### UC Davis Academic Calendar 2006–2008*

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<td>May 8</td>
<td>Oct 23</td>
<td>Jan 29</td>
<td>May 7</td>
<td>Oct 22</td>
<td>Jan 28</td>
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**Pass 1 Registration (assigned appointments)**
- May 15
- Aug 28

**Pass 2 Registration (assigned appointments)**
- Aug 28
- Nov 27

**Last day to:**
- Sep 21
- Oct 26
  - Pay fees and enroll without incurring a $50 late fee
  - Petition for classification to resident status

**Quarter begins**
- Sep 25
- Jan 2
- Mar 27
- Sep 24
- Jan 4
- Mar 27

**Instruction begins**
- Sep 28
- Jan 3
- Mar 28
- Sep 27
- Mar 7
- Mar 31

**Last day to:**
- Oct 11
- Jan 17
- Apr 11
- Oct 10
- Jan 18
- Apr 11

**Quarter ends**
- Dec 16
- Mar 22
- Jun 14
- Dec 14
- Mar 21
- Jun 12

**Commencement**
- Dec 17

**Academic and Administrative Holidays**
- Nov 10
- Nov 23–24
- Dec 25–26
- Dec 29–Jan 1

**Orientation**
- Sep 23–27
- Jan 2
- Mar 27
- Sep 24–26
- Jan 4
- Mar 27

**Instruction begins**
- Sep 28
- Jan 3
- Mar 28
- Sep 27
- Mar 7
- Mar 31

**Last day to:**
- Oct 11
- Jan 17
- Apr 11
- Oct 10
- Jan 18
- Apr 11

**Final examinations**
- Dec 11–16
- Mar 16–22
- Jun 8–14
- Dec 10–14
- Mar 17–21
- Jun 7–12

**Financial Aid Filing Period**
- Jan 1–Mar 2
- Apr 1–May 15

**Summer Sessions 2007**
- Jun 25–Aug 3
- Aug 6–Sep 14

**Key to Symbols**
- Dates are subject to change and should be checked with appropriate Class Schedule and Registration Guide.
- For students graduating Sep 2007, the filing period is May 17–Jul 8.
- For students graduating Sep 2007, the deadline to file a minor program with Dean's Office is Jul 8.

---

**Filing for Candidacy (Graduation)**
- Jun 1–Oct 11
- Nov 1–Jan 17
- Feb 1–Apr 11
- Jun 1–Oct 10
- Nov 1–Jan 18
- Feb 1–Apr 11

**Undergraduate Admission—Readmission**
- Nov 30, 2006
- Jul 31, 2006
- Oct 31, 2006
- Nov 30, 2006
- Jul 31, 2007
- Oct 31, 2007

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**Key to Symbols**
- Dates are subject to change and should be checked with appropriate Class Schedule and Registration Guide.
- For students graduating Sep 2007, the filing period is May 17–Jul 8.
- For students graduating Sep 2007, the deadline to file a minor program with Dean's Office is Jul 8.
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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 AND IN THE CLASS SCHEDULE AND REGISTRATION GUIDE (CSRG).

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.

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2828 Cowell Blvd., Davis, CA 95616-4902
(530) 752-2944
http://bookstore.ucdavis.edu/

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Supplemental Major and Course Information

The provisions of this catalog reflect information as of the date of publication. The most current information available to the Office of the University Registrar may be found in the Class Schedule and Registration Guide (CSRG).

Previously, course listing changes (e.g., new/changed/cancelled courses) were published in the next available Class Schedule and Registration Guide (CSRG) and the Fall General Catalog Addendum. This practice has been discontinued. All new/changed/cancelled General Catalog course listings will be published exclusively in the General Catalog Supplement. You can find the 2006-2008 General Catalog Supplement at http:///registrar.ucdavis.edu/UCDWebCatalog/.
Welcome to UC Davis. We're delighted you've chosen the Davis campus as the place to pursue your academic goals. All of us — faculty, staff and alumni—are committed to helping you toward your 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 an academic foundation strengthened by research and internships. It also ensures that you will understand how your learning is relevant to the greater world. UC Davis has a profound commitment to public service and seeking solutions to today's critical issues and we encourage you to integrate these goals into your educational plan.

Students who get involved love UC Davis! While you're here, you'll make lifelong friends and have experiences that will determine the direction of your growth as a human being and as a member of the larger community in which you live. It's your passion and vision that energize and inspire the campus and make your time here meaningful.

We are very 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 to students in the classroom, through freshmen seminars and through research, arts and honors activities.

The campus continues to grow and offer new opportunities. 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 new 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. I'm happy you're joining our community. Congratulations on becoming an Aggie!

Larry N. Vanderhoef
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
Buehler Alumni and Visitors Center
(530) 752-8111 (campus tours, maps and information)

Campus Information Center
Memorial Union
(530) 752-2222

Offices of the Chancellor and Provost
Fifth Floor, Mrak Hall
(530) 752-2065

College of Agricultural and Environmental Sciences
150 Mrak Hall
(530) 752-0107

College of Biological Sciences
202 Life Sciences Addition
(530) 752-0410

College of Engineering
1050 Kemper Hall
(530) 752-0553

College of Letters and Science
200 Social Sciences and Humanities Building
(530) 752-0392

Graduate Studies
250 Mrak Hall
(530) 752-0650

Graduate School of Management
106 AOB 4
(530) 752-7399

School of Law
1013 King Hall
(530) 752-2717

School of Medicine
126 Medical Sciences 1-C
(530) 752-3184

Veterinary Medicine
114 Haring Annex
(530) 752-1383

Office of the University Registrar
12 Mrak Hall
(530) 752-2973
(registration information, transcripts)

Financial Aid Office
Dutton Hall
(530) 752-2390
(undergraduate and graduate loans, grants and employment information)

Undergraduate Scholarship Office
Dutton Hall
(530) 752-2804

Fellowships and Graduate Scholarships
Graduate Studies
250 Mrak Hall
(530) 752-7481

Teaching and Research Assistantships
Write to department or group concerned.

ASUCD (Associated Students UC Davis)
347 Memorial Union
(530) 752-1990

Student Disability Center
160 South Silo
(530) 752-3184 (voice), (530) 752-6833 (telephone device for the speech
and hearing impaired)

Student Health Service
Cowell Student Health Center
(530) 752-2300

Student Housing Office
(530) 752-2033

Admissions
Undergraduate
Undergraduate Admissions and
Outreach Services
178 Mrak Hall
(530) 752-2971

EOP Office of Admissions
175 Mrak Hall
(530) 752-3710

Graduate
Graduate Studies Admissions
252 Mrak Hall
(530) 752-0655

Law
School of Law Admissions
115 King Hall
(530) 752-6477

Management
Graduate School of Management
106 AOB 4
(530) 752-7399

Medicine
School of Medicine Admissions
126 Medical Sciences 1-C
(530) 752-2717

Veterinary
School of Veterinary Medicine

Fellowships and Graduate Scholarships
Graduate Studies
250 Mrak Hall
(530) 752-7481

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(530) 752-2300

Student Housing Office
(530) 752-2033

Legal Analyst—Residence Matters
1111 Franklin St., 8th Floor
Oakland, CA 94607-5206
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* = closed to new students, † = graduate degree offered under Engineering, **=Master's degree offered only en route to Ph.D.

Administration
M.B.A.- Graduate School of Management

Aeronautical Science and Engineering
B.S. † ................. Engineering

African American and African Studies
A.B. ......................... L&S

Agricultural and Environmental Chemistry
M.S., Ph.D.

Agricultural and Resource Economics
M.S., Ph.D., M.S.M.B.A

Agricultural Education
Credential/M.A.

Agricultural Management and Rangeland Resources
B.S. ......................... A&ES

American Studies
A.B. ......................... L&S

Animal Behavior
Ph.D.

Animal Biology
B.S., M.S., Ph.D. ............. A&ES

Animal Science
B.S., M.A.M., M.S. ............. A&ES

Animal Science and Management
B.S. ......................... A&ES

Anthropology
A.B. or B.S., M.A., Ph.D. ...... L&S

Applied Mathematics
B.S. ......................... L&S

Applied Mathematics
M.S., Ph.D.

Applied Science Engineering
M.S., Ph.D.

Applied Physics
B.S. ......................... L&S

Art
M.F.A.

Art History
A.B., M.A. ..................... L&S

Art Studio
A.B. ......................... L&S

Asian American Studies
A.B. ......................... L&S

Atmospheric Science
B.S., M.S., Ph.D. ............. A&ES

Avian Sciences
B.S., M.S. ..................... A&ES

Biochemical Engineering
B.S. ......................... Engineering

Biochemistry and Molecular Biology
B.S., M.S., Ph.D. ............. CBS

Biological Sciences
A.B. or B.S. ..................... CBS

Biological Systems Engineering
B.S., M.S., M.Engr., Ph.D.,
D.Engr.  ....................... Engineering

Biomedical Engineering
B.S., M.S., Ph.D.  ................ Engineering

Biophysics
Ph.D.

Biotestistics
M.S., Ph.D.

Biotechnology
B.S. ......................... A&ES

Cell and Developmental Biology
M.S., Ph.D.

Cell Biology
B.S. ......................... CBS

Chemical Engineering
B.S., M.S., Ph.D. ............. Engineering

Chemical Engineering/Materials Science and Engineering
B.S. ......................... Engineering

Chemistry
A.B. or B.S., M.S., Ph.D. ...... L&S

Chicana/Chicano Studies
A.B. ......................... L&S

Child Development
M.S.

Chinese
A.B. ......................... L&S

Civil and Environmental Engineering
M.S., M.Engr., Ph.D., D.Engr., Certificate

Civil Engineering
B.S. ......................... Engineering

Civil Engineering/Materials Science and Engineering
B.S. * ......................... Engineering

Classical Civilization
A.B. ......................... L&S

Clinical Nutrition
B.S. ......................... A&ES

Clinical Research
M.A.S.

Communication
A.B., M.A. ..................... L&S

Community and Regional Development
B.S. ......................... A&ES

Community Development
M.S.

Comparative Literature
A.B., M.A., Ph.D. ............. L&S

Comparative Pathology
M.S., Ph.D.

Computational Applied Science
B.S. ......................... Engineering

Computer Engineering
B.S. † ......................... Engineering

Computer Science
B.S. ......................... L&S

Computer Science
M.S., Ph.D. ................. Engineering

Computer Science and Engineering
B.S. ......................... Engineering

Crop Science and Management
B.S. ......................... A&ES

Cultural Studies
M.A., Ph.D.

Design
A.B. ......................... L&S

Dramatic Art
A.B., M.F.A. ................... L&S

East Asian Studies
A.B. ......................... L&S

Ecology
M.S., Ph.D.

