary critical theories including recent, innovative approaches to Hispanic literature and culture. Readings from Semiotics and Deconstructionism to Psychological and Sociological approaches. Emphasis on Postmodern and Neo-colonial discourse. (Offered in alternate years) I (II.) Bejel

203. Research Methodologies (1) Seminar—2 hours. Introduction to the range of scholarly research methodologies currently being realized in Spanish linguistics, literary and cultural studies: archival research, textual analysis, discourse analysis, statistics for linguistics, et c. introduction to scholarly writing (MLA style) and scholarly publishing. (S/U grading only). (II.) Bejel, Bernucci, Blake, Carazo, Colombi, Egan, Irwin, Martín, Martínez-Lazzara, Newcomb, Peluffo

205. Spanish Phonology (4) Seminar—3 hours; term paper. Prerequisite: some knowledge of phonetics is required and consent of instructor. Linguistics 109 and 139 highly recommended. Analyzes the sound patterns of Spanish from both linear and nonlinear perspectives. Students will develop a clear understanding of what phonology and the nature of Spanish phonology, as defined by modern linguistic analysis. (II.)

206. Spanish Syntax (4) Seminar—3 hours; term paper. Prerequisite: Linguistics 140 and 165. An examination of Spanish word order within the framework of general linguistic theory. The student will investigate how to write a grammar of Spanish with particular attention to the structure of noun and verb clauses. (I.) Blake

207. History of the Spanish Language (4) Seminar—3 hours; term paper. Prerequisite: Latin 1. (Former course 202A.) I, II, III, IV. (III.) Blake

208. Old Spanish Texts (4) Seminar—3 hours; term paper. Prerequisite: course 207. An in-depth linguistic examination of Old Spanish texts from the 12th to the 15th centuries, with particular attention to the significance of orthographic changes. (II.) Blake

211. Hispanic Dialectology (4) Seminar—3 hours; term paper. Prerequisite: course 220 or consent of instructor. Descriptive and historical study of the distinctive features of Peninsular and American Spanish dialects. (Former course 221.)—I, II, III, IV

212. Applied Linguistics (4) Seminar—3 hours; term paper. Prerequisite: graduate standing and courses 215 and 216 recommended. Focuses on the relevant linguistic aspects of teaching Spanish. Designed for graduate students who have an interest in second-language learning and teaching. (II.) Colombi, Blake

215. Special Topics in Hispanic Linguistics (4) Seminar—3 hours; term paper. Prerequisite: consent of instructor, courses 205 and 206 recommended. Specialized topics in Hispanic linguistics (e. g., pragmatics, sociolinguistics, topics in syntax, semantics, or diachronic studies). May be repeated for credit when topic differs. (II.)

222. Critical Approaches to Spanish Literature I: Prose and Essay (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Critical approaches to Spanish narrative and essay. May be repeated two times for credit when topic differs. Offered in alternate years. (II.) Aliscens, Martin

223. Critical Approaches to Spanish Literature II: Poetry and Drama (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Critical approaches to Spanish poetry and drama. May be repeated two times for credit when topic differs. Offered in alternate years. (II.) Aliscens, Martin

224. Studies of a Major Writer, Period, or Genre in Spanish Literature (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Artistic development of a major Spanish writer and his/her...
intellectual and literary milieu or study of a special topic, period, or genre. May be repeated for credit with consent of instructor.—(III.)

220. Catalan Language and Culture (4)
Lecture/discussion—3 hours; laboratory—1 hour. Prerequisite: good command of Spanish, Portuguese, French or Italian and graduate level of study in these other languages. Open to advanced undergraduate students, with notions of Catalan, can be admitted with consent of instructor; designed for graduate students. Foundation for the acquisition of Catalan as a resource and for elementary writing level skills for students of Spanish (Iberianists or Hispanicists), with the capacity to interpret educated written language. Emphasis on weekly review of grammar and all language skills. Offered irregularly.—I. Altisent

231. Interamerican Studies (4)
Seminar—3 hours; term paper. Survey of methodological investigations of research for transnational or comparative projects in the geographical context of the Americas. Focus on particular problems of language, discipline, national definitions, and global hierarchies of knowledge that complicate such projects. Readings of interamerican cultural texts. Offered in alternate years.—(II.) Irwin

252. Medieval Spanish Literature: Prose (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. An exploration of the major genres of medieval Spanish prose from its origins to 1450.—I. (I.)

253. Medieval Spanish Literature: Epic (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Medieval Spanish epic literature; major theoretical perspectives on the genesis, diffusion, and character of the Medieval epic. Relationship of epic to ballad literature.—II. (II.)

254. Medieval Hispanic Lyric (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Analysis of the most representative lyric poetry in the various Peninsula languages and in provencal, troubadour poetry, Ahd, villancicos, cantigas de amigo, and courtly lyric.—III. (III.)

255. Spanish Literature of the Early Renaissance (4)
Seminar—3 hours; term paper. Spanish literature, 1450-1550, with emphasis on La Celestina. (Former course 229.)—I. (I.) Martin

256. Spanish Literature of the Renaissance and Golden Age: Poetry (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Exegetical critical study of the main currents of Renaissance and Baroque Spanish poetry through its language structures, styles ("Culturismo-Conceptismo"), rhetorical devices, myths, and themes (love, death, time).—I. (I.) Martin

257. Spanish Literature of the Renaissance and Golden Age: Drama (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. An exploration of major 16th and 17th century literary and cultural developments through the study of selected dramas.—I. (I.) Martin

258. Spanish Literature of the Renaissance and Golden Age: Prose (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. The origins and development of the Spanish novel during the Renaissance and the Spanish Golden Age.—I. (I.) Martin

259. Cervantes and the Novel (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. The narrative works of Miguel de Cervantes with special emphasis on Don Quijote.—I. (I.) Martin

260. Modern Spanish Literature (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Topics of Spanish literature, from 1700-1920.—I. (I.)
A.B. Major Requirements:

Preparatory Subject Matter .......... 19-23
Mathematics 16A, 16B, 16C, or 17A, 17B, 17C; or 21A, 21B, 21C .......... 9-12
Mathematics 22A ................................ 3
Computer Science Engineering 30 or
Computer Science Engineering 40 (or the equivalent) .................. 4
Statistics 32 .................................. 4

Depth Subject Matter ................. 45-48
Statistics 106, 108, 138 or the equivalent ........................................ 12
Statistics 130A, 130B ....................... 8
Statistics 137 or 141 .......................... 4
Three courses from Statistics 104, 135, 137, 141, 142, 144, 145 .......... 12
Related elective courses ................. 9-12
Three upper division courses approved by major adviser; they should follow a coherent sequence in one single discipline in the social sciences where statistical methods and models are applied and should cover the quantitative aspects of the discipline.

Total Units for the Major ............... 64-71

B.S. Major Requirements:

General Statistics option UNITS

Preparatory Subject Matter .......... 30-32
Mathematics 21A, 21B, 21C, 21D ............ 16
Mathematics 22A, or 67 ................... 3-4
Mathematics 25 ................................ 4
Computer Science Engineering 30 or
Computer Science Engineering 40 (or the equivalent) .................. 4
Any one introductory statistics course except Statistics 10 ..................... 3-4

Depth Subject Matter ................. 51-52
Statistics 131A, 131B ....................... 8
Three courses from Statistics 104, 135, 137, 141, 142, 144, 145 .......... 12
Mathematics 125A, 108 or 125B, and 167 ........................................ 12
Related electives ......................... 3-4
One upper division course approved by major adviser; it should be in mathematics, computer science or in quantitative aspects of a substantive discipline.

Total Units for the Major ............... 81-84

Applied Statistics option

Preparatory Subject Matter .......... 26-31
Mathematics 22A ................................ 3
Computer Science Engineering 30 or
Computer Science Engineering 40 (or the equivalent) .................. 4
Two introductory courses serving as the prerequisites to upper division courses in a chosen discipline to which statistics is applied .................. 7-8
Any one introductory statistics course except Statistics 10 ..................... 3-4

Depth Subject Matter ................. 51-56
Statistics 130A, 130B ....................... 8
Three courses selected from Statistics 104, 135, 137, 142, 144, 145 .......... 12
Five upper division elective courses outside of Statistics ........................... 15-20
Electives are chosen with and must be approved by the major adviser. Electives should follow a coherent sequence in one single discipline where statistical methods and models are applied: at least three of them should cover the quantitative aspects of the discipline.

Total Units for the Major ............... 77-87

Computational Statistics option Preparatory Subject Matter .......... 30-31
Mathematics 21A, 21B, 21C, 21D ............ 16
Mathematics 22A ................................ 3
Computer Science Engineering 30 or
Computer Science Engineering 40 (or the equivalent) .................. 4
Any one introductory statistics course except Statistics 10 ..................... 3-4

Depth Subject Matter ................. 52
Statistics 106, 108, 141 ..................... 12
Statistics 131A, 131B ....................... 8
Two courses from Statistics 104, 135, 137, 138, 142, 144, 145 .......... 16
Programming, Data Management & Data Technologies: Computer Science Engineering 130 or 145, and 165A or 166 ........ 8
Two courses on Scientific Computational Algorithm and Visualization from: Computer Science Engineering 122A, 129, 140A, 138, 139, 163 .......................... 16

Total Units for the Major ............... 82-83

Major Adviser: A. Aue

Students are encouraged to meet with an adviser to plan a program as early as possible. Sometimes before or during the first quarter of the junior year, students planning to major in Statistics should consult with a faculty adviser to plan the remainder of their undergraduate programs.

Minor Program Requirements: The Department offers a minor program in Statistics that consists of five upper division level courses focusing on the fundamentals of mathematical statistics and of the most widely used applied statistical methods.

Minor Program Requirements:

Students must complete five upper division level courses focusing on the fundamentals of mathematical statistics and of the most widely used applied statistical methods. The Department offers such courses in the following disciplines: Mathematics, Computer Science, and Economics.

Statistics 106, 108, and 130A-130B or 131A:131B .................... 16
One course from: Statistics 104, 135, 137, 138, 141, 142, 144, 145 .... 4
Preparation: Statistics 13 or 22 or 100 or 102 .......................... 8

Graduate Study. The Graduate Program in Statistics offers study and research leading to the M.S. and Ph.D. degrees in Statistics, including a Ph.D. in Statistics with an emphasis in Biostatistics. Detailed information concerning these degree programs, as well as information on admissions and on financial support, is available from the Department of Statistics.

Graduate Adviser: D. Paul

Statistical Consulting. The Department provides a consulting service for researchers on campus. For more information, call the Statistical Laboratory office 530-752-6096.

Integrated B.S./M.S. Degree Program

The Department offers undergraduate majors a path into the Statistics M.S. program through the Integrated Degree Program (I.D.P.). This program is intended for students who seek to be employed as statisticians in government or industry. The minimum
major GPA requirement is 3.200 at the end of the junior year, although students with demonstrated excellence, at the discretion of the academic work (with a major GPA of 3.500 or above) are most likely to be admitted. Students with a major GPA of 3.500 or above may waive the GRE requirement in the M.S. application. Before moving into the graduate phase, I.D.P. students must satisfy all requirements of the B.S. degree.

To apply for the I.D.P., undergraduate students must submit the Statistics I.D.P. form along with supporting documentation during the last quarter of their junior year. In addition, applicants must submit an application to the M.S. program during the senior year prior to the deadline of May 31st. Before applying to the I.D.P., students are strongly advised to consult with both the undergraduate and graduate advisers.

Once a student enters the graduate phase of the I.D.P., they follow the course requirements for the Master’s degree (36 units, 18 of which are graduate level). A maximum of 12 units taken in the undergraduate phase can be transferred to the M.S. program. Students have not been allowed to satisfy any requirements of the B.S. degree.

Courses in Statistics (STA)

Lower Division

10. Statistical Thinking (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: two years of high school algebra. Statistics and probability in daily life. Examines principles of collecting, presenting and interpreting data in order to critically assess results reported in the media. Emphasizes understanding polls, unemployment rates, health studies; understanding probability, risk and odds. GE credit: SciEng | QL, SE.—I, II, III.

12. Introduction to Discrete Probability (4)
Lecture—3 hours; laboratory—1 hour. Prerequisite: two years of high school algebra. Random experiments; countable sample spaces; elementary probability axioms; counting formulas; conditional probability; Bayes theorem; expectation; gambling problems; binomial, hypergeometric, Poisson, geometric, negative binomial and multinomial models; limiting distributions; Markov chains. Applications not used to be satisfied any requirements of the B.S. degree.

Upper Division

100. Applied Statistics for Biological Sciences (4)
Lecture—3 hours; laboratory—1 hour. Prerequisite: Mathematics 16B or the equivalent. Descriptive statistics, probability, sampling distributions, estimation, hypothesis testing, contingency tables, ANOVA, regression; implementation of statistical methods using computer package. Only two units credit allowed to students who have taken courses 13, 32 or 103. Not open for credit to students who have taken course 102. GE credit: SciEng | QL, SL.—I, II, III.

90X. Seminar (1-2)
Seminar—1 to 2 hours. Prerequisite: high school algebra and consent of instructor. Examination of a special topic in a small group setting.

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

120. Probability and Random Variables for Engineers (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 21A, B, C. And D. Basic concepts of probability theory with applications to electrical engineering, discrete and continuous random variables, conditional probability, combinatorics, bivariate distributions, transformation of variables, large numbers, central limit theorem, and approximations. No credit for students who have completed course 131A or Civil and Environmental Engineering 114. GE credit: SciEng | QL, SE.—I, II, III.

130A. Mathematical Statistics: Brief Course (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 16B. Basic probability, densities and distributions, mean, variance, covariance, Chebyshev’s inequality, some special distributions, sampling distributions, central limit theorem and law of large numbers, point estimation, some methods of estimation, interval estimation, confidence intervals for certain quantities, computing sample sizes. Only 2 units of credit allowed to students who have taken course 131A. GE credit: SciEng | QL, SE.—I (I).

130B. Mathematical Statistics: Brief Course (4)

131A. Introduction to Probability Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 131A. Probability and random variables, discrete and continuous random variables, random processes, moment generating functions, laws of large numbers and the central limit theorem. Not open for credit to students who have completed Mathematics 135A. GE credit: SciEng | QL, SE.—I, II, III.

131B. Introduction to Mathematical Statistics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 131B, or consent of the instructor. Sampling, methods of estimation, sampling distributions, confidence intervals, testing hypotheses, linear regression, analysis of variance, elements of large sample theory and nonparametric inference. GE credit: SciEng | QL, SE.—II, III.

131C. Introduction to Mathematical Statistics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 131C, or consent of the instructor. Sampling, methods of estimation, sampling distributions, confidence intervals, testing hypotheses, linear regression, analysis of variance, elements of large sample theory and nonparametric inference. GE credit: SciEng | QL, SE.—II, III.

133. Mathematical Statistics for Economists (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 103 and Mathematics 168, or the equivalents; no credit will be given to students majoring in Statistics, Probability, or Civil and Environmental Engineering 114. Multiple continuous random variables (binomial, normal, t, chi-square); expectation and variance of a random variable; bivariate random variables (bivariate normal); sampling distributions, central limit theorem, estimation, maximum likelihood principle; basics of hypotheses testing [one-sample]. GE credit: SciEng | QL, SE.

135. Multivariate Data Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 130B, and preferably course 131B. Multivariate normal distribution; Mahalanobis distance; sampling distributions of the mean vector and covariance matrix; Hotelling’s T²; simultaneous inferential...
expectation. Topics selected from martingales, Markov chains, ergodic theory. (Same course as Mathematics 235A.)—II, III. (III.)

237A-237B. Time Series Analysis (4-4)
Lecture—3 hours; term paper. Prerequisite: course 131B or the equivalent; course 237A is a prerequisite for course 237B. Advanced topics in time series analysis. Models for experimental data, measures of dependence, large-sample theory, statistical estimation and inference. Univariate and multivariate spectral analysis, regression, ARIMA models, state-space models, Kalman filtering.
Offered in alternate years. —II, III.

238. Theory of Multivariate Analysis (4)
Lecture—3 hours; term paper. Prerequisite: courses 131B and 135. Multivariate normal and Wishart distributions, Hotelling’s T-squared, simultaneous inference, likelihood ratio and union intersection tests, Bayesian methods, discriminant analysis, principal component and factor analysis, multivariate clustering, multivariate regression, analysis of variance, application to data. Offered in alternate years. —II.

240A-240B. Nonparametric Inference (4-4)
Lecture—3 hours; term paper. Prerequisite: course 231C, courses 235A-235B-235C recommended. Topics in asymptotic theory of statistics chosen from weak convergence, contiguity, empirical processes, Edgeworth expansion, and semiparametric inference. Offered in alternate years. (III.)

241. Asymptotic Theory of Statistics (4)
Lecture—3 hours; term paper. Prerequisite: course 231C; courses 235A-235B-235C desirable. Topics in asymptotic theory of statistics chosen from weak convergence, contiguity, empirical processes, Edgeworth expansion, and semiparametric inference. Offered in alternate years. (III.)

242. Introduction to Statistical Programming (4)
Lecture—3 hours; laboratory—1 hour. Prerequisite: courses 130A and 130B or equivalent. Essentials of statistical computing using a general-purpose statistical language. Topics include algorithms; design, debugging and efficiency; object-oriented concepts; model specification and fitting; statistical visualization; data and text processing; databases; computer systems and platforms; comparison of scientific programming languages. Offered in alternate years. —II.

243. Computational Statistics (4)
Lecture—3 hours; laboratory—1 hour. Prerequisite: courses 130A and 130B or equivalent, and Mathematics 167 or Mathematics 67 or equivalent. Numerical analysis; random number generation; computer experiments and resampling techniques (bootstrap, cross validation); numerical optimization; matrix decompositions and linear algebra computations; algorithms (Markov chains, Monte Carlo, expectation-maximization); algorithm design and efficiency; parallel and distributed computing. Offered in alternate years. —II.

250. Topics in Applied and Computational Statistics (4)
Lecture—3 hours; lecture/discussion—1 hour. Prerequisites: course 131A; course 232A recommended, not required. Resampling, nonparametric and semiparametric models, incomplete data analysis, diagnostics, multivariate and time series analysis, applied Bayesian methods, sequential analysis and quality control, categorical data analysis, spatial and image analysis, computational biology, functional data analysis, models for correlated data learning theory. May be repeated for credit with consent of graduate adviser. Offered irregularly. —I, II, III.

251. Topics in Statistical Methods and Models (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 231B or the equivalent. Topics may include Bayesian analysis, nonparametric and semiparametric regression, sequential analysis, bootstrap, statistical methods in high dimensions, reliability, spatial processes, inference for stochastic process, stochastic methods in finance, empirical processes, change-point problems, asymptotics for parametric, nonparametric and semiparametric models, nonlinear time series, robustness. May be repeated for credit with consent of instructor. Offered irregularly. —II.

252. Advanced Topics in Biostatistics (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course 222, 223. Biostatistical methods and models selected from the following: genetics, bioinformatics and genomics; longitudinal or functional data; clinical trials and experimental design; animal and human; science and engineering; nutrition and toxicology; survival analysis; observational studies and epidemiology; computer-intensive or Bayesian methods in biostatistics. May be repeated for credit with consent of adviser when topic differs. (Same course as Biostatistics 252.) Offered in alternate years. —III.

280. Orientation to Statistical Research (2)
Seminar—2 hours. Prerequisite: consent of instructor. Guided orientation to original statistical research papers, and oral presentations in class of such papers by students under the supervision of a faculty member. May be repeated one time for credit. (S/U grading only.)—II.

290. Seminar in Statistics (1-6)
Prerequisite: consent of instructor. Seminar on advanced topics in probability and statistics. (S/U grading only.)—I, II, III. (I, II, III.)

292. Graduate Group in Statistics Seminar (1-2)
Seminar—1-2 hours. Prerequisite: graduate standing. Advanced study in various fields of statistics with emphasis in advanced topics presented, by members of the Graduate Group in Statistics and other guest speakers. (S/U grading only.)—II, III. (I, II, III.)

299. Individual Study (1-12)
Prerequisite: consent of instructor. (S/U grading only.)

299D. Dissertation Research (1-12)
Prerequisite: advancement to candidacy for Ph.D., consent of instructor. (S/U grading only.)

300. Professional (1-4)

300A. Methods of Teaching Statistics (2)
Lecture/discussion—1 hour; laboratory—1 hour. Prerequisite: graduate standing. Practical experience in methods/problems of teaching statistics at university undergraduate level. Lecturing techniques, analysis of tests and supporting material, preparation and grading of examinations, and use of statistical software. Emphasis on practical training. May be repeated for credit. (S/U grading only.)—I, II, III.

365. Teaching Assistant Training Practicum (1-4)
Prerequisite: consent of instructor; graduate standing. (S/U grading only.)—I, II, III, IV, V, VI, VII. (I, II, III.)

369. Methods in Statistical Consulting (3)
Lecture—3 hours; discussion—1 hour. Introduction to consulting, in-class consulting as a group, statistical consulting with clients, and in-class discussion of consulting problems. Clients are drawn from a pool of University students. Must be enrolled in the graduate program in Statistics or Biostatistics. May be repeated for credit with consent of graduate adviser. Offered irregularly. (S/U grading only.)—I, II, III, IV, V, VI, VII. (I, II, III.)

390. Methods of Teaching Statistics (2)
Lecture/discussion—1 hour; laboratory—1 hour. Prerequisite: graduate standing. Practical experience in methods/problems of teaching statistics at university undergraduate level. Lecturing techniques, analysis of tests and supporting material, preparation and grading of examinations, and use of statistical software. Emphasis on practical training. May be repeated for credit. (S/U grading only.)—I, II.

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: consent of instructor; graduate standing. (S/U grading only.)—I, II, III, IV, V, VI, VII. (I, II, III.)

399. Individual Study (1-12)
Prerequisite: consent of instructor. (S/U grading only.)

399D. Dissertation Research (1-12)
Prerequisite: advancement to candidacy for Ph.D., consent of instructor. (S/U grading only.)

400. Methods in Statistical Consulting (3)
Lecture—3 hours; discussion—1 hour. Introduction to consulting, in-class consulting as a group, statistical consulting with clients, and in-class discussion of consulting problems. Clients are drawn from a pool of University students. Must be enrolled in the graduate program in Statistics or Biostatistics. May be repeated for credit with consent of graduate adviser. Offered irregularly. (S/U grading only.)—I, II, III, IV, V, VI, VII.

401. Methods in Statistical Consulting (3)
Lecture—3 hours; discussion—1 hour. Introduction to consulting, in-class consulting as a group, statistical consulting with clients, and in-class discussion of consulting problems. Clients are drawn from a pool of University students. Must be enrolled in the graduate program in Statistics or Biostatistics. May be repeated for credit with consent of graduate adviser. Offered irregularly. (S/U grading only.)—I, II, III, IV, V, VI, VII.

Hans-Georg Müller, Ph.D., Chairperson of the Program

Program Office. 4118 Mathematical Sciences Building 530-692-5194
http://www.stat.ucdavis.edu

Faculty

Examples, Associated Professor (Statistics)
Alexander Ave, Ph.D., Associate Professor (Statistics)
Paul Baines, Ph.D., Assistant Professor (Statistics)
Laurel Beckett, Ph.D., Professor (Public Health Sciences)
Paul Baines, Ph.D., Assistant Professor (Statistics)
Prabir Burman, Ph.D., Professor (Statistics)
Colin Cameron, Ph.D., Professor (Economics)
Hao Chen, Ph.D., Assistant Professor (Statistics)
Christiana Drake, Ph.D., Professor (Statistics)
Thomas B. Farver, Ph.D., Professor (Population Health and Reproduction)
Peter Hall, Ph.D., Professor (Statistics)
Fushing Hsieh, Ph.D., Professor (Statistics)
Jiming Jiang, Ph.D., Professor (Statistics)
Oscar Jorda, Ph.D., Professor (Economics)
Thomas Lee, Ph.D., Professor (Statistics)
Hans-Georg Müller, M.D., Ph.D., Professor (Statistics)
Debashis Paul, Ph.D., Associate Professor (Statistics)
Jie Peng, Ph.D., Associate Professor (Statistics)
Wolfgang Polonik, Ph.D., Professor (Statistics)
David Rocke, Ph.D., Professor (Public Health Sciences)
Nedok Saito, Ph.D., Professor (Mathematics)
Duncan Temple Lang, Ph.D., Professor (Statistics)
Chih-Ling Tsai, Ph.D., Professor (Graduate School of Management)
Jane-Ling Wang, Ph.D., Professor (Statistics)

Emeriti Faculty

Examples, Emeritus Professor Emeritus
PK. Bhattacharya, Ph.D., Professor Emeritus
Alan P. Fenech, Ph.D., Professor Emeritus
George G. Roussas, Ph.D., Professor Emeritus
Yue-Polk [Ed] Mack, Ph.D., Professor Emeritus
Francisco J. Samaniego, Ph.D., Professor Emeritus
Robert H. Shumway, Ph.D., Professor Emeritus
Alvin D. Wiggins, Ph.D., Professor Emeritus

Affiliated Faculty

Examples, Lecturer (Statistics)

Graduate Study. The Graduate Program in Statistics offers programs of study and research leading to the M.S. and Ph.D. degrees. The M.S. gives students a strong foundation in the theory of statistics as well as substantial familiarity with the most widely used statistical methods. Facility in computer programming is essential for some of the course work. The supervised statistical consulting required of M.S. students has proven to be a valuable educational experience. The Ph.D. program combines advanced course work in statistics and probability with the opportunity for indepth study in an applied field. For detailed information contact the Chairperson of the Program or the Graduate Adviser.

Preparation. Preparation for the graduate program requires a year of calculus, a course in linear algebra, facility with a programming language and upper division coursework in mathematics and/or statistics. For admission to the Ph.D. program, coursework requirements for the M.S. degree, and at least one semester/two quarters of advanced calculus must be completed.

Graduate Adviser, Debasish Paul (Statistics)
Study of Religion
(A Graduate Group)

Archana Venkatesan, Ph.D., Chairperson of the Group
Program Office. 216 Sproul Hall 530-752-5799; Fax 530-752-8630
http://religiongradgroup.ucdavis.edu/

Faculty
Emily Albu, Ph.D., Professor (Classics)
David Biale, Ph.D., Professor (History)
Catherine Chin, Ph.D., Professor (Religious Studies)
Allison Coudert, Ph.D., Professor (Religious Studies)
Mark K. Elmore, Ph.D., Professor (Religious Studies)
Elizabeth Freeman, Ph.D., Professor (English)
John R. Hall, Ph.D., Professor (Sociology)
Mark Halperin, Ph.D., Professor
(Associate American Languages)
A. Kate Harris, Ph.D., Professor (Music)
Milmon F. Harrison, Ph.D., Professor
(African American & African Studies)
Inés Hernández-Avilá, Ph.D., Professor
(Native American Studies)
Naomi Janowitz, Ph.D., Professor
(Comparative Literature & Religious Studies)
A. Katie Harris, Ph.D., Professor (History)
John Smolenski, Ph.D., Professor (History)
Henry Spiller, Ph.D., Professor (Music)
Smith Srinivas, Ph.D., Professor (Anthropology)
Daniel Stolzenberg, Ph.D., Professor (History)
Mairaj Syed, Ph.D., Professor (Religious Studies)
Jan Szarl, Ph.D., Professor (Philosophy)
Baki Tezcan, Ph.D., Professor
(History & Religious Studies)
Archana Venkatesan, Ph.D., Professor
(Comparative Literature & Religious Studies)
Fethiye Kavas, Ph.D., Professor (History)
Keith Watenpaugh, Ph.D., Professor
(Religious Studies)
Diane Wolf, Ph.D., Professor (Sociology)
Aram Vagnozian, Ph.D., Professor (Anthropology)
Michael Ziser, Ph.D., Professor (English)

Graduate Study. The Graduate Group in the Study of Religion offers students classical training in the literatures of particular religious traditions, and they are encouraged to understand these traditions at the intersection of contemporary thematic and regional phenomena. Students have the opportunity to concentrate primarily on one of three regional specializations: American religious cultures, Mediterranean religions, and Asian religions. An additional regional specialization typically serves as a secondary area of competence. Students further shape their scholarship through intensive engagement in one of the following thematic specializations: Values, Ethics, and Human Rights; Modernity, Science, and Secularism; Visual Culture, Media, and Technology; Language, Rhetoric, and Performance; Body and Praxis; Theory and Method. This curriculum guides students through a rigorous course of study, providing the breadth and depth necessary to produce exciting, rigorous scholarship at forefront of the field of Religious Studies. Graduate Group training prepares students for careers in academia as well as in the government and the private sector.

Preparation. Admission to the Graduate Group requires a Bachelor's degree in a discipline relevant to the study of religion, as well as preparation in at least one language relevant to the intended area of primary research. The group requires three letters of recommendation and a sample of recent written work. The general GRE is also required.

Graduate Adviser. Contact the Group office.

Courses in Study of Religion (REL)
Graduate

200A. Historical Roots of the Study of Religion (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Consideration of the historical and philosophical formation of religion as a concept. Treats the emergence of religion as a category of analysis and understanding from the Reformation through the Enlightenment.—I—(I) Chin, Coudert, Elmore, Janowitz

200B. Foundational Theories of Religion (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Survey of classical 19th and 20th century approaches to the study of religion.—II—(II) Chin, Coudert, Elmore, Janowitz

200C. Contemporary Approaches to the Study of Religion (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Consideration of major themes, issues and methods in the contemporary study of religion. Perspectives from diverse cultural settings employed to consider modern historical, philosophical, and social contexts that inform understandings of religion.—III—(III) Chin, Elmore, Janowitz

200D. Field Profile Seminar I and II (1-2)
Project. Prerequisite: graduate standing or consent of instructor. Individually guided research to survey the field of study, under the supervision of a faculty member. Four units total over two or more quarters are required by the end of the second year. May be repeated for credit.—I—(I) III—(III) III—(III)

210A. Special Topics in American Religious Cultures (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of specific topics in American religious cultures. May be repeated for credit when topic differs.—I—(I) III—(III) III—(III) III—(III)

210B. Special Topics in Asian Religious Cultures (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of specific topics in Asian religious cultures. May be repeated for credit when topic differs.—I—(I) III—(III) III—(III)

210C. Special Topics in Mediterranean Religious Cultures (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of specific topics in Mediterranean religious cultures. May be repeated for credit when topic differs.—I—(I) III—(III) III—(III) III—(III)

210D. Dissertation Writing (1-12)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of religion through specific topics and themes relating to values, ethics, and human rights. May be repeated for credit when topic differs.—I—(I) III—(III) III—(III) III—(III)

230A. Thematic Topics—Body and Praxis (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of religion through specific topics and themes relating to the body and praxis. May be repeated for credit when topic differs.—I—(I) III—(III) III—(III)

230B. Thematic Topics—Language, Rhetoric, and Performance (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of religion through specific topics and themes relating to language, rhetoric, and performance. May be repeated for credit when topic differs.—I—(I) III—(III) III—(III)

230C. Thematic Topics—Modernity, Science, and Secularism (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of religion through specific topics and themes relating to modernity, science, and secularism. May be repeated for credit when topic differs.—I—(I) III—(III) III—(III) III—(III)

230D. Thematic Topics—Theory and Method (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of religion through specific topics and themes relating to theory and method. May be repeated for credit when topic differs.—I—(I) III—(III) III—(III) III—(III)

230E. Thematic Topics—Values, Ethics, and Human Rights (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Comparative, interpretive study of the treatment of religion through specific topics and themes relating to values, ethics, and human rights. May be repeated for credit when topic differs.—I—(I) III—(III) III—(III) III—(III)

231E. History, Theory and Criticism of Human Rights (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Restricted to graduate students. Introduces the advanced study of Human Rights and the theoretical and practical elaboration of the international Human Rights system. Seminar will engage with criticism of Human Rights and develop research and teaching within disciplinary and interdisciplinary frameworks. (Same course as Human Rights 200A)—II—(II) Watenpaugh

298. Group Study (1-5)
Prerequisite: graduate standing or consent of instructor. May be repeated for credit. (S/U grading only.)—I—(I) III—(III) III—(III)

299. Research (1-12)
Prerequisite: graduate standing or consent of instructor. (S/U grading only.)—I—(I) III—(III) III—(III) III—(III)

299D. Dissertation Writing (1-12)
Prerequisite: advanced candidacy for the Ph.D. program, consent of instructor. May be repeated for credit. (S/U grading only.)—I—(I) III—(III) III—(III)

Surgery

See Surgery (SUR), on page 420; and Surgical and Radiological Sciences (VSR), on page 541.