Economics
A.B., M.A., Ph.D. ............. L&S

Education
M.A., Ph.D., Ed.D., Credential

Electrical and Computer Engineering
M.S., Ph.D.

Electrical Engineering
B.S. † ......................... Engineering

Electrical Engineering/Materials Science and Engineering
B.S. ......................... Engineering

Engineering
M.Engr., M.S., D.Engr., Ph.D.

English
A.B., M.A., Ph.D. ............. L&S

Entomology
B.S., M.S., Ph.D. ............. A&ES

Environmental and Resource Sciences
B.S. ......................... A&ES

Environmental Biology and Management
B.S. ......................... A&ES
Environmental Horticulture and Urban Forestry
B.S. ................................. A&ES
Environmental Policy Analysis and Planning
B.S. ................................. A&ES
Environmental Toxicology
B.S. ................................. A&ES
Epidemiology
M.S., Ph.D.
Evolution, Ecology, and Biodiversity
A.B. or B.S. .......................... CBS
Exercise Biology
A.B. or B.S. .......................... CBS
Exercise Science
M.S.
Family Nurse Practitioner/Physician Assistant
Credential .......................... School of Medicine
Fiber and Polymer Science
B.S. ................................. A&ES
Film Studies
A.B. ................................. L&S
Food Science
B.S., M.S., Ph.D. ........................ A&ES
Forensic Science
M.S.
French
A.B., Ph.D. .......................... L&S
Genetics
B.S., M.S., Ph.D. ........................ CBS
Geography
M.A., Ph.D.
Geology
A.B. or B.S., M.S., Ph.D. ........................ L&S
German
A.B., M.A., Ph.D. ........................ L&S
History
A.B., M.A.**, Ph.D. ........................ L&S
Horticulture & Agronomy
M.S.
Human Development
B.S., Ph.D. ................................. A&ES
Hydrologic Sciences
M.S., Ph.D.
Hydrology
B.S. ................................. A&ES
Immunology
M.S., Ph.D.
Individual Major
A.B., B.S., M.S. ......................... A&ES, CBS or L&S
Integrated Pest Management
M.S. *
International Agricultural Development
B.S., M.S. ................................. A&ES
International Commercial Law
M.A. ................................. Law
International Relations
A.B. ................................. L&S
Italian
A.B. ................................. L&S
Japanese
A.B. ................................. L&S
Landscape Architecture
B.S. ................................. A&ES
Law
J.D., LL.M. ............................... School of Law
Linguistics
A.B., M.A., Ph.D. ........................ L&S
Managerial Economics
B.S. ................................. A&ES
Materials Science and Engineering
B.S., M.S., M. Engr., Ph.D. ........................ Engineering
Maternal and Child Nutrition
M.A.S. ................................. A&ES
Mathematical and Scientific Computation
B.S. ................................. L&S
Mathematics
A.B. or B.S., M.A., M.A.T.*, Ph.D. ........................ L&S
Mechanical and Aeronautical Engineering
M.S., Ph.D., M. Engr., D. Engr., Certificate ........................ Engineering
Mechanical Engineering
B.S.* ................................. Engineering
Mechanical Engineering/Materials Science and Engineering
B.S. ................................. Engineering
Medical Informatics
M.S.
Medicine
M.D. ................................. School of Medicine
Medieval and Early Modern Studies
A.B. ................................. L&S
Microbiology
A.B. or B.S., M.S., Ph.D. ........................ CBS
Molecular, Cellular, and Integrative Physiology
M.S., Ph.D.
Music
A.B., M.A., Ph.D. ........................ L&S
Native American Studies
A.B., M.A., Ph.D. ........................ L&S
Natural Sciences
B.S. ................................. L&S
Nature and Culture
A.B. ................................. L&S
Neurobiology, Physiology, and Behavior
B.S. ................................. CBS
Neuroscience
M.S., Ph.D.
Nutrition Science
B.S. ................................. A&ES
Nutritional Biology
M.S., Ph.D.
Optical Science and Engineering
B.S. ................................. Engineering
Performance Studies
(formerly Dramatic Arts Ph.D.)
Ph.D. ................................. L&S
Pharmacology and Toxicology
M.S.**, Ph.D.
Philosophy
A.B., M.A.**, Ph.D. ........................ L&S
Physics
A.B. or B.S., M.S., Ph.D. ........................ L&S
Plant Biology
A.B. or B.S., M.S., Ph.D. ........................ CBS
Plant Pathology
M.S., Ph.D.
Political Science
A.B., M.A./J.D., Ph.D. ........................ L&S
Political Science—Public Service
A.B. ................................. L&S
Population Biology
M.S.**, Ph.D.
Preventive Veterinary Medicine
M.P.V.M. ........................ School of Veterinary Medicine
Psychology
A.B. or B.S., Ph.D. ........................ L&S
Public Health
M.P.H. ........................ School of Medicine and School of Veterinary Medicine
Range and Wildlands Science
B.S.* ................................. A&ES
Religious Studies
A.B. ................................. L&S
Russian
A.B. ................................. L&S
Science and Technology Studies
A.B. ................................. L&S
Sociology
A.B., M.A.**, Ph.D. ........................ L&S
Sociology—Organizational Studies
A.B. ................................. L&S
Soils and Biogeochemistry
(formerly Soil Science)
M.S., Ph.D.
Soil and Water Science
B.S. ................................. A&ES
Spanish
A.B., M.A., Ph.D. ........................ L&S
Statistics
A.B. or B.S., M.S., Ph.D. ........................ L&S
Technocultural Studies
A.B. ................................. L&S
Textile Arts and Costume Design
M.FA.
Textiles
M.S.
Textiles and Clothing
B.S. ................................. A&ES
Transportation Technology and Policy
M.S., Ph.D.
Veterinary Medicine
D.V.M. ........................ School of Veterinary Medicine
Viticulture and Enology
B.S., M.S. ................................. A&ES
Wildlife, Fish, and Conservation Biology
B.S. ................................. A&ES
Women's Studies
A.B. ................................. L&S
**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 (SE) 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.

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<td>Agricultural Entomology and Bee Biology (Entomology)</td>
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<td>Agricultural Systems and Environment (Agronomy)</td>
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<td>Applied Computing &amp; Information Systems (Agronomy)</td>
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<td>Medieval and Early Modern Studies</td>
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<td>Sexuality Studies</td>
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<td>Social and Ethnic Relations (African American and African Studies, Asian American Studies, Native American Studies, Women and Gender Studies)</td>
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<tr>
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INTRODUCTION
INTRODUCTION

Welcome to UC Davis. Founded as the University Farm amid the fertile fields of the state's Central Valley, UC Davis initially emerged as an acknowledged international leader in agricultural, biological, biotechnological and environmental sciences and has now gained similar recognition for excellence in the arts, humanities, social sciences, engineering, education, health sciences, law and management. U.S. News & World Report ranks UC Davis 14th among public universities nationally and the campus is among a select group admitted into the prestigious Association of American Universities. Membership in this group of 62 institutions of higher learning is by invitation only.

The campus owes much of its strength to its deep traditional roots in agriculture and the impressive diversity of academic programs that emerged from this foundation. A distinguished faculty of scholars and scientists, a treasured sense of community and a dedication to the land-grant values of creative, responsive and innovative teaching, research and public service are hallmarks of UC Davis, as is interdisciplinary collaboration; many faculty hold cross-departmental appointments and students are challenged to explore the relationships between fields of study.

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 208,000 students, with more than 1.3 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 more than 100 UC campus libraries are surpassed in size in the United States only by that of the Library of Congress.

A Place for Learning

Providing a rich and challenging learning experience for undergraduate and graduate students is critical to UC Davis' mission and is a cherished commitment of the campus. Several programs support this aim, including a $30,000 prize awarded to a faculty member each year by the UC Davis Foundation in recognition of outstanding undergraduate teaching and scholarly achievement and a campuswide Davis Honors Challenge program through which students elect special courses and have closer contact with faculty.

UC Davis offers more than 100 undergraduate majors and 86-plus graduate programs in the College of Agricultural and Environmental Sciences, the College of Biological Sciences, the College of Engineering and the College of Letters and Science. UC Davis' five professional schools—the School of Education, the School of Law, the Graduate School of Management, the School of Medicine and the School of Veterinary Medicine—are a combination unique within the University of California system.

A Place for Discovery

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.

Research at UC Davis supports California's economic, intellectual and social development. The campus's varied research programs explore and seek solutions to problems in agriculture, resource management, the environment, health, medicine, engineering, business, the economy and public policy. UC Davis scholars also explore the intellectual frontiers of the physical, biological and social sciences, the humanities and the arts.

The campus's reputation has attracted a distinguished faculty of scholars and scientists in all fields. UC Davis ranks 12th in research funding among universities in the United States, receiving more than $500 million in 2004-2005.

Life on Campus

Teaching and research provide students with the academic side of their education and campus life balances the books. Students enjoy a wide range of offerings, including sports, internships, outdoor activities, student government, clubs and creative arts programs.

UC Davis is currently making the transition from Division II to Division I of the National Collegiate Athletic Association. UC Davis sponsors 14 varsity sports for women and 12 for men. Thirty-six club sports, organized by students, compete against other area colleges and amateur clubs are recreational and focus on skill development and social interaction. Intramural sports annually draw some 14,500 students who participate in 57 different men's, women's and coed activities.

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

The Mondavi Center for the Performing Arts features internationally known artists and speakers on tour and showcases offerings of the campus's music, theatre and dance departments in its 1,800-seat performance hall and 250-seat studio theatre.

Life in Davis

Davis' proximity to Sacramento, the state capital and the San Francisco Bay Area makes it easy to take advantage of big-city attractions while enjoying the security and friendliness of a university town. The Davis community combines the right blend of safe neighborhoods, convenient retail and service establishments, cultural amenities for a variety of tastes and plentiful recreational activities. There are 31 parks included in the 453 acres of parks, greenbelts and open space areas owned and maintained by the city. Known as environmentally aware and socially innovative, Davis has a strong history of bicycle use and planning. The city boasts more than 50 miles of bike paths and more bicycles per capita than any other city in the country. Davis residents are active—in local, national and international political causes, in sports, in the arts and in community organizations. Quality of life is a high priority in this community of more than 64,400 residents. Many citizen committees advise the city council on issues such as quality of child care and natural resources conservation. With students constituting about half the city's population, Davis is one of California's few remaining college towns.
The 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 central purpose of UC Davis, as a comprehensive research university, is the generation, advancement, dissemination and application of knowledge. In this, UC Davis is committed to developing and sustaining leading programs in

- The arts, humanities, biological and physical sciences and social sciences—disciplines at the core of all universities;
- Agricultural and environmental disciplines and engineering;
- Professional studies in education, law, management, medicine and veterinary medicine.