Surgical and Radiological Sciences

See Veterinary Medicine, School of, on page 539.
Sustainable Agriculture and Food Systems

The Major Program

The Sustainable Agriculture and Food Systems (SAFS) major serves students interested in improving the sustainability and food systems of society. This major prepares graduates to understand the interdisciplinary and systems-based aspects of sustainability and provides them with the knowledge, leadership skills and experiences required to excel in agricultural and food systems professions.

The Program

This program is designed to develop students’ competencies for addressing the environmental, social, and economic challenges and opportunities associated with agricultural and food systems sustainability. The program emphasizes an experiential learning approach to sustainability education, allowing students to explore three tracks within the major. Students in the Agriculture and Ecology track focus on crop and animal production systems, ecology, and practices that mitigate negative impacts while producing environmental and social benefits. Students in the Food and Society track focus on issues related to the social, cultural, political and community development aspects of agriculture and food systems. The Internship track focuses on issues related to agricultural and resource economics, policy and management. The program provides students with practical experiences through courses with on- and off-campus field work and through internship placements at sites related to students’ interests and focus of study.

Internships and Career Alternatives

Sustainable Agriculture and Food Systems students are required to complete an internship in the field before graduation. Internships have been arranged with local, county, and state agricultural agencies, production farms and commercial processors and retailers, domestic and international non-governmental organizations, and rural and urban community development agencies. Graduates are prepared to pursue a broad range of careers related to agricultural production and food system management, rural and urban community services, education and development and to apply their skills and environmental science, as well as careers in agricultural, environmental, and economic policy and analysis. Positions may be in private industry, government and public service agencies and in the non-profit sector nationally and internationally. The major also prepares students for graduate studies in a wide range of fields related to agriculture and food systems.

B.S. Major Requirements:

**English Composition Requirement** .......................... 4-8
See College requirement, must include Communications 1.

<table>
<thead>
<tr>
<th>Course Requirements</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Physical Sciences 120 or 101A</td>
<td>4</td>
</tr>
<tr>
<td>Plant Sciences 150</td>
<td>4</td>
</tr>
<tr>
<td>Community and Regional Development</td>
<td>20</td>
</tr>
<tr>
<td>Environmental Science and Policy 191A, 191B</td>
<td>6</td>
</tr>
</tbody>
</table>

**Internship Requirement** .......................... 12
Students must complete at least 12 units of internship, eight of which must be completed off campus.

**Applied Production** .......................... 6-9
Select 1 course from: Animal Science 49A, Animal Science 49B | 2-3
Select 1 course from: Applied Biological Systems Technology 49, 52, 101, 142 | 2-3

**Track I: Agriculture and Ecology**

Focuses on crop and animal production systems, ecology, and practices that mitigate negative impacts while producing environmental and social benefits.

**Track I Adviser:** William Horwath, Ph.D.

**Preparatory Subject Matter** .......................... 60-61
Mathematics 16A, 16B | 6
Plant Sciences 120 or Statistics 100 | 4
Chemistry 2A, 2B | 10
Physics 1A, 1B | 3
Biological Sciences 2A, 2B, 10 | 10
Plant Sciences 2 | 2
Animal Sciences 1 or 2 | 4
Food Science 1, 2 | 4
Economics 1A | 4

**Track II: Food and Society**

Focuses on issues related to the social, cultural, political and community development aspects of agriculture and food systems.

**Track II Adviser:** Ryan Galt, Ph.D.

**Preparatory Subject Matter** .......................... 57-64
Philosophy 3 or 31 | 4
Chemistry 2 or 3 | 4
Select one course from: Philosophy 150, 142 | 4
Sociology 468 or Statistics 13 | 4
Select at least one course from: Community and Regional Development, Applied Biological Systems Technology 180, Landscape Architecture 150, Statistics 103, Sociology 106 | 3-6

**Track III: Economics and Policy**

Focuses on issues related to agricultural and resource economics, policy and management.

**Track III Adviser:** Tom Tomich, Ph.D.

**Preparatory Subject Matter** .......................... 60-64
Mathematics 16A, 16B | 6
Sociology 468 or Statistics 13 | 4
Select 1 course from: Agricultural and Resource Economics 106, Statistics 103, Sociology 106 | 4
Chemistry 2A | 5
Biological Sciences 2A or 10 | 5
Plant Sciences 2 | 4
Select 1 course from: Evolution and Ecology 2, Biological Sciences 28, Environmental Science and Policy 1, 30, Wildlife, Fish, and Conservation Biology 10, 11 | 3-5
Food Science 1 | 3
Soil Science 10 | 3
Economics 1A, 1B | 4
Political Science 4 | 4
Select 1 course from: Anthropology 2, Sociology 1, Sociology 3, Community and Regional Development | 4-5
Select 1 course from: Philosophy 14, 15, 24 | 4

**Depth Subject Matter** .......................... 43-44
Select one course from: Agricultural and Resource Economics 112 or 150 | 4
Select 1 course from: Agricultural and Resource Economics 147, 176 | 4
Environmental Science and Policy 160, 161, 169, 172, 179 | 3-4
Choose 12 units from: Anthropology 101, 102, Community and Regional Development 142, 152, Sociology 139, 144, 145A, 145B | 12
Select 1 course from: American Studies 101C, 155, History 172 or Philosophy 109 | 4
Additional upper-division restricted electives chosen in consultation with the track faculty advisor | 20

**Total units for the major** .......................... 140-163

**Major Adviser:** Tom Tomich (Human Ecology)

**Program Office:** 143 Robbins Hall, 530-752-9195; http://asi.ucdavis.edu

**Committee in Charge:**

R. Sexton, Ph.D.
(AGH)
A. Oberbauer, Ph.D. (Animal Science)
M. Pantalio, M.L.A.
(Entomology and Nematology)
S. Handy, Ph.D.
(Environmental Science & Policy)
M. Hubanks, M.L.A.
(Human Ecology)
D. Campbell, Ph.D. (Human Ecology)
R. Southard, Ph.D.
(Land, Air & Water Resources)
D. Rizzo, Ph.D. (Plant Pathology)
C. Kessel, Ph.D. (Plant Sciences)

**Internship Requirement** .......................... 12
Students must complete at least 12 units of internship, eight of which must be completed off campus.

**Applied Production** .......................... 6-9
Select 1 course from: Animal Science 49A, Animal Science 49B | 2-3
Select 1 course from: Applied Biological Systems Technology 49, 52, 101, 142 | 2-3

**Track I: Agriculture and Ecology**

Focuses on crop and animal production systems, ecology, and practices that mitigate negative impacts while producing environmental and social benefits.

**Track I Adviser:** William Horwath, Ph.D.

**Preparatory Subject Matter** .......................... 60-61
Mathematics 16A, 16B | 6
Plant Sciences 120 or Statistics 100 | 4
Chemistry 2A, 2B | 10
Physics 1A, 1B | 3
Biological Sciences 2A, 2B | 10
Plant Sciences 2 | 2
Animal Sciences 1 or 2 | 4
Food Science 1, 2 | 4
Economics 1A | 4
Community and Regional Development | 4
Select one course from: Philosophy 14, 15, 24 | 4
Select one course from: Anthropology 2, Political Science 4, Sociology 1, Sociology 3 | 4

**Depth Subject Matter** .......................... 34-38
Agricultural and Resource Economics 120 or 147 | 3-4
Environmental Science and Policy 161 or 169 | 3-4
Soil Science 100 or Soil Science 109 | 4-5
Additional upper-division restricted electives chosen in consultation with the track faculty advisor | 20

**Track II: Food and Society**

Focuses on issues related to the social, cultural, political and community development aspects of agriculture and food systems.

**Track II Adviser:** Ryan Galt, Ph.D.

**Preparatory Subject Matter** .......................... 57-64
Philosophy 3 or 31 | 4
Select one course from: Philosophy 150, 142 | 4
Sociology 468 or Statistics 13 | 4
Select at least one course from: Community and Regional Development, Applied Biological Systems Technology 180, Landscape Architecture 150, Statistics 103, Sociology 106 | 3-6

**Track III: Economics and Policy**

Focuses on issues related to agricultural and resource economics, policy and management.

**Track III Adviser:** Tom Tomich, Ph.D.

**Preparatory Subject Matter** .......................... 60-64
Mathematics 16A, 16B | 6
Sociology 468 or Statistics 13 | 4
Select 1 course from: Agricultural and Resource Economics 106, Statistics 103, Sociology 106 | 4
Chemistry 2A | 5
Biological Sciences 2A or 10 | 5
Plant Sciences 2 | 4
Select 1 course from: Evolution and Ecology 2, Biological Sciences 28, Environmental Science and Policy 1, 30, Wildlife, Fish, and Conservation Biology 10, 11 | 3-5
Food Science 1 | 3
Soil Science 10 | 3
Economics 1A, 1B | 4
Political Science 4 | 4
Select 1 course from: Anthropology 2, Sociology 1, Sociology 3, Community and Regional Development | 4-5
Select 1 course from: Philosophy 14, 15, 24 | 4

**Depth Subject Matter** .......................... 43-44
Select one course from: Agricultural and Resource Economics 112 or 150 | 4
Select 1-12 units from: Agricultural and Resource Economics 120, 130, 147, 176, Environmental Science and Policy 160, 161, 169, 172, 179 | 11
Select 8 units from: Anthropology 101, 102, Community and Regional Development 142, 152, Sociology 139, 144, 145A, 145B | 8
Additional upper-division restricted electives chosen in consultation with an advisor | 20
Courses in Sustainable Agriculture and Food Systems (SAF)

Lower Division

92. Internship (1-12)

Internship—3-36 hours. Prerequisite: consent of instructor. Restricted to Sustainable Agriculture and Food Systems majors or with consent of instructor. Lower-division internship for students enrolled in the Sustainable Agriculture and Food Systems program of study. Enrollment for non-majors by consent of instructor. May be repeated up to 12 units for credit with consent of instructor. (P/NP grading only)—I, II, III. (I, II, III) Galt, Horwath, Tomich, Van Horn

98. Directed Group Study (1-5)

Prerequisite: consent of instructor. Restricted to Sustainable Agriculture and Food Systems major or with consent of instructor. Group study on focused topics in Sustainable Agriculture and Food Systems. Varies according to instructor. Course plan is adapted to student need and interest in conjunction with the expertise of the instructor. Offered irregularly. (P/NP grading only)—I, II, III. (I, II, III)

99. Special Study for Undergraduates (1-5)

Independent study—3-15 hours. Prerequisite: consent of instructor. Under faculty supervision, students pursue a special or individualized course of study related to Sustainable Agriculture and Food Systems. May be repeated for credit. (P/NP grading only)—I, II, III. (I, II, III)

Upper Division

192. Internship (1-12)

Internship—3-36 hours. Prerequisite: upper-division standing or consent of instructor. Restricted to Sustainable Agriculture and Food Systems majors or with consent of instructor. Upper-division internship for students enrolled in the Sustainable Agriculture and Food Systems Program of Study. Enrollment for non-majors by consent of instructor. May be repeated up to 12 units for credit. (P/NP grading only)—I, II, III. (I, II, III) Galt, Horwath, Tomich, Van Horn

197T. Tutoring in Sustainable Agriculture and Food Systems (SA&FS) (1-15 hours)

Tutorial—3-15 hours. Prerequisite: upper division standing; consent of instructor. Undergraduate assistant the instructor by tutoring students in regularly scheduled courses that fulfill S&A&S major requirements. May be repeated for credit. Offered irregularly. (P/NP grading only)—I, II, III. (I, II, III)

197C. S&A&S Tutoring in the Community (1-5)

Tutorial—3-15 hours. Prerequisite: upper division standing; consent of instructor. Undergraduate assist the instructor by tutoring community in settings related to Sustainable Agriculture and Food Systems. May be repeated for credit. Offered irregularly. (P/NP grading only)—I, II, III. (I, II, III)

198. Directed Group Study (1-5)

Prerequisite: upper division standing; consent of instructor. Restricted to Sustainable Agriculture and Food Systems majors or with consent of instructor. Group study on focused topics in Sustainable Agriculture and Food Systems. Varies according to instructor. Course plan is adapted to student need and interest in conjunction with the expertise of the instructor. May be repeated for credit. Offered irregularly. (P/NP grading only)—I, II, III. (I, II, III)

199. Special Study for Advanced Undergraduates (1-5)

Independent study—3-15 hours. Prerequisite: upper division standing; consent of instructor. Under faculty supervision, advanced students pursue a special or individualized course of study related to Sustainable Agriculture and Food Systems. May be repeated for credit. (P/NP grading only)—I, II, III. (I, II, III)

Sustainable Environmental Design

[College of Agriculture and Environmental Sciences] [Department of Human Ecology]

Patsy Eubanks Owens, M.L.A., Chairperson, Human Ecology

Department Office. 131 Hunt Hall, 530-752-3907; http://sed.ucdavis.edu

Faculty

Elizabeth Boult, MLA Continuing Lecturer

David de la Pena, Ph.D., Assistant Professor

Steven E. Greco, Ph.D., Associate Professor

Eric Larsen, Ph.D., Associate Research Scientist

Jeff Loux, Ph.D., Associate Adjunct Professor

Brett Milligan, M.L.A., Assistant Professor

N. Claire Napawan, M.L.A., Assistant Professor

Lorence Oki, Ph.D., Associate Specialist in Cooperative Extension

Patsy Eubanks Owens, M.L.A., Professor

Michael Rios, Ph.D., Associate Professor

Sheryl-Ann Simpson, M.L.A., Assistant Professor

Stephen Wheeler, Ph.D., Associate Professor

The Major Program

The Sustainable Environmental Design major is intended to build student understanding and skills related to creation of sustainable communities and landscapes. Coursework emphasizes urban and environmental design, sustainable development theory and practice, green building, local government planning and decision-making, community dynamics and organizations, and written, graphic, and oral presentation of sustainability strategies.

The Program

The Sustainable Environmental Design major is particularly suited for students who are interested in the physical form and design of communities and related public and private processes. It is focused on the physical environment of communities and the process of designing, planning for, and regulating the built landscape and the place-making considerations involved in creating sustainable communities.

Career Alternatives

Graduates will choose to pursue work in government, community organizations, education, or the private sector. They will also be well-positioned to pursue graduate education in urban and regional planning, landscape architecture, architecture, public policy, public administration, law, real estate, and related fields.

B.S. Major Requirements:

Preparatory Subject Matter ............... 63

UNITS

English Writing/Oral Communication ..... 6

Biological Sciences 2A, 2B .................. 9

One course each in Statistics, Economics, Political Science, Physical Sciences, and Sociology ............................................. 23

Landscape Architecture 1, 2, 3, 21, 30, 50 ........................................ 70

Depth Subject Matter ..................... 21

Landscape Architecture 140, 141, 142, 14 Environmental Science and Policy 171 ..... 4

Landscape Architecture 190 (three quarters) .............................. 3

Restricted Electives ....................... 20-25

Select 20 units of upper division courses chosen from courses related to community sustainability ...................................... 20

Internship: Recommended .................. 5

Total units for the major .................. 104-109

Major Adviser. Stephen Wheeler

Advising Center is located in 135 Hunt Hall; 530-754-8628

Technocultural Studies

See Cinema and Technocultural Studies, on page 195.

Textile Arts and Costume Design

See Design, on page 219.

Textile Science

See Fiber and Polymer Science, on page 311.

Textiles (A Graduate Group)

Gang Sun, Ph.D., Chairperson of the Group

Group Office. 129 Everson Hall

303752-8035; jblevins@ucdavis.edu

http://textiles.ucdavis.edu

Faculty

Susan Avila, M.F.A. Professor (Design)

Colin A. Carter, Ph.D., Professor

(Agricultural and Resource Economics)

James Chollant, Ph.D. Professor

(Agricultural & Resource Economics)

Hidgarde Heymann. Professor

(Viniculture and Enology)

You-Lo Hsieh, Ph.D., Professor (Textiles and Clothing)

Joel T. Johnson, Professor (Psychology)

Susan B. Kaiser, Ph.D., Professor (Textiles and Clothing, Women and Gender Studies)

Ning Pan, Ph.D., Professor (Textiles and Clothing, Biological and Agricultural Engineering)

Tingrui Pan, Ph.D. Associate Professor

(Biomedical Engineering)

Diana Strazdes, Associate Professor (Art History)

Gang Sun, Ph.D., Professor (Textiles and Clothing)

Susan Verba, M.F.A., Associate Professor (Design Program)

Emeriti Faculty

Stephen Jett, Ph.D., Professor Emeritus

(Textiles and Clothing, Geography)

Gyongy Laky, M.A., Professor Emeritus

(Textiles and Clothing)

Margaret H. Rucker, Ph.D., Professor Emeritus

(Textiles and Clothing)

Howard G. Schultz, Ph.D., Professor Emeritus

(Consumer Science)

James F. Shackelford, Ph.D., Professor Emeritus

(Chemical Engineering and Materials Science)

Charles F. Shoemaker, Ph.D., Professor Emeritus

(Food Science and Technology)

Jo Ann C. Stabb, M.A., Senior Lecturer Emeritus (Design)

S. Haig Zeronian, Ph.D., Professor Emeritus

(Textiles and Clothing)

Graduate Study. The Graduate Group in Textiles offers a program of study and research leading to the M.S. degree. Students in the program use an interdisciplinary approach emphasizing the physical and behavioral science aspects of textiles. Research areas include chemical, physical, biochemical, and mechanical properties of fibers and polymers as well
Textiles and Clothing

[College of Agricultural and Environmental Sciences]
YouLo Hsieh, Ph.D., Chairperson of the Division
Division Office. 129 Everson Hall
530-752-6650, http://textiles.ucdavis.edu
Faculty
YouLo Hsieh, Ph.D., Professor
Susan B. Kaiser, Ph.D., Professor
(Students and Gender Studies)
Ning Pan, Ph.D., Professor
Gang Sun, Ph.D., Professor
Emeriti Faculty
Stephen C. Jeft, Ph.D., Professor Emeritus
Cynthia Laky, M.A., Professor Emeritus
Mary Ann Morris, Ph.D., Professor Emeritus
Margaret H. Rucker, Ph.D., Professor Emeritus
S. Hagi Zeronian, Ph.D., D.Sc., Professor Emeritus
The Major Program
The textiles and clothing major emphasizes the connections among (a) the physical characteristics of textile products, (b) human perceptions of and behavior toward these products, and (c) global economic trends affecting the textile/apparel marketplace. An integrative knowledge base links textile products with people and processes, to focus on the production, distribution, and consumer use of textiles and apparel; see also Fiber and Polymer Science, on page 311.

The Program.
The textiles and clothing majors offer two options: textile science and marketing/economics. The Textile Science option provides students with a broad knowledge base in both the social and physical sciences. This base includes production, end-use applications and care of textiles and apparel, physical and chemical properties of textiles, and social-psychological and economic aspects of textiles and clothing. The Marketing/Economics option emphasizes social science and business-course work, while also providing students with an awareness of the physical nature of textile products.

Internships and Career Alternatives.
Textiles and clothing majors can pursue internships and careers in apparel production and merchandising, retail management, international marketing, textile testing and conservation, and textiles journalism. The majority of textiles and clothing graduates accept entry-level management and technical positions within the textile and apparel industry or in related fields; e.g., merchandising and marketing, production, research and development, technical service and design. Students may also pursue graduate study in textiles, business, and other areas depending on their specific selections of restricted elective course work.

B.S. Major Requirements:

**Preparatory Subject Matter**

<table>
<thead>
<tr>
<th>UNITS</th>
<th>Plant Sciences 21 or Computer Science Engineering 15 or 30</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Economics 1A-1B</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>Anthropology 2, Science and Society 1, Art History 1A, 1B, or 1D</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Physics 1A or 10</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Psychology 1</td>
<td>4</td>
</tr>
</tbody>
</table>

**Social Science**

| 4 | Sociology 2 |

**Mathematics**

<table>
<thead>
<tr>
<th>3-4</th>
<th>Statistics 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Textiles and Clothing 6, 7, 8</td>
</tr>
</tbody>
</table>

Select one of the following two options:

**Marketing/Economics option**

<table>
<thead>
<tr>
<th>Additional Preparatory Subject Matter for the option:</th>
<th>18-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management 11A-11B</td>
<td>8</td>
</tr>
<tr>
<td>Chemistry 10 or 2A</td>
<td>4-5</td>
</tr>
<tr>
<td>Mathematics 16A-16B</td>
<td>6</td>
</tr>
</tbody>
</table>

**Depth Subject Matter**

| 56-57 | Agricultural and Resource Economics 100A-100B, 106, 128A, 128B, 132A, 132B, 134, 136, 162, and other relevant course work, Foreign language units may be used to satisfy any or all of the required 12 units, Mathematics 16C, Psychology 123, 126, 140, 141, 145, Textiles and Clothing 180A, 180B, 230, 293, with consent of instructor, and a maximum of five units in either Textiles and Clothing 192 or 199 |

**Restricted Electives**

| 12 | Courses selected from the following: Agricultural and Resource Economics 18, 112, 142, 155, 157, 171A, 171B, Anthropology 122A, 126A, Consumer Science 100, Design 77, 107, 143, Economics 11A-11B, 123, 134, 162, and other relevant course work, Foreign language units may be used to satisfy any or all of the required 12 units, Mathematics 16C, Psychology 151 or Consumer Science 100, Fiber and Polymer Science 110, Textiles and Clothing 107, 162, 162L, 163, 163L, 164, 165, 171, 173, 174, 33 |

**Textile Science option**

<table>
<thead>
<tr>
<th>Additional Preparatory Subject Matter for the option:</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 2A, 28, 8A, 8B</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 16A</td>
<td>3</td>
</tr>
</tbody>
</table>

**Depth Subject Matter**

| 51-52 | Agricultural and Resource Economics 112, 113 | 8 |
|---|---|
| Design 143 | 4 |
| Psychology 151 or Consumer Science 100 | 3-4 |
| Fiber and Polymer Science 100, 161, 161L, Textiles and Clothing 107, 162, 162L, 163, 163L, 164, 165, 171, 173, 174 | 36 |

**Restricted Electives**


**Total Units for the Major**

| 128-132 | Major Advisor: S. Kaiser |

Advising Center for the major is located in 1298 Everson Hall 530-754-8368.

**Minor Program Requirements**

The Division of Textiles and Clothing offers a minor program for students interested in satisfying secondary career objectives. For acceptance into the program see the staff adviser in 1298 Everson Hall.

<table>
<thead>
<tr>
<th>Sociology 2</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics 13</td>
<td>4</td>
</tr>
<tr>
<td>Textiles and Clothing 6, 7, 8</td>
<td>12</td>
</tr>
</tbody>
</table>

Questions pertaining to the following courses should be directed to the instructor or to the Division of Textiles and Clothing. See also courses in Fiber and Polymer Science, on page 311.

**Lower Division**

6. **Introduction to Textiles (4)**
Lecture—3 hours; laboratory—3 hours. Introduction to the structure and properties of textiles. Consumer use and fabric characteristics are emphasized. GE credit: SciEng | SE, St., VL—II. (8) Sun

7. **Style and Cultural Studies (4)**
Lecture/discussion—3 hours; discussion/lab/orb—1 hour. The multiple and overlapping influences of gender, sexuality, ethnicity, and class on the constructions of identity and community are explored through the study of styles of apparel and culture and everyday life. Continuity and change in clothing and appearance styles are interpreted. GE credit: ArtHum or SocSci, Div; Wrt | AH or St, VL, WC—II. (III) Kaiser

8. **The Textile and Apparel Industries (4)**
Lecture—4 hours. Textile and apparel industries including fashion theory, production, distribution, and consumption of textile goods. GE credit: SocSci, Div | St, SS.

92. **Internship in Textiles and Clothing (1-12)**
Internship—3-36 hours. Prerequisite: consent of instructor. Work experience off campus in a textiles or clothing-related area. Supervision by a member of the Textiles and Clothing faculty. (P/NP grading only.)

98. **Directed Group Study (1-5)**
Prerequisite: consent of instructor. (P/NP grading only.)

99. **Special Study for Lower Division Students (1-5)**
(P/NP grading only.)

**Upper Division**

107. **Social and Psychological Aspects of Clothing (4)**
Lecture—3 hours; discussion—1 hour. Prerequisite: Sociology 2. Social and cognitive factors influencing management and perception of personal appearance in everyday life. Concepts and methods appropriate to the study of meaning of clothing in social and cultural contexts. GE credit: SocSci, Div; Wrt | VL, SS, VL, VE—II. (III) Sun

162. **Textile Fabrics (3)**
Lecture—3 hours. Prerequisite: course 6. Properties of fabrics as related to serviceability, comfort, and appearance. GE credit: SciEng | SE, VL—III. (III) Pan

162T. **Textile Fabrics Laboratory (1)**
Laboratory—3 hours. Prerequisite: course 162 may be taken concurrently. Laboratory methods and procedures employed in studying properties of textile fabrics as related to serviceability, comfort, and appearance. GE credit: SciEng | QL, SE, VL, WE—II. (III) Pan

163. **Textile Coloration and Finishing (3)**
Lecture—3 hours. Prerequisite: course 6, Fiber and Polymer Science 110, or Chemistry 1B. Basic principles of textile dyeing, printing, and finishing; color theory; structure, properties, and application of dyes and finishes; factors affecting application and fastness; maintenance of dyed and finished textiles. GE credit: SciEng | SE, VL—III. (III) Sun

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2015-2016 offering in parentheses.


Fall 2011 and on Revised General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures, WE—Writing Experience
163L. Textile Coloration and Finishing Laboratory (1)
Laboratory—3 hours. Prerequisite: course 163 (may be taken concurrently). Demonstrates various aspects of dyeing, printing, and finishing of textile substrates including the effect of fiber and finish type, and physical and chemical variables on dyeing and finishing processes and on the properties of the resultant textile. GE credit: SciEng | QL, SE, SL, WE. —III. (III.) Sun

164. Principles of Apparel Production (3)
Lecture—3 hours. Prerequisite: course 6 or 8. Overview of technology, processes, and research in apparel manufacturing industries including study of government statistics, material utilization and fabrication, mechanization, management, and production engineering. GE credit: SocSci | QL, SS, VL.

165. Textile Processes (3)
Lecture/discussion—3 hours. Prerequisite: course 6. Physical processes involved in the production of textiles from the individual fiber to the finished fabric. Includes spinning, knitting, weaving, finishing, dyeing, and hand and aesthetic properties, clothing comfort, and material and assembly technology. GE credit: SciEng | SE, difficult to read.

171L. Clothing Materials Science (4)
Lecture—3 hours; laboratory/discussion—3 hours. Prerequisite: course 6, 8, and senior standing. The properties, characterization, and performance evaluation of clothing materials and structures for specific functional and aesthetic applications. Principles and methods related to wetting and transport properties, fabric hand and aesthetic properties, clothing comfort, and material and assembly technology. GE credit: SciEng | SE, VL.—II. (II.) Hsieh

173. Principles of Fashion Marketing (3)
Lecture—3 hours. Prerequisite: course 8, Economics 1A, Agricultural and Resource Economics 113 or 136. Study of basic elements of fashion marketing including philosophy and objectives, organization, merchandising, pricing, promotion and personnel. Offered in alternate years. GE credit: SocSci | SS, VL.—II. (II.)

174. Introduction to World Trade in Textiles and Clothing (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 8. Structure of the global fiber/textile/apparel complex and its distribution patterns with an overview of political, economic and technological factors that are changing these industries and their markets. GE credit: SocSci, Div | SS, WC.—II. (II.)

180A-180B. Introduction to Research in Textiles (2-3)
Laboratory—6 hours. Prerequisite: senior standing with textile-related major, and consent of instructor. Senior thesis on independent problems. Research begun in course 180A will be continued and completed in course 180B. (Deferred grading only; pending completion of sequence.) GE credit: SocSci | SS, WE.—I, II, III, (I, I, II.)

192. Internship in Textiles and Clothing (1-12)
Laboratory—3.36 hours. Prerequisite: consent of instructor. Work–learn experience off campus in a textiles or clothing-related area. Supervision by a member of the Textiles and Clothing faculty. (P/NP grading only.)

197T. Tutoring in Textiles and Clothing (1-5)
Discussion/laboratory—3.15 hours. Prerequisite: upper division textiles-related major and consent of instructor. Tutoring of students in Textiles and Clothing courses. Assistance with discussion groups and laboratory sections under supervision of instructor. May be repeated for credit if tutoring another textiles course. (P/NP grading only.)

198. Directed Group Study (1-5)
(P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.)

Graduate

230. Behavioral Science Concepts in Textiles (3)
Lecture—3 hours. Prerequisite: course 107, upper division graduate or division course in statistics (e.g., Agricul-tural Management and Rangeland Resources 120) and one in a behavioral science (e.g., Psychol-ogy 145). Examination of theories and research con-cerning relationships between current and human behavior with emphasis on research techniques, including methods of measuring clothing variables. Offered in alternate years. —Kaiser

290. Seminar (1)
Seminar—1 hour. Review of selected topics of current interest in textiles. (S/U grading only)—II, (I, II)

290C. Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing, consent of instructor. Individual faculty members meet with their graduate students. Critical presentations of original research are made by graduate students. Research activities are planned. Discussions are led by major professors for their research groups. (S/U grading only)—II, (II, III, (I, III, III)

293. Recent Advances in Textiles (3)
Lecture—3 hours. Prerequisite: two upper division courses in Textiles and Clothing or consent of instructor. Critical reading and evaluation on selected topics of current interest in textiles. Multidisciplinary aspects of the topics selected will be stressed. May be repeated for credit. —(II.)

298. Group Study (1-5)
(S/U grading only)

Professional

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only)—II, III, (I, III, III)

Theatre and Dance

(College of Letters and Science)

Jon D. Rossini, Chairperson of the Department
Office of the Dean, 101 Art Building
530-752-0888; Fax 530-752-8818
http://arts.ucdavis.edu/theatre-dance

Faculty

Lawrence Bogad, Ph.D., Associate Professor
David Grenke, Professor
Lynette Hunter, Ph.D., Distincted Professor
John Iacovelli, M.F.A., Professor
Peter Lichtenfels, Professor
Bella Merlin, Ph.D., Professor
Margie Morgan, M.F.A., Associate Professor
Thomas J. Munn, Professor
Jon D. Rossini, Ph.D., Associate Professor
Emeriti Faculty

Bobbie J. Bolden, M.A., Senior Lecturer Emerita
Gary C. Johnson, M.A., Professor Emeritus
William E. Kleb, D.F.A., Professor Emeritus
Barbara Sellers-Young, Ph.D., Professor Emerita
Peggy Shannon, Professor Emerita

The Dramatic Art Major Program

The A.B. degree in Dramatic Art provides students with an appreciation for and understanding of performance and its role in culture and society. The program offers a strong foundation in all aspects of drama, theatre (acting, performance, and production). Students build significant skills in specific areas (including acting, directing, choreography, design, playwrighting and devising, production skills and management) as well as achieving a broad knowledge of theatre and dance.