In these programs, the campus integrates 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 tradition of the land-grant university, the basis of its founding. This tradition—built on the premise that the broad purpose of a university is service to people and society—guides today the campus’s special commitments and emphases.

UC Davis has a history of focused attention on undergraduate education. The central elements of a liberal education—the arts and languages, history and philosophy and the sciences—offer the opportunity for a broad general education combined with specialization in a scholarly discipline. Coupled with this are manifold opportunities for personal development through programs for academic enrichment, including undergraduate research, work-learn experiences and extracurricular student life.

Dedicated to scholarship, the furtherance of knowledge and the education of graduate students who will advance the next generations of research, UC Davis offers a diverse array of post-baccalaureate programs. Drawing upon the wide range of specialized academic fields, stimulating cross-disciplinary approaches, and using its distinctive graduate groups, a structure that permits students to pursue lines of inquiry that cross traditional disciplinary lines, UC Davis continues to follow and redefine the mandate of a major research university.

The campus has a commitment to advancing teaching and scholarly work in the arts, humanities and the social sciences, studies that also enrich the life of each person and society as a whole. Infusing the pursuit of careers in education, law, management and medicine with these insights and values is also emphasized.

Because of its prominence in the biological, physical and engineering sciences—and building on its distinguished programs in the agricultural and environmental sciences—UC Davis plays a leadership role in modern biology, focusing its strength on basic research and related studies in agriculture, human and animal health and the environment. Consonant with this emphasis is UC Davis’ enhancement of its strength in the engineering and physical sciences, reflecting the importance of these disciplines for the economic vitality of California and the nation.

The life of UC Davis extends beyond teaching and study to service to the region, state, nation and the world. This is given in many forms: cooperative extension to agriculture and education; medical services to central California and beyond through the multifaceted UC Davis Health System in Sacramento; diverse educational programs of UC Davis Extension that share knowledge with the region; 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 Sacramento, 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.

UC Davis remains committed to its human values: caring and personal relationships, collaborative and thoughtful work, all within a human-scale environment. These special qualities are sustained by intellectual strength within a collegial community whose members share a deep desire for teaching and learning, for an abiding commitment to discovering and applying new knowledge.
Educational Objectives for Students

- 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
VISITING THE CAMPUS

Visitor Services Office
Buehler Alumni and Visitors Center
(530) 752-8111; http://www.visit.ucdavis.edu/

You are welcome to pay us a visit. Weekend tours depart from the Buehler Alumni and Visitors Center at 11:30 a.m. Weekday tours depart at 10 a.m. and 2 p.m. Register for tours one week in advance by calling (530) 752-8111 or at http://visit.ucdavis.edu. You may also visit our Virtual Tour Web site at http://vtour.ucdavis.edu. If you have questions about application procedures or entrance requirements, write or visit Undergraduate Admissions and Outreach Services in Mrak Hall.

THE UNDERGRADUATE COLLEGES

The College of Agricultural and Environmental Sciences

College Office
150 Mrak Hall
(530) 752-0108; http://www.aes.ucdavis.edu

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

Dean's Office
202 Life Sciences Addition
(530) 752-0410; http://biosci.ucdavis.edu

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, 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 Section in the College offers laboratory courses in the new 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, a career in research in education, environmental work or pharmaceutical sales, 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 Web site at http://biosci.ucdavis.edu, and then click on Academics.

The College of Engineering

Dean's Office
1050 Kemper Hall
(530) 752-1979; http://engineering.ucdavis.edu

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 approximately 3,000 undergraduates and 1,100 undergraduate students, the College is one of the largest undergraduate engineering colleges in the University of California system.

We have 209 engineering faculty, with 13 current and emeriti members named to the National Academies of Engineering, Science and Medicine.

Our eight departments offer the greatest number of ABET (Accreditation Board for Engineering Technology) accredited majors (11) in the University of California system. Three recent additions include majors in optical science and engineering, biomedical engineering and computational applied sciences.
The College maintains a long-standing commitment to undergrad-
uate 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 gradu-
ate-level research.

Nine graduate engineering programs benefit from state-of-the-art
research facilities and a unique graduate group approach that
brings together faculty and students from a broad spectrum of dis-
ciplines university-wide to develop more effective, real world solu-
tions to society's most complex problems.

In the proud tradition of America's great land-grant research uni-
versities, 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 Applied Science** instructs students in
  broad areas of scientific technology and offers an innovative pro-
gram for undergraduates in optical science and engineering and
  computational applied science that prepares students for careers
  in industry, national research laboratories to pursue graduate
  work leading to advanced degrees.

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

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

- **The Department of Chemical Engineering and Materials Sci-
  ence** offers curricula integrating knowledge of chemistry, biolog-
  ical sciences or materials science and engineering that enable
  students to solve problems in both current and future manufac-
  turing technologies or to analyze the structure, properties and
  behavior of materials.

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

- **The Department of Computer Science** offers programs in all
  aspects of 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 contin-
  ued 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 Aeronautical
  Engineering** educates students in the design and manufacture of
  complex engineering systems for transport, industry or energy
  and to design, manufacture and operate aircraft and aeronautical
  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 Summer Advising program, held
the summer before your first quarter on campus. Summer Advis-

ing sessions can provide you with the information you need to
make your academic experience 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. Aca-
demic advisers in the Undergraduate Advising Office (1050
Kemper Hall) and a well-developed peer advising system supple-
ments 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 as a foundation for graduate study. To
these ends, the college emphasizes fundamental sciences to give
students the maximum postgraduate flexibility. Technological
developments in recent years have made it clear that engineering
education must be based on fundamentals or rapidly become
obsolete.

Engineers will continue to face new challenges as society demands
improvements in the quality of life and as our state and nation
demand greater participation by engineers in efforts toward com-
petitiveness in a global market. As part of a land-grant institution,
the College of Engineering must help maintain the technological
leadership long enjoyed by the United States, while advancing
technology for the benefit of all.

**The College of Letters and Science**

Office of the Deans
200 Social Sciences and Humanities Building
(530) 752-0392; 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's general education courses, more than 40 major pro-
grams of study and thousands of courses per year across a broad
range of subject areas. Its nearly 500 faculty members are orga-
nized into three Divisions-Humanities, Arts and Cultural Studies;
Mathematical and Physical Sciences; and Social Sciences. The col-
lege 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 accom-
plishments and of matter and things. Within this curriculum you
are able to explore a variety of academic fields, engage in the pur-
suit of fundamental knowledge and gain the capacity for indepen-
dent study and thought. By learning to think carefully and
critically, you will be able to continue the ongoing process of edu-
cation 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 pri-
mary 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 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, student peer advisers and professional staff advisers who are available for individual consultations with undergraduates in a variety of settings, from the deans’ 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

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 more than 80 graduate programs leading to master's or doctoral degrees, which together enroll more than 4,000 graduate students. Many graduate programs are offered through graduate groups, an interdisciplinary concept that allows students to study and work in interrelated areas to broaden their intellectual experiences; see the Graduate Studies chapter.

**PROFESSIONAL STUDY**

UC Davis has three professional schools—the School of Law (J.D.), the School of Medicine (M.D.) and the School of Veterinary Medicine (D.V.M., M.P.V.M.)—and the Graduate School of Management offers the M.B.A. degree. These schools and programs are described in later chapters.

**ACADEMIC RESOURCES**

**The University Library**

(530) 752-6561; http://www.lib.ucdavis.edu

The General Library at UC Davis is one of the premier research libraries in North America. In addition to Peter J. Shields Library, there are four other General Library facilities: the Physical Sciences and Engineering Library, the Loren D. Carlson Health Sciences Library, the Agricultural and Resource Economics Library and the Blaisdell Medical Center Library in Sacramento. The combined collections of the various General Library facilities total more than 3.2 million volumes and more than 37,000 periodical and journal titles are received annually. An extensive variety of government documents, maps, microfilms and CD-ROMs are also part of the collection.

Shields Library houses the collections in the humanities, arts, social sciences, biological sciences, agricultural sciences, mathematics and computer science. The Physical Sciences and Engineering Library collections support teaching and research in engineering, chemistry, geology and physics. The Carlson Health Sciences Library serves the Schools of Medicine and Veterinary Medicine. The Blaisdell Library at the UC Davis Medical Center provides a clinical collection of more than 41,000 volumes. The law library, administered by the School of Law, is located in King Hall.

The General Library’s HARVEST catalog identifies campus library resources, while the UC MELVYL online catalog identifies the library collections at UC Davis and the other nine UC campuses. The HARVEST catalog, MELVYL and other electronic resources, including more than 19,000 full text journals can be searched in the libraries, at campus locations and remotely via the Internet. Workstations with Internet access are available for patron use in all library facilities. A wireless network in Shields Library, the Physical Sciences and Engineering Library, the Carlson Health Sciences Library and the Blaisdell Medical Center Library connects authorized laptop users to library and campus resources and services.

Information about library services, full text electronic books and journals, and important subject-specific Internet sites are available at the library’s Web site. The library provides classes on the use of the HARVEST catalog, MELVYL and 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.

**UC Davis Arboretum**

Arboretum Headquarters
(530) 752-4880; http://arboretum.ucdavis.edu

The 95-acre UC Davis Arboretum is a living museum with a documented collection of more than 22,000 trees, shrubs and perennials for use in teaching and research, arranged in a series of gardens along Putah Creek's historic north fork. Outstanding plant collections include Shields Oak Grove, Mary Wattis Brown Garden of California native plants, Ruth Storer Garden of flowering perennials and shrubs, T. Elliot Weier Redwood Grove and Arboretum Terrace home demonstration garden. Arboretum education programs promote sustainable and environmentally-appropriate gardening practices. Internships are available in nursery management, landscape design and maintenance, environmental education, conservation biology, Integrated Pest Management (IPM) and Geographic Information Systems (GIS).

**Information and Educational Technology**

IT Express
182 Shields Library
(530) 754-HELP (4357); ithelp@ucdavis.edu; http://scg.ucdavis.edu

Information and Educational Technology (IET) provides computing, communications and digital media services to the campus in support of research and instruction. IET provides the following range of service and support to students.

**Computing Help and Information.** IT Express, the campus computing help desk, provides assistance with many topics, including Internet software, campus Internet access, and activating and accessing your UC Davis e-mail and computing accounts. A comprehensive source for student computing information, the Student Computing Guide Web site (http://scg.ucdavis.edu), provides campus-related computing and technology news, computer room locations and hours, IT Express hours and much more. Students can also visit the TechNews Web site (http://technews.ucdavis.edu) and sign up to receive a weekly e-mail that includes links to the latest information on computer security, campus wireless and other important service changes and upgrades. MyUCDavis, the campus
personalized Web portal (http://my.ucdavis.edu) provides students with access to e-mail, academic information (including grades and class Web sites) and MySpace, a file-storage tool that provides up to 100 MB of storage space for class-related files.

**Computer Hardware and Software Needs.** Every entering undergraduate student is expected to own a computer that meets certain minimum performance standards and can connect effectively to the Internet. Rather than require a specific system, the campus is stating its expectation in terms of a minimum set of functional requirements. Students should have a computer that will run a word processing program, a spreadsheet program, an e-mail program, an Internet browser and is equipped with a CD-ROM drive; a printer is also recommended. Equipment feature suggestions for desktop and laptop computers are available at http://computerownership.ucdavis.edu. Desktop systems and laptops that meet or exceed the campus recommended specifications can be purchased at competitive prices at the UC Davis Bookstore Computer Shop. Students who are eligible for need-based financial aid can apply for additional funding to pay for these systems through the Financial Aid Office.

**Connecting to the Internet.** Students living on campus can connect directly to the Internet from their rooms using ResNet, the high-speed residence hall network. Wireless access to the campus network is also available in many areas on campus, including Shields Library and the Memorial Union; visit http://wireless.ucdavis.edu for more information. Students living off campus need a modem to access the 56K Student Modem Pool.

**Campus Computer Rooms.** Open-access computer rooms are available on campus for drop-in use and provide access to the Internet and a range of software programs used in UC Davis courses. Many computer classrooms are also available on a drop-in basis when not being used for instruction and two “media” computer labs are available that specialize in the viewing, editing and distribution of various types of media.

**Computer Security.** Guarding against computer viruses and hacker intrusions has become an important part of campus computing life. The campus IT security group maintains a comprehensive Web site (http://security.ucdavis.edu) that provides information on the latest campus security efforts and helpful instructions on how to prevent a wide range of security issues, including compromised passwords and identity theft.

**File-Sharing.** Copyright issues surrounding file-sharing and the downloading of music and other digital media are popular topics of discussion at universities nationwide. To help you better understand your rights and responsibilities as a UC Davis student, the Student Computing Guide Web site provides a number of resources on file-sharing; see http://scg.ucdavis.edu/downloading.cfm.

**RESEARCH PROGRAMS AND RESOURCES**

**Organized Research Units**

Organized Research Units (ORUs) are campuswide 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.

**Agricultural History Center**

5202 Social Sciences and Humanities Building  
(530) 752-1827

The center coordinates and administers several research and publication programs that further the study of agricultural and natural resource history. Research activities include studies of comparative farm policy, migration and agricultural development, the history of farm land values, the agricultural-environmental border, rural international borderlands in the Americas, the causes and consequences of agricultural mechanization and other sources of productivity improvements in the 19th and 20th centuries and the impact of scientific research.

**Bodega Marine Laboratory and Reserve**

Bodega Marine Laboratory  
P.O. Box 247  
Bodega Bay, CA 94923  
(707) 875-2111; Fax (707) 875-2009;  
ucdbml@ucdavis.edu; http://www.bml.ucdavis.edu

The Bodega Marine Laboratory is dedicated to research and teaching in marine biology and related fields. Research areas include marine ecology, coastal terrestrial ecology, oceanographic influences on marine populations, impacts of non-native species, responses of marine organisms to environmental stress, and fisheries ecology and conservation. Well-equipped facilities feature running seawater in two classrooms and most laboratories, a marine science library, lecture hall, housing facilities, greenhouses, experimental freshwater system for anadromous 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

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 behavioral and neurobiology, developmental and reproductive biology, respiratory diseases, virology and 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 spontaneously occurring disorders.
Center for Geotechnical Modeling
Brooks Road
(530) 752-7929; http://nees.ucdavis.edu
At the Center for Geotechnical Modeling, students and faculty from various departments and other universities conduct research in physical and numerical modeling of geotechnical problems. The center operates two centrifuges including the 9-m radius, 4,500-kg payload, 80-g National Geotechnical Centrifuge. These centrifuges are used to study a variety of topics including groundwater, deformations of foundations of bridges and large buildings and the effects of earthquakes on earth structures. The large centrifuge has undergone a $5 million upgrade funded by the National Science Foundation's George E. Brown, Jr., Network for Earthquake Engineering Simulation (NEES; http://nees.ucdavis.edu). The upgrades include installation of a biaxial shaker, a robot, a network of wireless sensors and the ability for researchers to actively participate in earthquake research using the Internet.

Center for Health and the Environment
(formerly Institute of Toxicology and Environmental Health)
(530) 752-1340
The Center for Health and the Environment (CHE) coordinates interdisciplinary research on the effect of environmental agents, including chemicals and radiation, on the health of humans, animals and other organisms. Researchers conduct epidemiologic studies in human populations and experiments are performed with whole animals as well as organisms, cells and molecules to measure environmental exposures and health outcomes associated with them. 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 universitywide program and federally funded center in occupational medicine and a School of Medicine program in reproductive biology.

Crocker Nuclear Laboratory
(530) 752-1460
This facility is an interdepartmental laboratory for the application of nuclear science to a variety of disciplines. The laboratory has research programs in nuclear physics and chemistry, air pollution analysis, use of pulsed ultra-violet light as an alternative to pesticides and insecticides, biology, material damage studies, the effect of background radiation on computers and historical studies. Isotopes produced by the variable-energy 76-inch cyclotron are used in clinical and research applications, including pioneering work in brain imaging.

Institute for Data Analysis and Visualization
Kenneth Joy and David Rocke
(530) 752-6298; Fax (530) 752-8894; http://data.ucdavis.edu
The Institute for Data Analysis and Visualization focuses on data analysis, visualization, computer graphics, optimization and electronic imaging. The central emphasis is the investigation of techniques for the study of large-scale, multi-dimensional data sets. These techniques may be applied to the analysis and visualization of environmental, geophysical, astrophysical, biological, fluid flow and satellite data. The center seeks to solve complex data analysis and visualization problems in a cross-disciplinary environment, working with researchers in academia, national research laboratories and industry.

Institute of Governmental Affairs
Alan L. Olmstead, Director
360 Shields Library
(530) 752-2042; Fax (530) 752-2835; 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 visiting scholars from throughout the United States and around the world.

Located in the core of the Davis campus, IGA houses eight formal research programs: Asian Economic Panel; Center for International Data; Center for State and Local Taxation; Center on Rural Economies of the Americas and Pacific Rim; Center on Quantitative Social Science Research; Migration Dialogue; Economy, Justice and Society (EJS); and Program on Decision-making, Communication and Uncertainty.

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 also enhances the education of students by providing research opportunities. The institute sponsors an active public affairs program. IGA serves as the UC Davis liaison to the systemwide program, Institute on Global Conflict and Cooperation (IGCC) and the All-UC Group in Economic History.

Institute of Transportation Studies
Daniel sperling
(530) 752-6548; Fax (530) 752-6572; dsperling@ucdavis.edu http://www.its.ucdavis.edu
The institute conducts multidisciplinary research on complex problems related to traffic congestion and local and global pollution 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 55 faculty members and 90 students from more than 13 academic disciplines, including four Engineering departments, Economics, Environmental Science and Policy, Ecology, Agricultural Resource Economics, and the Graduate School of Management, participate in the research activities of the institute. The institute houses a University of Transportation Center of the US Department of Transportation, Graduate Automotive Technology Education center of the US Department of Energy, the Hydrogen Pathways program, and the Graduate Group in Transportation Technology and Policy.

John Muir Institute of the Environment
Deb A. Niemeier, Director
(530) 754-8396
The John Muir Institute of the Environment (JMIE) is a center of excellence for interdisciplinary research and education on complex environmental problems. The JMIE works closely with policy makers, resource agencies, academic scientists and the public to integrate science with environmental decision making. The Institute is the administrative home to more than 100 active faculty involved in research ranging from watershed science, air pollution...
and the built environment to developing new cutting edge knowledge on invasive species as well as remote sensing.

**Program in International Nutrition**

Kenneth H. Brown  
3233 Meyer Hall  
(530) 752-1992; Fax (530) 752-3406;  
kbbrown@ucdavis.edu; http://www.nutrition.ucdavis.edu/pin/index.htm

Faculty members of the Program in International 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. The program manages a small microcomputer center for the analysis of clinical and population-based studies of relevance to international nutrition.

**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 at 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.

**California Agricultural Experiment Station**

College of Agricultural and Environmental Sciences  
(530) 752-1610

The California Agricultural Experiment Station has branches on the Davis, Riverside and Berkeley campuses. The Davis branch includes approximately 500 faculty and CE Specialists in more than 30 departments and units in the College of Agricultural and Environmental Sciences, the College of Biological Sciences and the School of Veterinary Medicine. In addition to laboratory facilities, it has approximately 3,000 acres devoted to agricultural research in the areas of experimental crops, orchards and animal facilities. The Experiment Station assists in agricultural production, food processing, nutrition, animal care and disease prevention, consumer sciences and community development and environmental quality, with emphasis on resource conservation and management, water and soil pollution and regional planning.

**Center for Child and Family Studies**

West House of Center for Child and Family Studies  
(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 and Community Development. 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 theories of development in a naturalistic setting, linking theory to principles of interaction and developing a recognition and respect for individual differences. Selected undergraduate students participate in faculty and graduate student research at the laboratory. The CCFS also houses several research and outreach facilities, such as the Eichhorn Family House, and a computer lab for Human and Community Development students.

**Center for Developmental Nutrition**

TB 33  
(530) 752-7516

The Center for Developmental Nutrition supports predoctoral and postdoctoral research in nutrition and development. The laboratory promotes collaborative research on the study of how nutrients influence the development of individuals at multiple life stages.

**Center for Neuroscience**

Edward G. Jones, Director  
1544 Newton Ct.  
Davis, CA 95616  
(530) 757-8708; Fax (530) 757-8827;  
http://www.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, distributes a quarterly newsletter, 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.

**Health Sciences Research Laboratories**

The Health Sciences Research Laboratories are biological science facilities with research staff and assistance for faculty, staff and students.