Productions and Facilities. Each year’s schedule includes opportunities to work with professional directors and choreographers in three Granada Artists-in-Residence productions; the Main Stage Dance/Theatre Festival; the UC Davis Film Festival; projects generated through the Institute for Exploration in Theatre, Dance and Performance; and work shops and performance projects developed by M.F.A and Ph.D. students. These productions are staged in our prosenium (Main), thrust (Wyatt), black box (Arena), performance studio (Nelson Hall) and intimate laboratory theatre (Lab A), as well as in the Mondavi Center’s Vanderhoef Studio Theatre and Jackson Hall. These productions are part of the academic program of the department and serve an important purpose in the study of theatre and dance. Participation is open to all students.

A.B. with Honors Major Requirements:

Preparatory Subject Matter ............................................. 24
Choose four units from: Dramatic Art 21A, 40A, 40B, 42A, 42B ................................. 4
Dramatic Art 28, 55, 56A, 56B, 56C ........ 20

Depth Subject Matter ................................................... 42
Two courses from: Dramatic Art 142, 150, 155, 155A, 156, 156B, 156C, 156D, 158, 159 ................................. 8
Choice 6 units from at least 2 of Dramatic Art 145, 180A, 180B, 180C ......................................... 6
Dramatic Art 180D ........................................ 4
One course from: Dramatic Art 180E, 180F, 180G ..................................................... 2
Dramatic Art 195 ........................................ 2

Total Units for the Major ................................................ 66

Preparatory Subject Matter ............................................. 24
Choose four units from: Dramatic Art 21A, 40A, 40B, 42A, 42B ................................. 4

Depth Subject Matter ................................................... 56
Two courses from: Dramatic Art 142, 150, 155, 155A, 156, 156B, 156C, 156D, 158, 159 ................................. 8
One course from: Dramatic Art 124A, 124B, 124C, 124D, 124E, 124F, 124G ................................. 4
One course from: Dramatic Art 127A, 140A, 160A ................................. 4
Choice 6 units from at least 2 of Dramatic Art 145, 180A, 180B, 180C ......................................... 6
Dramatic Art 180D ........................................ 4
One course from: Dramatic Art 127A, 140A, 160A ................................. 4
Choice 6 units from at least 2 of Dramatic Art 145, 180A, 180B, 180C ......................................... 6
Dramatic Art 180D ........................................ 4

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer, 2015-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div=Domestic Diversity; Writ=Writing Experience
Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; ACHG=American Cultures, DD=Dominant Diversity, OL=Oral Skills, QL=Quantitative, SL=Scientific, VL=Visual, WC=World Cultures, WRI=Writing Experience
Theatre and Dance

28. Entertainment Engineering and Management: Stagecraft to Stage (4)
Lecture/discussion—4 hours. Introduction to technical production and management in theatre and dance. Topics include stage management, theatrical mechanics, backstage protocols, scenic construction, properties, lighting, basic scripts, casting, shop use and construction, basic make-up, sound equipment, graphics and robotics for theatre. GE credit: ArtHum | AH — I, II, III, IV

30. Theatre Laboratory (1-5)
Prerequisite: course 25 or consent of instructor. Projects in acting, production, and design of stage and costume, and consideration of the nature of performance and technology. GE credit: AH, VL — I, II, III, IV

40A. Beginning Modern Dance (2)
Laboratory/discussion—4 hours. Prerequisite: course 14 or consent of instructor. Fundamentals of modern dance focusing primarily on the development of techniques and creative problem solving. Basic anatomy, dance terminology and general overview of modern dance history. May be repeated for credit up to 11 units. GE credit: AH — I, II, III, IV

40B. Intermediate Modern Dance (2)
Laboratory/discussion—4 hours. Prerequisite: course 40A. Open to students who have completed 14 and 40A, unless consent of instructor. Modern dance techniques. Basic anatomy, dance terminology and general overview of modern dance history. May be repeated for credit up to 11 units. GE credit: AH — I, II, III, IV

41A. Beginning Jazz Dance (2)
Laboratory/discussion—4 hours. Prerequisite: course 14 or consent of instructor. Fundamentals of jazz dance; includes warm-ups, dance techniques and combinations. Basic anatomy, dance terminology and general overview of jazz dance history. May be repeated one time for credit with consent of instructor.

41B. Intermediate Jazz Dance (2)
Laboratory/discussion—4 hours. Prerequisite: course 41A. Warm-ups, dance techniques and combinations at the intermediate level. Basic anatomy, dance terminology and general overview of jazz styles of historically significant jazz choreographers and leading contemporary jazz choreographers. May be repeated one time for credit with consent of instructor.

42A. Beginning Ballet (2)
Laboratory/discussion—4 hours. Prerequisite: course 14 or consent of instructor. Fundamentals of basic anatomy focusing on the development of technique through proper alignment, quality, and rhythm. Basic anatomy, ballet terminology, and dance history. May be repeated for credit with consent of instructor. GE credit: AH, VL

42B. Intermediate Ballet (2)
Laboratory/discussion—4 hours. Prerequisite: courses 14 and 42A or consent of instructor. Barre and center work at the intermediate level. Development and refinement of technique through proper alignment, rhythm and qualitative understanding. Anatomy, ballet terminology, and dance history. May be repeated for credit with consent of instructor. GE credit: AH, VL

43A. Contact Improvisation Dance (2)
Lecture—2 hours; laboratory—2 hours. Course 14 or consent of instructor. A form of dance that focuses on the exploration of the shared space created by two dancers. Basic anatomy, dance terminology and general overview of jazz styles of historically significant jazz choreographers and leading contemporary jazz choreographers. May be repeated one time for credit with consent of instructor.
developing relaxed readiness and personal expression. May be repeated two times for credit. Offered irregularly. GE credit: AH, VL.

43B. Intermediate Contact Improvisation (2) Lecture/laboratory—4 hours. Prerequisite: course 43A. Building on the fundamentals. Reviewing basics, extended improvising skillfully working with partners of different sizes and abilities, advanced lifting, advanced safety practices, embarking risk and disorientation, subtle nuances of communication. May be repeated two times for credit. GE credit: ArtHum | AH, VL.—I, II, III, IV. (I, II, III, IV.)

44A. Beginning Hip Hop Dance (2) Laboratory/discussion—4 hours. Fundamentals of Hip Hop dance focusing on developing a fluid movement vocabulary, facility in body isolations, intricate rhythmic patterning, quick shifts of weight and mastering dance combinations. Discussions on Hip Hop dance history, styles and terminology. May be repeated one time for credit.

44B. Intermediate Hip Hop Dance (2) Laboratory/discussion—4 hours. Prerequisite: course 44A or consent of instructor. Expansion of Hip Hop dance vocabulary by focusing on mastering body isolations and intricate rhythmic techniques, complex dance combinations, movements across the floor sequences. May be repeated one time for credit.

55. Contemporary Local, National and Global Theatre, Dance and Performance (4) Lecture/discussion—4 hours. Introduction to contemporary theatre, dance and performance in local, national and international settings. Training in critical approaches to and aesthetic appreciation of these forms. Emphasis varies based on instructor. GE credit: ArtHum | AH, DD, VL, WC.—I, II, III, II, III, III.


56B. History of Theatre and Dance II: Romance, Revenge and Rebellion (4) Lecture/discussion—4 hours. Exploration of aesthetic movements in various disciplines of theatre and dance from 1550 to 1850. Examination of genres, styles, techniques, rhythm and rebellion using European, North and South American, and Asian examples. GE credit: ArtHum | AH, VL, WC.—I, II, III, I, II, III, III.


92. Internship in Dramatic Art (1-12) Prerequisite: consent of instructor and department chairperson; limited to students (less than 84 units completed). Internship outside the Department of Theatre and Dance enabling students to practice their skills. May be repeated for credit up to 12 units. (P/NP grading only.)—I, II, III, IV, V, VI, VII, VIII, IX.

98. Directed Group Study (1-5) Primarily for lower division students. (P/NP grading only)

99. Special Study for Undergraduates (1-5) (P/NP grading only)

Upper Division

111. Advanced Presentation Skills (2) Lecture/laboratory—4 hours. Class size limited to 20 students. Development of clear oral and physical communication skills, presentation style and clarity for students whose command of English is at a competent to fluent level. GE credit: OL.


114. Theatre on Film (4) Lecture/discussion—3 hours; film viewing—2 hours; term paper. Prerequisite: consent of instructor; graduate standing; course 1, 14, 15. Study of six-eight plays on film, using mixed casts and raising issues of diversity. Focus: sociohistorical context for production and reception, interpretation and analysis of topics (gender, ethnicity, age, politics, philosophy), and film's, screenwriting, design, and acting/directing for film. GE credit: ArtHum or SocSci, Div, Wrt | VL.

115. Advanced Study of Major Film Makers (4) Lecture/discussion—3 hours; film viewing—2 hours. Prerequisite: course 15. Analysis of the contribution of some outstanding film creators. Study of diverse aesthetic theories of the directors and their application to selected films. GE credit: VL.

116. Design on Screen (4) Lecture/discussion—3 hours; film viewing—3 hours. Analysis of the contribution of outstanding designers for cinema, television and filmed entertainment. Study of diverse aesthetic theories of production design and art direction, costume design, or cinema-tography. Introductory principles and practice, history. May be repeated two times for credit when topic differs. (Same course as Cinema and Agricultural Studies 116.) Offered irregularly. GE credit: ArtHum | AH, VL—Lacovelli, Morgan

120. Intermediate Acting/Gateway: The Actor's Toolkit (4) Lecture/laboratory—6 hours. Prerequisite: course 21A or consent of instructor. Limited enrollment. Implementation of acting tools derived predominantly from Stanislavsky's "system". Gateway into the Advanced Acting courses. GE credit: OL, VL—Leavy, Merlin

121A. Advanced Acting: Scene Study and Script Analysis (4) Lecture/laboratory—6 hours. Prerequisite: course 120 and consent of instructor. Limited enrollment. In-depth study, analysis and performance of texts from different eras, genres and styles. Implementation of tools to undertake independent preparation of character, text, and performance. May be repeated up to eight units for credit. Since acting requires repetition to habituate the body and imagination to new practices, this course may be taken twice. Monologues and scenes must be undertaken in the repetition. Offered in alternate years. GE credit: OL, VL.

121C. Advanced Acting: Character and Style (4) Lecture/laboratory—6 hours. Prerequisite: course 120 and consent of instructor. Limited enrollment. Study of psychophysical techniques to create characters with an emphasis on non-realistic styles. May be repeated up to eight units for credit. Since acting requires repetition to habituate the body and imagination to new practices, this course may be taken twice. New scripts and scenes must be undertaken in the repetition. Offered in alternate years. GE credit: ArtHum | OL, VL.

122A. Advanced Acting: Devising and Collaboration (4) Lecture/laboratory—6 hours. Prerequisite: course 120, consent of instructor. Study and practice of various devising techniques, to collaborate, to enhance/devising, to produce a series of short etudes and dramatic scenes/short plays. May be repeated up to eight units for credit. Since acting requires repetition to habituate the body and imagination to new practices, this course may be taken twice. New scripts and scenes must be undertaken in the repetition. Offered in alternate years. GE credit: ArtHum, OL.

122B. Advanced Acting: Shakespeare and His Contemporaries (4) Lecture/laboratory—6 hours. Prerequisite: course 120 and consent of instructor. Limited enrollment. Study and performance of various plays (Shakespearian and others) in terms of their historical context, significant themes (gender, ethnicity, age, politics, philosophy), and acting/directing for film. GE credit: ArtHum or SocSci, Div, Wrt | VL.

122C. Advanced Acting: Special Topics in Acting (4) Lecture/laboratory—6 hours. Prerequisite: course 120 and/or consent of instructor. Dramatic Arts majors. Restricted to Dramatic Arts majors; limited enrollment. Intensive study and practical experience of a specialized area (for example, World Theatre, Social Theatre, Physical Theatre, Musical Theatre, The Ancient Greeks, etc.) May be repeated up to eight units for credit. Offered irregularly. GE credit: AH, OL, VL.

124A. Principles of Theatrical Design: Scenery (4) Lecture/discussion—4 hours. Prerequisite: course 24 or consent of instructor. Scene design processes, working drawings, sketching techniques, scale models, methods and materials of scenery construction. GE credit: ArtHum | AH, VL—lacovelli

124B. Principles of Theatrical Design: Scenery (4) Lecture/discussion—4 hours. Prerequisite: course 24 or consent of instructor. Analysis of plays in terms of scenic design, elements of design, execution of designs, working together in collaborative projects. GE credit: ArtHum | AH, VL—lacovelli

124C. Principles of Theatrical Design: Lighting (4) Lecture/discussion—4 hours. Prerequisite: course 24 or consent of instructor. Theories of lighting the stage, equipment and control systems, execution of lighting plots. GE credit: ArtHum | AH, VL—Munn

124D. Principles of Theatrical Design: Costume (4) Lecture/discussion—4 hours. Prerequisite: course 24 or consent of instructor. Source materials for theatrical costuming, selecting fabrics, elements of design, analysis of plays in terms of costume design, execution of designs for modern settings and techniques. GE credit: ArtHum | AH, OL, VL—Morgan

124E. Costume Design for Film (4) Lecture/discussion—4 hours. Prerequisite: for Dramatic Art majors; course 24 or 124D or consent of instructor. Theory and practice of the art and business of film costume design. Script analysis, costume research, developing design concepts, budgeting, and current production practices and methods. Exe.
cution of designs for period and contemporary films. Viewing of current films. 

141. Introduction to the Fundamentals of Movement (4)
Lecture/discussion—4 hours. Introduction to fundamentals of movement that combines intellectual and kinesthetic understanding of the body's skeletal and muscular systems. Explorations based on theories of various body mind specialists including Laban, Feldenkrais, Bartenieff and Sweigard as well as the eastern discipline of Yoga. GE credit: VL.

142. History of Modern Dance (5)
Lecture—3 hours; laboratory—3 hours; extensive writing. The Modern Dance tradition in the U.S., focusing on the development of group choreography, focusing on the development of group choreography. GE credit: VL.

143. Dance and Movement Studio (1-4)
Lecture/discussion—2-8 hours. Prerequisite: course 14 or consent of instructor. Special studies in dance and movement such as African, Balinese, Baroque, Chinese, European, and stage combat. May be repeated up to eight units for credit. GE credit: AH, VL—I, II, III, IV, V, VI, VII, VIII.

144. Introduction to Traditional Chinese Physical Culture (4)
Lecture/discussion—4 hours. Traditional Chinese WuShu practices, explored through practical work in dance laboratory conditions. Integration of practice with conceptual analysis; contemporary social, educational and artistic applications. GE credit: VL.

145. Directed Choreography Projects (4)
Lecture/laboratory—6 hours. Prerequisite: courses 140A, 140B, 140C or consent of instructor. Conceptualization, creation, casting, rehearsing, and presentation of a series of choreographed pieces, with students integrating elements of stagecraft and directing the on-stage rehearsals. GE credit: VL.

146. Professional Track Modern Dance I (3)
Lecture/discussion—6 hours. Laboratory—discussion—6 hours. Prerequisite: courses 408 and 146A; consent of instructor. Continuation of course 146A. Body and space relationships in solos, duets and group work, stylistic variations of Graham technique; works of Paul Taylor. May be repeated two times for credit.—Grenke.

146C. Professional Track Modern Dance III (3)
Lecture/discussion—6 hours. Prerequisite: courses 408, 146A, and 146B; consent of instructor. Continuation of course 146C. Integration of the on-stage theatrical device, sustaining movement and non-movement, phrasing, musicality. May be repeated two times for credit. —Grenke.

150. American Theatre and Dance (4)
Lecture—4 hours. The history of the theatre from Colonial times to the present. Readings of selected plays. Offered in alternate years. GE credit: ArtHum, Div, Wrt | ACGH, AH, DD, VL, WE.

151. Australian Performance and Culture (4)

154. Asian Theatre and Drama: Contexts and Forms (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Selection of Asian theatre and performance forms in their cultural and artistic contexts; myth, ritual and the theatre; performance training, visual presentation of the text; political theatre; inter-cultural performance. The fusion of Asian and Western traditions. Offered in alternate years. GE credit: ArtHum, Div, Wrt | AH, WC, WE.

155. Representing Race in Performance (4)
Lecture—4 hours. Representation and performance of race” in American culture featuring different sub-headings such as “African American Theatre” or “Asian-Americans on Stage.” May be repeated one time for credit when topic differs. GE credit: ArtHum, Div | AH, DD, WE.

155A. African American Dance and Culture in the United States, Brazil and the Caribbean (4)
Lecture/discussion—4 hours. Comparative study of the African American dance forms in the U.S., Brazil, Haiti, Cuba, Jamaica, Barbados, and Trinidad. Examination of ritual, folk, and popular dance forms and the socio/historical factors that have influenced these forms. (Same course as African American Studies 155A.) Offered in alternate years. GE credit: ArtHum | AH, VL, WC.

155B. Ancient and Contemporary Greek Theatre and Dance (4)
Discussion/laboratory—10 hours; performance instruction—10 hours; seminar—13 hours. Origins of early theatres and the first actors, playwrights and dancers and their powerful influence on western performance and thought up to present day. Offered in Greece. GE credit: ArtHum | AH. —IV. (IV.)

156A. Performance Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1, 2, or consent of instructor. Performance on the stage, in the street, in everyday life, ritual, and in politics. Satire, irony, creative protest and performance. Social movements, the state, and performance as tactical intervention. GE credit: ArtHum, Div, Wrt | AH, WC, WE.

156B. Theatre in History and Place: Local, National and Global Conditions for Production (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1, 2 or consent of instructor. Performance on the stage, in the street, in everyday life, ritual, and in politics. Satire, irony, creative protest and performance. Social movements, the state, and performance as tactical intervention. GE credit: ArtHum, Div, Wrt | AH, WC, WE.
156C. Modern Aesthetic Movements in Performance (4) Laboratory/discussion—3 hours; discussion—1 hour. Prerequisite: course 1, course 20 or consent of instructor. Important movements in performance, especially theater and dance, from realism to the present. Primary emphasis on Western traditions though others may be studied. GE credit: AH, Div, Div, Wrt | AH, WE.—I, II, III, (I, II, III).

156D. Theatre History through Shakespeare (4) Lecture—4 hours; extensive writing. Shakespeare's plays, theatre history and theatre today. European contexts from 1590/2004 and international theatre from 20th century. Stagecraft, different media [print, stage, film], social/political environments, design, and cultural change (gender, sexuality and ethnicity). May be repeated one time for credit. AH, Div, Div, Wrt | AH, OT, WC, WE.—II, IV (I, IV).

158. Performance Studies Undergraduate Seminar (4) Seminar—4 hours. Prerequisite: course 156A, B, or C, or consent of instructor. Focused inquiry into a particular genre, period, movement, artist, or theme in performance. Philosophical and aesthetic approaches as well as historical and cultural performance contexts. In-depth research projects in relationship to the subject of inquiry. May be repeated for credit. GE credit: Wrt.

159. Contemporary Experimental Performance, Theatre and Drama (4) Lecture/discussion—3 hours; extensive writing. Examination and evaluation of the "New Theatre," its experimental and innovative nature since the 1960s. Dance, film, stage, performance, performance art and public acts of a performative nature. May be repeated three times for credit when topic differs. GE credit: AH, DD, VL, WC.—I, II, III.

159S. Contemporary Experimental Performance, Theatre and Drama (4) Lecture/discussion—4 hours. Examination and evaluation of the "New Theatre"—its experimental and innovative nature since the 1960s. Dance, film, stage, performance, performance art and public acts of a performative nature. This course is offered in Sydney, Australia. Not open for credit to students who have completed course 156D. GE credit: AH, DD, VL, WC.—I, II, III.

160A-160B. Principles of Playwriting (4-4) Lecture/seminar—4 hours. Prerequisite: two courses in Dramatic Art or related courses in other departments; course 160A prerequisite for 160B or consent of instructor. Analysis of dramatic structure; preparation of scenarios; the composition of plays. GE credit: WE.

170. Media Theatre (4) Lecture—1 hour; rehearsal—2 hours; performance instruction—1 hour. Prerequisite: upper division standing in Dramatic Art, Art Studio, Design, Technological Studies, Film Studies, Computer Science, or Engineering: Computer Science, or consent of instructor. New media and application of the in theatre setting. May be repeated for credit. GE credit: AH, VL.

174. Acting for Camera (4) Lecture/laboratory—6 hours. Prerequisite: consent of instructor. Analysis and practice of acting skills required for camera work and digital media. May be repeated eight times for credit when different instructor is assigned. (Same course as Cinema & Technological Studies 174.)—III. (III) Anderson, Merlin.

180. Theatre Laboratory (1-5) Prerequisite: upper division standing or course 25, or consent of instructor. Projects in acting, production, scene design, costume, lighting, directing, and playwriting. Participation in departmental productions. May be repeated for credit.—I, II, III, (I, II, III).

180A. Theatre Laboratory: Performance (1-5) Rehearsal—12 hours. Prerequisite: consent of instructor. Limited enrollment. Rehearsal and performance of a production directed or choreographed by visiting Granada Artists-in-Residence and/or faculty, and/or the UG Edge Festival. May be repeated for credit. Since each production involves different scripts, directions, logistics, rehearsal techniques, and performance processes, it is possible for students to appear in a variety of productions in the course of their education. Admission by petition.—I, II, III, (I, II, III).

180B. Theatre Laboratory: Design (1-4) Prerequisite: course 24, 25, 124A, 124B, 124C, 124D and/or 130 or consent of instructor. Limited enrollment. Design-related participation in theatre and dance productions. Study and execution of design concepts. May be repeated for credit. Because each theatrical piece is conceived and produced afresh with new source material, scripts, and production style the challenges and assignments for the designers will be new each and every time they design a show. GE credit: AH, VL.—I, II, III, (I, II, III).

180C. Theatre Laboratory: Management, Directing, other Production Team (1-5) Prerequisite: consent of instructor. Participation in theatre and dance production management, direction, choreography, dramaturgy, writing or other production related role; research, creation and implementation of production concept in collaboration with the director and other members of the production team. May be repeated for credit. Because each theatrical piece is conceived and produced afresh with new source material, scripts, and production style the challenges and assignments for the designers will be new each and every time they design a show. GE credit: AH, VL.—I, II, III, (I, II, III).

180D. Theatre Laboratory: Crew (2-4) Laboratory—6-12 hours. Prerequisite: consent of instructor. Participation in theatre and dance productions as backstage running crew which will involve scheduling, rehearsal, and execution of performance. May be repeated for credit.—I, II, III, (I, II, III).

180E. Theatre Laboratory: Scenic (1-4) Laboratory—3 hours. Prerequisite: consent of instructor. Practicing experience working on scenery and properties for theatre and dance department productions. Study and execution of basic scenery and prop engineering, construction, painting, rigging, scenic techniques, materials, tools, and equipment use. Safety training requirement. May be repeated for credit.—I, II, III, (I, II, III).

180F. Theatre Laboratory: Costume (1-4) Laboratory—3-12 hours. Prerequisite: consent of instructor. Practicing experience working on costumes for theatre and dance department productions. Study and execution of basic costume construction techniques and materials, tools, and equipment use. Skills development, professional etiquette. Safety training requirement. May be repeated for credit.—I, II, III, (I, II, III).

181. Directed Group Study (1-5) May be repeated for credit. GE credit: Wrt.

192. Internships in Theatre and Dance (1-12) Internship—3-36 hours. Theatre production experience arising from differences in the type and style of plays selected from Greece to the present. May be repeated for credit.

192S. Internships in Theatre and Dance (1-12) Internship—3-36 hours. Theatre production experience arising from differences in the type and style of plays selected from Greece to the present. May be repeated for credit. GE credit: WE.

194HA-194HB. Special Study for Honors Students (3-3) Independent study—9 hours. Prerequisite: qualification for Letters and Science Honors Program and admission to Dramatic Art Senior Honors Program. Preparation and presentation of a culminating project and the supervision of an instructor, in one of the creative or scholarly areas of Dramatic Art. (Deferred grading only, pending completion of sequence.)

195. Senior Capstone Experience (2) Project; lecture/discussion—1 hour. Open to Dramatic Art Majors who have completed 135 or more units. Capstone experience for majors. Examination, reflection and synthesis on development. Discussion of professional development and transferrable skills. Individual project and development of portfolio. (P/N grading only.) GE credit: AH, VL.—I, II, III, (I, II, III).

197L. Tutoring in Dramatic Art (1-5) Lecture—1 hour. Prerequisite: upper division or graduate standing with major in dramatic art; consent of department chairperson. Leading of small voluntary groups affiliated with one of the department’s regular courses. May be repeated for credit. (P/N grading only.)

198. Directed Group Study (1-5) May be repeated for credit. GE credit: Wrt.

199. Special Study for Advanced Undergraduates (1-5) Prerequisite: consent of instructor. (P/N grading only.)

Graduate

200. Methods and Materials in Theatre Research (4) Seminar—3 hours; term paper. Essential research tools in theatre and related fields; bibliographies, primary sources, methods of evaluating and presenting evidence, delineating research areas in the field.

211. Advanced Voice and Speech (3) Lecture—2 hours; laboratory—2 hours. Prerequisite: advanced senior undergraduate Acting major or graduate student. Open only to Dramatic Arts Students and Ph.D. students with an emphasis in Performance and Theatre. Review a progression of exercises to free, develop and strengthen the voice, first as a human instrument, and then as an actor’s instrument using various texts such as Shakespeare, Ibsen and contemporary plays. Required for the M.F.A. degree in Acting. May be repeated twice for credit.

212. Advanced Stage Movement (3) Laboratory—6 hours. Prerequisite: graduate standing in the MFA Program. The application of modes of exploration, breath placement, and the use of imagery as well as laboratory movement system as a method of analysis in classic and modern plays. Open to advanced undergraduates by consent of instructor. May be repeated for credit.

214. Special Problems in Advanced Acting (4) Seminar—2 hours; laboratory—4 hours. Prerequisite: consent of instructor. Advanced acting problems arising from differences in the type and style of plays selected from Greece to the present. May be repeated for credit.

Quarter Offered: T-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): AH=Arts and Humanities; SCI=Science and Engineering; SOC=Sociocultural; Div=Dominant Diversity; Wrt=Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SCI=Science and Engineering; SOC=Sociocultural; Div=Dominant Diversity; Wrt=Writing Experience
224A. Seminar in Theatrical Design: Ancient Worlds—Early 17th Century (4)
Seminar—2 hours; project—2 hours. Prerequisite: graduate standing; group study while focusing primarily on one discipline: scenic, costume or lighting design. Periods covered: Greek, Medieval, Renais-
sance, Baroque, and Rococo, early 17th century. Projects focus on a variety of media, theatre, dance, film, video, computer-based, looking at cultural, aesthetic, rhetor-
al and political theory. Offered in alternate years. May be repeated three times for credit when topic differs.

224B. Seminar in Theatrical Design: Mid 17th Century to Present (4)
Seminar—2 hours; project—2 hours. Prerequisite: graduate standing; course 224A and consent of instructor. Group study focusing primarily on one discipline: scenic, costume or lighting design. Periods covered: Cavalier, Restoration 17th century opera and ballet, 19th century drama. Design projects include script analysis, research of period style, fashion, character development, developing design concepts, presentation skills.

224C. Seminar in Theatrical Design: the 20th Century (4)
Seminar—2 hours; project—2 hours. Prerequisite: graduate standing; course 224A and 224B or consent of instructor. Group study focused on contemporary design concepts for new works and classics: Shakespeare, modern dance, concept plays and musicals. Script and character analysis for design in performance, research, design projects.

224D. Seminar in Theatrical Design: Contemporary Concepts (4)
Seminar—2 hours; project—2 hours. Prerequisite: graduate standing; course 224A, 224B, 224C, and 224D or consent of instructor. Group study focusing primarily on one discipline: scenic, costume or lighting design. Emphasis on contemporary design concepts for new works and classics. Projects related to form a whole in space and time, as well as methods of sequencing used by each discipline to produce artistic products. May be repeated one time for credit.

224E. Seminar in Theatrical Design: Advanced Concepts (4)
Seminar—2 hours; project—2 hours. Prerequisite: graduate standing; courses 224A, 224B, 224C, and 224D or consent of instructor. Group study focusing primarily on one discipline: scenic, costume or lighting design. Emphasis on special issues in contemporary design concepts for new works and classics. Script and character analysis for design in performance, research, design projects.

225. Performance Design Studio: Techniques and Media (2)
Studio—2 hours. Prerequisite: graduate standing; must be taken concurrently with course 224 series. Exploration and development of techniques and skills in the performance design process. Drafting, model building, drawing, painting and rendering, costume drawing, color theory, lighting techniques, design portfolio preparation and presentation. May be repeated up to five times for credit.

228. Seminar in Directing Theory: Non-Realism (4)
Seminar—3 hours; term paper. Modern directing theory as it applies to non-realistic theatre; development of directoral concepts for production of selected non-realistic plays—Greek to the present. May be repeated two times for credit. —I, II, III, (I, II, III)

229. Special Problems in Directing (4)
Seminar—2 hours; laboratory—2 hours; rehearsal—4 hours. Prerequisite: consent of instructor. Projects in directing scenes selected from plays from ancient Greece to the present. May be repeated two times for credit. —I, II, III, (I, II, III)

230. Advanced Problems in Choreography and Performance (2)
Laboratory/discussion—2 hours. Prerequisite: consent of instructor. Focuses contemporary issues of choreography and performance in depth and how these issues pertain to performance work. Focus will include contemporary thought on representation, legibility, new forms, and cultural attitudes. May be repeated six times for credit. —I, II, III, (I, II, III)

244. Critical Approaches to Traditional Systems of Body Movement (4)
Discussion/laboratory—6 hours; project—term paper. Introduction to traditional systems for body movement; development of different approaches to them, and experiments in how they inform training and practice in theatre, dance, and performance. May be repeated five times for credit. Offered irregularly.

250. Modern Theatre (4)
Seminar—3 hours; term paper. The theatre of Europe and America, 1860-1940, with emphasis on the relationship of the dramas of the period to the historical circumstances under which they were pro-
duced.

251. Scoring and Scripting in Performance (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: graduate standing. The process of weaving together various performance elements brought into play by the artists in their respective disciplines. The "script" is the thread from which the artists’ "scores" will layer and transform the "script" into performance for specific time, place, spectators.

252. Performance: Concepts of Space, Place, and Time (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: graduate standing. Exploration of the concepts of creating performance spaces, establishing a sense of place, and communicating the concept of time explored through collaborative interaction. Research includes traditional principles, site-specific spaces and consider-
ation of various tools from music and movement.

253. Approaches to Collaboration (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: graduate standing. Historical and contemporary the-
ories of constructing stage identities. Discussion and project collaborations based on theories. Questions of identity related to ethnicity, gender or sexual ori-
tentation.

255. Composition in the Arts (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: graduate standing. Examination of various approaches to collaboration among artists in differ-
ent media and their influence on the creative pro-
cess. —I

257. Interdisciplinary Seminar in Theatre, Performance, and Practice. Instruction is ofored a variety of disci-

260. Topics in Contemporary Theatre and Performance (4)
Seminar—3 hours; term paper; project. Prerequisite: admission to any graduate program in the Universi-
ty. Preference will be given to students enrolled in the Designated Emphasis in Studies in Performance and Practice. Instruction is offered a variety of disci-

265A. Performance Studies: Modes of Production (4)
Seminar—3 hours; term paper; project. Introduces students to the literature of performance production in a variety of media: theatre, dance, film, video, computer-based, looking at cultural, aesthetic, rhetor-
al and political theory. Offered in alternate years. May be repeated three times for credit when topic differs.

265B. Performance Studies: Signification and the Body (4)
Seminar—3 hours; term paper; project. Introduces students to analysis of the body in performance, drawing on theoretical models from several fields. Offered in alternate years. May be repeated three times for credit when topic differs.

265C. Performance Studies: Performance and Society (4)
Seminar—3 hours; term paper; project. Introduces students to the role of performance (broadly defined), in everyday life, sociopolitical negotiation, identity, social movements, the media, and the state. Offered in alternate years. May be repeated three times for credit when topic differs.

280. Theatre Laboratory (1-12)
Advanced practice in acting, designing, directing, playwriting, and technical theatre. May be repeated for credit. —I, II, III, (I, II, III)

299. Group Study (1-5)
Prerequisite: consent of instructor.

299D. Dissertation Research (1-12)
(S/U grading only.)

Professional

396. Teaching Assistant Training Practicum (1-12)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III, (I, II, III)

412. Stage Makeup (1)
Lecture/laboratory—2 hours. Prerequisite: consent of instructor. Approved for graduate degree credit. Lectures, demonstrations, and practical work in aspects of theatrical makeup.

Transportation Technology and Policy (A Graduate Group)

John Harvey, Ph.D., Chairperson of the Group

Group Office. 1605 Tilia, Suite 100
530-752-0247; http://www.its.ucdavis.edu

Faculty
Ralph C. Aldridge, III, Ph.D., Professor
Mechanical and Aerospace Engineering

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses.

Pre-Fall 2011 General Education (GE): AH—Arts and Humanities; Div—Diversity; SS—Social Sciences; VL—Visual; WC—World Cultures; Div+—Diversity Co-Principled Major

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; Div+—Diversity; SS—Social Sciences; VL—Visual; WC—World Cultures; Div+—Diversity Co-Principled Major

AGCH—American Cultures; DD—Diversity; Div—Diversity; HUM—Humanities; Sci—Science and Engineering; SocSci—Social Sciences; W—Writing Experience
Transportation Technology and Policy (A Graduate Group)

Christopher Yang, Ph.D., Research Scientist
(Institute of Transportation Studies)
Sonia Yeh, Ph.D., Research Scientist
(Institute of Transportation Studies)

Graduate Study. The Graduate Group in Transportation Technology and Policy offers the M.S. (Plan I—thesis; and Plan II—exam), and Ph. D. degrees in two areas of specialization: Transportation Technology; and Transportation Planning and Policy. The technology track is for students trained in engineering and the physical sciences and interested in systems-level planning, analysis, management and design of advanced technologies (emphasizing vehicle propulsion and “intelligent transportation system” technologies) focusing on energy and environmental issues. The planning and policy track is aimed at students from a wider range of disciplines interested in the broader public policy issues concerning transportation systems. The curriculum for both tracks includes coursework in mechanical, environmental engineering, economics, policy sciences, statistics, travel behavior, management, technology assessment and environmental studies.

Preparation. Applicants will normally be expected to have completed two courses in calculus, one course in linear algebra, and one course each in calculus-level statistics and microeconomics. Additionally, students entering the technology track will need either to have an appropriate technical background or make up a relatively large number of prerequisite courses in order to be able to take the approved courses in that track.

Program of Study. Students will have the option of following either the technology or policy/management track. M.S. students complete 6 core courses plus electives. Ph.D. students take 7 courses from the same core, 3 additional courses from their chosen track, and pass two comprehensive oral exams. Master’s degrees require a minimum of 36 quarter units and doctoral degrees require a minimum of 54 quarter units. M.S. Plan I students may replace up to 6 units from the core with research (course 299) units. At least two thirds of all credits must be at the graduate level.

Graduate Advisers. YueYue Fan and Alissa Kendall

Curriculum

Core Courses. Students in each track are required to take courses in a common set of core competencies, as well as (for Ph.D. students) some courses in the other track.

Knowledge areas core courses: M.S. and Ph.D. students take Transportation Technology (TTP 210), Transportation Policy (ECI 252 or TTP 220), and Transportation Systems (ECI 251).

Skill areas core courses: M.S. and Ph.D. students take one in the area of Research Design from the following: Survey Research Methods (TTP 200), Research Methods in Environmental Policy (ESP 278), Survey and Questionnaire Research Methods (FY 207), Design and Analysis of Engineering Experiments (ECE 265), Experimental Design and Analysis (PSY 205), Engineering Experimentation and Uncertainty Analysis (MAE 207), or Statistical Methods for Research (STA 205).

Natural Resource Economics (ARE 175)

Environmental Economics (ARE 176)

Microeconomic Analysis (ARE 204)

Economic Analysis of Resource and Environmental Policies (ARE 275)

Environmental Technology (ARE 276), or Infrastructure Economics (ECI 268), Energy Economics (125).

Technology Courses. Approved courses in this area include the following; additional courses may be added upon approval by the Chairperson:

Applied Biological Systems Technology 180, 181N, 182

Atmospheric Science 116, 270

Applied Science 116, 220A, 220B

Biological Systems Engineering 216

Civil and Environmental Engineering 143, 149, 161, 162, 179, 242, 244, 250, 253, 256, 257, 269

Computer Science Engineering 168

Environmental and Resource Sciences 131, 186

Electrical and Computer Engineering 207

Geography, 200CN

Landscape Architecture 150

Mechanical Engineering 134, 161, 163, 188, 216, 217, 218, 226, 234, 236, 258, 269

Other Courses. Approved courses in this area include the following; additional courses may be added upon approval by the Chairperson:

Agricultural and Resource Economics 100B, 125X, 132, 144, 145, 175, 176, 204, 275, 276

Anthropology 104N, 127, 211, 222

Civil and Environmental Engineering, 165, 244A, 252, 258, 266

Civil and Environmental Engineering/Environmental Science and Policy 163, 289A

Communication 170

Community and Regional Development 162, 171, 240, 245

Eco 213

Economics 101, 2000

Education 222

Engineering 250

Environmental Horticulture 110

Environmental Science and Policy 163, 167, 169A, 171, 179

Geography 155

History 172

Landscape Architecture 180C, 180L, 180M, 181M, 201, 205, 220

Management 240, 251, 293

Political Science 175, 187, 208, 279

Psychology 155

Sociology 141, 143A, 143B, 160

Transportation Technology and Policy 200, 210, 220, 281, 282, 289A

ACGH = American Cultures; All = All; Arts and Humanities; AT = Arts and Technology; Div = Divisional; SciEng = Science and Engineering; SocSci = Social Sciences; Wrt = Writing Experience

Fall 2011 and on Revised General Education (GE): AH = Arts and Humanities; SE = Science and Engineering; SS = Social Sciences; Div = Divisional; SciEng = Science and Engineering; Wrt = Writing Experience
Transportation Technology and Policy 200

Courses in Transportation Technology and Policy (TTP)

Graduate

200. Transportation Survey Methods (4)
Lecture
Prerequisite: Statistics 13; Civil and Environmental Engineering 251 recommended. Description of types of surveys commonly used in transportation demand modeling, including travel and activity diaries, attitudinal, panel, computer, and stated-response surveys. Discussion of sampling, experimental design, and survey design issues. Analysis methods, including factor, discriminant and cluster analysis. Not open for credit to students who have taken Civil and Environmental Engineering 255. [Same course as Geography 287.]—II. (Ill.)

210. Fundamentals of Transportation Technology (4)
Lecture—4 hours. Prerequisite: consent of instructor; Mathematics 21A, 21B, 22A; graduate or junior/senior undergraduate as a technical elective. Limited enrollment. Not open for credit to students who have completed Transportation Technology and Policy; and Fundamentals of Transportation Technology 289. (Former course Transportation Technology and Policy; Fundamentals of Transportation Technology 289) —II. (II.)

220. Transportation Planning and Policy (4)
Lecture/discussion—4 hours. Limited enrollment. Transportation planning process at the regional level, including the role of federal policy in shaping regional transportation planning, tools and techniques used in regional transportation planning, issues facing regional transportation planning agencies, pros and cons of potential solutions and strategies. Students having taken this course previously as course 289 cannot repeat it for credit; having taken other course 289 offerings does not preclude taking this course for credit. [Same course as Geography 236]. Offered in alternate years.—II. (III) Handy

281. ITS Transportation Seminar Series (1)
Seminar—1.5 hours. Transportation seminars by guest speakers, on varied topics. May be repeated for credit. [S/U grading only]—I, II, III. (I, II, III) Handy, Spering

282. Transportation Orientation Seminar (1)
Seminar—1 hour. Ten weeks of seminars, introducing various topics in transportation research and education, focusing on topics of particular interest at UC Davis. May be repeated for credit. [S/U grading only]—I, II, III. (I, II, III) Handy

283. Professionalism, Leadership, and Ethics (1)
Seminar—2 hours. Speakers from industry, government, academia, and NGOs will lead discussions about succeeding and performing in the professional world. They will address leadership, ethics, and other workplace issues. May be repeated for credit. [S/U grading only]—III. (III) Handy

289A. Selected Topics in Transportation Technology and Policy (1-5)
Lecture and/or laboratory. Prerequisite: consent of instructor. Directed group study of special topics with instruction carried out through lecture or laboratory, or a combination of both. May be repeated for credit.—I, II, III. (I, II, III)

289B. Selected Topics in Transportation Technology and Policy (1-5)
Lecture and/or laboratory. Prerequisite: consent of instructor. Directed group study of special topics with instruction carried out lecture or laboratory, or a combination of both. May be repeated for credit. [S/U grading only]—I, II, III.

290C. Graduate Research Group Conference (1)
Discussion—1 hour. Prerequisite: consent of instructor. Research problems, progress, and techniques in transportation. May be repeated for credit. [S/U grading only]—I, II, III. (I, II, III)

292. Internship in Transportation Technology and Policy (1-5)
Prerequisite: second year standing; approval of project prior to period of internship. Supervised work experience in transportation studies. May be repeated for credit if topic differs. [S/U grading only]—I, II, III. (I, II, III)

298. Group Study (1-5)
Discussion—1.5 hours. Prerequisite: consent of instructor. [S/U grading only]

299. Research (1-12)
Discussion—1 hours. Prerequisite: consent of instructor. [S/U grading only]

Professional

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. [S/U grading only]—I, II, III. (I, II, III)

UC Davis Study Abroad

Ailiki Dragona, Ph.D., Fadi Fathallah, Ph.D., Faculty Directors
UC Davis Study Abroad
207 Third Street, Suite 130
530-297-4633; Fax 530-297-4695;
studyabroad@ucdavis.edu;
http://studyabroad.ucdavis.edu/

The opportunity to study abroad is one of the richest educational experiences a student can have. When students return from study abroad in places like Italy or Hong Kong, they describe their time abroad as an experience that changed their lives. Students who study abroad to see the world, to study their academic interests in a global context, to learn a language, to prepare for a job in the global economy and to add distinction to an application for graduate or professional school.

UC Davis Study Abroad can help students decide which program is best for them, whether to study abroad for a summer, quarter, semester or full year and when to go abroad (freshman through senior years). UC Davis Study Abroad Coordinators also participate in freshman seminars, offer financial aid workshops and can advise on programs that have internship opportunities. UC Davis Study Abroad also administers the Global and International Studies (GIS) minor, which is sponsored by the Humanities Program in the College of Letters and Science.

UC Davis Study Abroad is home to UC Davis Summer Abroad, UC Davis Seminars Abroad and the University of California Education Abroad Program (UCEAP). UC Davis Study Abroad also provides advising for students interested in non-Uc Davis programs and administers the Non-UC Study Abroad leave program. Finally, UC Davis Study Abroad advises and provides student services for international UCEAP students.

UC Education Abroad Program (UCEAP)

Fadi Fathallah, Ph.D., Faculty Director
UC Davis Study Abroad
207 Third Street, Suite 120
530-297-4633; Fax 530-297-4695;
http://studyabroad.ucdavis.edu/programs/uceap/

The UC Education Abroad Program (UCEAP) is one of the premier programs for students in the nation. UCEAP offers international study programs in association with nearly 140 host universities and institutions in some 32 countries around the world. Participating students remain registered at UC while studying abroad and receive full academic credit for their work. UCEAP students maintain their financial aid and scholarship eligibility while abroad. UCEAP has study abroad opportunities for undergraduates at all class levels as well as for qualified graduate students who have completed at least one full year of graduate work and have the support of their graduate program and graduate adviser. UCEAP offers semester, quarter, and summer programs for all majors. Over 50% of the programs are offered in English, while several programs allow students to learn a language while experiencing the culture first hand. Some programs include the possibility of internships or field research. In most cases, students attend courses taught by the faculty of the host institution.

UC faculty members serve as directors at most Study Centers abroad, providing in-country academic advising to students during their program. Full UC credit is granted for courses satisfactorily completed, and courses and grades are recorded on official UC transcripts. With careful planning, most UCEAP students make normal progress toward their UC degrees, even those students who study abroad for a full year. With approval of their major or college advisers, students may earn credit towards their major, minor and general education requirements.

Graduation Requirements

II prospective applicants, particularly students who intend to study abroad during their senior year, should carefully plan their course program for Davis and abroad in order to satisfy university, college, and major/minor requirements for their degree.

Although units and grade points earned while studying abroad through UCEAP are incorporated into the University transcript and GPA, departments and minors retain the right to determine which UCEAP courses will be accepted in satisfaction of major and minor requirements.

All degree candidates must meet the University residence requirement. Recognizing the special value of study abroad, the faculty have approved two exceptions to the usual residence requirement for students participating in the Education Abroad Program:

1. Students planning to graduate immediately upon completion of their UCEAP program may satisfy the University residence requirement by completing at least 35 of their final 45 units on the Davis campus preceding entry into the EAP.

2. Students who have not finished all of their degree requirements following completion of their UCEAP program may satisfy the University residence requirement by completing at least 35 units, including at least 12 units after returning from UCEAP, on the Davis campus within the final 90 units earned towards their degree. With this option, as many as 55 units taken abroad may be applied toward the unit requirement for graduation.

Students must consult with their college Dean's office early during the UCEAP planning process for information on the university residence requirement.

Students must satisfy GE requirements while on UCEAP, but should consult with the Education Abroad Center UC Davis Study Abroad and their college Dean's office prior to departure for information on the certification process.

Students may participate in UCEAP provided that (1) they will not exceed 225 units prior to their departure and (2) that all their degree requirements have been fulfilled either before they leave campus or during their time on UCEAP study abroad program. Participants may only return to campus from UCEAP to complete any outstanding degree requirements provided that they can do so within 225 units.

Participants in programs that conclude in May or June who satisfy all degree requirements while
abroad and expect to graduate upon completion of the year abroad should file for candidacy to receive their degree in time for the June commencement ceremony, however, their graduation date will be in September. Participants in programs that conclude in November or December should file for candidacy to receive their degree in March. Such returning students may be eligible to participate in the June commencement ceremony.

UC Davis Summer Abroad

Aliki Dragona, Ph.D., Faculty Director
207 Third Street, Suite 120
530-297-4633; Fax 530-297-4695;
http://studys abroad.ucdavis.edu/programs

UC Davis Summer Abroad offers a number of faculty-led programs abroad, including UC Davis Quarter Abroad, UC Davis Summer Abroad, and UC Davis Seminars Abroad. These programs enable students to study abroad in small program cohorts taught by UC Davis faculty in over 30 countries around the world. Programs are specifically tailored to UC Davis disciplines and provide unique opportunities for study, field or lab work, research, internship and language learning in intimate and engaging environments.

UC Davis Seminars Abroad

Aliki Dragona, Ph.D., Faculty Director
207 Third Street, Suite 120
530-297-4633; Fax 530-297-4695;
http://studys abroad.ucdavis.edu/programs

Students earn 2-6 UC Davis quarter units through one or more courses taught abroad. These short courses are taught by UC Davis faculty and may be offered as stand-alone programs abroad, or as an international component to a course taught during a regular term on campus. A heavy focus on field trips, onsite projects and group activities enhance classroom instruction. Students many be able to apply earned units toward their major, minor, or general education requirements. Programs are typically offered in September, June, or during the winter break.

Courses in Education Abroad Program (EAP)

100X. International Education Seminar (1) Seminar—1 hour. Prerequisite: open to all EAP or UC Davis study abroad students. Seminar examines the academic, cultural, and personal issues of study abroad, including academic programs abroad, country-specific history and culture, cross-cultural experiences, culture shock, racial and gender issues. May be repeated for credit. (P/NP grading only)—I, II, III, IV.

110X. International Education Seminar (1) Seminar—1 hour. Prerequisite: open to all EAP or UC Davis study abroad students. Seminar examines the academic, cultural, and personal issues of study abroad, including academic programs abroad, country-specific history and culture, cross-cultural experiences, culture shock, racial and gender issues. May be repeated for credit. (P/NP grading only)—I, II, III, IV.

120X. International Education Seminar (1) Seminar—1 hour. Prerequisite: open to all EAP or UC Davis study abroad students. Seminar examines the academic, cultural, and personal issues of study abroad, including academic programs abroad, country-specific history and culture, cross-cultural experiences, culture shock, racial and gender issues. May be repeated for credit. (P/NP grading only)—I, II, III, IV.

180X. Education Abroad: Special Topics (1-12) Lecture/discussion—3-12 hours; laboratory/discussion—3 hours. Prerequisite: minimum GPA requirement for each study abroad program as specified in the written agreement between UC Davis and the host institution; permission courses may also apply. Students who participate in approved international programs take this course up to 12 units while studying abroad. May be repeated for credit; credit limited to UC and Dean’s Office to determine how they fulfill UC Davis requirements. Offered irregularly— I, II, III, IV.

190X. International Education Seminar (1) Seminar—1 hour. Prerequisite: open to upper division students for UC Davis study abroad and international internship programs. Seminar examines the academic, cultural, and personal issues of study abroad, including academic programs abroad, country-specific history and culture, cross-cultural experiences, culture shock, racial and gender issues. May be repeated for credit. (P/NP grading only)—I, II, III, IV.

200X. Internship—3-12 hours. Prerequisite: participation in academic internship. Students are required to complete an academic internship. Students must complete the assignment, students take advantage of internships provided by UC Davis and regularly make arrangements for academic internships, often including guest speakers, observations of congressional committees and federal agencies, and other relevant Washington experiences.

Courses are taught by UCDC faculty appointed by the various UC campuses, or visiting faculty from the Washington area. Financial aid eligibility and awards as determined by the home campus is maintained while enrolled in the program, and the aid package can be adjusted to reflect the additional costs of the program.

Summer Component (10 weeks). UCDC also offers a 10-week Summer Program with a credit or non-credit option. The credit option allows students to enroll in courses in addition to working at an internship. Students pay the summer sessions rate per credit. UC Davis’ Washington Center (UCDC) offers the program, and the aid package can be adjusted to reflect the additional costs of the program.
University Graduation Requirements

- All prospective applicants should carefully plan their course programs in order to satisfy university, college, and major/minor requirements for their degree.
- Although units and grade points earned at UCDC are incorporated into the University transcript and GPA calculations, departments and programs retain the right to determine which UCDC courses will be accepted in satisfaction of major and minor requirements.
- All degree candidates must meet the University residence requirement. Students should consult with their college Dean’s office early during the UCDC planning process for information on the university residence requirement, particularly students who intend to study abroad or participate in UCDC during their senior year.

Recognizing the special value of UCDC, the faculty has approved exceptions to the usual residence requirement for students participating in the Washington Program:

- Students planning to graduate immediately upon completion of participation in UCDC may satisfy the University residence requirement by completing at least 35 of their final 45 units on the Davis campus immediately preceding entry into UCDC.
- Students who have not finished all of their degree requirements following completion of their participation in the UCDC program may satisfy the University residence requirement by completing at least 35 units, including at least 12 units after returning from UCDC, on the Davis campus within the final 90 units earned toward the degree.

Students who will not meet the residency requirements outlined may petition their Dean’s office requesting an exception to policy.

- Students may satisfy GE requirements while at UCDC by consulting with their college Dean’s office prior to departure for information on the certification process.
- Students with a large number of units may participate in the UCDC program provided that (1) they will not exceed 225 units prior to their departure and (2) that all their degree requirements have been fulfilled either before they leave campus or during their time at UCDC. Participants may only return to campus from UCDC to complete any outstanding degree requirements provided that they can do so within the 225 unit restriction.

Courses in UC Washington Center (WAS)

Optional elective courses listed at http://www.ucdc.edu/academic/courses.

Upper Division

175. Health Policy and Health Politics (4)
Seminar—3 hours; extensive writing or discussion—1 hour. Restricted to students attending UC Washington Center program. Following the model of a Congressional subcommittee, identification of four salient health policy issues for study, research, and development of model policies to address them. (Same course as Public Health Sciences 175W.) GE credit: SocSci, Writ I, II, SS, WE.

187. Gun Violence (4)
Lecture/discussion—4 hours. Gun violence, viewed from the perspectives of criminology and public health. Topics include personal and societal contributing factors and development of potential solutions. Offered in alternate years.

192. Internship in the UC Davis Washington Center Program (7)
Internship—28 hours. Prerequisite: Junior or senior standing, admission in the UC Davis Washington Center undergraduate program, course 193 concurrently. Internship in Washington, DC with associated, supervised work experience under the auspices of the Davis Honors Challenge. May be repeated for credit for a total of 12 units. (P/NP grading only.)

193. Washington Center Research Seminar (4)
Lecture/discussion—1 hour; independent study—3 hours; tutorial—0.5 hour. Prerequisite: course 192 concurrently. Core academic component of Washington Program. Topics coordinated with internships. Research draws on resources uniquely available in Washington, DC. Supervised preparation of extensive paper. (Same course as Political Science 192W.) GE credit: SocSci, Writ I, OL, SS, WE.

University Honors Program

(formerly Honors Challenge and Integrated Studies Honors Program)

Ari Kelman, Ph.D.; Program Director
Lolita Nelson-Adkins, Program Manager

Faculty

Includes members from various departments across colleges.

The Program of Study

The honors program consists of a designed to enhance the undergraduate experience of highly motivated students in all academic pathways. The University Honors Program (UHP) is an interdisciplinary, campus-wide honors program for top students interested in enhancing their education through special courses, close contact with faculty, and dynamic interaction with academic peers.

General Education Honor honors courses, seminars, and special study opportunities constitute the course offerings of the University Honors Program. First-year and second-year students in the UHP take part General Education honors courses during their first and second year. Upper division and transfer students complete a variety of research projects and serve learning opportunities. All students who successfully complete the program participate in the University Honors Program. Issues and research projects and provide experience with group dynamics and collaborative exploration of problems. Course enrollment is generally limited to 25 students.

Updated program information is available at the UHP website. A complete list of these courses, with course registration numbers, is made available to admitted students through the UHP office.

Only University Honors Program students may register for the courses in the University Honors Program (HNR)

Courses in Davis Honors Challenge (HNR)

Lower Division

90X. Honors Discussion Section (1)
Discussion—1 hour. Prerequisite: open only to students in the Davis Honors Challenge. Examination of special topics in selected lower division courses through additional readings, discussions, term papers, collaborative work, or special activities, including projects, field and laboratory experiences, computer simulations, creative works. May be repeated for credit.

92. Internship (1-12)
Internship—3.36 hours. Prerequisite: open only to students in the Davis Honors Challenge. Supervised work experience under the auspices of the Davis Honors Challenge. May be repeated for credit for a total of 12 units. (P/NP grading only.)

94. Honors Seminar (4)
Seminar—4 hours. Open to students in the Davis Honors Challenge. Collaborative, multidisciplinary exploration of complex topics in the social sciences. Focus on critical thinking and analytical interpretation, on oral and written communication, and on the use of electronic media in gathering information. May be repeated for credit. GE credit: Writ I, II, III, IV, SS, WE.

98. Directed Group Study (1-5)
Discussion—1-5 hours. Prerequisite: open only to students in the Davis Honors Challenge. May be repeated for credit. (P/NP grading only.)

99. Special Study for Undergraduates (1-5)
Independent study—1-5 hours. Prerequisite: student in the Davis Honors Challenge. May be repeated for credit. (P/NP grading only.)

Upper Division

190X. Honors Contract (1)
Independent study or discussion—3 hours. Prerequisite: open only to students in the Davis Honors Challenge. In-depth examination of material in an upper division course as defined in an Honors Contract Proposal submitted by the student. Contract must be approved by the instructor and the Honors Council of the Academic Senate. May be repeated for credit.

192. Internship (1-12)
Internship—3.36 hours. Prerequisite: open only to students in the Davis Honors Challenge. Supervised work experience under the auspices of the Davis Honors Challenge. May be repeated for credit for a total of 12 units. (P/NP grading only.)

194. Honors Seminar (3)
Seminar—3 hours. Open only to students in the Davis Honors Challenge. Team-based work on actual problems drawn from the public or private sector. Focus on critical thinking and analytical interpretation, oral and written communication skills, and development of practical solutions to real-world problems. GE credit: Writ I, II, III, IV.

195. Honors Thesis/Honors Project (1-3)
Independent Study—3.9 hours. Prerequisite: Open only to students in the Davis Honors Challenge. Guided independent study of a selected topic leading to the presentation of an honors thesis/honors project. May be repeated for credit up to 9 units.

198. Directed Group Study (1-5)
Discussion—1-5 hours. Prerequisite: open only to students in the Davis Honors Challenge. May be repeated for credit. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Independent study—1-5 hours. Prerequisite: open only to students in the Davis Honors Challenge. May be repeated for credit. (P/NP grading only.)

Courses in Integrated Studies (IST)

Lower Division

8. Colloquium (1)
Discussion—1 hour. Lectures, films, and readings on the interaction between the arts and sciences. May be repeated for credit. (P/NP grading only.)

8A. Special Topics in Natural Science and Mathematics (4)
Lecture—3 hours; discussion—1 hour. Group study of a special topic in natural sciences and mathematics. Course varies with topic approved by the instructor. Limited enrollment. May be repeated for credit. GE credit: SciEng, Writ I, SE, SL, I, II, III, IV.

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; Fall 2015-Spring 2016 offering in parenthesis.

Pre-Fall 2011 General Education (GE): ArtHum-Arts and Humanities; SciEng-Science and Engineering; SocSci-Social Sciences; ACGH-American Culture; DD-Domestic Diversity; Writ-Writing Experience

Fall 2011 and on Revised General Education (GE): AH-Arts and Humanities; SE-Science and Engineering; SS-Social Sciences; ACGH-American Culture; DD-Domestic Diversity; OL-Oral Skills; QL-Quantitative; SL-Scientific; VL-Visual; WC-World Cultures; Writ-Writing Experience
University Honors Program

8B. Special Topics in Humanities (4)
Lecture—3 hours; discussion—1 hour. Group study of a special topic in humanities. Course varies with topic offered. Limited enrollment. May be repeated for credit. GE credit: ArtHum, Wrt | AH. —I, II, III (I, II, III)

8C. Special Topics in the Social Sciences (4)

9. Seminar (1)
Lecture—1 hour. Preparation of a research report. Normally taken with course 8. May be repeated for credit. (P/NP grading only.) —I, II, III (I, II, III)

90. Seminar (1)
Seminar—1 hour. Prerequisite: course 9, consent of instructor; completion of 45 units with a minimum GPA of 3.250. Interrelation between the arts and sciences, focusing on a special topic. Limited to sophomores who participated in the Integrated Studies Honors Program during their freshman year and transfer students by consent of instructor. (P/NP grading only.) —I, II, III (I, II, III)

94. Seminar (1)
Seminar—1 hour. Prerequisite: course 9, consent of instructor and completion of 45 units with a minimum GPA of 3.500. Restricted to sophomores who participated in the Integrated Studies Honors Program during their freshman year and other students by consent of instructor. The nature of research at the undergraduate level. (P/NP grading only.)

Upper Division

190. Topics in Integrated Studies (1)
Seminar—1 hour. Prerequisite: course 9. Discussion of the integration of the arts and sciences, focusing on a special topic. May be repeated three times for credit when topic differs. (P/NP grading only.)

194HA. Special Study for Honors Students (4)
Independent study—3 hours; seminar—1 hour. Prerequisite: course 9, consent of instructor and completion of 45 units with a minimum GPA of 3.500. A program of research culminating in the writing of a junior honors thesis under the direction of a faculty adviser. May be repeated one time for credit. (Deferred grading only, pending completion of sequence.) —I, II, III (I, II, III)

194HB. Special Study for Honors Students (4)
Independent study—3 hours; seminar—1 hour. Prerequisite: course 9, consent of instructor and completion of 90 units with a minimum GPA of 3.500. A program of research culminating in the writing of a senior honors thesis under the direction of a faculty adviser. May be repeated one time for credit. (Deferred grading only, pending completion of sequence.) —I, II, III (I, II, III)

197T. Tutoring in Integrated Studies (1-4)
Tutorial—1 hour. Prerequisite: consent of Director of Integrated Studies Honors Program. Tutoring in Integrated Studies courses, usually in small discussion groups. Weekly discussions with the instructor on the subject matter of the course being tutored and on the art and craft of teaching. May be repeated eight times for credit. (P/NP grading only.) —I, II, III (I, II, III)

University Writing Program

[College of Letters & Science]
Carl Whithaus, Ph.D., Program Director
Program Office, 109 Voorhis Hall 530-752-6283; http://writing.ucdavis.edu

Committee in Charge
Rebekka Andersen, Ph.D. (University Writing Program)
David Masel, M.F.A. ([University Writing Program]
Dana R. Ferris, Ph.D. (University Writing Program)
Beth Levy, Ph.D. (Music)
Gary Goodman, Ph.D. (University Writing Program)
Sarah Ferrall, Ph.D. (University Writing Program)
Daniel Potter, Ph.D. (Plant Sciences)
Angie Louie, Ph.D. (Biomedical Engineering)
Christopher J. Thaiss, Ph.D. (University Writing Program)
Carl W. Whithaus, Ph.D. (University Writing Program)

Faculty
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Dana R. Ferris, Ph.D., Professor
Sarah Ferrall, Ph.D., Assistant Professor
Christopher J. Thaiss, Ph.D., Professor
Carl W. Whithaus, Ph.D., Professor

Affiliated Faculty
Sasha Abramsky, M.S., Lecturer
Cynthia J. Bates, M.A., Lecturer
Mary E. Bly, M.A., Lecturer
Amie Clarke, Ph.D., Lecturer
Marlene B. Clarke, Ph.D., Lecturer
Alli Dragaon, Ph.D., Lecturer
Pamela Demory, Ph.D., Lecturer
Laurie Glover, Ph.D., Lecturer
Gary S. Goodman, Ph.D., Lecturer
Jared Haynes, M.A., Lecturer
Mary M. Hurd, M.A., Lecturer
Scott H. Herring, Ph.D., Lecturer
Alicia Johnson, Ph.D., Lecturer
Stephen Maggioni, B.A., Lecturer
Pamela J. Major, Ph.D., Lecturer
James McElroy, Ph.D., Lecturer
Don Messenheimer, Ph.D., Lecturer
Raeel Scherer, Ph.D., Lecturer
Renee Scidmore, Ph.D., Lecturer
Alicia S. Smith, Ph.D., Lecturer
Jaimee D. Smith, Ph.D., Lecturer
Ryan Stenzel, Ph.D., Lecturer
Academic Foundation Excellence in Teaching Award
Pamela Demory, Ph.D., Lecturer
Alli Dragaon, Ph.D., Lecturer
Laurie Glover, Ph.D., Lecturer
Scott H. Herring, Ph.D., Lecturer
Academic Foundation Excellence in Teaching Award
Brad J. Henderson, Ph.D., Lecturer
Andy Jones, Ph.D., Lecturer
Stephen Maggioni, B.A., Lecturer
Pamela J. Major, Ph.D., Lecturer
James McElroy, Ph.D., Lecturer
Don Messenheimer, Ph.D., Lecturer
Raeel Scher, Ph.D., Lecturer
Academic Foundation Excellence in Teaching Award
Wylie Sentientia, Ph.D., Lecturer
Vitor Squirelli, Ph.D., Lecturer
Academic Foundation Excellence in Teaching Award
John Stenzel, Ph.D., Lecturer
Academic Foundation Excellence in Teaching Award

The Program
The University Writing Program [UWP] offers writing courses and seeks to improve writing instruction across campus through a variety of programs. The UWP coordinates first year, intermediate, and advanced writing courses that satisfy college composition requirements and offers courses in writing across the curriculum, writing in specific disciplines, and writing in the professions. The Professional Writing Minor serves students from all majors who are planning careers as professional writers or editors, as well as those whose academic and professional careers demand advanced writing skills. The Program offers graduate courses in the teaching of writing and in composition theory, history, and research.