**Animal Surgery Laboratory**

Buildings H and J—Center for Laboratory Animal Science  
(530) 752-7756; latalken@ucdavis.edu; osdavis@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. Staff are available to perform or assist with both survival and non-survival surgical procedures depending on the
instructor'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; (530) 754-8675

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 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 a biochemistry lab, 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**

Georges Van Den Abbeele, Director  
Ron Saufley, Associate Director  
227 Voorhies Hall  
(530) 752-2295; Fax (530) 752-4263

The Davis Humanities Institute organizes interdisciplinary research seminars open to faculty and graduate students and promotes creative exchanges among the humanities, social sciences and environmental sciences. Its fellowship program enables campus fellows and distinguished visitors to participate in year-long seminars on designated themes. The institute also sponsors distinguished visiting lecturers, develops conferences and colloquia, supports interdisciplinary research clusters and a graduate student research assistantship program, co-sponsors lectures with other departments, produces a calendar of events and publishes a newsletter, *Humanities at Davis*.

**Mann Laboratory**

103 Mann Laboratory  
(530) 752-4501; Fax (530) 752-4554

Plant scientists in the Louis K. Mann Laboratory study the physiology, biochemistry, microbiology and molecular biology of preharvest and harvested fruits, ornamentals, vegetables and seeds to improve and maintain their quality and safety during harvest, storage, processing, distribution and marketing. The six 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 ranges from the basic molecular biology to practical storage technologies for horticultural crops, including whole and lightly processed products. Results 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. The facility is equipped with 18 controlled-temperature rooms, eight research laboratories, specialized postharvest analytical equipment and a small conference room.

**Molecular Structure Facility**

8 Hutchison Hall  
(530) 752-6392

The Molecular Structure Facility (MSF) provides state-of-the-art instrumentation for the structural elucidation and identification of biological and organic molecules. Protein/proteome analysis is a particular focal point of the facility. The MSF keeps abreast of the latest technological advances in proteomics including mass spectrometers and liquid chromatography systems such as MALDI-TOF, ESI-TOF, TOF-TOF, and 2-D LC/MS/MS and also provides advanced biotechnological instrumentation for protein sequencing, amino acid analysis, 2D-gel electrophoresis and DNA synthesis. As a core instrumentation and biomolecular resource facility, the MSF supports various research programs across the campus and is open to off-campus researchers as well.

**Natural Reserve System**

Virginia Boucher  
2112 Wickson Hall  
(530) 752-6949; [http://nrs.ucdavis.edu](http://nrs.ucdavis.edu)

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

- Bodega Marine Reserve, located at Bodega Bay, 100 miles west of campus, consists of coastal dune vegetation and bay and coastal tidal areas with facilities for overnight and longer stays; see [Bodega Marine Laboratory and Reserve, on page 21](#).

- Eagle Lake Biological Field Station is on the shore of Eagle Lake in northeastern California and has boats, a small laboratory and 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, playa lakes 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 long-term overnight stays with a well-equipped kitchen, full bath 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 a facility with a well-equipped kitchen, full bath, 3 four-wheel drive vehicles and camping areas for 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.

The university maintains over 35 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](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 six spectrometers of varying purposes and capabilities. Two horizontal magnet bore spectrometers are used for imaging and in vivo spectroscopy of small animals and materials. Two vertical bore spectrometers are used primarily for solution studies of biomolecules, with an additional vertical bore instrument for in vitro studies of perfused organs. One spectrometer is used for spectroscopy of solids. All of the spectrometers are multi-nuclear, and a large variety of high resolution, surface and imaging coils are available for use. 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.

**Social Science Data Service**

105 Social Sciences and Humanities Building  
(530) 752-4009; [http://www.ssds.ucdavis.edu](http://www.ssds.ucdavis.edu)

The Social Science Data Service (SSDS) is a unit of the Institute of Governmental Affairs (IGA). SSDS provides consulting, computing and specialized support services to faculty and graduate students involved in quantitative social science research on the UC Davis campus. SSDS staff provides consulting on a wide range of software used by social scientists and assists with questions regarding the use of SSDS computers, as well as statistical and data-related programming. SSDS manages a UNIX system that provides a platform for quantitative social science computing. Specialized support is available for extramurally funded research projects managed by IGA.

**Student Farm**

(530) 752-7645; studentfarm@ucdavis.edu; [http://studentfarm.ucdavis.edu](http://studentfarm.ucdavis.edu)

The Student Farm offers students a wide range of educational and research opportunities in sustainable agriculture through numerous internship offerings, formal courses (e.g., in organic crop production, sustainable agriculture and environmental education) and research efforts. Opportunities include working in several staff-supervised hands-on projects such as year-round production and marketing of organic vegetables, on-farm composting, tractor operations and environmental education tours for school children. In addition, students may conduct field and greenhouse experiments in various aspects of sustainable agriculture or other individual projects. The farm is located on the west edge of the campus core, near the Rec Pool, and is open to all students, regardless of major or background.

**UC Agricultural Issues Center**

161 Hunt Hall  
(530) 752-2320; agissues@ucdavis.edu; [http://www.agissues.ucdavis.edu](http://www.agissues.ucdavis.edu)

The UC Agricultural Issues Center is a university-wide research and outreach unit that draws 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 (UC Davis Herbarium)**

1026 Sciences Laboratory Building, Department of Plant Sciences  
(530) 752-1091; [http://herbarium.ucdavis.edu](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 species. The Herbarium’s support group, the Davis Botanical Society, hosts a wide range of botanical events, workshops and trips each year.

**Veterinary Genetics Laboratory (VGL)**

DNA Laboratory, Armstrong Tract  
(530) 752-2211

The laboratory is recognized for its pioneering research on animal blood groups and biochemical polymorphisms. Current research activities include studies of genetics, genomic and forensic research of domestic and wildlife animal species, including horses, cattle, sheep, goats, camels, dogs, cats, wild felids and canids, bears, birds and primates. Activities include DNA genotyping and mitochondria sequencing for applications in animal identification, parentage verification, forensic analyses, population structure and genetic diversity. Projects include, among others, mapping of phenotypic traits, coat color and disease genes in horse, dogs and cats; identification of causative mutations; development and validation of microsatellite and single nucleotide polymorphism markers for several species; development of robust diagnostic and genotyping DNA tests; population and breed relationship studies through allele frequency and mitochondria sequence analyses; the genetic structure of wild populations; development of software for DNA genotyping and implementation of electronic data interchange for reporting of laboratory results. VGL is also involved in high profile criminal cases both nationally and internationally through their Forensic Unit.
**Veterinary Medicine Teaching and Research Center (VMTRC)**

UC Davis VMTRC  
18830 Road 112  
Tulare, CA 93274  
559-688-1731; [http://www.vmtrc.ucdavis.edu](http://www.vmtrc.ucdavis.edu)

VMTRC is a clinical teaching and research center within the UC Davis School of Veterinary Medicine. The center offers a forum for teaching, research and service programs for D.V.M. students, M.P.V.M. students, graduate students, residents, university faculty and visiting researchers interested in food animal production medicine. VMTRC programs emphasize herd health medicine, epidemiology and preventive medicine, production management, agricultural economics, environmental protection, food safety/defense, animal health and well-being, and renewable energy.

**X-Ray Crystallographic Facility**

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

The X-Ray Crystallographic Facility, located in the Department of Chemistry, provides crystal structure determinations for researchers. Single crystals from all branches of chemistry are studied. The facility is equipped with two X-ray diffractometers, a Bruker SMART1000 and a Siemens P4 equipped with a rotating Cu anode source and possesses a stereo-microscope. Access to a Bruker ApexII diffractometer is also available. All instruments possess variable low temperature systems. Consultation and collaboration on a variety of single crystal related projects can be arranged.
UNDERGRADUATE ADMISSION

Undergraduate Admissions
One Shields Avenue
University of California
Davis, CA 95616-8507
(530) 752-2971; TTY (530) 752-4360; Fax (530) 752-1280;
undergradadmissions@ucdavis.edu;
http://admissions.ucdavis.edu

APPLYING TO UC DAVIS

You can apply online at http://www.universityofcalifornia.edu/apply, or you can download a printable copy of the application at http://www.universityofcalifornia.edu/admissions/undergrad_adm/apply/download.html.

You may request a mailed copy of the UC application for undergraduate admission and scholarships. E-mail your request to ucinfo@application.net and include your name, address, the term for which you’re applying and your planned applicant status (freshman or transfer).

The initial filing periods to apply for admission and scholarships for fall quarter at UC Davis are as follows:

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Initial Filing Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2007</td>
<td>November 1–30, 2006</td>
</tr>
<tr>
<td>Fall 2008</td>
<td>November 1–30, 2007</td>
</tr>
</tbody>
</table>

UC Davis expects to be open to transfer applicants for winter 2007. Please see http://www.universityofcalifornia.edu/admissions for details. Contact UC Davis Undergraduate Admissions for information about winter quarter 2008.

UC Davis is usually closed to new undergraduate applicants for spring quarter. To seek admission for spring quarter, you will need to submit a completed application with fee and an appeal letter directly to Undergraduate Admissions during the appropriate initial filing period. The filing periods to submit your application for admission and scholarships for winter or spring quarters at UC Davis are as follows:

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Initial Filing Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring 2007</td>
<td>October 1–31, 2006</td>
</tr>
<tr>
<td>Spring 2008</td>
<td>October 1–31, 2007</td>
</tr>
</tbody>
</table>

For more information, please see the Admission Checklist, on page 37.

APPLICATION FEES

The application fee of $60 for domestic students and $70 for international students entitles you to apply to one University of California campus. If you want to apply to more than one UC campus, you must pay an additional fee for each campus you select. These fees are not refundable. You must include the fee with the application or it will not be processed. Applicants who apply online will be prompted to pay the fee before submitting the application. If you submit the application by mail, attach a check or money order made payable to the Regents of the University of California to the application form.

The University of California will waive application fees for up to three years for qualified students who otherwise would be unable to apply for admission. To be accepted for the fee waiver program, you must meet specific requirements related to your family income and size. The fee waiver program is for United States citizens and permanent residents only. If you apply online, you can fill out the fee waiver form included with the online application. If you are filing a paper application, please see http://www.universityofcalifornia.edu/admissions/undergrad_adm/apply/how_apply/apply_fees.html.

ADMISSION AS A FRESHMAN

The University of California defines a freshman applicant as a student who has graduated from high school but has not enrolled since then in a regular session in any college-level institution. Summer session immediately following high school graduation is excluded in this determination.

Admission requirements for California residents are different from those for nonresidents. Nonresidents must meet higher scholarship requirements.

The following describes the minimum requirements to establish eligibility at the University of California. Applicants to UC Davis generally must perform well above these minimums in order to gain admission since the number of eligible applicants exceeds the number of students we can admit. For a description of the comprehensive review selection process, please see the Campus Admission Standards section on page 34.

Minimum Requirements for California Residents

To be minimally eligible for admission to the University of California as a freshman, you must meet the Subject Requirement, Scholarship Requirement and Examination Requirement that are described on this and the following pages.