The Designated Emphasis in Writing, Rhetoric, and Composition Studies offers Ph.D. students in affiliated programs the opportunity to prepare for leadership roles in writing research, teaching, and program administration. The UWP also administers the English Composition Examination, an alternative way to satisfy the advanced writing requirement. The UWP publishes an annual anthology of exemplary student writing, Prized Writing, and a journal for writing instructors, Writing on the Edge. The Writing in the Disciplines Workshop Program presents workshops on teaching writing for faculty and TAs and workshops on writing for students. The Writing Ambassadors Program trains advanced undergraduates and places them as interns in K-12 classrooms to improve writing instruction.

Minor Program Requirements:

UNITS

Professional Writing ............................. 20

One course from each of the following four groups:


Group B: University Writing Program 104A, 104B, 104C, 104D, 104E, 104F, 104G, 104H, 104I, 110, 111A, 111B, 111C

Group C: Anthropology 110, 120, Classics 110, Communication 101, 105, 152, Design 145, 149, English 105, English/Linguistics/ UWP 106, English/Science and Technology Studies 164, History 101, Philosophy 137A, 137B, 137C, Technocultural Studies 191, University Writing Program 100, 112A, 120, 121

Group D: University Writing Program 192 (or equivalent)

Additional units to achieve a total of 20 upper division units .............................................. 4

One additional course from Groups A, B, or C above.

Note: At least twelve units must be from University Writing Program courses.

Courses in University Writing Program (UWP)

Lower Division

1. Expository Writing (4)
Lecture/discussion—4 hours. Prerequisite: completion of Entry-Level Writing Requirement. Composition, the essay, paragraph structure, diction, and related topics. Frequent writing assignments. GE credit: ArtHum, Wrt | AH, WE. —I, II, III, IV (I, II, III, IV)

1V. Expository Writing (4)
Web virtual lecture—2 hours; web electronic discussion—2 hours. Prerequisite: completion of Entry-Level Writing Requirement. Composition, the essay, paragraph structure, diction, and related topics. Frequent writing assignments. Not open to students who have taken course 1 or 1V. GE credit: ArtHum, Wrt | AH, WE. —I, II, III, IV (I, II, III, IV)

1. Expository Writing (4)
Lecture/discussion—2 hours; web electronic discussion—2 hours. Prerequisite: completion of Entry-Level Writing Requirement. Composition, the essay, paragraph structure, diction, and related topics. Frequent writing assignments. Not open to students who have taken course 1 or 1V. GE credit: ArtHum, Wrt | AH, WE. —I, II, III, IV (I, II, III, IV)

10. Introduction to Professional Writing Studies (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or the equivalent. Introduction to writing as an object of study and to theories and research in the field. Survey of how writing is created, disseminated, and used in public, private, and academic contexts. GE credit: ArtHum | AH, WE. —I (I)
11. Popular Science and Technology Writing (4)
Lecture/discussion—2 hours; discussion—1 hour. Positioning of science and technology in society as reflected and constructed in popular texts. Topics include genre theory, demarcation, rhetorical figures, and critical thinking. GE credit: ArtHum | AH, WE.—II. (II.)

10. Introduction to discipline of professional writing.

100. Genre Theory and Professional Writing (4)
Lecture/discussion—4 hours. Prerequisite: course 1 or English 3 or the equivalent. Style, language, and structure in the essay. Analyzing style, developing a voice in writing, revising sentences, developing effective paragraphs and arguments, and writing with emphasis on clear and precise content. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (II, III.)

19. Writing Research Papers (4)
Lecture/discussion—4 hours. Prerequisite: course 1 or English 3 or the equivalent. Critical reading, analysis, documentation, and writing research-based assignments. Focus on research and development of effective arguments. Reading and writing assignments may focus on a single theme. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (II, III.)

21. Introduction to Reading and Writing in Non-Native Speakers (5)
Lecture/discussion—5 hours. Prerequisite: admission by placement examination only. Provides undergraduate students whose native language is not English with intensive work in reading and writing organized, coherent, and grammatically correct paragraphs and short academic essays. (P/NP grading only.)

22. Intermediate Reading and Writing for Non-Native Speakers (4)
Lecture/discussion—4 hours. Prerequisite: admission by placement examination, successful completion of course 21, or by consent of instructor. Provides undergraduate students whose native language is not English with experience in writing essays in recognized rhetorical modes. Students will also read to develop fluency and critical thinking and will study grammar needed for academic writing. (P/NP grading only.—I, II, III, (I, II, III.)

23. Advanced Reading and Composition for Non-Native Speakers (4)
Lecture/discussion—4 hours. Prerequisite: admission by placement examination, successful completion of course 22, or by consent of instructor. Provides undergraduate students whose native language is not English with experience in writing persuasive essays and related rhetorical passages. Students will also read for tone, style, context, and assumptions and will study advanced grammar needed for persuasive essays. (P/NP grading only.—I, II, III, (I, II, III.)

92. Internship in Writing (1-12)
Internship—3-36 hours. Prerequisite: course 1 or English 3. Internships in fields where students can practice their skills. May be repeated for credit for a total of 12 units. (P/NP grading only.)

98. Directed Group Study (1-5)
Prerequisite: course 1 or English 3 or the equivalent; consent of instructor. May be repeated two times for credit. (P/NP grading only.) GE credit: AH, WE.

99. Special Study for Undergraduates (1-5)
Prerequisite: course 1 or English 3 or the equivalent; consent of instructor. (P/NP grading only.) GE credit: AH, WE.

Upper Division

100. Genre Theory and Professional Writing (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 1 or the equivalent; course 10. Introduction to discipline of professional writing. Examination of writing as a social practice, using genre theory as a conceptual framework. Analysis of how genres function rhetorically in specific contexts and how social systems both shape and are shaped by genres. GE credit: AH, WE.—II. (II.)

101. Advanced Composition (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to majors or to students concurrently enrolled in an upper division course in a specific academic discipline or interdisciplinary field. Advanced instruction in writing in that discipline and practice in effective styles of communication. May be repeated one time for credit if taken in conjunction with a different upper-division course. GE credit: ArtHum, Wrt | AH, WE.—I, II, III, IV. (II, III, IV.)

102A. Writing in the Disciplines: Special Topics (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to majors or to students concurrently enrolled in an upper division course in a specific academic discipline or interdisciplinary field. Advanced instruction in writing in that discipline and practice in effective styles of communication. May be repeated one time for credit if taken in conjunction with a different upper-division course. GE credit: ArtHum, Wrt | AH, WE.—I, II, III, IV. (II, III, IV.)

102B. Writing in the Disciplines: Biology (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to majors in a biological science or to students concurrently enrolled in an upper division biological science course. Advanced instruction in writing in biology. GE credit: ArtHum, Wrt | AH, WE.—I, II, III, (II, III.)

102C. Writing in the Disciplines: History (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to majors in history or to students concurrently enrolled in an upper division course accepted for the history major. Advanced instruction in writing in history. GE credit: ArtHum, Wrt | AH, WE.—II. (II.)

102D. Writing in the Disciplines: International Relations (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to majors in international relations or to students concurrently enrolled in an upper division course accepted for the major. Advanced instruction in writing in international relations. GE credit: ArtHum, Wrt | AH, WE.—II. (II.)

102E. Writing in the Disciplines: Engineering (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to majors in engineering and to students enrolled in an upper division engineering or computer science course for the major. Advanced instruction in writing in engineering. GE credit: ArtHum, Wrt | AH, WE.—I, II, III. (I, II, III.)

102F. Writing in the Disciplines: Food Science and Technology (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to majors in food science and technology and to students concurrently enrolled in an upper division course in food science and technology. GE credit: ArtHum, Wrt | AH, WE.—II. (II.)

102G. Writing in the Disciplines: Environmental Studies (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Open to students with upper division coursework with an environmental focus. Advanced instruction in writing and practice in effective styles of communication in the fields of environmental study, policy, or advocacy. Not open for credit to students who have completed course 102A in the same academic field. GE credit: ArtHum, Wrt | AH, WE.—II. (I)
Departmental Courses

Anatomy, Physiology and Cell Biology (APC)

Lower Division

92. Internship (1-12)
Internship—3-36 hours. Prerequisite: lower division standing; consent of instructor. Internship experience off and on campus in all subject areas offered in the Department of Anatomy, Physiology & Cell Biology. Internships are supervised by a member of the faculty. Offered irregularly. (P/NP grading only.)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Upper Division

100. Comparative Vertebrate Organology (4)
Lecture—2 hours; laboratory—2 hours. Prerequisite: Biological Science 1A and 1B or 2A and 2B. Functional anatomy of major organ systems in vertebrates. Each system examined from cellular to gross level in fish, birds, and mammals. Emphasis on how differentiated cell types are integrated into tissues and organs to perform diverse physiological functions. (Same course as Neurobiology, Physiology, and Behavior 123.)—II. (II.) Genetos

192. Internship (1-15)
Internship—3-45 hours. Prerequisite: upper division standing, approval of internship. Internship experience off and on campus in all subject areas offered in the Department of Anatomy, Physiology and Cell Biology. Internships are supervised by a member of the faculty. May be repeated for credit if topic differs. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Graduate

286. Basics of Microscopy and Cellular Imaging (2)
Lecture—1 hour; laboratory—2 hours. Prerequisite: graduate standing. Practical applications of basic microscope techniques used to image cells and tissues with the goal of using these techniques to generate publication-quality images. Principles of light, epifluorescent, confocal and electron microscopy, their applications and limitations. Restricted enrollment. Offered in alternate years.—II. Van Winkle

290. Seminar (1)
Seminar—1 hour. Discussion and critical evaluation of advanced topics and current trends in research. (P/NP grading only.)—I, II, III. (I, II, III.)

291. Topics in Biology of Respiratory System (1)
Seminar—1 hour. Prerequisite: graduate standing; consent of instructor. Topics concerning structure and function of respiratory system. Possible topics include: lung growth, pulmonary reaction to toxins, pulmonary inflammation, lung metabolism, biology of lung cells, tracheobronchial epithelium, nasal cavity structure and function. May be repeated for credit. (S/U grading only.)—I, II, III. (I, II, III.) Pinkerton, Wu

298. Group Study (1-5)
Laboratory—6-15 hours. Prerequisite: consent of instructor.

299. Research (1-12)
Laboratory—6-36 hours. Prerequisite: consent of instructor. (S/U grading only.)
Molecular Biosciences (VMB)

Lower Division

92. Internship (1-12)
Internship—3-36 hours. Prerequisite: lower division standing and consent of instructor. Work experience off and on campus in all subject areas offered in the Department of Molecular Biosciences. Internships supervised by a member of the faculty. (P/NP grading only.)

101Y. Principles of Pharmacology and Toxicology (1)
Lecture—1 hour; web virtual lecture—1 hour; web electronic discussion—0.5 hour; autotutorial—5 hours. Prerequisite: upper division standing in a science major; Chemistry through organic chemistry, general biology, or consent from instructor; good standing with university; computing capability using MS Word, Excel, and PowerPoint; menu driven software programs, SmartSite; computer, or ready access to a computer, with broadband Internet access. Restricted to upper division undergraduate students in good standing with school and fulfill course prerequisites. Hybrid course provides training in core concepts of pharmacological and toxicological sciences. Develop higher-order problem solving and critical thinking skills. GE credit: OL, SE, SL—III. (III.) Puchner

Upper Division

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: completion of 84 units and consent from the course coordinator. General principles of neurotoxicology, the cell and molecular mechanisms and health impacts of specific neurotoxics and the contribution of neurotoxic concepts to complex neurodevelopmental disorders and neurodegenerative diseases. (Same course as Environmental Toxicology 234 and Molecular, Cellular, and Integrative Physiology 234.)—II, III. (III.) O’Connor

253. Metabolism of Toxicants and Drugs (2)
Lecture—2 hours. Prerequisite: Pharmacology and Toxicology 201, 202, 203, general biochemistry or consent of instructor. Significance/chemical pathways of toxicants and drug metabolism, enzymology and molecular aspects of P450 and flavin monooxygenases, hydroxides and phase 2 transferases and experimental approaches for metabolism studies. Offered in alternate years.——II.

254. Toxicology of the Respiratory System (3)
Lecture—3 hours; discussion. Prerequisite: Pharmacology and Toxicology 201, 202, 203, or consent of instructor. Survey of structure and function of the respiratory system, the pathophysiology of major lung diseases, the interactions of toxicants with the lung and response of this organ to injury. Offered in alternate years.——II.

255. Pharmacokinetics and Biopharmaceuticals (2)
Lecture—16 sessions; discussion—4 sessions. In-depth study of pharmacokinetics, including the fundamentals of pharmacokinetics, how to design a pharmacokinetic study and how to use both compartmental and non-compartmental analysis to interpret the data. Offered in alternate years.——II. (III.) Knysz

290. Seminar (1)
Seminar—1 hour. Prerequisite: course in topics in nutrition, pharmacology/toxicology, and biochemistry. May be repeated for credit. (S/U grading only.)—I, II, III, (I, II, III.)

297T. Tutoring in Graduate Molecular Biosciences (1-5)
Prerequisite: graduate or professional student standing and consent of instructor. Assist in preparation and teaching of courses in Nutrition, Pharmacology and Toxicology, or other courses offered by the department under direct supervision of the instructor. Designed for graduate or professional students who desire teaching experience in graduate courses. May be repeated up to 5 units of credit. (S/U grading only.)—I, II, III, (I, II, III.)

298. Group Study (1-5)
(S/U grading only.)

299. Research (1-12)
(S/U grading only.)

Professional

397T. Tutoring in Molecular Biosciences (1-5)
Discussion—1.5 hours. Prerequisite: graduate or professional standing and consent of instructor. Experience in professional curriculum for graduate or professional students, not teaching assistants, under direct supervision of instructor. May be repeated up to 5 units of credit (S/U grading only.)—I, II, III, (I, II, III.)

Pathology, Microbiology, and Immunology (PMI)

Lower Division

99. Special Study for Undergraduates (1-5)
(P/NP grading only.)

Graduate

234. Current Topics in Neurotoxicology (3)
Lecture—3 hours. Prerequisite: core courses in one of the following graduate programs: Pharmacology and Toxicology, Agricultural and Environmental Chemistry, Biochemistry and Molecular Biology, Cell and Developmental Biology, Immunology, Molecular Cellular and Integrative Physiology or Neuroscience. Restricted to upper level undergraduate students. Work experience off and on campus in all subject areas offered in the Department of Molecular Biosciences. Internships supervised by a member of the faculty. (P/NP grading only.)

99. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.)

Graduate

234. Current Topics in Neurotoxicology (3)
Lecture—3 hours. Prerequisite: core courses in one of the following graduate programs: Pharmacology and Toxicology, Agricultural and Environmental Chemistry, Biochemistry and Molecular Biology, Cell and Developmental Biology, Immunology, Molecular Cellular and Integrative Physiology or Neuroscience. Restricted to upper level undergraduate students. Work experience off and on campus in all subject areas offered in the Department of Molecular Biosciences. Internships supervised by a member of the faculty. (P/NP grading only.)

254. Toxicology of the Respiratory System (3)
Lecture—3 hours; discussion. Prerequisite: Pharmacology and Toxicology 201, 202, 203, or consent of instructor. Survey of structure and function of the respiratory system, the pathophysiology of major lung diseases, the interactions of toxicants with the lung and response of this organ to injury. Offered in alternate years.——II.

255. Pharmacokinetics and Biopharmaceuticals (2)
Lecture—16 sessions; discussion—4 sessions. In-depth study of pharmacokinetics, including the fundamentals of pharmacokinetics, how to design a pharmacokinetic study and how to use both compartmental and non-compartmental analysis to interpret the data. Offered in alternate years.——II. (III.) Knysz

290. Seminar (1)
Seminar—1 hour. Prerequisite: course in topics in nutrition, pharmacology/toxicology, and biochemistry. May be repeated for credit. (S/U grading only.)—I, II, III, (I, II, III.)

129Y. One Health: Human, Animal & Environmental Interfaces (3)
Lecture/discussion—3 hours; web electronic discussion. Class size limited to upper division undergraduate students in good standing with the school and who fulfill the course prerequisites below. Enrollment limited to 100 students per term. Introduction to fundamental, challenges, and opportunities in One Health using local and global health case studies. Animal, human, and environmental health problems, among tools and transdisciplinary approaches, will be introduced to foster innovative thinking that addresses complex issues. GE credit: SciEng or SocSci | OL, SE or SS, SL—III. (III.) Miller, Papa, Georgiou

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.)
210. Epidemiological Approaches to Waterborne Zoonotic Pathogens (1)
Lecture—2 hours. Prerequisite: Waterborne zoonotic diseases remain a significant cause of human illness. Review key waterborne pathogens; their biology, fate and transport in aquatic systems; on-farm management practices for reducing microbial contamination of California’s fresh and marine aquatic resources from livestock production systems. (S/U grading only.)—II. (III.) Atwill

212. Epidemiology of the Zoonoses (4)
Lecture—35 sessions; discussion—5 sessions. Prerequisite: graduate standing or third-year standing in the School of Veterinary Medicine or consent of instructor. Epidemiological, biological and ecological features of some major infections shared by humans and other animals. Wildlife and domestic animals zoonoses of major health and economic significance are presented to illustrate how knowledge of zoonoses epidemiology is essential for implementing control measures. (P/NP grading only.)—I, II, III, (II, III.) Byrne

241. Advanced Topics in Canine Genetics and Genomics (2)
Discussion—2 hours. Prerequisite: Genetics 201A, 201C (or equivalents, with consent of instructor). In-depth study of topics in canine genomics and genetics. Topics will vary annually, but can include positional cloning, whole genome association, complex traits and linkage disequilibrium. Students will lead discussions on assigned readings. May be repeated for credit when topic differs. Limited enrollment. Offered in alternate years.—(III.) Bannasch

Lecture—2 hours; discussion—0.5 hours; laboratory—0.5 hours. Prerequisite: undergraduate genetics and ecology/conservation biology courses recommended. Introduction to the field of applied ecological genetics to include applications in conservation ecology, population genetics, population biology, wildlife health and disease ecology. Limited enrollment. (Same course as Ecology 242.)—I. (II.) Ernest

266. Applied Analytic Epidemiology (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: Preventive Veterinary Medicine 404 or consent of instructor. Principles and applications in analysis of epidemiologic data. Methods of analyzing stratified and matched case-control regression for cohort and case-control studies, Poisson regression, survival-time methods. (Same course as Master of Public Health 266.)—III. (III.) Kass

277. Mathematical Models in Epidemiology (3)
Lecture/discussion—2 hours; laboratory—2 hours. Prerequisite: Preventive Veterinary Medicine 403 and Epidemiology 405; consent of instructor; although not required, students are encouraged to refresh their knowledge of high school calculus and differential equations. Class size limited to 30 students. Theory of epidemics and mathematical modeling concepts for infectious diseases to include discrete and continuous time models, their use to explore disease dynamics and investigate prevention and control strategies for human and veterinary infectious diseases. (Same course as Epidemiology 277.)—III. (III.) Aly

298. Group Study (1-5)
Prerequisite: consent of instructor.

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only.)
The Major Program

The Viticulture and Enology major provides an interdisciplinary education in the biological and physical principles underlying grape and wine production as well as practical knowledge of grape growing (viticulture) and wine making (enology). This program provides the knowledge base for problem-solving and decision-making in commercial grape and wine production.

Preparatory Requirements. Before transferring into the Viticulture and Enology major, students must complete the following courses with a grade of C or better and with a combined grade point average of at least 2.500 at the University of California (at least 3.000 for similar courses taken at community college) for these and all other preparatory courses. In addition, students’ overall UC GPA must be 2.250 or higher. All courses must be taken for a letter grade.

Preparatory Subject Matter

<table>
<thead>
<tr>
<th>Subject Matter</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences 1A or 2A</td>
<td>4-5</td>
</tr>
<tr>
<td>Chemistry 2A, 2B, 2C, 8A</td>
<td>17</td>
</tr>
<tr>
<td>Mathematics 16A</td>
<td>3</td>
</tr>
<tr>
<td>Physical Science</td>
<td>4</td>
</tr>
</tbody>
</table>

Recommendations. Completion of UC Davis equivalents of the following preparatory courses for the major are not required for entry but are highly recommended. Failure to complete these will delay entry into the major and division courses and may delay graduation. Some courses may be available at UC Davis during Summer Session:

<table>
<thead>
<tr>
<th>Subject Matter</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 8B</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics 16B</td>
<td>3</td>
</tr>
<tr>
<td>Biological Sciences 1C or Plant Sciences 2</td>
<td>4-5</td>
</tr>
<tr>
<td>Biological Sciences 102</td>
<td>3</td>
</tr>
</tbody>
</table>

The Program. The curriculum builds upon a foundation of biology, chemistry, biochemistry, and mathematics with specialized courses related to grape and wine production. To complete the program, students may choose to place particular emphasis on viticulture, enology, or economics. Credit may also be earned for foreign language study and internships.

Career Alternatives. Graduates are qualified for a variety of vineyard and winery positions, including production manager, quality control, and research. Additionally, they may work in related fields such as pest management, nursery production, and analytical services.

B.S. Major Requirements:

<table>
<thead>
<tr>
<th>Subject Matter</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Preparatory Subject Matter</td>
<td>44-51</td>
</tr>
<tr>
<td>Biological Sciences 1A or 2A and 1C or Plant Sciences 2</td>
<td>8-10</td>
</tr>
<tr>
<td>Chemistry 2A-2B-2C</td>
<td>15</td>
</tr>
<tr>
<td>Chemistry 8A, 8B</td>
<td>6</td>
</tr>
<tr>
<td>Plant Sciences 21 or equivalent and adviser approval</td>
<td>6-9</td>
</tr>
<tr>
<td>Mathematics 16A-16B</td>
<td>6</td>
</tr>
<tr>
<td>Physics 1A, 1B or Plant Sciences 2</td>
<td>6</td>
</tr>
<tr>
<td>Viticulture and Enology</td>
<td>3</td>
</tr>
</tbody>
</table>

Depth Subject Matter

<table>
<thead>
<tr>
<th>Subject Matter</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences 102, 103 or 105</td>
<td>3-6</td>
</tr>
<tr>
<td>Microbiology 102</td>
<td>5</td>
</tr>
<tr>
<td>Plant Sciences 120 or Statistics 106</td>
<td>10</td>
</tr>
<tr>
<td>Viticulture and Enology</td>
<td>101A, 101B, 101C, 110, 118</td>
</tr>
<tr>
<td>Viticulture and Enology</td>
<td>123, 124, 125, 126, 128, 135</td>
</tr>
<tr>
<td>and in consultation with the adviser, choose 3 of the following courses:</td>
<td></td>
</tr>
<tr>
<td>123L, 124L, 125L, 126L, 128L</td>
<td></td>
</tr>
<tr>
<td>3 or more than 3 are taken, the extra courses will count as restricted electives in Area B</td>
<td></td>
</tr>
</tbody>
</table>

Restricted Electives

<table>
<thead>
<tr>
<th>Subject Matter</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>In consultation with adviser, choose 28 units from the following five areas. At least 12 units must be from one of the following areas:</td>
<td>28</td>
</tr>
<tr>
<td>(A) Plant Science area</td>
<td>Applied Biological Systems Technology 142, 145, 147, 175, 180, Atmospheric Science 133, Biological Sciences 101, Biotechnology 160, Entomology 110, Science 110, 124, Molecular and Cellular Biology 126, Neurology 100, Plant Biology 111, 112, 123, 143, 172, Plant Pathology 120, Plant Sciences 142, 146, 154, 157, 158, 171, 176, Soil Science 100, 102, 109, 118, Viticulture and Enology 111.</td>
</tr>
<tr>
<td>(B) Food Science and Microbiology area</td>
<td>Biological Sciences 101, Food Science and Technology 102A, 102B, 104, 104L, 108, 109, 110A, 110B, 127, Microbiology 140, 150, 155L, Viticulture and Enology 140.</td>
</tr>
<tr>
<td>(D) Language area</td>
<td>Maximum 12 units, not counting course 1, of one of the following languages: French, German, Italian, Portuguese or Spanish. At least one course must be Intermediate or Conversational; qualifying Intermediate or Conversational courses are listed below.</td>
</tr>
<tr>
<td>(E) Internship area</td>
<td>A maximum of eight units of Viticulture and Enology 190X, 192, 199, 200 or 298 may be counted as restricted electives by prior arrangement with adviser. May be increased to 12 units in exceptional circumstances.</td>
</tr>
</tbody>
</table>

Total Units for the Major

120-133

Major Adviser. M. Matthews

Related Major Programs.

Graduate Study. Several graduate groups offer programs of study leading to advanced degrees in the fields of viticulture and enology. For the M.S. or Ph.D. degree, see Agricultural and Environmental Engineering, Chemical Engineering and Materials Science, the Graduate Group in Plant Biology, or the Graduate Group in Horticulture and Agronomy.

Courses in Viticulture and Enology (VEN)

Lower Division

2. Introduction to Viticulture (2)

Lecture—2 hours. Fundamental principles of biology and culture of the grapevine, taxonomy, morphology, physiology, distribution, domestication, utilization, propagation, production systems, harvesting, and storage and processing of grapes. Successful completion of the course should prepare students for upper division courses in viticulture. GE credit: SE.—I. (I.) Cantu

3. Introduction to Winemaking (3)

Lecture—3 hours. Overview of the history of wine, viticulture, fermentation, viticulture operations, the physiology of wine consumption, wines produced in California and other major wine-producing regions and the sensory evaluation of wine. GE credit: SE.—III. (I.) Hymanson, Adams

90X. Lower Division Seminar (2)

Seminar—1 hour; term paper (required/discussion).

Prerequisite. Lower division standing and consent of instructor. Introduction to current issues surrounding wine and health as they relate to diet, nutrition, and toxicology. May not be repeated for credit. GE credit: Wrt.

99. Special Study for Undergraduates (1-5)

(P/NP grading only.)

Upper Division

101A. Viticultural Practices (3)

Lecture—1.5 hours; discussion/lab—3.5 hours. Prerequisite: course 2. Identification, cultivation, and use of the major wine, table, raisin, and rootstock cultivars. Includes practices specific to the fall such as fruit contracts, maturity sampling, harvesting, cover crops, and soil-pests. One field trip required. GE credit: SE.—I. (I.) Walker

101B. Viticultural Practices (3)

Lecture—1.5 hours; discussion/lab—3.5 hours. Prerequisite: course 2. Theory, principles, and practices of pruning and grapevine propagation. Plant materials and the current propagation practices and control and weed identification, wood diseases, and frost protection. One field trip required. GE credit: SE.—II. (II.) Walker

101C. Viticultural Practices (3)

Lecture—1.5 hours; discussion/lab—3.5 hours. Prerequisite: course 2. Field oriented experience in the principles and practices of grapevine production, including vineyard establishment, vine training, trellising, canopy management practices, irrigation and water management, and methods of crop adjustment for improvement of fruit quality. One field trip required. GE credit: ScEng | SE.—III. (III.) Smart

110. Grapevine Growth and Physiology (3)

Lecture—3 hours. Prerequisite: course 2. Botanical aspects including morphology and domestication will precede lectures covering flower development and energy budget concepts. Impact of physiological variables such as photosynthesis translocation, mineral nutrition, and water relations on fruit ripening and composition will be covered. GE credit: ScEng | OL, SE, WE

112. Chemical Evaluation of Wines of the World (1)

Laboratory/discussion—3 hours. Prerequisite: course 111 (must be taken concurrently), course 125 with a grade of C or better. Critical analysis of wines produced in different parts of the world with emphasis on the relationship between sensory properties of the wines and factors associated with their place of origin. (P/NP grading only.) GE credit: SE

113. Raisin and Table Grape Production (2)

Lecture—2 hours; Prerequisites: 3. Overview of the raisin and table grape industries in California and other production areas of the world. Cultural practices associated with raisin and table grape production will also be discussed. GE credit: ScEng | SE

118. Grapevine Pests, Diseases, and Disorders (3)

Lecture—3 hours. Prerequisite: course 2. Various pests and diseases of vineyards throughout California. Pest/disease identification and control methods (to include sampling techniques) also will be discussed. Integrated management approach to pest control methods will be emphasized. GE credit: ScEng | SE.—I. (I.) Cantu

Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Diversity; DomDiv—Domestic Diversity; Wrt—Writing Experience

Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SE=Science and Engineering; SS=Social Sciences; AGCM=American Cultures; DD=Domestic Diversity, OL=Oral Skills; QL=Quantitative, SL=Scientific, VL=Visual, WC=World Cultures; WE=Writing Experience
123. Analysis of Musts and Wines (2)
Lecture—2 hours. Prerequisite: Chemistry 2C and 88 or equivalent; Agricultural Management and Range-land Resources 21, or consent of instructor. Students enrolled in the lecture portion of the course will be required to enroll in 1 unit of course 199/299. Fundamental principles of analytical chemistry as they relate to specific methods used in winemaking. GE credit: SciEng | SE—II. (I) Waterhouse

123L. Analysis of Musts & Wines Laboratory (2)
Lab—3 hours; independent study—2 hours. Prereq-uisites: Chemistry 2C and 88, or equivalent; Agra-cultural Management and Rangeland Resources 21, and course 123 (course 123 may be taken concur-rently). Fundamental principles of analytical chemis try as they relate to specific methods used in winemaking. Laboratory exercises demonstrating various chemical, physical and biochemical meth-ods. Data will be analyzed and results interpreted in weekly lab reports; includes student-designed inde-pendent project and written report. Enrollment restricted to upper division and graduate students in Viticulture & Enology; others by approval of instruc- tor. GE credit: SciEng, Wrt | QL, SE, VL, WE—II. (I) Waterhouse

124. Wine Production (2)
Lecture—2 hours. Prerequisite: course 3, 123 (may be taken concurrently). Principles and practices of making standard types of wines, with special reference to grape varieties used and methods of vinification. SciEng | GE credit: SE—WE—II. (I) Bisset

124L. Wine Production Laboratory (3)
Laboratory—3 hours; independent study—3 hours; term paper. Prerequisite: course 124 (may be taken concurrently). Restricted to undergraduate students in fermentation science, viticulture and enology, bio-technology, microbiology, food science and applied plant biology or graduate students in food science, agricultural and environmental chemistry and horti-culture. Current technologies used in production of California table wines; analysis and monitoring of impact of fermentation variables on microbial perfor-mance and product quality; student-designed inde-pendent research project. GE credit: SciEng | QL, SE, WE—II. (I) Bisset

125. Wine Types and Sensory Evaluation (2)
Lecture—2 hours. Prerequisite: course 124; Plant Sciences 120 or Statistics 106. Open to upper division and graduate students in Viticulture & Enology; others by approval of instructor. Principles of sensory evaluation and application to wines. Factors influ-encting wine flavor, data from sensory analysis of model solu-tions. GE credit: SciEng | QL, SE—III. (III) Heymann

125L. Sensory Evaluation of Wine Laboratory (2)
Laboratory—2 hours; term paper. Prerequisite: course 125 (may be taken concurrently). Restricted to upper division majors in fermentation science or viticulture and enology or graduate students in food science. Sensory evaluation of wines and model systems. Analysis of discrimination tests, ranking, descriptive analysis and time-intensity analysis. Data analyzed by appropriate statistical tests and results interpreted in extensive weekly lab reports. GE credit: SciEng | QL, SE, VL—II. (I) Heymann

126. Wine Stability (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 124. Restricted to students in viticulture and enology, fermentation science, applied plant biology majors, or graduate students in food science, micro-biology, horticulture, and agriculture and agronomy. Principles of equilibria and rates of physical and chemical reactions in wines; treatment of unstable components in wines by absorption, ion exchange, refrigeration, filtration, and membrane processes; and protein, polysaccharide, tannate, oxidative, and color stabilities. GE credit: SciEng | SE—II. (II) Boulton

126L. Wine Stability Laboratory (2)
Laboratory—3 hours; independent study—3 hours. Prerequisite: course 126 (may be taken concurrently). Restricted to upper division fermentation sci-ence, viticulture and enology majors, or graduate students in food science, agricultural and environ-mental chemistry, microbiology or by consent of instructor. Principles of the principles of equili-bria and rates of physical and chemical reactions to wine stability. GE credit: SciEng | SE, WE—II. (II) Boulton

128. Wine Microbiology (2)
Lecture—2 hours. Prerequisite: courses 123 and 124; Microbiology 102 and 102L, or Food Science and Technology 104 and 104L; courses 125 and 126 recommended. Nature, development, physiology, biochemistry and control of yeasts and bacteria involved in the making, aging and spoilage of wine. GE credit: SciEng | SE—II. (II) Mills

128L. Wine Microbiology Laboratory (2)
Laboratory—6 hours. Prerequisite: course 123, 124, and 128 (may be taken concurrently). Microbiology 102L or Food Science and Technology 104 and 104L; course 125 and 126 recommended. Restricted to upper division students in fermentation science, viticulture and enology or graduate students in food science. Nature, development, physiology, biochemistry and control of yeasts and bacteria involved in the making, aging and spoilage of wine. GE credit: SciEng | SE, WE—II. (II) Mills

135. Wine Technology and Winery Systems (3)
Lecture—3 hours; discussion/laboratory—2 hours. Prerequisite: course 124. Process technologies and process systems for modern commercial wineries. Lectures, demonstrations, problem solving sessions, and possible field trips. Includes grape preparation and fermentation equipment; post-fermentation processing equipment; wine utility, cleaning systems, and waste treatment. GE credit: SciEng | QL, SE—II. (III) Block

140. Distilled Beverage Technology (3)
Lecture—3 hours. Prerequisite: Chemistry 88; Food Science and Technology 110A. Distillation principles and practices, production technology of brandy, whiskey, rum, vodka, gin, and other distilled bever-ages; characteristics of raw materials, fermentation, distillation, and aging. Offered in alternate years. GE credit: SciEng | QL, SE, WE—III. (III) Heymann

181. Readings in Enology (1)
Discussion—1 hour. Prerequisite: course 3. Critical evaluation of selected monographs in enology. Dis-cussion led by the students. May be repeated three times for credit. (P/NP grading only.) GE credit: SE—III. (III) Matthews

190X. Winemaking Seminar (1)
Seminar—1 hour; discussion—1 hour. Prerequisite: course 3. Open to Viticulture and Enology majors and graduate students. Outside speakers on a spe-cific winemaking topic chosen for the quarter. Dis-cussion with the speaker hosted by the faculty member(s). May be repeated for credit up to 3 times. (P/NP grading only.) GE credit: SE—III. (III)

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: completion of 94 units. Work experience related to Fermentation Science (Enology) or Plant Science (Viticulture) majors. Internships must be approved and super-vised by a member of the department or major fac-ulty, but are arranged by the student. (P/NP grading only.) GE credit: SE—II. (II)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.) GE credit: SE—Graduate

200. Introduction to Scientific Methods (2)
Lecture/discussion—1 hour; term paper. Prerequisite: graduate standing or consent of instructor. Procedures involved in scientific research. Topics include conducting literature review, formulating hypotheses, and analyzing and reporting results. Annotated bibliography and written and oral research proposals.

210. Grape Development and Composition (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 102 and 103, or 105. Anatomy, physiology and biochemistry of grape development, with emphasis on the development of grape composition relevant to winemaking. Offered in alternate years.—III. Adams, Polito

213. Flavor Chemistry of Foods and Beverages (3)
Lecture/discussion—3 hours. Prerequisite: Chemistry 88, course 123, course 123L or Food Science and Technology 103 or consent of instructors. Students will become familiar with basic principles of flavor chemistry, analysis, and formation in fresh and pro-cessed foods. Students will be required to read and critically evaluate flavor chemistry literature. [Same course as Food Science and Technology 213].—III. (III) Ebeler, Heymann

215. Sensometrics (3)
Lecture—3 hours. Prerequisite: Food Science and Technology 117 or the equivalent, course 125 and 125L, or Food Science and Technology 103 or 107B. Experimental design and statistical analysis, including multivariate analysis, for both sensory and instrumental data in enology and food-related studies.—I. (I) Smart

216. Sustainable Vineyard Development (5)
Lecture/discussion—3 hours; fieldwork—3 hours; term paper. Prerequisite: course 101A, 101B, 101C, and one of courses 115 and 118 or consent of instructor; course 110, Soil Science 100, Atmospheric Science 133 and Agricultural and Resource Economics 140 recommended. Application of plant, meteorological, soil, water, GIS, and economic sci-ences to sustainable vineyard development. Prepara-tion of a comprehensive study to determine the viticultural and economic feasibility of a given site for raisin, table, or wine grape production.—I. (I) Smart

217. Field and GIS Evaluation of Soils (3)
Lecture/laboratory—4 hours; fieldwork—3 hours. Prerequisite: Plant Sciences 120, 205 or 206, Soil Science 100, 105, or 107; course 101C. Applied Biotechnology 180 are recommended; consent of Instructor. Principles and practices used to evaluate agricultural soils in the field, including soil pits, soil cores, electrical conductivity meters, ground pene-trating radar, geomorphology and surface terrain analysis. Use of geographic information sciences, soil databases, digital elevation models and geosta-tistics. Offered in alternate years.—II. (II) Smart

219. Natural Products of Wine (3)
Lecture—3 hours. Prerequisite: courses 123 and 124, or natural products background and consent of instructor. Structure, occurrence, and changes due to winemaking to the natural products found in wine. Chemicals with a sensory impact will be emphasized, including flavonoids and other pheno-lides, terpenes and norisoprenoids, pyrazines, oak volatiles and other wine constituents.—I. (I) Waterhouse

223. Instrumental Analysis of Must and Wine (4)
Lecture—2 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: courses 123 or 124, and Microbiology 102 or 102L, or Food Science and Technology 103 required. Biological Sciences 102 and 103 or Biological Sciences 105, Chemistry 107B or Chemistry 115 recommended. Open to upper division students in Viticulture & Enology, Food Science and Technology; students in Food Sci-ence, Ag & Environmental Chemistry and Viticulture & Enology graduate groups. Theory and practice of instrumental analysis of wine and vineyard grape on the principles of analytical techniques (e.g., CE, GC, HPLC, Mass Spectrometry) and factors deter-mining correct choice of instrumental method.—II. (II) Ebeler
224. Advances in the Science of Winemaking (3)
Lecture—2 hours. Prerequisite: course 125, 126 and graduate standing or consent of instructor. Selected topics in the science and technology of winemaking. Topics drawn from current research of participating faculty. Critical analysis of the technical content of published material.—III, (II, I).

225. Advanced Sensory Analysis of Wines (3)
Lecture/discussion—2 hours; laboratory—4 hours. Prerequisite: courses 124 and 125 (or Food Science and Technology 107) and Agricultural Management and Rangeland Resources 120 or the equivalent. Sensory descriptive analysis experiments will be designed and conducted using standard sensory science methods. Data will be analyzed by analyses of variance, principal component analyses and generalized Procrustes analysis to evaluate the judge's performance and interpret the significance of the results.—II, Heymann.

235. Winery Design (4)
Lecture—2 hours; discussion—1 hour; independent study. Prerequisite: course 124, 135 or consent of instructor. Design of wineries. Includes process calculations, equipment selection, process layout and building choice and siting. Project scheduling, capital costs, and ten-year cash flow analysis for the winery. One field trip required. Offered in alternate years.—II, Boulton.

270. Critical Evaluation of Scientific Literature (2)
Discussion—2 hours. Prerequisite: consent of instructor. Contemporary research topics in biological sciences. Discussion of recent research articles in a special topic area. Intended to develop skills in critical evaluation of scientific publications. May be repeated for credit. (S/U grading only)—II, III, (II, III, III, Bissun)

290. Seminar (1)
Seminar—1 hour. Prerequisite: consent of instructor. (S/U grading only)—II, III, (II, III, III)

290C. Advanced Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Planning and results of research programs, proposals, and experiments. Discussion and critical evaluation of original research being conducted by the group. Discussion led by individual research instructors for research group. May be repeated for credit. (S/U grading only)—II, III, (II, III, III)

291. Advanced Viticulture (2)
Lecture/discussion—2 hours. Prerequisite: course 110, 110C, 124, 125, 125C, 125L, 126, 126L, 128, 1281; consent of instructor. Restricted to Viticulture & Enology Graduate Group graduate students. Work experience related to Fermentation Science (Enology) or Plant Science (Viticulture) majors. Internships must be planned and supervised by a graduate group faculty member or students major professor, but are arranged by the student. May be repeated 12 units for credit. Offered in alternate years.—II, (II, I, III)

297T. Tutoring in Viticulture and Enology (1-5)
Prerequisite: graduate standing and consent of instructor. Designed for graduate students who desire teaching experience, but are not teaching assistants. Student contact primarily in laboratory or discussion sections, and under direction of a faculty member. (S/U grading only)

298. Group Study (1-5)
(S/U grading only)

299. Research (1-12)
(S/U grading only)

Professional
396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only)—II, III, (II, III)

Viticulture and Enology (A Graduate Group)

David A. Mills, Ph.D., Chairperson of the Group
Group Office, 1204 EMI South
530-752-1852; Fax 530-758-032; http://vengg.ucdavis.edu

Faculty
Douglas O. Adams, Ph.D., Professor (Viticulture and Enology)
Charles W. Bamforth, Ph.D., Professor (Food Science and Technology)
Linda F. Bissun, Ph.D., Professor (Viticulture and Enology)
David E. Black, Ph.D., Professor (Viticulture and Enology, Chemical Engineering)
Academic Senate Distinguished Teaching Award
Roger B. Boulton, Ph.D., Professor (Viticulture and Enology, Chemical Engineering)
Dario Cantu, Ph.D, Assistant Professor (Viticulture and Enology)
Susan E. Ebeler, Ph.D., Professor (Viticulture and Enology)
Jean-Xavier Quinard, Ph.D., Professor (Food Science and Technology)
Hildegard Heymann, Ph.D., Professor (Viticulture and Enology)
Maria Marco, Ph.D, Assistant Professor (Food Science and Technology)
Mark A. Matthews, Ph.D, Professor (Viticulture and Enology)
David A. Mills, Ph.D., Professor (Viticulture and Enology, Food Science and Technology)
Kenneth A. Shackel, Ph.D., Professor (Plant Sciences)
David R. Smart, Ph.D., Associate Professor (Viticulture and Enology)
Li Tian, Ph.D., Assistant Professor (Plant Sciences)
M. Andrew Walker, Ph.D., Professor (Viticulture and Enology)
Andrew L. Waterhouse, Ph.D., Professor (Viticulture and Enology)
Gary E. Williams, Ph.D., Professor (Viticulture and Enology)

Affiliated Faculty
Matthew W. Fidelibus, Ph.D., Associate Specialist in Cooperative Extension (Viticulture and Enology)
W. Douglas, Gubler, Ph.D., Specialist in Cooperative Extension (Plant Pathology)
Andrew J. McElrone, Ph.D. Assistant Adjunct Professor (Viticulture and Enology)
Anita Oberholster, Ph.D., Assistant Specialist in Cooperative Extension (Viticulture and Enology)
Keri I. Steenwerth, Ph.D., Assistant Adjunct Professor (Viticulture and Enology)

Graduate Study
The M.S. program offers advanced studies in viticulture and enology, ranging from the genetics, physiology and biochemistry of grapevines to the chemistry, microbiology and sensory science of wines and the chemical engineering of winemaking. Applications must be submitted online by January 15. Ph.D. studies are not offered by the Graduate Program in Viticulture and Enology.

Preparation
Applicants to the program are required to have a level of competence equivalent to that of a strong science undergraduate program.

This includes coursework in biology, general chemistry, organic chemistry, calculus, statistics (analysis of variance), biochemistry, microbiology, and economics.

Specific requirements are outlined in detail and may be obtained by visiting http://vengg.ucdavis.edu.

Graduate Advisers. H. Heymann, A.J. McElrone

War–Peace Studies

[College of Letters and Science]
The interdisciplinary minor in War–Peace Studies examines the causes and dynamics of intra- and international wars and efforts to prevent and settle such conflicts. Students in the minor are encouraged to participate in the educational activities of the Davis Program of the UC Institute on Global Conflict and Cooperation (IGCC). The minor is sponsored by the International Relations Program.

Minor Program Requirements:

UNITS
War–Peace Studies................................. 19-20
One or two courses from each of the following areas:
Approaches: Anthropology 123AN, 126B, Comparative Literature 157, Philosophy 115, 116, Political Science 121, 123, 124, 132, 176, Sociology 157, Women’s Studies 102
Northern and Western Regions: History 134A, 139C, 142A, 143, 144A, 144B, 145, 1708, 171B, 1748, Native American Studies 1308, Political Science 130, 131
Southern and Eastern Regions: Anthropology 142, 143A, 143B, 144, History 165, 191F, 194C, Native American Studies 120, Political Science 142A
Restriction. No more than two courses from a single department may be offered in satisfaction of the minor requirements.

Advising, International Relations Program 530754-8098

Water Science

See Hydrologic Sciences (A Graduate Group), on page 347; Hydrology, on page 348; and Soil and Water Science, on page 511.

Wildlife, Fish, and Conservation Biology

[College of Agricultural and Environmental Sciences]
John M. Eade, Ph.D., Chairperson of the Department
Department Office, 1088 Academic Surge
530-752-6586, http://wotcb.ucdavis.edu

Faculty
Louis W. Botsford, Ph.D., Professor
Tim Caro, Ph.D., Professor
John M. Eade, Ph.D., Professor
Nann A. Fangue, Ph.D., Assistant Professor
Douglas A. Kelt, Ph.D., Professor
A. Peter Klimley, Ph.D., Adjunct Professor
Peter B. Mayle, Ph.D., Professor

Quarter Offered: I=Winter, II=Spring, III=Summer, IV=Summer; 2013-2016 offering in parentheses
Pre-Fall 2011 General Education (GE): AH=Arts and Humanities; SCI=Science and Engineering; SS=Social Sciences; Div=Domestic Diversity; Wrt=Writing Experience
Fall 2011 and on Revised General Education (GE): AH=Arts and Humanities; SCI=Science and Engineering; SS=Social Sciences; Div=Domestic Diversity; Wrt=Writing Experience
Preparatory Subject Matter..............49-50

The Major Program
The Wildlife, Fish, and Conservation Biology major deals with the relationships between the require-
ments of wildlife and the needs of people. Under-
standing these relationships is vital for the
maintenance of ecological diversity, recreational
activities, and conservation biology emphasizing vertebrate
life, Fish, and Conservation Biology must consult the
Adviser.

Career Alternatives. The major prepares stu-
dents to excel in diverse fields of environmental and
biology, including veterinary and wildlife health sciences. The
breadth of course requirements, when combined
with electives also make this an excellent prepara-
tory major for secondary school teaching. Certifica-
tion by professional societies such as The Wildlife
Society, American Fisheries Society, or the Ecologi-
cal Society of America, or preparation for graduate studies may also be achieved by careful planning of
 electives with a faculty adviser careful planning of
 electives with a faculty adviser.

Areas of Specialization
(1) Conservation Biology: Complete Wildlife, Fish, and Conservation Biology 153 & 155L.
(2) Environmental Science and Policy 161, 170, or 171.
(3) Wildlife, Fish, and Conservation Biology 152, 155, or 157.
(4) Animal Science 103, 170, 171A, 172, or 173.
(5) Veterinary Medicine 170.
(6) Fish Biology: Complete Wildlife, Fish, and Conservation Biology 120 & 120L.
(7) Wildlife, Fish, and Conservation Biology 151.
(8) Plant Sciences 131, 144, 145, or 148.
(9) Environmental Science and Policy 116N, 150C, 151, 151L, 161, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.
(10) Animal Science 118, Environmental Science and Policy 116N, 150C, 151, 151L, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.
(11) Animal Science 118, Environmental Science and Policy 116N, 150C, 151, 151L, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.
(12) Animal Science 118, Environmental Science and Policy 116N, 150C, 151, 151L, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.
(13) Animal Science 118, Environmental Science and Policy 116N, 150C, 151, 151L, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.

Restricted Electives...........................15-24
Choose one from the five Areas of Specialization shown below. Students must maintain a C average (2.0 GPA) and pass all course work in their chosen specialization.

Areas of Specialization
(1) Conservation Biology: Complete Wildlife, Fish, and Conservation Biology 153 & 155L.
(2) Environmental Science and Policy 161, 170, or 171.
(3) Wildlife, Fish, and Conservation Biology 152, 155, or 157.
(4) Animal Science 103, 170, 171A, 172, or 173.
(5) Veterinary Medicine 170.
(6) Fish Biology: Complete Wildlife, Fish, and Conservation Biology 120 & 120L.
(7) Wildlife, Fish, and Conservation Biology 151.
(8) Plant Sciences 131, 144, 145, or 148.
(9) Environmental Science and Policy 116N, 150C, 151, 151L, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.
(10) Animal Science 118, Environmental Science and Policy 116N, 150C, 151, 151L, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.
(11) Animal Science 118, Environmental Science and Policy 116N, 150C, 151, 151L, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.
(12) Animal Science 118, Environmental Science and Policy 116N, 150C, 151, 151L, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.

Restricted Electives...........................15-24
Choose one from the five Areas of Specialization shown below. Students must maintain a C average (2.0 GPA) and pass all course work in their chosen specialization.

Areas of Specialization
(1) Conservation Biology: Complete Wildlife, Fish, and Conservation Biology 153 & 155L.
(2) Environmental Science and Policy 161, 170, or 171.
(3) Wildlife, Fish, and Conservation Biology 152, 155, or 157.
(4) Animal Science 103, 170, 171A, 172, or 173.
(5) Veterinary Medicine 170.
(6) Fish Biology: Complete Wildlife, Fish, and Conservation Biology 120 & 120L.
(7) Wildlife, Fish, and Conservation Biology 151.
(8) Plant Sciences 131, 144, 145, or 148.
(9) Environmental Science and Policy 116N, 150C, 151, 151L, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.
(10) Animal Science 118, Environmental Science and Policy 116N, 150C, 151, 151L, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.
(11) Animal Science 118, Environmental Science and Policy 116N, 150C, 151, 151L, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.
(12) Animal Science 118, Environmental Science and Policy 116N, 150C, 151, 151L, Evolution and
Ecology 115, Environmental Science and Management 100, Hydrology 143,
Wildlife, Fish, and Conservation Biology 152.

Minor Program Requirements:
The minor in Wildlife, Fish, and Conservation Biology is for students interested in basic training and understanding of the ecology and conservation of wild terrestrial and aquatic vertebrates, emphasizing birds, mammals, and fish, but with relevance and application to all life forms.

UNITs
Wildlife, Fish, and Conservation Biology

Courses in Wildlife, Fish, and Conservation Biology (WFC)

Lower Division

10. Wildlife Ecology and Conservation (4)

11. Introduction to Conservation Biology (3)
Lecture—3 hours. Introduction to conservation biology and to the biological issues and controversies surrounding loss of species and habitats for students with no background in biological sciences. Offered in alternate years. GE credit: SciEng, Writ | SE, SL, WE—III. Caro

50. Natural History of California’s Wild Vertebrae (3)
Lecture—2 hours; discussion—1 hour. Examination of the natural history of California’s wild vertebrates (fish, amphibians, reptiles, birds, and mammals), including their biogeography, systematics, ecology, and conservation status. GE credit: SciEng. Writ | SE, SL, WE—II. (II.) Townsend

92. Internship (1-6)
Internship—3–18 hours. Prerequisite: lower division standing and instructor’s approval. Work experience off and on campus in all subject areas offered in the department. Internships supervised by a member of the faculty. (P/NP grading only.)

99. Special Study for Undergraduates (1-5)
Special study for undergraduates. (P/NP grading only.)—I, II, III. (I, II, III.)

Upper Division

100. Field Methods in Wildlife, Fish, and Conservation Biology (4)
Lecture—2 hours; laboratory—3 hours; fieldwork—3 hours. Prerequisites: Evolution and Ecology 101 or Environmental Science and Policy 100 and consent of instructor. Introduction to field methods for monitoring and studying wild vertebrates and their habitats, with an emphasis on ecology and conservation. Required weekend field trips. GE credit: SciEng | SE—III. (III.) Eadie, Kelt, Todd, Van Vuren

101. Field Research in Wildlife Ecology (2)
Lecture/discussion—2 hours. Prerequisite: Consent of instructor and one upper division course in each of ecology, statistics, and ornithology. Morphological, physiological, and behavioral adaptations of mammals. Morphological, physiological, reproductive, and behavioral adaptations of mammals to their environment.—III. (III.) Kelt

110. Biology and Conservation of Wild Mammals (3)
Lecture—6 hours. Prerequisite: course 110 may be taken concurrently; consent of instructor. Laboratory exercises in the morphology, systematics, species identification, adaptations of wild mammals to different habitats. Limited enrollment.—III. (III.) Kelt

111. Biology and Conservation of Wild Birds (3)
Lecture—3 hours. Prerequisites: Biological Sciences 1A, 1B, 1C, or Biological Sciences 2A, 2B, 2C; Evolution and Ecology 101 or Environmental Science and Policy 100 or equivalent course. Phylogeny, distribution, migration, population dynamics, behavior and physiological ecology of wild birds. Emphasis on adaptations to environments, species interactions, management, and conservation. GE credit: SciEng | SE—II. (II.) Eadie

111L Laboratory in Biology and Conservation of Wild Birds (3)
Laboratory—6 hours; fieldwork—3 hours. Prerequisite: course 111 may be taken concurrently; consent of instructor. Laboratory exercises in bird species identification, anatomy, molt, age and sex, specialized adaptations, behavior, research, with emphasis on conservation of wild birds. Several weekend field trips, stock days, and independent bird study are required. Limited enrollment.—I. (I.) Eadie

120. Biology and Conservation of Fishes (3)
Lecture—3 hours. Prerequisites: Biological Sciences 2A, 2B, 2C. Evolution and conservation of marine and freshwater fishes.—I. (I.) Moyle

120L. Laboratory in Biology and Conservation of Fishes (2)
Laboratory—3 hours. Prerequisite: course 120 may be taken concurrently. Limited enrollment. Morphology, taxonomy, conservation, and identification of marine and freshwater fishes with emphasis on California species.—I. (I.) Moyle

121. Physiology of Fishes (4)
Lecture—3 hours; laboratory—3 hours. Prerequisites: upper division courses in nutrition and physiology or consent of instructor. Comparative physiology, growth, reproduction, behavior, and energy relations of fishes. Offered irregularly. GE credit: SciEng, Writ | SE, WE.—II. (II.)

122. Population Dynamics and Estimation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisites: Mathematics 16A-16B; Statistics 13 or the equivalent; an upper division course in ecology. Description of bird, mammal and fish population dynamics, modeling philosophy, techniques for estimation of animal abundance (e.g., mark-recapture, chaining, ratio, etc.), mathematical models of populations (e.g., Leslie matrix, logistic, dynamic pool, stock-recruitment), case histories.—III. (III.) Sotsford

102L Field Studies in Fish Biology: Laboratory (6)
Fieldwork—15 hours; laboratory—12 hours; discussion/lab—3 hours. Prerequisites: course 102, upper division course in each of ecology, aquatic biology, fish biology, and statistics, and consent of instructor. Field investigations of fish biology emphasized including interpretative literature and methods and individual research projects on ecology, behavior, physiology or population biology of fishes at the field site in relation to their habitats. Offered irregularly. (Deferred grading only pending completion of projects.) GE credit: SciEng, Writ | SE, WE—III. Moyle

110L Laboratory in Biology and Conservation of Wild Mammals (3)
Laboratory—6 hours. Prerequisite: course 110 may be taken concurrently; consent of instructor. Laboratory exercises in the morphology, systematics, species identification, adaptations of wild mammals to different habitats. Limited enrollment.—III. (III.) Kelt

111L Laboratory in Biology and Conservation of Wild Birds (3)
Laboratory—6 hours; fieldwork—3 hours. Prerequisite: course 111 may be taken concurrently; consent of instructor. Laboratory exercises in bird species identification, anatomy, molt, age and sex, specialized adaptations, behavior, research, with emphasis on conservation of wild birds. Several weekend field trips, stock days, and independent bird study are required. Limited enrollment.—I. (I.) Eadie

120. Biology and Conservation of Fishes (3)
Lecture—3 hours. Prerequisites: Biological Sciences 2A, 2B, 2C. Evolution and conservation of marine and freshwater fishes.—I. (I.) Moyle

120L. Laboratory in Biology and Conservation of Fishes (2)
Laboratory—3 hours. Prerequisite: course 120 may be taken concurrently. Limited enrollment. Morphology, taxonomy, conservation, and identification of marine and freshwater fishes with emphasis on California species.—I. (I.) Moyle

121. Physiology of Fishes (4)
Lecture—3 hours; laboratory—3 hours. Prerequisites: upper division courses in nutrition and physiology or consent of instructor. Comparative physiology, growth, reproduction, behavior, and energy relations of fishes. Offered irregularly. GE credit: SciEng, Writ | SE, WE.—II. (II.)

122. Population Dynamics and Estimation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisites: Mathematics 16A-16B; Statistics 13 or the equivalent; an upper division course in ecology. Description of bird, mammal and fish population dynamics, modeling philosophy, techniques for estimation of animal abundance (e.g., mark-recapture, chaining, ratio, etc.), mathematical models of populations (e.g., Leslie matrix, logistic, dynamic pool, stock-recruitment), case histories.—III. (III.) Sotsford

130. Physiological Ecology of Wildlife (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Evolution and Ecology 101 or Environmental Science and Policy 100 or equivalent course. Field Principles of ecological physiology, emphasizing vertebrates. Ecological, evolutionary, and behavioral perspectives on physiological mechanisms used by animals to adapt to their environment, including consideration of climate-change and other threats to biodiversity. Tropical, temperate, and polar ecosystems are highlighted. GE credit: SciEng | SE—II. (II.) Fangue

134L. Herpetology Laboratory (3)
Laboratory—6 hours. Prerequisite: Biological Sciences 2A, 2B, 2C; Evolution and Ecology 101 or Environmental Science and Policy 100 or equivalent upper division course recommended; course 134 concurrently; consent of instructor. Diagnostic characteristics and functional attributes of amphibians and reptiles, emphasizing ecological, biogeographic, and phylogenetic evidence of evolutionary relationships with common species of reptiles and amphibians in the Davis area. Offered in alternate years.—III. Todd

136. Ecology of Waterfowl and Game Birds (4)
Lecture—3 hours; laboratory—3 hours; fieldwork—1 hour. Prerequisite: course 111, 111L or the equivalent, or consent of instructor. Detailed examination of distribution, behavior, population dynamics, and management of waterfowl and upland game birds. Offered in alternate years.—II. Eadie

141. Behavioral Ecology (4)
Lecture—3 hours; film viewing—1 hour. Prerequisite: Evolution and Ecology 101 or Environmental Science and Policy 100 or equivalent course. Basic theories underlying the functional and evolutionary significance of behavior, and the role of ecological constraints. Supporting empirical evidence taken mainly from studies of wild vertebrates. Offered in alternate years. GE credit: SciEng | SE—II. (II.) Caro

150. Urban Wildlife Ecology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 2A, 2B, 2C, or the equivalent. Introduction to the behavior, ecology, and evolution of species that occur in urban environments. Effects of urbanization on disease, fitness, and dynamics of animal populations. Conservation and conflict management efforts in urban settings. Offered in alternate years.—II. Townsend

151. Wildlife Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 2A, 2B, 2C or equivalent. Ecology of wild vertebrates, including habitat selection, spatial organization, demography, population dynamics, competition, predation, herbivory, energetics, and community dynamics, set in the context of human-caused degradation of environments in North America.—I. (I.) Van Vuren

152. Ecology of Human—Wildlife Conflicts (3)
Lecture—3 hours. Prerequisite: Biological Sciences 2A, 2B, 2C, or the equivalent. Introduction to the behavior, ecology, and evolution of species that occur in urban environments. Effects of urbanization on disease, fitness, and dynamics of animal populations. Conservation and conflict management efforts in urban settings. Offered in alternate years.—II. Todd

153. Wildlife Ecotoxicology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: introductory courses in organic chemistry, ecology, and physiology, or consent of instructor. Ecological approaches to managing wild vertebrates that come into conflict with agriculture, public health, or the conservation of biodiversity. Offered in alternate years.—II. Van Vuren
Seminar—1 hour. Prerequisite: upper division stand-

154. Conservation Biology (4) Lecture—3 hours; term paper [will be one or more book reviews]. Prerequisite: Evolution and Ecology 101 or Environmental Science and Policy 100 or the equivalent. An introduction to conservation biology and background to the biological issues and contro-
versies surrounding loss of species and habitats. GE credit: SciEng | SE, WE. —I. (F) Todd

155. Habitat Conservation and Restoration (3) Lecture—3 hours. Prerequisite: Evolution and Eco-

155L. Habitat Conservation and Restoration Laboratory (2) Fieldwork—3 hours; laboratory—3 hours. Prerequisite: Evolution and Ecology 101 or Environmental Science and Policy 100 or equivalent course; course 154 and Environmental Horticulture 160 recommended. Analysis of the characteristics of wildlife and fish habitats, the con-

156. Plant Geography (4) Lecture—3 hours; laboratory—3 hours; term paper. Field trips will be substituted for some in-lab activi-

157. Coastal Ecosystems (4) Lecture—3 hours; laboratory/fieldwork—3 hours. Prerequisite: Environmental Studies 100 or Evolution and Ecology 101; course work in organismal bi-

158. Infectious Disease in Ecology and Conservation (3) Lecture—3 hours. Prerequisite: Evolution and Eco-

192. Internship (1-12) Internship—3-36 hours. Prerequisite: completion of 84 units and consent of instructor. Work experience off and on campus in all subject areas offered in the department. Internships supervised by a member of the faculty. (P/NP grading only.)