Subject Requirement: a–g

You must complete at least 15 high school units in the subject areas listed below. One unit is equal to an academic year, or two semesters or three quarters of study. At least seven of the required 15 units must be taken in the last two years of high school. The required course sequence is often referred to as the “a-g” pattern. To see the “a-g” pattern for the UC approved course list for California high schools, see https://admissions.ucop.edu/doorways/list/.

Courses taken in the 9th grade and completed with a grade of C or better can satisfy a subject requirement; however, the grades will not be used in computing your grade point average. If you receive a grade of D or lower in a 9th-grade course, you have not satisfactorily completed the subject requirement until you repeat the course (or, in some cases, complete a more advanced course) with a grade of C or better.

a. History/Social Science—2 years required

One year of United States history, or one-half year of United States history and one-half year of civics or American government; and one year of world history, cultures and geography.

b. English—4 years required

Four years of English—composition and literature. Classes should stress preparation for university study, including frequent and regular practice in writing expository prose compositions of some length. Not more than one year will be accepted from the 9th grade and no more than one year may be ESL-type coursework.

c. Mathematics—3 years required; 4 years recommended

Three years of mathematics—elementary algebra, geometry and second-year advanced algebra. (Courses taken in grades 7 and 8
may partially satisfy the requirement if they are accepted by the high school as equivalent to its own courses.)

d. Laboratory Science—2 years required; 3 years recommended

The second year or higher of the same language must be completed to fulfill this requirement. Courses should emphasize speaking and understanding, and include instruction in grammar, vocabulary, reading and composition. (Courses taken in grades 7 and 8 may satisfy this requirement if they are accepted by the high school as equivalent to its own courses.)

e. Language other than English—2 years; 3 years recommended

Two years of the same language other than English. Courses should emphasize speaking and understanding, and include instruction in grammar, vocabulary, reading and composition. (Courses taken in grades 7 and 8 may satisfy this requirement if they are accepted by the high school as equivalent to its own courses.)

f. Visual and Performing Arts—1 year required

A single yearlong approved art course from a single VPA discipline: dance, drama/theater, music or visual art. Courses should enable you to understand and appreciate artistic expression, and to talk and write with discrimination about artistic materials studied. Courses that develop creative artistic ability or artistic performance may be used. (Courses that are recreational or are offered under physical education are not acceptable.)

g. College Preparatory Electives—1 year required

One year (two semesters), in addition to those required in "a-f" above, chosen from the following areas: visual and performing arts (non-introductory-level courses), history, social science, English, advanced mathematics, laboratory science and language other than English (a third year in the language used for the "e" requirement or two years of another language).

If you are a California high school graduate, the courses used to satisfy the "a-g" subject requirement must appear on the official University of California certified course list. If you submit courses taken in grades 7 and 8 may satisfy this requirement if they are accepted by the high school as equivalent to its own courses.

Scholarship Requirement

The Scholarship Requirement defines the grade point average (GPA) you must attain in the "a-g" subjects, the ACT Assessment plus Writing or SAT Reasoning Test scores, and the SAT Subject Test scores you must earn to be eligible for admission.

If your GPA is 2.800 or above, you satisfy the minimum scholarship requirement if you achieve the test score total indicated in UC Eligibility Index for California Residents.

The University calculates your GPA in the “a-g” subjects by assigning point values to the grades you earn, totaling the points and dividing the total by the number of "a-g" course units. Points are assigned as follows: A = 4 points, B = 3 points, C = 2 points, D = 1 point and F = 0 points.

Only the grades you earn in “a-g” subjects in the 10th and 11th grades are used to calculate your GPA. Courses you take in the 9th grade can be used to meet the Subject Requirement if you earn a grade of C or better, but they will not be used to calculate your GPA.

The University assigns extra points for up to four units of UC-certified honors level and advanced placement courses taken in the last three years of high school: A=5 points, B=4 points, C=3 points.

No more than two units of UC-approved honors level courses taken in the 10th grade may be given extra points. A grade of D in an honors or advanced placement course does not earn extra points.

Examination Requirement

Each applicant must submit scores on an approved core test of mathematics, language arts and writing. This requirement can be satisfied by taking either of the following:

- The ACT Assessment plus Writing,

- The SAT Reasoning Test (critical reading, mathematics and writing).

In addition, all applicants must complete two SAT Subject Tests in two different subject areas: history/social science, English literature, mathematics, laboratory science or language other than English. All exams must be taken no later than December of the year before you plan to enroll at UC Davis.

ACT. If you take both the SAT Reasoning Test and the ACT Assessment, we will use the test that gives you the higher score in our admissions decision.

SAT Reasoning Test. If you take the SAT Reasoning Test, we will use your highest overall score (combined reading, math and writing scores) from the same test sitting.

SAT Subject Tests. You must submit scores for two SAT Subject Tests taken in two different subjects (e.g. science and literature); the scores do not have to be from the same sitting. The SAT Math Level IC examination is not accepted in fulfillment of one of the tests; see http://www.universityofcalifornia.edu/admissions/undergrad_adm/policies/subject_tests.html for more information. You may repeat the SAT Subject Tests as many times as you wish and we will use only your highest score for each individual SAT Subject Test.

Reporting Your Scores. You are responsible for making sure that the testing agencies send your scores directly to each campus to which you apply. You may report your official test scores to UC Davis either at the time you take each test by requesting that your score report be automatically sent to us once it's available, or after you've received your scores by contacting the testing agency (ACT or College Board for the SAT Reasoning Test and SAT Subject Tests) to order an additional score report to be sent to UC Davis. We ask you to self-report your scores on your application, but we must receive official copies of your score reports confirming your self-report to complete processing of your application.

Make arrangements to take the required exams with your high school or at the ACT Web site at http://www.actstudent.org and
<table>
<thead>
<tr>
<th>Examination</th>
<th>Score</th>
<th>UC Davis Course Equivalencies</th>
<th>Continuing Course</th>
<th>Credit Toward Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENGLISH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English 1</td>
<td>5, 4, 3</td>
<td>English 3, University Writing Program 1</td>
<td></td>
<td>8 units</td>
</tr>
<tr>
<td>English 2</td>
<td>5, 4, 3</td>
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<td></td>
<td>8 units</td>
</tr>
<tr>
<td>English 3</td>
<td>5, 4, 3</td>
<td>English 3, University Writing Program 1</td>
<td></td>
<td>8 units</td>
</tr>
<tr>
<td><strong>FOREIGN LANGUAGES</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>French</td>
<td>5</td>
<td>French 22</td>
<td></td>
<td>8 units</td>
</tr>
<tr>
<td>German</td>
<td>5, 4</td>
<td>German 21</td>
<td></td>
<td>8 units</td>
</tr>
<tr>
<td>Latin</td>
<td>5, 4</td>
<td>Latin 2</td>
<td></td>
<td>4 units</td>
</tr>
<tr>
<td>Spanish</td>
<td>5, 4, 3</td>
<td>Spanish 3</td>
<td></td>
<td>8 units</td>
</tr>
<tr>
<td><strong>HUMANITIES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Art Studio</td>
<td>5</td>
<td>Art Studio 2, 5</td>
<td></td>
<td>8 units</td>
</tr>
<tr>
<td><strong>NATURAL SCIENCES</strong></td>
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<td>Biology</td>
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<td>Biological Sciences 10</td>
<td></td>
<td>8 units</td>
</tr>
<tr>
<td>Chemistry</td>
<td>5</td>
<td>Chemistry 2A</td>
<td></td>
<td>8 units</td>
</tr>
<tr>
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<td>Engineering: Computer Science 30</td>
<td>Engineering: Computer Science 40</td>
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<tr>
<td>Computer Science AB</td>
<td>5, 4</td>
<td>Engineering: Computer Science 30</td>
<td>Engineering: Computer Science 40</td>
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</tr>
<tr>
<td><strong>SOCIAL SCIENCE</strong></td>
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<td></td>
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<tr>
<td>American Government</td>
<td>5, 4, 3</td>
<td>Political Science 1</td>
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<td>4 units</td>
</tr>
<tr>
<td>Political Science 1</td>
<td>5</td>
<td>Political Science 2</td>
<td></td>
<td>4 units</td>
</tr>
<tr>
<td>Comparative Government</td>
<td>5, 4, 3</td>
<td>Political Science 2</td>
<td></td>
<td>4 units</td>
</tr>
<tr>
<td>Economics (Micro)</td>
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<td>Economics 1A</td>
<td>Economics 100</td>
<td>4 units</td>
</tr>
<tr>
<td>Economics (Macro)</td>
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<td>Economics 1B</td>
<td>Economics 101</td>
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</tr>
<tr>
<td>Psychology</td>
<td>5</td>
<td>Psychology 1</td>
<td></td>
<td>4 units</td>
</tr>
</tbody>
</table>
Eligibility in the Local Context

The top four percent of students at each participating California high school are designated UC eligible and are highly encouraged to apply to one of the nine UC general campuses under the Eligibility in the Local Context (ELC) pathway.

To be considered for ELC, you must complete 11 specific units of the subject requirement by the end of your junior year. With the assistance of each participating high school, the university will identify the top four percent of students on the basis of GPA in the required coursework.

The 11 units include one unit of history/social science; three units of English; three units of mathematics; one unit of laboratory science; one unit of language other than English; two units chosen from among other subject requirements.

The university will notify ELC students of their status at the beginning of their senior year. If you are designated UC-eligible through ELC, you must submit the university's undergraduate application during the November initial filing period and complete remaining eligibility requirements including the subject and examination requirements.

The ELC designation is one of the criteria considered by selective campuses when the number of applicants exceeds the spaces available. For more information, please see http://www.ucop.edu/sas/elc/.

Minimum Eligibility by Examination Alone

If you do not meet the requirements for Eligibility in the Statewide Context or Eligibility in the Local Context, you may be able to qualify for admission to the University by earning high scores on the standardized tests listed in the Examination Requirement. Because of the recent changes to the ACT and SAT, the minimum scores for eligibility by exam alone are being revised. The new scores will be available at http://www.universityofcalifornia.edu/admissions/examonly in late spring 2006.

Minimum Requirements for Residents of Other States

If you are a freshman applicant who does not claim California residency, you must meet the following requirements for minimum admission eligibility to the University of California. Applicants to UC Davis generally must perform well above the minimum in order to gain admission to UC Davis:

• Graduate from a regionally accredited or state-accredited high school
• Satisfactorily complete the subject requirements listed under Requirements for California Residents
• Earn a grade point average of at least 3.400 in the courses used to meet the subject requirements
• Complete the examination requirements listed for California residents
• Meet the UC Eligibility Index for Nonresidents

UC Eligibility Index for Nonresidents

<table>
<thead>
<tr>
<th>“a-g” GPA</th>
<th>Minimum Test Score Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;3.400</td>
<td>ineligible</td>
</tr>
<tr>
<td>3.400-3.440</td>
<td>1882</td>
</tr>
<tr>
<td>3.450 and above</td>
<td>1858</td>
</tr>
</tbody>
</table>

High School Proficiency Examination

The University of California will accept the Certificate of Proficiency or the General Education Development (GED) certificate awarded by the State Department of Education in lieu of the regular high school diploma. However, you must also meet all other university entrance requirements (subject, scholarship and examination).