193. Field and Laboratory Research (3) Laboratory–4 hours; discussion—1 hour. Prerequisite: course 110L, 111L, or 120L, 121 or 130; Evo-

197T. Tutoring in Wildlife and Fisheries (1-5) Prerequisite: major in Wildlife, Fish, and Conserva-

198. Directed Group Study (1-5) (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only)

Graduate

222. Advanced Population Dynamics (3) Lecture—3 hours. Prerequisite: graduate standing; advanced course in ecology [e.g., Evolution and Ecology 101], population dynamics [e.g., course 122], and one year of calculus; familiarity with matrix algebra and partial differential equations recom-

223. Conservation Biology and Animal Behavior (3) Lecture—1.5 hours; discussion—1.5 hours. Prerequisite: Ecology 208 or Animal Behavior 221. Influ-

290. Seminar (1-3) Seminar—1-3 hours. Prerequisite: consent of instruc-

291. Seminar in Aquatic Ecology (2) Seminar—2 hours. Prerequisite: graduate standing in biology. Presentation and analysis of assigned topics in aquatic ecology and conservation. Offered in alternate years. (S/U grading only.)—I, III

292. Physiology of Fishes Seminar (1) Seminar—1 hour. Prerequisite: graduate standing and at least two hours in physiology; consent of instructor. Seminar devoted to current topics concern-

294. Behavioral Ecology of Predators and Prey (3) Seminar—2 hours. Prerequisite: graduate standing. Presentation and analysis of research papers on social and foraging behavior of predatory animals, antipredator strategies of prey species, co-evolution of predators and prey, and ecology of predator prey interactions. May be repeated twice for credit. (Same course as Animal Behavior 294.) Offered in alternate years. —II. Caro

295. Seminar in Wildlife Ecotoxicology (3) Seminar—2 hours; term paper. Prerequisite: gradu-

Wine Production

Food Science and Technology, on page 313; Microbiology and Molecular Genetics, on page 423; and Viticulture and Enology, on page 541.

Women and Gender Studies

[College of Letters and Science] Maxine Craig, Ph.D., Program Director

Program Office. 1101 Hart Hall 530-752-6429; http://wms.ucdavis.edu/

Committee in Charge

Elizabeth Constable, Ph.D. (Women and Gender Studies)
Maxine Craig, Ph.D. (Women and Gender Studies)
Wendy Ho, Ph.D. (Asian American Studies, Women and Gender Studies)
Suad Joseph, Ph.D. (Anthropology, Women and Gender Studies)
Susan Kaiser, Ph.D. (Textiles and Clothing, Women and Gender Studies)
Anna K. Kuhn, Ph.D., Emerita (Women and Gender Studies)
Amina Mama, Ph.D. (Women and Gender Studies)
Kimberly D. Netles-Barcelón, Ph.D. (Women and Gender Studies)

Faculty

Elizabeth Constable, Ph.D., Associate Professor (Women and Gender Studies)
Maxine Craig, Ph.D., Associate Professor (Women and Gender Studies)
Women's Studies is an interdisciplinary major founded on the principle that the social production of gender is inseparable from that of race, sexuality, class, national identity and other categories of difference. Our curriculum places feminist concerns within a comparative context, while respecting the need for geographic and historical specificity. These frameworks inform our teaching, our research, our institutional and community practices, and the way we bring to our classroom. Women and Gender Studies offers a wide range of courses that use the lens of gender to examine colonialism and post-colonialism, globalization, history, sexuality, queer theory, literature, popular culture, feminist video production, area studies, film, fashion and food. The Women and Gender Studies Program offers both an undergraduate major and minor. We also work collaboratively with other units on campus to sponsor two undergraduate minors, Sexuality Studies and Social and Ethnic Relations, and an undergraduate concentration in transnational production and consumption.

The Program. One of the most exciting and challenging aspects of the Women and Gender Studies Program is that students, in consultation with the peer and faculty advisers, can pursue their particular academic interests as they design their course of study accordingly. In devising their major plan, students will draw on courses offered in African American and African Studies, American Studies, Anthropology, Asian American Studies, Chicano/o Studies, Comparative Literature, English, French, German and Italian Studies, History, Linguistics, Native American Studies, Political Science, Psychology, Sociology, Spanish, Textile and Clothing, and other related disciplines.

In addition to offering a broad array of courses that deal with gender, class, race, ethnicity, and sexuality, the Women and Gender Studies Program affords interested students the opportunity to earn internship credit and conduct independent research as well as take advantage of the Honors Thesis option. Students design a program of study in consultation with an adviser that is in accordance with their individual career goals. Many Women and Gender Studies majors find it advantageous to pursue a double major, or to minor in another field of study. Upon successful completion of the degree requirements, students majoring in the program will graduate with a Bachelor of Arts Women’s Studies.

Career Alternatives. A degree in Women’s Studies opens many possibilities for future employment. The major introduces students to relevant social issues, fosters critical thinking, and encourages social advocacy.

Pre-professional students will discover that a major in Women’s Studies offers useful preparatory training for medical or law school. It is particularly suitable for those interested in specializing in social policy, international development, social justice or gender-related work in a wide range of institutions and contexts. Students who plan to do practical work in counseling, clinical psychology, social services, education, media criticism, and also find Women’s Studies provides a strong foundation. Those who wish to pursue graduate level research in such fields as anthropology, comparative literature, cultural studies, economics, education, ethnic studies, English, film studies, history, languages and literatures, performance studies, philosophy, political science, and sociology will also benefit from a strong undergraduate background in critical theory, social analysis, history, feminist social theory, and a sound understanding of cultural representation and narratives of difference.

Increasingly, media and cultural institutions, corporations, and personnel firms are hiring specialists in women and gender studies trained in understanding the complex cultural shifts and demands arising from diverse communities. State and federal agencies need people who have special understanding of the problems that diverse groups of women face in society, institutions, and corporations. Educational institutions across the spectrum need specialists to develop and administers women and gender studies programs, multi-cultural community centers and other organizations designed specifically to deal with gender, social diversity and inequality, and a growing range of old and new social challenges arising in the context of globalization.

Some of our alumni have developed careers other than those described above. Talking to your Women and Gender Studies faculty and peer advisor can give you even more ideas about possible future careers. Doing internships related to your course work allows you to test your skills in a hands-on practice and service in the community.

Women’s Studies

A.B. Major Requirements:

Preparatory Subject Matter............... 20
Two courses from: Women’s Studies 20, 50, 60, 70, 71, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136

Depth Subject Matter............... 44
Women’s Studies 103, 104, 190 and one additional upper division Women’s Studies course .................................................. 16
Cross-Cultural Requirement............... 16
Choose four courses (at least one from each category). Courses in this requirement may not duplicate those used to meet other Women’s Studies major requirements. The list that follows represents a partial list of options; other courses may be included with the consent of the Women’s Studies Adviser.


Gender-based courses .................. 12

Choose one of two tracks: Disciplinary or Thematic. Courses used to meet this requirement may not duplicate those used to meet other Women’s Studies major requirements.

Disciplinary track

Choose three courses from one of the following focus groups:

Anthropology: Anthropology 129, 130, 131, 134, 139, 148B, 158, Women’s Studies 102, 182, 184


Italian 141, Native American Studies 180.

Literature and Language focus: Comparative Literature 135, 138, 159, English 185A, 185B, French 133, German 129, Italian 141, Linguistics 163, Russian 142, Women’s Studies 129.

Sociology and Psychology focus:


Thematic track

In consultation with a Women’s Studies adviser, choose three courses that form a thematic cluster (for example, women and Race in the United States; The Cultural Representations of Gender; Gender and Public Policy; Gender and Global Issues; Gender and Anti-Semitism; Gender and Autobiography; Gender, Theory and Representation; Sexualities; and Gender Science). Other clusters may be developed in consultation with a Women’s Studies adviser.

Total units for the major .................. 64

Major Adviser. All Women’s Studies majors and minors must consult with a faculty adviser, individually, at least once each academic year.

Minor Program Requirements:

Women’s Studies

Women’s Studies 20, 50, 60, 70 or 80 ... 4

Choose one from: African American and African Studies 123, Anthropology 139, Asian American Studies 112, Chicano/o Studies, 111, 122, 131, Native American Studies 114, Sociology 134, 172, Women’s Studies 160, 180 ...

Choose one from: Anthropology 148B, Comparative Literature 135, 138, 159, English 185A, 185B, German 102G, 102H, 148A, 148B, Women’s Studies 102, 182, 184 ...

Additional Electives from approved list of upper division cross-listed and Women’s Studies courses ...

Note: With prior consultation with an adviser, other upper division courses may be accepted toward the minor program. Under no circumstances may more than one lower division course be offered in satisfaction of requirements for the minor.

Minor Adviser. All Women’s Studies majors and minors must consult with a faculty adviser, individually, at least once each academic year.

Graduate Study. The Women and Gender Studies Program offers a designated emphasis in Feminist Theory and Research for students enrolled in the Ph.D. programs of twelve other affiliated departments.

Courses in Women’s Studies (WMS)
Lecture/discussion—4 hours; term paper. Prerequisite: course 50 or consent of instructor. Class size limited to 60 students. Critical introduction on the history of Western science, scientific institutions and the changing role of science in relation to inequalities of class, race, gender, and global struggles for freedom and justice. Offered irregularly. GE credit: ArtHum or SocSci, Div | AH or SS, DD, WC, WE.—III. (III.) Craig, Kaiser, Mama

158. Contemporary Masculinities (4)
Lecture/discussion—4 hours. Prerequisite: one course specified for the Women’s Studies major. A multicultural study of contemporary trends in masculinity and the economic, social and political forces that have shaped them. Topics may include men’s movements, ethnic nationalism, masculinities, representations of masculinity and images of masculinity in popular culture. GE credit: ArtHum or SocSci, Div | ACGH, AH or SS, DD, WE.—III. (III.) Craig, Ho, Mama

160. Women, ‘Race’ and Sexuality in Postcolonial Cinema (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 20 or 50. Class size limited to 90 students. Feminist analysis of race, sexuality and class in the representations of women in commercial and/or independent films. Offered in alternate years. GE credit: ArtHum, Div | Wrt, AH, VL, WC, WE.—III. (III.) Kaiser, Mama

162. Feminist Film Theory and Criticism (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: one course from the Women’s Studies major and Humanities 10 or consent of instructor. Historical overview of and contemporary issues in feminist film theory, including representation, spectatorship, and cultural production. Film stars, women filmmakers, and the intersections of gender, race, sexuality, and class in films and their audiences. Offered in alternate years. GE credit: ArtHum, Div | ACGH, AH, DD, VL, WC, WE.—III. Constable

164. Topics in Gender and Cinematic Representation (4)
Lecture/discussion—3 hours; laboratory—3 hours; fieldwork—6 hours. Prerequisite: one course from the Women’s Studies major and Humanities 10 or consent of instructor. Examination of a specific topic within the broad rubric of gender and cinema. Possible topics include Latinas in Hollywood; gender, nation, cinema; and gender and film genre. Topics vary. May be repeated two times for credit when topic differs. Offered in alternate years. GE credit: ArtHum, Div | AH, VL, WC, WE.—III. Kaiser

165. Feminist Media Production (6)
Lecture/discussion—3 hours; laboratory—3 hours; fieldwork—6 hours. Prerequisite: one course in Women and Gender Studies or consent of instructor. Basic media production and community service. Video, audio and photography instruction; feminist community documentary; video ethnography; video journals, alternative representations of fashion and women’s bodies. Fundamentals of camera and microphone operation, interviewing techniques, and editing. May be repeated two times for credit when topic differs. Offered irregularly. GE credit: ArtHum or SocSci, Div | ACGH, AH or SS, DD, VL.—III. (III.) Kaiser

170. Queer Studies (4)
Lecture/discussion—4 hours. Prerequisite: course 20, or 50, or 70, or consent of instructor. Study of queer sexualities, identities, and cultures. Alternative sexualities as historical, social, and cultural constructions in intersections with race, gender, class, nationality. Interdisciplinary exploration of sexual orientation and the regulation of sexuality through history, theory and expressive cultural forms. Offered irregularly. GE credit: ArtHum or SocSci, Div | Wrt | ACGH, AH or SS, DD, WE.—Constable

175. Gender and Exceptional Race (4)
Lecture/discussion—4 hours. Prerequisite: course 50, 60, or consent of the instructor. Exploration of the co-construction of “race” and gender in comparative national historical contexts and contemporary lived experience. Study of intersections of race and identity politics, and the social construction of women’s experience. GE credit: ArtHum or SocSci, Div | ACGH, AH or SS, DD, WC, WE.—III. (III.) Craig, Mama

104. Feminist Approaches to Inquiry (4)
Lecture/discussion—4 hours. Prerequisite: one course specified for the Women’s Studies major. Feminist applications and transformations of traditional disciplinary issues and methodologies in feminist interdisciplinary work. GE credit: ArtHum or SocSci | ACGH, AH or SS, DD, WE.—II. (II.) Nettles-Barcelón

137. Feminist Interpretations of Contemporary Western Thought (4)
Lecture/discussion—4 hours. Prerequisite: one course in Women’s Studies, or consent of instructor. Introduction to deciphering, demystifying, and interpreting poststructuralist, postmodern, and postcolonial thought from a feminist perspective: applications to gender, race, sexuality, and class. Offered irregularly. GE credit: ArtHum or SocSci, Div | Wrt | ACGH, AH or SS, DD, WE.—Constable

130. Feminism and the Politics of Family Change (4)
Lecture/discussion—4 hours. Prerequisite: any Women’s Studies course or Sociology 131 or 132. Examination of contemporary conflicts over family values and the changing family from a feminist perspective. Offered in alternate years. GE credit: ArtHum or SocSci, Div | ACGH, AH or SS, DD, WE.—II. (II.)

136. Topics in Gender, Production, Consumption (4)
Lecture/discussion—3 hours; term paper. Construction of gender through production and consumption of goods and services. Transnational movement of peoples and goods and services. GE credit: ArtHum or SocSci, Div | ACGH, AH or SS, DD, WE.—II. (II.) Nicole

90X. Lower Division Seminar (2)
Seminar—2 hours. Examination of a special topic in Women’s Studies through shared readings, discussions, and written assignments. Offered in alternate years.—Constable, Kaiser, Nettles-Barcelón

91. Research Seminar in the Transnational Production and Consumption of Fashion (1-3)
Seminar—1-2 hours. Preparation for a research conference. May be repeated for credit when topic varies.—II. (II.) Kaiser

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)—Constable, Ho, Kaiser, Nettles-Barcelón, Swain

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)—Constable, Craig, Ho, Joseph, Kaiser, Nettles-Barcelón, Swain

102. Gender and Post Colonialism (4)
Lecture/discussion—4 hours; term paper. Prerequisite: course 50, 60. Explores changing configurations of race, gender, sexuality, class and implications for governmentality in one or more colonial or postcolonial regimes in one or more societies. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, DD, WC, WE.—I. Mama

103. Introduction to Feminist Theory (4)
Lecture/discussion—4 hours. Prerequisite: one course specified for the Women’s Studies major. Introduction to the emergence of feminist theory and to key concepts in feminist theorizing. Examination of past and current debates over sexuality, race,

148. Science, Gender, and Social Justice (4)
Lecture/discussion—4 hours, term paper. Prerequisite: course 50 or consent of instructor. Course limited to 60 students. Critical reading and discussion on the history of Western science, scientific institutions and the changing role of science in relation to inequalities of class, race, gender, and global struggles for freedom and justice. Offered irregularly. GE credit: ArtHum or SocSci, Div | AH or SS, DD, WC, WE.—III. (III.) Craig, Kaiser, Mama

25. Gender and Global Cinema (4)
Lecture—3 hours; film viewing—3 hours. The role gender plays in film history/culture in various geographical contexts and in aspects of contemporary globalization. Films from nations such as China, Columbia, India, Iran, Korea, New Zealand, and the U.S. GE credit: ArtHum, Div, Wrt | AH, VL, WC, WE.—II. (II.) Constable

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Women and Gender Studies

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses: Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; ACGH—American Cultures, DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Domestic Diversity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience

Lecture and discussion—4 hours. In-depth examination of movements for sexual liberation and the regulation of the body. GE credit: ArtHum or SocSci, Div | ACGH, AH or SS, DD, WE.—I. (I.) Constable

Prerequisite: consent of instructor. Critical introduction to major traditions of social thinking in the West from a feminist perspective. Offered irregularly. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.—Craig

Theory and History of Sexualities (4)
Lecture/discussion—4 hours. Key issues in the social construction of the subject. May be repeated for credit when topic differs. Limited enrollment.—Constable, Ho, Kaiser, Nettles-Barcelón

90X. Lower Division Seminar (2)
Seminar—2 hours. Examination of a special topic in Women’s Studies through shared readings, discussions, and written assignments. Offered in alternate years.—Constable, Kaiser, Nettles-Barcelón

91. Research Seminar in the Transnational Production and Consumption of Fashion (1-3)
Seminar—1-2 hours. Preparation for a research conference. May be repeated for credit when topic varies.—II. (II.) Kaiser

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)—Constable, Ho, Kaiser, Nettles-Barcelón, Swain

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)—Constable, Craig, Ho, Joseph, Kaiser, Nettles-Barcelón, Swain

Upper Division

102. Gender and Post Colonialism (4)
Lecture/discussion—4 hours; term paper. Prerequisite: course 50, 60. Explores changing configurations of race, gender, sexuality, class and implications for governmentality in one or more colonial or postcolonial regimes in one or more societies. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt | AH or SS, DD, WC, WE.—I. Mama

103. Introduction to Feminist Theory (4)
Lecture/discussion—4 hours. Prerequisite: one course specified for the Women’s Studies major. Introduction to the emergence of feminist theory and to key concepts in feminist theorizing. Examination of past and current debates over sexuality, race,
gender in identities and how institutions, labor migration, social movements and consumption shape racialized gendered identities. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE. — III. (III.) Ho, Nettles

178A-G. Women Writers and the Transnational Imaginary (4)
Lecture/discussion—4 hours. Prerequisite: one course in Women’s Studies, or consent of instructor. Writings by women from diverse regions and cultures, understood in their cultural, socioeconomic, and historical contexts, with each course offering a focus on women’s writing in specific geographic/national locations and their diasporas: (A) The Arab World; (B) Asia; (C) The Caribbean; (D) Africa; (E) Diasporic Women Writers in Europe. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WC, WE. — Constable, Ho, Mama, Nettles-Barcelón

178F. Transnationalism and Writing by Women of Color (4)
Lecture/discussion—4 hours. Prerequisite: one course in Women’s Studies, or consent of instructor. Writings by women of color in a transnational framework, understood in their cultural, socioeconomic, and historical contexts. The intersection among gender, writing, nationalism, and transnationalism, with focus on women’s writing in specific geographic/national locations and their diasporas: (F) Topics on Women’s Writings of Coloniality. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WC, WE. — Constable, Ho, Nettles-Barcelón

179. Gender and Literature (4)
Lecture/discussion—4 hours. Prerequisite: one course in Women’s Studies, or consent of instructor. Role of literature, especially novels, in constructing, challenging, and transforming normative genders in society. Transhistorical and transnational focus on gender in its intersections with race, class, sexuality, and politics. Offered irregularly. GE credit: ArtHum, Div, Wrt | AH, WC, WE. — Constable, Ho

180. Women of Color Writing in the United States (4)
Lecture/discussion—4 hours. Prerequisite: course 20 or 50. Literature, especially novels, written by contemporary women of color in the United States, understood in their socioeconomic, cultural and historical contexts. GE credit: ArtHum, Div | ACGH, AH, DD, WE. — II. (II.) Ho, Mama

182. Globalization, Gender and Culture (4)
Lecture/discussion—4 hours. Prerequisite: course 50; consent of instructor. Critical gender analysis of globalization in the process of interconnected cultural, social and economic transformations affected by gender, nation, class and race/ethnicity. Critical self-reflection and social observation skills. Offered in alternate years: ArtHum or SocSci, Div, Wrt | AH or SS, OL, WC, WE. — III. Mama

184. Gender in the Arab World (4)
Lecture/discussion—4 hours. Prerequisite: course 50. Examination of the history, culture, and social/political dynamics of gender relations and gendering in the Arab world. GE credit: SocSci, Div, Wrt | SS, WC, WE. — II. (II.)

185. Women and Islamic Discourses (4)
Lecture/discussion—4 hours. Prerequisite: course 50 or comparable course. Introduction to the debates/discourses about women and Islam. Transformations in debates/discourses in colonial and postcolonial periods in the Middle East & South Asia. Comparative study of debates/discourses on family, work, low, sexuality, religion, comportment, human rights, feminist and religious movements. Offered irregularly. (Same course as Middle East/South Asia Studies 150.) GE credit: ArtHum or SocSci | AH or SS, WC.

187. Gender and Social Policy (4)
Lecture/discussion—3 hours; term paper. Prerequisite: upper division standing and a course in Women’s Studies in the creation of social policies, especially with respect to issues brought into the policy arena by contemporary feminism. Offered in alternate years. GE credit: SocSci, Div | ACGH, DD, SS, WE. — III. (III.) Craig, Nettles-Barcelón

189. Special Topics in Critical Gender Studies (4)
Lecture/discussion—4 hours. Prerequisite: one course specified for the Women’s Studies major. In-depth examination of a woman’s studies topic related to the research interests of the instructor. May be repeated one time for credit when topic differs. Offered irregularly. GE credit: ArtHum or SocSci | AH or SS, WE. — I.

190. Senior Seminar (4)
Seminar—4 hours. Prerequisite: senior standing in Women’s Studies. Capstone course for senior Women’s Studies majors. Supervised internship and study in positions/institutional settings dealing with gender-related problems or issues, as for example, a women’s center, affirmative action office, advertising agency, or social welfare agency. Final written report on internship experience. (P/NP grading only.)—Constable, Craig, Ho, Kaiser, Nettles-Barcelón, Swain

191. Capstone Seminar: Women’s Studies (4-12)
Seminar—4 hours. Prerequisite: course 104 or Textiles and Clothing 107, and course 194A, course 199, or Textiles and Clothing 199, or consent of instructor. Revision, consolidation, and preparation of senior research or creative project. Creating a multipage Med web site for publishing research and creative projects. GE credit: ArtHum or SocSci, Wrt | ACGH, AH or SS, DD, WE. — III. (III.) Kaiser

192. Internship in Women’s Studies (1-12)
Internship—3-36 hours; written report. Prerequisite: completion of a minimum of 84 units and consent of instructor; enrollment dependent on availability of intern positions with priority to Women’s Studies majors. Supervised internship and study in positions/institutional settings dealing with gender-related problems or issues, as for example, a women’s center, affirmative action office, advertising agency, or social welfare agency. Final written report on internship experience. (P/NP grading only.)—Constable, Craig, Ho, Kaiser, Nettles-Barcelón, Swain

193. Feminist Leadership Seminar (2)
Seminar—2 hours. Prerequisite: course 50, 192. Use feminist methods to critically reflect on the ethical, methodological and strategic aspects of an organization, project, campaign, movement or other social change initiative. May be repeated for credit. Offered irregularly. (P/NP grading only.) GE credit: ArtHum or SocSci | ACGH, AH or SS, DD, WE. — II. (II.)

194HA-194HB. Senior Honors Project in Women’s Studies (4-6)
Independent study—12 hours. Prerequisite: senior standing, Women’s Studies major, and advisor’s approval. In consultation with an advisor, students complete a major research paper or significant creative project on a Women’s Studies topic. (Deferred grading only, pending completion of sequence.) GE credit: ArtHum or SocSci | AH or SS, WE. — Constable, Craig, Ho, Joseph, Kaiser, Mama, Nettles-Barcelón

195. Thematic Seminar in Critical Gender and Women’s Studies (4)
Seminar—4 hours. Prerequisite: course 50, 60. Limited enrollment. Group study of a topic, issue or area in feminist theory and research involving intensive reading and writing. May be repeated for credit. Offered irregularly. GE credit: ArtHum or SocSci, Div, Wrt | ACGH, AH or SS, DD, WE.

197. Tutoring in Women’s Studies (1-4)
Tutoring—3-12 hours. Prerequisite: upper division standing and consent of director. Leading small, voluntary discussion groups affiliated with a Women’s Studies course. May be repeated for credit for a total of 8 units. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: upper division standing; consent of instructor. (P/NP grading only.)—Constable, Joseph, Kaiser, Kaplan, Kuhn, Mena, Nettles-Barcelón, Swain

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: upper division standing; consent of instructor. (P/NP grading only.)—Constable, Joseph, Kaiser, Kaplan, Kuhn, Mena, Nettles-Barcelón, Swain

Graduate
200A. Current Issues in Feminist Theory (4)
Seminar—4 hours. Current issues in feminist theory; techniques employed to build feminist theory in various fields. — I. (I.) Ho

200B. Problems in Feminist Research (4)
Seminar—4 hours. Prerequisite: course 200A with a grade of B+ or better. Application of feminist theoretical perspectives to interdisciplinary investigation of a problem or question chosen by the instructor(s). May be repeated for credit when subject area differs. — II. (II.) Mama

201. Special Topics in Feminist Theory and Research (4)
Lecture/discussion—4 hours. Explores in depth a topic in feminist theory and research related to the research interests of the instructor. May be repeated for credit when topic differs. Limited enrollment.— (III.) Constable, Craig, Ho, Kaiser, Mama, Nettles-Barcelón, Swain

250. Cultural Study of Masculinities (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Interdisciplinary approaches to understanding the social and cultural construction of masculinities; attention to the effects of biology, gender, race, class, sexual and national identities; criticism of oral, printed, visual, and mass mediated texts, and of social relations and structures. (Same course as American Studies 250.)—Craig, Ho

299. Special Study for Graduate Students (1-12)
(S/U grading only.) — Constable, Craig, Ho, Joseph, Kaiser, Nettles-Barcelón, Swain

299D. Dissertation Research and Writing (4)
Prerequisite: courses 200A and 200B; fulfillment of course requirements for the DE in Feminist Theory and Research, advancement to candidacy. (S/U grading only.)—Constable, Ho, Joseph, Kaiser, Kaplan, Kuhn, Mena, Nettles-Barcelón, Swain

Professional
396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III, (II, III.) Constable, Craig, Ho, Joseph, Kaiser, Mena, Nettles-Barcelón, Swain

Zoolgy
Sec Evolution and Ecology, on page 308.
GENERAL EDUCATION OPTIONS/COURSES
NEW GENERAL EDUCATION COURSES; FALL 2011 AND ON

The following section pertains to students who matriculated to UC Davis for the first time in Fall 2011 or later. Students who matriculated prior to Fall 2011 should refer to the Former General Education Courses; Pre-Fall 2011, on page 576.

For the most up-to-date General Education courses, use the class search tool at http://classes.ucdavis.edu/.

TOPICAL BREADTH

These courses satisfy the GE requirement for Topical Breadth.

Arts & Humanities

Art History 10  Art History 1  Art History 3  Art History 4  Art History 5  Art History 6  Art History 7  Art History 8  Art History 9  Art History 10  Art History 11  Art History 12  Art History 13  Art History 14  Art History 15  Art History 16  Art History 17  Art History 18  Art History 19  Art History 20  Art History 21  Art History 22  Art History 23  Art History 24  Art History 25  Art History 26  Art History 27  Art History 28  Art History 29  Art History 30  Art History 31  Art History 32  Art History 33  Art History 34  Art History 35  Art History 36  Art History 37  Art History 38  Art History 39  Art History 40  Art History 41

# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
† Also assigned to another area of topical breadth.
* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.

For the most up-to-date General Education courses, use the class search tool at http://classes.ucdavis.edu/.
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Design 135B
Design 135A
Design 132B
Design 132A
Design 131
Design 126
Design 125
Design 124E
Design 124C
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Design 119B
Design 119A
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* This course is not used to satisfy a college or university composition requirement and GE writing experience simultaneously.

† Also assigned to another area of topical breadth.

# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
Credit for writing experience allowed if co-course taken concurrently (see writing experience list).

† Also assigned to another area of topical breadth.

* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.

** This course may at department discretion be used to satisfy a college or university composition requirement and GE writing experience simultaneously.

†† Also assigned to another area of topical breadth.

††† Also assigned to another area of topical breadth.
* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.
† Also assigned to another area of topical breadth.
†† Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
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† Also assigned to another area of topical breadth.
# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
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* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously. 

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* Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
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† This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.
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* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.
† Also assigned to another area of topical breadth.
‡ Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
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† Also assigned to another area of topical breadth.
# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
CORE LITERACIES

These courses satisfy the GE requirement for Core Literacies.

**American Cultures, Governance, and History (ACGH)**

Afr Am & Afr St 10
Afr Am & Afr St 15
Afr Am & Afr St 50
Afr Am & Afr St 100
Afr Am & Afr St 123
Afr Am & Afr St 133
Afr Am & Afr St 165
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† Also assigned to another area of topical breadth.

# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
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Sociology 106
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Soil Science 118
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Statistics 102
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Statistics 108
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Textiles & Clothing 163L
University Writing Program 121
VM Molecular Biosciences 101Y
VM Pathology, Microbiol & Immunol

Wild, Fish & Conserv Biol 50
Wild, Fish & Conserv Biol 11
VM Molecular Biosciences 101Y
University Writing Program 121
Textiles & Clothing 6
Statistics 108
Soil Science 118
Soil Science 111
Soil Science 109
Soil Science 102
Soil Science 100
Sociology 103
Science and Society 110

Visual (VL)
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Afr Am & Afr Stud 50
Afr Am & Afr Stud 51
Afr Am & Afr Stud 10
Afr Am & Afr Stud 12
Afr Am & Afr Stud 17
Afr Am & Afr Stud 17A
Afr Am & Afr Stud 18
Afr Am & Afr Stud 185
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Applied Biological System Tech 32
Applied Biological System Tech 101
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Biological Sciences 134
Biological Sciences 180L
Biological Sciences 183
Biotechnology 150
Molecular Biosciences 101Y
Pathology, Microbiol & Immunol

Wild, Fish & Conserv Biol 50
Wild, Fish & Conserv Biol 11
Wild, Fish & Conserv Biol 50

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* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.
† Also assigned to another area of topical breadth.
# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
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*This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.

† Also assigned to another area of topical breadth.

# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
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* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.

† Also assigned to another area of topical breadth.

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* Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
† Also assigned to another area of topical breadth.
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* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.
* Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
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## General Education Options/Courses

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* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.

† Also assigned to another area of topical breadth.

# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
### FORMER GENERAL EDUCATION COURSES; PRE-FALL 2011

The following section pertains to students who matriculated to UC Davis prior to Fall 2011. Students who matriculated for the first time in Fall 2011 or later should refer to the New General Education Courses; Fall 2011 and On, on page 352.

For the most up-to-date General Education courses, use the class search tool at [http://classes.ucdavis.edu/](http://classes.ucdavis.edu/).