Transfer Credit

Transfer credit may be granted to a freshman applicant for an acceptable college course taken while still in high school when an official transcript is received from the college that conducted the course. Transfer credit is granted for each College Board Advanced Placement Examination completed with a score of 3, 4 or 5. Students completing the International Baccalaureate (IB) diploma with a score of 30 or above will receive 30 quarter (20 semester) units toward their UC undergraduate degree. The university grants 8 quarter (5.3 semester) units for students who receive IB certificates with scores of 5, 6 or 7 on Higher Level exams. If students take college courses in combination with Advanced Placement or International Baccalaureate Examinations in the same subject areas, transfer credit may be limited due to duplication of credit.
Advanced Placement Examinations

If you take one or more of the College Board Advanced Placement (AP) Examinations and score 3, 4, or 5, you will be awarded college credit. The credit will become 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.

See College Board Advanced Placement (AP) Examination Credit, on page 30, to learn how many units you will receive for an AP Examination; see the Credit Toward Degree column heading. How those units will be applied toward specific degree requirements in each college is explained for each exam category and in the notes below each exam listing. 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 84.

In general, you may not earn university credit for college courses that duplicate credit 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 talk with an academic adviser in your major department or dean’s office before selecting and enrolling in classes.

International Baccalaureate Examinations

UC Davis recognizes the International Baccalaureate (IB) examinations for college credit. Higher Level examinations presented with scores of 5, 6 or 7 receive degree credit and in specific instances are deemed comparable to various lower division courses. Students who present the IB Diploma will receive 30 quarter units of credit. The credit will apply toward the minimum 180 quarter units needed to receive a bachelor’s degree.

See International Baccalaureate (IB) Higher Level Examination Credit, on page 33, to learn how many units you will receive for an acceptable IB examination. The table also specifies which UC Davis lower division course an IB examination is comparable to. Please note that the courses for which IB credit have 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 84.

In general, you may not earn university credit for college courses that duplicate credit earned through IB. Similarly, students will not receive duplicate credit for comparable AP examinations if granted IB credit. Additionally, each college may have special restrictions on the use of IB examinations. Please check with your dean’s office and department adviser to determine any restrictions in their use toward breadth requirements and lower division major course requirements.

Deferred Enrollment

The Deferred Enrollment program allows newly admitted undergraduate students to postpone their initial enrollment at the university for up to one year. The purpose is to allow time to pursue other activities and opportunities that will assist students in clarifying their educational goals (e.g., job opportunities and experience away from campus, time to resolve personal or medical problems); however, students are not allowed to enroll at another college during this time. To be eligible for deferred enrollment, students must return their affirmative Statement of Intent to Register with the deposit by the deadline and must satisfy all university admission and entrance requirements. The processing fee for this program is $60 and the deadline to submit an application is the first day of instruction of the student’s first quarter. For more information or to receive an application, contact Undergraduate Admissions at (530) 752-3710.

ADMISSION AS A TRANSFER STUDENT

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 your college record and apply for admission as a freshman.

California residents must meet the requirements that follow. If you are not a California resident, see Minimum Requirements for Residents of Other States, on page 31. Applicants to UC Davis generally must perform well above the minimums in order to gain admission, since the number of eligible applicants exceeds the number of students we can admit.

The highest priority for admission is given to junior-level California community college transfer applicants with 90 quarter (60 semester) units completed by the end of the spring term prior to fall admission.

Transfer applicants to UC Davis generally must perform well above the minimum requirements needed to gain admission to UC Davis.

UC Minimum Requirements for California Residents

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

1. Complete 90 quarter (60 semester) units of transferable college credit with a grade point average of at least 2.400. No more than 21 quarter (14 semester) units may be taken Passed/Not Passed.

2. Complete the following course pattern requirement, earning a grade of C or better in each course:

   • Two transferable college courses (four-to-five quarter or three semester units each) in English composition; and,

   • One transferable college course (four-to-five quarter or three semester units) in mathematical concepts and quantitative reasoning; and,

   • Four transferable college courses (four-to-five quarter or three semester units each) from at least two of the following subject areas: arts and humanities, social and behavioral sciences, physical and biological sciences.

If you were eligible for admission to UC when you graduated from high school—meaning you satisfied the subject, scholarship and examination requirements, or were identified by UC during the senior year as eligible in the local context—you are eligible to transfer if you have a C (2.000) in your transferable college course work.
If you met the Scholarship Requirement in high school, but did not satisfy the Subject Requirement, you must take transferable college courses in the missing subjects and earn a C or better in each required course to be eligible to transfer.

To verify UC transferable courses for California community colleges, see [http://www.assist.org](http://www.assist.org).

**Minimum Requirements for Residents of Other States**

If you meet the requirements for admission as a nonresident freshman, you must have a grade point average of 2.800 or better in college courses that are accepted for transfer credit by the University of California.

If you do not meet the minimum requirements for admission as a nonresident freshman, you must have completed at least 90 quarter (60 semester) units of transferable work with a grade point average of 2.800 or better and have completed the subject requirements for California residents.

**Unit Credit for Courses Taken Elsewhere**

The university gives quarter unit credit to transfer students for courses they have completed at other accredited colleges and universities. To be accepted for credit, your courses must be comparable to those offered at the university, as determined by Undergraduate Admissions. You can find information about transferable credit from California community colleges at [http://www.assist.org](http://www.assist.org).

A total of 105 quarter (70 semester) transferable units toward a university degree may be earned at a community (two-year) college. Only subject credit will be granted for courses taken in excess of these amounts.

### International Baccalaureate (IB) Higher Level Examination Credit

<table>
<thead>
<tr>
<th>Examination</th>
<th>Score</th>
<th>UC Davis Course Equivalencies</th>
<th>Continuing Course</th>
<th>Credit Toward Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENGLISH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English A1</td>
<td>5,6,7</td>
<td>English 3</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>College of Letters and Science: Satisfies first course toward English Composition requirement. College of Agricultural and Environmental Sciences: Satisfies first half of English Composition requirement.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LANGUAGES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>French A1</td>
<td>5,6,7</td>
<td>French 21, 22, 23</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>French A2</td>
<td>5,6,7</td>
<td>French 21, 22</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>French B</td>
<td>5,6,7</td>
<td>French 1, 2, 3</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>German A1</td>
<td>5,6,7</td>
<td>German 1, 2</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>German A2</td>
<td>5,6,7</td>
<td>German 1, 2</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>German B</td>
<td>5,6,7</td>
<td>German 1, 2</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Italian A1</td>
<td>5,6,7</td>
<td>Italian 4, 5</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Latin A1</td>
<td>5,6,7</td>
<td>Latin 1, 2, 3</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Spanish A1</td>
<td>5,6,7</td>
<td>Spanish 28</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Spanish A2</td>
<td>5,6,7</td>
<td></td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>College of Letters and Science: French and Latin examinations satisfy the Foreign Language requirement for A.B. degree. College of Agricultural &amp; Environmental Sciences: 8 units credit allowed toward Breadth requirement or Unrestricted electives for each language examination passed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HUMANITIES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Americas</td>
<td>5,6,7</td>
<td>History 17A, 17B</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Europe</td>
<td>5,6,7</td>
<td>History 4C</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Islamic World</td>
<td>5,6,7</td>
<td>History 6</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Music</td>
<td>5,6,7</td>
<td>Music 10</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>College of Letters and Science: Music examination partially satisfies Area (breadth) requirement for A.B. degree. College of Agricultural &amp; Environmental Sciences: 8 units credit allowed toward Breadth requirement or Unrestricted electives for each examination passed.</td>
<td></td>
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</tr>
<tr>
<td><strong>NATURAL SCIENCES</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Biology</td>
<td>5,6,7</td>
<td>Biological Science 10</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Chemistry</td>
<td>5,6,7</td>
<td>Chemistry 10 (5, 6); Chemistry 2A (7)</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Mathematics</td>
<td>5,6,7</td>
<td>Math 21a, 21b [credit for one math series only]</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td></td>
<td>5,6,7</td>
<td>Math 17a, 17b [credit for one math series only]</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Physics</td>
<td>5,6,7</td>
<td>Math 16a, 16b [credit for one math series only]</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>College of Letters and Science/College of Agricultural and Environmental Sciences: 4 units of credit toward Natural Sciences. Credit or Preparatory Course Work allowed for science majors for each Natural Sciences examination passed, except 8 units of credit allowed for Mathematics and Physics examinations.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SOCIAL SCIENCE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthropology</td>
<td>5,6,7</td>
<td></td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Economics</td>
<td>5,6,7</td>
<td>Economics 1A and 1B</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Philosophy</td>
<td>5,6,7</td>
<td>Philosophy 1</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>Psychology</td>
<td>5,6,7</td>
<td>Psychology 1</td>
<td>Determined by adviser consultation</td>
<td>8 units</td>
</tr>
<tr>
<td>College of Agricultural and Environmental Sciences: 4 units of credit allowed toward Breadth requirement or Unrestricted electives for each Social Science examination passed, except 8 units allowed for courses with 8 units of credit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**IB Diploma**

IB Diploma 30 units
UC Intercampus Transfer

If you are an undergraduate student currently or previously registered at another UC campus and have not since been registered in another institution, you may apply for transfer to the Davis campus. Filing dates, the application, fees and admission requirements are the same as those listed for new applicants.

ADMISSION AS AN INTERNATIONAL STUDENT

International students attend the University of California, Davis, from many countries around the world. There were 87 different countries represented on the Davis campus in the 2005-2006 academic year, by an international student population of approximately 1,900 students, as well as approximately 1,500 visiting international faculty and researchers.

Freshman Admission

To be considered for freshman admission, applicants must complete secondary school earning superior marks in academic subjects and receive a certificate of completion that grants admission to university-level studies in that country. All freshman applicants are considered using the same eligibility requirements and are included in the same selection process. If applicants have attended both foreign and U.S. high schools, both foreign and U.S. courses and grades will be considered. Demonstration of English proficiency may also be required.