#### TOPICAL BREATH

These courses provide GE credit for topical breadth. Many of these courses also satisfy the GE requirement for social-cultural diversity (indicated by D) and/or provide GE credit for writing experience (indicated by W). Complete lists of the courses that satisfy the social-cultural diversity requirement and the courses that provide writing experience credit follow this list.

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* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.

† Also assigned to another area of topical breadth.

# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
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*This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.*

*Also assigned to another area of topical breadth.*

*Credit for writing experience allowed if co-course taken concurrently (see writing experience list).*
This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.

* Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
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* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.
* Also assigned to another area of topical breadth.
* Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
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† Also assigned to another area of topical breadth.
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*This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.
† Also assigned to another area of topical breadth.
# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
SOCIAL-CULTURAL DIVERSITY

These courses satisfy the GE requirement for social-cultural diversity. Many of these courses also provide GE credit for topical breadth or writing experience. Refer to the topical breadth and writing experience course lists to determine if any additional GE credit applies.

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# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
### General Education Options/Courses

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* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.  
† Credit for writing experience allowed if co-course taken concurrently [see writing experience list].
These courses satisfy the GE requirement for writing experience. Many of these courses also provide GE credit for topical breadth or social-cultural diversity. Refer to the topical breadth and social-cultural diversity course lists to determine if any additional GE credit applies.

**WRITING EXPERIENCE**

This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.

![List of courses satisfying writing experience](attachment:image)
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† Also assigned to another area of topical breadth.
‡ Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
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History 191B
Latin 113
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History 191C
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Law 286
Philosophy 123
History 191B
Law 286C
Philosophy 125
History 191D
Law 409A
Physics 1D
History 191E
Plant Biology 143
History 191F

† Also assigned to another area of topical breadth.

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<td>Psychology 142</td>
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<td>Psychology 158</td>
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<td>Russian 143</td>
<td>Sociology 135</td>
<td>Wild, Fish &amp; Conserv Biol 50</td>
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<tr>
<td>Religious Studies 1E</td>
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<td>Spanish 147</td>
<td>Women's Studies 102</td>
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<td>Religious Studies 23</td>
<td>Science &amp; Tech Studies 130B</td>
<td>Spanish 149</td>
<td>Women's Studies 136</td>
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<td>Statistics 10</td>
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<td>Science &amp; Tech Studies 173</td>
<td>University Writing Program 1V</td>
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<td>Religious Studies 69</td>
<td>Science and Society 2</td>
<td>University Writing Program 18  *</td>
<td>Women's Studies 178B</td>
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<td>Science and Society 3</td>
<td>University Writing Program 19  *</td>
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<td>University Writing Program 102A  *</td>
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<td>University Writing Program 102E  *</td>
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<td>Science and Society 10</td>
<td>University Writing Program 102F  *</td>
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<td>Religious Studies 120</td>
<td>Science and Society 11</td>
<td>University Writing Program 102G  *</td>
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<tr>
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<td>Science and Society 12</td>
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<td>University Writing Program 102I</td>
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<td>Religious Studies 141A</td>
<td>Science and Society 20</td>
<td>University Writing Program 102L</td>
<td>Women's Studies 191</td>
</tr>
</tbody>
</table>

* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.
† Also assigned to another area of topical breadth.
# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
The following section only pertains to students who matriculated to UC Davis prior to Fall 2011.

### Arts & Humanities

**Majors**

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<tr>
<td>Native American Studies Philosophy</td>
<td>Professional Writing</td>
<td>Religious Studies</td>
<td>Russian</td>
<td>Sexuality Studies</td>
<td>Social and Ethnic Relations</td>
<td>Spanish</td>
<td>Women's Studies</td>
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</tbody>
</table>

**Science & Engineering**

**Majors**


**Minors**


### Social Sciences

**Majors**


**Minors**

| Aging and Adult Development Anthropology (General emphasis) Anthropology (Sociocultural emphasis) Coaching Principals and Methods Community Development Contemporary Leadership East Asian Studies Economics Education Energy Policy Environmental Policy Analysis Global and International Studies (Social Science emphasis) History & Philosophy of Science Human Development India and South Asia Studies International Agricultural Development Latin American and Hemispheric Studies Linguistics Linguistics for Language Teachers Managemental Economics Middle East/South Asia Studies Political Science Psychology Science and Society Sociology Technology Management Textiles & Clothing War-Peace Studies |

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* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.
† Also assigned to another area of topical breadth.
# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
GENERAL EDUCATION THEME OPTIONS

The following section only pertains to students who matriculated to UC Davis prior to Fall 2011.

General Education theme options are sets of GE courses sharing a common intellectual theme. These GE theme options are not a separate element of the GE requirement, but a way of selecting your GE courses so that you may benefit from a coherent focus of study while completing the GE requirement. Completion of a theme satisfies the GE requirement for students with majors assigned to the GE topical breadth area of Arts and Humanities. Students with majors assigned to the topical breadth area of either Science and Engineering or Social Science will need to complete additional GE courses in Arts and Humanities to satisfy the campus GE requirement.

Global Population and Environmental Issues

For centuries, there have been concerns and predictions about population growth and its potential effects on the environment and the quality of life. Perspectives on population and environmental issues often vary based on such factors as gender, social class, culture, nation, race/ethnicity, and religion. In this group of courses, students will learn about the complex interplay among environmental, economic, and ethical issues through the study of global population patterns. They will learn how science addresses the use of natural resources by humans, along with the fundamentals of environmental impacts such as global warming. This option group of courses explores diverse perspectives on global population and environmental issues by examining biological, physical, and social processes that influence the everyday lives of people around the world.

Topics might include the social, economic, and environmental challenges of population growth; and the ethics and dilemmas of natural resource use.

### Global Population

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Area(s)</th>
<th>Wrt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atmospheric Science 5 [or 10]</td>
<td>SciEng, Wrt</td>
<td></td>
</tr>
<tr>
<td>Human Development 117</td>
<td>SciEng, Wrt</td>
<td></td>
</tr>
<tr>
<td>Agricultural and Resource Economics 15</td>
<td>SocSci, Div, Wrt</td>
<td></td>
</tr>
<tr>
<td>Science and Society 1</td>
<td>SciEng or SocSci, Div, Wrt</td>
<td></td>
</tr>
<tr>
<td>[or Fiber and Polymer Science 110]</td>
<td>SciEng or SocSci, Wrt</td>
<td></td>
</tr>
<tr>
<td>International Agricultural Development 10,</td>
<td>SocSci, Div, Wrt</td>
<td></td>
</tr>
<tr>
<td>[or Community &amp; Regional Development 1]</td>
<td>SocSci, Div, Wrt</td>
<td></td>
</tr>
</tbody>
</table>

Biodiversity and Cultural Diversity

The nations with the greatest biodiversity often have tremendous ethnic and cultural diversity. This option examines diversity in many interrelated contexts: biological diversity and the impact of contemporary humans; values and cultural practices in regard to production and consumption; the clothes people wear; creation and use of social spaces; and the preservation of genetic resources for food, fiber, and pharmaceuticals.

Topics might include conservation biology; integration of human and natural systems; cultural expression through clothing and appearance; and discussion of what are cultural and social rights.

### Biodiversity and Cultural Diversity

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Area(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildlife, Fish and Conservation Biology 10</td>
<td>SciEng, Div, Wrt</td>
</tr>
<tr>
<td>Plant Biology 11</td>
<td>SciEng, Wrt</td>
</tr>
<tr>
<td>Textiles and Clothing 7</td>
<td>SocSci, Div, Wrt</td>
</tr>
<tr>
<td>Community and Regional Development 2</td>
<td>SocSci, Div, Wrt</td>
</tr>
<tr>
<td>Landscape Architecture 2</td>
<td>SocSci, Wrt</td>
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</tbody>
</table>

Food and Fiber

This option focuses on food and fiber systems, from their plant, animal, or synthetic sources to their ultimate use by humans for health, safety, communication, and pleasure. Understanding these systems enables students to see the connections between the food and clothes that are part of our everyday lives and the scientific, social, and cultural issues that make them so significant to society as a whole.

Topics might include food and clothing safety, quality, and availability; media and consumer perceptions; and cultural histories, values, and meanings.

### Food and Fiber

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Area(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Science 1</td>
<td>SciEng, Wrt</td>
</tr>
<tr>
<td>[or Plant Biology 12]</td>
<td>SciEng, Div, Wrt</td>
</tr>
<tr>
<td>Nutrition 10 and Nutrition 11</td>
<td>SciEng, Wrt</td>
</tr>
<tr>
<td>[or Food Science and Technology 10]</td>
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</tr>
<tr>
<td>Textiles and Clothing 6</td>
<td>SciEng</td>
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<tr>
<td>Textiles and Clothing 7 or 107</td>
<td>SocSci, Div, Wrt</td>
</tr>
<tr>
<td>Science and Society 1</td>
<td>SciEng or SocSci, Div, Wrt</td>
</tr>
<tr>
<td>Viticulture and Enology 3</td>
<td>SciEng or SocSci</td>
</tr>
</tbody>
</table>

Changing Agriculture

Changing demographics, environmental issues, and social-political trends in California all play a role in public perceptions and policies related to our food and fiber systems, natural resources, and community values. These perceptions, policies, and values need to be critically examined in the context of larger global economic trends and environmental health and safety. In this group of courses, students can explore a range of challenging issues related to the complex interplay between rural and urban needs and values.

Topics might include holistic approaches to agriculture; international migration and agricultural development; and how plants and animals influence the course of history.

### Changing Agriculture Theme Option

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Area(s)</th>
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</thead>
<tbody>
<tr>
<td>Animal Science 1</td>
<td>SciEng, Wrt</td>
</tr>
<tr>
<td>Entomology 110</td>
<td>SciEng, Wrt</td>
</tr>
<tr>
<td>Plant Biology 12</td>
<td>SciEng, Div, Wrt</td>
</tr>
<tr>
<td>Agricultural and Resource Economics 15</td>
<td>SocSci, Div, Wrt</td>
</tr>
<tr>
<td>Environmental &amp; Resource Sciences 121*</td>
<td>SciEng, Wrt</td>
</tr>
<tr>
<td>Science and Society 2</td>
<td>SciEng or SocSci, Wrt</td>
</tr>
</tbody>
</table>

* This course may not be used to satisfy a college or university composition requirement and GE writing experience simultaneously.
† Also assigned to another area of topical breadth.
# Credit for writing experience allowed if co-course taken concurrently (see writing experience list).
RESIDENCE FOR TUITION INFORMATION

Policy Governing Residence

The determination of residence for tuition purposes at the University of California is governed by the UC Residence Policy and Guidelines. Under the UC Residency Policy, adult citizens and certain classes of aliens can establish residence for tuition purposes. There are particular rules that apply to the residence classification of minors and that establish exemptions. The UC Residence Policy establishes the Residence Determination Date for each term as the day instruction begins at the last of the University of California campuses to open for the quarter, and for schools on the semester system, the day instruction begins for the semester. All of the UC requirements for residency must be met prior to the Residence Determination Date for classification as a resident. Documentary evidence may be required and all relevant indications will be considered in determining residence classifications.

You are cautioned that this summary is not a complete explanation of the regulations regarding residence. Please note that changes may be made in the residence requirements between the publication of this statement and the relevant residence determination date.

Office of the General Counsel

Requirements for Resident Classification, Rules Applying to Minors and Exemptions from Nonresident Supplemental Tuition can be found published as the “UC Residency Policy and Guidelines” available at Office of the General Counsel website under Educational Affairs and Campus Services.

Read the full text of UC Residency Policy-Residency Guidelines for Purposes of Tuition and Fees at http://www.ucop.edu/general-counsel/.

Nonresident Supplemental Tuition Fee for Nonresident Students

If you have not met all of the UC requirements for residency prior to the Residence Determination Date each term in which you propose to attend the University, you must pay Nonresident Supplemental Tuition in addition to all other fees.

Resident Determination Process

California residence for tuition purposes is determined for each student under the UC Residence Policy and Guidelines based on information provided to a campus Residence Deputy on the Statement of Legal Residence. Additional information and documentation in support of your claim of resident status for tuition purposes may be requested as needed. Applicants and students are responsible for submitting ALL RELEVANT DOCUMENTATION AND INFORMATION to the campus Residence Deputy in support of their in-state residency request. Information or documents requested but not made available to the Residence Deputy will NOT be considered or reviewed on appeal.

Incorrect Classification

If you were incorrectly classified as a resident, you are subject to reclassification and to payment of all Nonresident Supplemental Tuition not paid. If you concealed information or furnished false information and were classified incorrectly as a result, you are also subject to University discipline. Resident students who become nonresidents must immediately notify the campus Residence Deputy.

Appeals

Any student, following a final decision on their residence classification by the Residence Deputy may apply for an appeal with the Office of the General Counsel within 30 days of notification of the Residence Deputy's final decision.

All inquiries regarding the appeal process should be addressed to the Office of the General Counsel at Residency.Appeal@ucop.edu.

Petitions for Classification to Resident Status

Nonresident students may apply for a change of classification to resident status once all the requirements have been met. Petitions for Classification to Resident Status from continuing UC Davis students classified as nonresident for tuition purposes in a prior quarter must be filed during the filing period and no later than the published deadline for the term they wish to classify as a Resident. Deadline exceptions will only be made in the cases of a documented medical illness, death in the immediate family, or an administrative error on the part of the university. Petition supporting documents will not be accepted after the 10th day of instruction unless an extension has been granted by a Residence Deputy.

Inquiries

Inquiries regarding residence requirements, determination, classification and recognized exceptions should be directed to Residence Deputy, Office of the University Registrar, One Shields Avenue, Davis, California 95616 or residedeputy@ucdavis.edu.

Inquiries regarding the UC Residence Policy and Guidelines or appeals, should be directed to Office of the General Counsel at Residency.Appeal@ucop.edu.

RESIDENCE DEPUTIES ARE THE ONLY AUTHORIZED UNIVERSITY PERSONNEL TO PROVIDE INFORMATION REGARDING RESIDENCE REQUIREMENTS.
UNIVERSITY POLICY ON NONDISCRIMINATION, SEXUAL HARASSMENT/SEXUAL ASSAULT, DISABILITY ACCOMMODATIONS, STUDENT RECORDS AND PRIVACY

Nondiscrimination. The University of California, in accordance with applicable Federal and State law and University policy, does not discriminate on the basis of race, color, national origin, religion, sex, gender identity, pregnancy (including pregnancy, childbirth, and medical conditions related to pregnancy or childbirth), physical or mental disability, age, medical condition (cancer-related or genetic characteristics), ancestry, marital status, citizenship, sexual orientation, or service in the uniformed services (includes membership, application for membership, performance of service, application for service, or obligation for service in the uniformed services) status as a Vietnam-era veteran or special disabled veteran. The University also prohibits sexual harassment, including sexual assault. This nondiscrimination policy covers admission, access, and treatment in University programs and activities.

Discrimination, Harassment, or Arbitrary Treatment. If students have questions about student-related nondiscrimination policies or concerns about possible discrimination, harassment, or arbitrary treatment, they may contact Student Judicial Affairs for information and assistance 530-752-1128. Additional resources for students include the UC Davis Chief Compliance Officer (ADA and Title IX Officer) 530-752-9466 or the dean's office for their college. Graduate students may also contact the Office of Graduate Studies 530-752-0650 or the Graduate Students Association 530-752-6108. Students are encouraged to seek assistance as soon as possible, as time limits may apply to grievance processes.

Campus policies provide for a prompt and effective response to student complaints. This response may include early resolution procedures or, as appropriate, an administrative review or investigation. The student will be informed of the results of the review.

Sexual Harassment/Sexual Assault. Sexual harassment and sexual assault are prohibited by law and by university policy and will not be condoned. Campus policy (PPM Section 380-12 at http://manuals.ucdavis.edu/ppm/380/380-12.pdf) describes campus procedures for responding to reports of sexual harassment and sexual assault. Under this policy, sexual assault is considered an extreme form of sexual harassment. UC Davis' response to reports of sexual harassment and sexual assault may include interim actions, early resolution, and formal investigation procedures. If a complaint of sexual harassment or sexual assault is substantiated, the campus will take appropriate remedial action, including discipline. The Harassment and Discrimination Assistance and Prevention Program 530-752-9255 works with students to resolve complaints of sexual harassment, including sexual assault; and provides referrals to other campus resources. Students may report sexual harassment to deans, supervisors, managers, the Campus Sexual Harassment Officer and other campus officials, including Student Judicial Affairs, Student Housing, and the Chief Compliance Officer (Title IX Officer). With the exception of certain confidential resources, University officials receiving a report of sexual harassment or sexual assault must immediately consult with the Sexual Harassment Officer. Students may seek confidential advice and support from Counseling and Psychological Services 530-752-0871, the Campus Violence Prevention Program 530-752-3299, the Lesbian, Gay, Bi-Sexual, and Transgender, Queer, Intersex Asexual Resource Center 530-752-2432, and the Women's Resources and Research Center 530-752-3372. Consultation with these resources will not lead to an official report unless additional action is taken by the individual seeking advice.

Accommodations for Students with Disabilities. Students with documented disabilities may be entitled to reasonable accommodations to gain access to the University's academic programs. More information about academic accommodations can be obtained by contacting the Student Disability Center 530-752-3184 or http://sdc.ucdavis.edu. Questions or concerns about accommodations that are not related to academic programs should be directed to the UC Davis Compliance Director (ADA Officer) 530-752-9466. For complaints of alleged discrimination on the basis of disability under PPM Section 280-05, contact Student Judicial Affairs 530-752-1128 or the UC Davis Compliance Director.

Disclosures from Student Records. Students have the right to review records that relate to themselves in their capacity as students and to request corrections of records believed to be inaccurate. Most disclosures from student records to outside parties require prior consent from the student.

Under the Family Educational Rights and Privacy Act of 1974 and University and campus policies, UC Davis students have the following rights:

A. To review their own student records within 45 days after the student submits a written request for access to the University Registrar or other department in possession of the records. That office will make arrangements for access and notify the student when and where the records may be reviewed. If the records requested are in a different office, the request will be redirected and the student notified. The campus maintains several types of student records in various locations. Questions about how to obtain records should be referred to Student Judicial Affairs at 530-752-1128.

B. To request amendment of their own student records if they believe the records are inaccurate or misleading, students should submit a written request to the office that maintains the records specifying the portion of the record the student wants changed and why it is believed to be inaccurate or misleading. That office has 45 days to determine whether the record should be changed and notify the student of the decision. If a student wishes to contest this decision, the student should contact Student Judicial Affairs.

C. To restrict the disclosure of personally identifiable information contained in student records, except when law and policy permit disclosure without consent. Examples of circumstances in which the student’s consent is not required for disclosure of student records include the following:

- Disclosure of “directory” or “public” information including the student’s name; local and/or permanent address(es), email addresses and telephone number(s); dates of attendance; major field(s) of study [major, minor, concentration, specialization, and similar designations]; grade level; enrollment status [undergraduate/graduate, full time or
part time, number of enrolled course units) degrees and honors received; most recent previous educational institution attended; participation in officially recognized activities, including Intercollegiate Athletics (ICA), and the name, weight and height of participants on ICA teams.

- To prevent disclosures of telephone numbers and/or addresses, students must submit a Directory Confidential Update Form to the Office of the University Registrar. To prevent disclosure of their email address, students must follow instructions at https://computingaccounts.ucdavis.edu/, and select the Change your directory information option.

- Students may designate all information about themselves as confidential and withhold it from public disclosure by filing a request with the Office of the University Registrar in 12 Mrak Hall. If all information is designated confidential, UC Davis cannot respond to requests for verification of student status or degrees, make public any honors, or include the student's name in the commencement program without the student's specific written consent.

- Disclosure to campus officials (for example faculty, staff, student employees, or those under contract with the University) having a legitimate educational interest in the records. Legitimate educational interest means the information is relevant and necessary to a task or determination that is (a) an employment responsibility or an assigned subject matter for the inquirer and/or related to (b) the inquirer's participation in the student's education; (c) the discipline of a student; or (d) providing a service or benefit related to a student or student's family (such as health care, counseling, job placement, or financial aid).

- Disclosure of appropriate student records, including academic records, disciplinary records, and other student records, to other educational institutions in which a student seeks or intends to enroll, or is currently enrolled, so long as the disclosure is for purposes related to the student's enrollment or transfer.


Contact Student Judicial Affairs 530-752-1128 for questions about these rights and requirements. Student complaints regarding alleged violations of privacy rights should be submitted to Student Judicial Affairs.


**Social Security Numbers.** A student's Social Security number is used to verify personal identity in the UC Davis Student Records System. Students are mandated to disclose their social security number to UC Davis. In compliance with state law, Social security numbers are confidential and are not used as student identifiers.

**Release of Registration Material and Grades.** In compliance with student privacy rights under federal and state law and University policy, the Office of the University Registrar may not release a students grades, registration material, and/or identification card to anyone other than the student without specific written authorization signed by the student. The person to whom the information, material, or card is released must be designated by name and must present proof of identity. The signed authorization is kept in the “Record of Disclosures” in the student’s file.

**CAMPUS SECURITY, CRIME AWARENESS, AND ALCOHOL AND DRUG ABUSE PREVENTION**

In accordance with federal law, UC Davis annually provides students and employees with information regarding campus security, crime statistics, and alcohol and drug abuse prevention, pursuant to the Student Right to Know and Campus Security Act of 1990 and the Drug Free Schools Act of 1989. The UC Davis Police and Campus Administration make continual efforts to reduce crime on campus. A well-informed community is better served and safer.

For a copy of the complete UC Davis security and crime prevention report, including crime statistics, campus security measures and crime reporting procedures, applicants for admission or prospective employees may contact the UC Davis Campus Violence Prevention Office, located in the UC Davis Police Department, contact 530-752-3299, or mkspangler@ucdavis.edu.

**ACCREDITATION**

The University of California, Davis is accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges (WASC), 985 Atlantic Avenue, Suite 100, Alameda, CA 94501 (510) 748-9001, an institutional accrediting body recognized by the Council for Higher Education and the U.S. Department of Education.

UC Davis is also accredited by the Accreditation Board for Engineering and Technology, Accreditation Council for Graduate Medical Education, Accreditation Review Commission on Education for the Physician Assistant (ARC-PA), American Association for Accreditation of Laboratory Animal Care, American Bar Association, American Chemical Society, American Dietetic Association, American Psychological Association, American Society of Crime Lab Directors Laboratory Accreditation Board (ASCLD/LAB); American Society of Landscape Architects, Association of American Law Schools, Association of American Medical Colleges, Association to Advance Collegiate Schools of Business; Commission on Collegiate Nursing Education; Commission on Teacher Credentialing, Computer Science Accreditation Commission, Council on Education and Public Health, the Council on Education of the American Veterinary Medical Association, Intersocietal Commission for the Accreditation of Vascular Laboratories (ICAVL), and the Liaison Committee on Medical Education.

Students interested in reviewing WASC accreditation documents may do so at http://wasc.ucdavis.edu. Those interested in reviewing profession-specific accreditation documents should contact the relevant Dean's office.
THE BOARD OF REGENTS

Governance of the University of California is entrusted to a corporation called the Board of Regents. Of the individuals composing the board, eighteen are California citizens appointed by the governor, and seven, including the president of the University and the governor of California, serve ex officio. A Student Regent is selected each year from a list of names submitted to the board by the Student Body Presidents’ Council.

The Regents delegate authority in academic matters to the Academic Senate of the faculty, which determines academic policy and supervises the instructional activities of the entire University. All of the permanent faculty, as well as key administrators, are members of the Senate.

The Regents delegate authority for the organization of the University to the president. Janet Napolitano is President and head of the Universitywide administration. Authority for the administration of each campus is delegated to a chancellor.

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Speaker of the Assembly

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President of the Alumni Associations of the University of California

Van Schultz
Vice President of the Alumni Associations of the University of California

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Russell Gould, 2017
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Cinthia Flores, 2014
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Mary Gilly, 2015

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Secretary and Chief of Staff

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Chief Compliance and Audit Officer

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George R. Blumenthal
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Dushyant Pathak
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  - Assistant Vice Chancellor—Alumni Relations
Allen Tolleson
  - Assistant Vice Chancellor—Administrative and Resource Management (Facilities Management)
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  - Assistant Vice Chancellor—Administrative and Resource Management (Design and Construction Management—Campus Architect)
Diane Davies-Conley, C.P.A., M.B.A.
  - Assistant Vice Chancellor—Administrative and Resource Management (Chief Operating Officer)
Robert Segar, M.L.A.
  - Assistant Vice Chancellor—Administrative and Resource Management (Campus Planning and Community Resources)
Sid England, Ph.D.
  - Assistant Vice Chancellor—Administrative and Resource Management (Environmental Stewardship and Sustainability)
Adrienne Martin, Ph.D
  - Associate Vice Provost—University Outreach and International Programs (International Programs)
Marc Schenker, M.D., M.P.H.
  - Associate Vice Provost—University Outreach and International Programs (Outreach and Engagement)
Gary Ford, Ph.D.
  - Associate Vice Provost—Undergraduate Education
Robert Kerr, Ph.D.
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**University Librarian**
MacKenzie Smith

**Registrar**
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  - Director, Internal Audit Services
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  - Executive Director, Student Affairs Office of Technology
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  - Executive Director, Mondavi Center
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Sallie-Grace Tate, Assistant Dean for Development

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Jan E. Ilkiw, B.V.Sc., Ph.D., Associate Dean—Academic Programs
Karl E. Jandrey, D.V.M., Director, Continuing Professional Education Center
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Sean D. Owens, D.V.M., Associate Dean—Student Programs

John R. Pascoe, B.V.Sc., Ph.D., Executive Associate Dean
Isaac N. Pessah, Ph.D., Associate Dean—Research and Graduate Education Programs
W. David Wilson, B.V.M.S., M.R.C.V.S, Director, Veterinary Medical Teaching Hospital

UC Davis Extension
Dennis Pendleton, Ph.D., Dean
Rita Bunch, M.B.A., Assistant Dean/COO
PROPORTION OF UC DAVIS GRADUATES FINDING WORK IN THEIR FIELDS OF CHOICE

The percent of alumni whose full-time job is in the field of their choice is shown by field of study. Figures do not include the five percent of graduates who had not decided on a career field at the time of the survey.

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>Percentage Finding Work in Field of Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Sciences, 75%</td>
<td>Humanities, Arts and Cultural Studies, 65%</td>
</tr>
<tr>
<td>Biological Sciences, 69%</td>
<td>Human Sciences, 81%</td>
</tr>
<tr>
<td>Engineering, 85%</td>
<td>Mathematical and Physical Sciences, 79%</td>
</tr>
<tr>
<td>Environmental Sciences, 72%</td>
<td>Social Sciences, 64%</td>
</tr>
</tbody>
</table>

Total, 71%

Source: A 2012 survey of June 2010-11 graduates conducted by Institutional Analysis–Student Research and Information.

RETENTION DATA AND GRADUATION RATES AT UC DAVIS

Freshmen

(Retention and graduation rates through Summer 2013 for all undergraduates entering UC Davis as freshmen.)

<table>
<thead>
<tr>
<th>Fall Quarter of Initial Enrollment</th>
<th>Number of Students**</th>
<th>Percent Returned for Second Year</th>
<th>Percent Graduating in Four Years</th>
<th>Percent Graduating in Five Years</th>
<th>Percent Graduating in Six Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>3616</td>
<td>90%</td>
<td>39%</td>
<td>72%</td>
<td>78%</td>
</tr>
<tr>
<td>1999</td>
<td>3816</td>
<td>90%</td>
<td>42%</td>
<td>75%</td>
<td>80%</td>
</tr>
<tr>
<td>2000</td>
<td>4319</td>
<td>90%</td>
<td>43%</td>
<td>76%</td>
<td>81%</td>
</tr>
<tr>
<td>2001</td>
<td>4400</td>
<td>90%</td>
<td>43%</td>
<td>73%</td>
<td>79%</td>
</tr>
<tr>
<td>2002</td>
<td>4653</td>
<td>91%</td>
<td>47%</td>
<td>77%</td>
<td>81%</td>
</tr>
<tr>
<td>2003</td>
<td>4775</td>
<td>90%</td>
<td>50%</td>
<td>75%</td>
<td>80%</td>
</tr>
<tr>
<td>2004</td>
<td>4298</td>
<td>91%</td>
<td>51%</td>
<td>78%</td>
<td>82%</td>
</tr>
<tr>
<td>2005</td>
<td>4375</td>
<td>90%</td>
<td>51%</td>
<td>77%</td>
<td>82%</td>
</tr>
<tr>
<td>2006</td>
<td>5505</td>
<td>90%</td>
<td>51%</td>
<td>76%</td>
<td>81%</td>
</tr>
<tr>
<td>2007</td>
<td>4949</td>
<td>90%</td>
<td>51%</td>
<td>76%</td>
<td>81%</td>
</tr>
</tbody>
</table>

Transfer Students

(Retention and graduation rates through Summer 2013 for all undergraduates transferring to UC Davis from California community colleges.)

<table>
<thead>
<tr>
<th>Fall Quarter of Initial Enrollment</th>
<th>Number of Students**</th>
<th>Percent Returned for Second Year</th>
<th>Percent Graduating in Two Years</th>
<th>Percent Graduating in Three Years</th>
<th>Percent Graduating in Four Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>1596</td>
<td>88%</td>
<td>39%</td>
<td>75%</td>
<td>82%</td>
</tr>
<tr>
<td>2001</td>
<td>1609</td>
<td>89%</td>
<td>40%</td>
<td>75%</td>
<td>83%</td>
</tr>
<tr>
<td>2002</td>
<td>1671</td>
<td>90%</td>
<td>46%</td>
<td>78%</td>
<td>84%</td>
</tr>
<tr>
<td>2003</td>
<td>1583</td>
<td>90%</td>
<td>47%</td>
<td>78%</td>
<td>83%</td>
</tr>
<tr>
<td>2004</td>
<td>1734</td>
<td>89%</td>
<td>48%</td>
<td>78%</td>
<td>85%</td>
</tr>
<tr>
<td>2005</td>
<td>1589</td>
<td>88%</td>
<td>53%</td>
<td>79%</td>
<td>84%</td>
</tr>
<tr>
<td>2006</td>
<td>1618</td>
<td>90%</td>
<td>49%</td>
<td>80%</td>
<td>85%</td>
</tr>
<tr>
<td>2007</td>
<td>1630</td>
<td>88%</td>
<td>48%</td>
<td>77%</td>
<td>84%</td>
</tr>
<tr>
<td>2008</td>
<td>1704</td>
<td>90%</td>
<td>49%</td>
<td>80%</td>
<td>86%</td>
</tr>
<tr>
<td>2009</td>
<td>1900</td>
<td>89%</td>
<td>48%</td>
<td>79%</td>
<td>85%</td>
</tr>
</tbody>
</table>

Average yearly salary offered to graduates with bachelor’s, master’s, and doctorate degrees

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>Average Yearly Salary</th>
<th>Bachelor's</th>
<th>Master's</th>
<th>Doctorate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>$62,564</td>
<td>$68,100</td>
<td>Not reported</td>
<td></td>
</tr>
<tr>
<td>Humanities/Social Sciences</td>
<td>$38,045</td>
<td>$49,100</td>
<td>Not reported</td>
<td></td>
</tr>
<tr>
<td>Health Sciences/Life Sciences</td>
<td>$47,050</td>
<td>$61,500</td>
<td>Not reported</td>
<td></td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>$45,400</td>
<td>$57,950</td>
<td>Not reported</td>
<td></td>
</tr>
</tbody>
</table>

Source: 2010-2013 National Salary Survey data provided by the National Association of Colleges and Employers.
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