Transfer Applicants

Priority is given to prospective California community college transfer students who are prepared to begin their junior or third year of study. Coursework from other colleges and universities is considered transferable if the applicant completed the course at an institution that is recognized by the University of California and is comparable to coursework offered at UC Davis. Students attending colleges or universities outside of the United States should be aware that many foreign technical institutes are not recognized and that vocational coursework is not transferable.

International students applying to transfer to UC Davis from California colleges or universities are considered for admission using the same eligibility criteria as domestic students. Applicants who have attended both foreign and U.S. colleges and universities will be evaluated using both foreign and U.S. academic records.

Required 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. Certified English translations of all academic records are required.

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 the school language of instruction prior to study in the United States was not English. Applicants may do so in one of the following ways:

• Complete two 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 213 on the computer-based TOEFL. For more information, see http://www.toefl.org.

• Achieve a minimum score of 7 (academic module) on the International English Language Testing System (IELTS). Your IELTS score must be sent directly to the following address: Undergraduate Admissions University of California One Shields Avenue Davis, CA 95616-8507

• Achieve a minimum score of 560 on the SAT II: Subject Examination in Writing (taken prior to March 2005) or a minimum score of 560 on the Writing component of the SAT Reasoning Test (taken March 2005 or later).

• The new ACT Assessment plus Writing, the Writing score of the SAT Reasoning Test and the Internet-based TOEFL examinations are currently under review.

Estimated Costs for 2006-2007

International students are responsible for all of their expenses while studying at UC Davis. The expenses include nonresident tuition, educational fees, room and board and a modest amount for personal expenses. For the 2006-2007 academic year, we estimate the cost will be $42,300. Because the exact cost for tuition and fees is not determined until just before the beginning of the academic year, $42,300 is only a preliminary figure. This minimum allowance may be increased without advance notice.

CAMPUS ADMISSION STANDARDS

The University of California makes every effort to provide a place for all California resident applicants who meet the minimum UC admission requirements and file an application during the initial filing period.

UC Davis receives more applications than the number of spaces available. When UC Davis cannot accept all eligible applicants, it uses standards that are more demanding than the minimum requirements to select students. These standards, which are called selection criteria, identify those students who have demonstrated the capacity for high academic achievement and who have a variety of other qualities that can contribute to the strength and diversity of the campus community.

The selection criteria described below were used for applicants for the fall 2006 term. The criteria may differ for the winter and spring terms because enrollment targets and applicant qualifications change. Applicants for winter or spring should contact Undergraduate Admissions for more information.
Selection Guidelines
Each campus, in consultation with the Office of the President, develops enrollment targets that specify the number of new freshman and advanced standing students expected to enroll. UC Davis receives more applications than required to meet our enrollment target and therefore admits students using the criteria described below.

Freshman Applicants
Freshmen are selected based on a comprehensive review of their academic and personal accomplishments and the context in which those accomplishments have been achieved.

The assessment honors academic achievement and offers foremost consideration to students with commendable academic records. Academic accomplishments are considered in the context of the opportunities and challenges a student has experienced and the full range of each student's personal achievements are used to assess merit and likely contribution to the campus community.

The academic factors considered in the review are high school GPA calculated on UC "a-g" courses completed; scores on required entrance tests; breadth of academic preparation, including coursework in the senior year; number of courses completed beyond the minimum UC eligibility requirements; honors, AP, IB or college coursework completed or in progress; and Eligibility in the Local Context (ELC) status.

Some examples of personal factors included in the assessment are demonstrated leadership promise; completion of academic preparation and enrichment programs; one or more special (extraordinary) talents; demonstrated perseverance or persistence in unusually challenging personal circumstances; and marked improvement in academic performance from 9th through 11th grade.

The highest-scoring applicants for each college/division are admitted based on the available spaces in the specific college/division. Admission spaces are unique for each college/division and may vary each year. No single personal or academic characteristic guarantees admission to UC Davis, and while factors reflecting academic progress and intellectual development continue to be of primary importance, no applicant will be admitted on the basis of academic criteria alone. No eligible applicant will be denied admission without complete review of application materials. For complete information about our selection procedure, please see http://admissions.ucdavis.edu/admissions/fr_selection_process.

Transfer Applicants
Academic Criteria. UC-eligible junior-level California community college transfer applicants with 90 quarter (60 semester) transferable units of work completed by the end of the spring term prior to fall admission are given top priority for admission consideration. Other UC-eligible transfer applicants will be admitted if space is available.

Applications far exceed the number of spaces available in majors such as biological sciences, biotechnology, communication, engineering, international relations, psychology and viticulture and enology. Applicants must complete specific lower division preparatory courses with a specific GPA in the major and an overall required GPA. To see our selective majors and their specific requirements for admission, please see http://admissions.ucdavis.edu/admissions/tr_select_majors. See our complete list of majors at http://admissions.ucdavis.edu/majors. The Assist Web, at http://www.assist.org, provides articulation with California community colleges.

Supplemental Criteria. The same supplemental criteria described above for freshmen are used with the exception of the high school record.

Notification and Acceptance of Admission
Throughout the admissions process, you can check your application status at the MyAdmissions Web site at http://myadmissions.ucdavis.edu. Once our review of your application is complete, you will receive an e-mail directing you to MyAdmissions to check your admissions status. You will also receive an admission notification letter by mail. Most fall quarter applicants will be notified of their admission status between March 15 and the end of March.

If you are admitted, you can use MyAdmissions to respond to your offer of admission and declare your Statement of Intent to Register (SIR), check financial aid and scholarship status and pay the required nonrefundable $100 deposit. This advance deposit is applied to your university registration fee as long as you register in the quarter to which you are admitted. EOP applicants are not required to submit the $100 advance deposit; however, they will pay full registration fees at the time of registration.

Declare your Statement of Intent to Register (SIR) by May 1 (freshman) or June 1 (transfer). You may not file SIRs at multiple UC campuses for the same term. Students admitted to winter or spring quarter must return the SIR by the date specified on the letter of admission.

SPECIAL PROGRAMS
Open Campus (Concurrent) Courses
Open Campus (Concurrent) courses are regular UC Davis courses open to the community on a space-available basis through UC Davis Extension. This program allows an individual to pursue academic interests and to test academic abilities at the university. Students may apply credit for courses taken in the Open Campus program towards the UC Davis 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 enrolled at UC Davis may not enroll in Open Campus courses. For information, see the Extension Web site at http://extension.ucdavis.edu/opencampus or contact the UC Davis Extension office at (530) 757-8777.

Limited Status
Students in limited status are those whose special attainments qualify them to take certain courses in the university toward a definite and limited objective. To apply for limited status admission, you must either have a bachelor’s degree (but not be a candidate for an advanced degree), or have completed a substantial amount of college work with a satisfactory grade point average. You must submit an undergraduate application with fee as well as a limited status petition and official transcripts from all schools attended. The limited status petition can be downloaded at http://admissions.ucdavis.edu/admissions/tr_special_situations. As a limited status student you will be expected to maintain a certain scholarship average during a predetermined time of enrollment.
Application filing dates are the same as those for new undergraduate applicants. Fees for limited status students are the same as those for new applicants. You will not be admitted to limited status for the purpose of raising a low scholarship average.

Admission to the College of Agricultural and Environmental Sciences requires the approval of the Undergraduate Admissions director and the dean of the college. The College of Biological Sciences, College of Engineering and the College of Letters and Science do not accept limited status applicants.

Second Baccalaureate

If you have a bachelor's degree substantially equivalent to one that is granted by the University of California, you may be allowed to enroll as an undergraduate seeking a second bachelor's degree. Admission in this category will depend upon a superior academic record and clear evidence of a change in objective.

Admission to the College of Agricultural and Environmental Sciences and College of Engineering requires the approval of the Undergraduate Admissions director and the dean of the college. You must submit an undergraduate application, a second baccalaureate petition (except College of Engineering) as well as official transcripts from all schools attended. The second baccalaureate petition can be downloaded at [http://admissions.ucdavis.edu/admissions/tr_special_situations](http://admissions.ucdavis.edu/admissions/tr_special_situations). Application filing dates are the same as those for new undergraduate applicants.

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. The College of Letters and Science and the College of Biological Sciences do not accept second baccalaureate applicants.

Special Status

The special status classification is for applicants 21 years of age or older who have not had the opportunity to complete a satisfactory high school program or who have not completed a substantial amount of college work, but by reason of special attainment or background may be prepared to undertake certain courses at UC Davis toward a definite and limited objective.

You will not be admitted to special status for the purpose of fulfilling requirements for admission as a regular student. Conditions for admission are determined by the Undergraduate Admissions director and are subject to approval by the dean of the College of Agricultural and Environmental Sciences. Admission is for a specified time only and a prescribed scholastic average must be maintained. Application, special status petition, fees and filing dates are the same as those for new applicants.

The College of Engineering, the College of Letters and Science and the College of Biological Sciences do not accept special status applicants.

Educational Opportunity Program (EOP)

The Educational Opportunity Program (EOP) assists students from economically, socially or educationally disadvantaged backgrounds. EOP provides help with the admission application process and offers academic, social and cultural support. Application fee waivers and financial aid are available for individuals with demonstrated financial need. Contact Undergraduate Admissions for information on fee waivers and the Financial Aid Office for information on financial assistance. Once enrolled, contact the EOP Information Office for access to extensive tutoring, advising and support resources. For more information, see Academic Advising, on page 54.

To apply for EOP, complete the regular UC admission application and answer all questions related to EOP. In addition, we advise you to use your personal statement to explain your reasons for requesting EOP assistance. To apply for EOP after enrolling at UC Davis, contact Undergraduate Admissions.

READMISSION

If you are a former UC Davis undergraduate student planning to resume studies at the Davis campus as an undergraduate, you must file an application for readmission, available in the Office of the University Registrar, and pay a nontransferable, nonrefundable fee of $60. You are a former student if you have interrupted the completion of consecutive terms of enrollment on the Davis campus.

Official transcripts of all work you may have attempted in the interim must be submitted to the Office of the University Registrar.

Students applying for readmission must file their applications on or before the following deadlines:

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Deadline Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2006</td>
<td>Jul 31, 2006</td>
</tr>
<tr>
<td>Spring 2007</td>
<td>Jan 31, 2007</td>
</tr>
<tr>
<td>Fall 2007</td>
<td>Jul 31, 2007</td>
</tr>
<tr>
<td>Spring 2008</td>
<td>Jan 31, 2008</td>
</tr>
</tbody>
</table>
Apply via the Internet at http://www.universityofcalifornia.edu/apply. You can also download a printable copy of the application at http://www.universityofcalifornia.edu/admissions/undergrad_adm/apply/download.html. You may request a mailed copy of the UC application for undergraduate admission and scholarships. E-mail your request to ucinfo@application.net and include your name, address, the term for which you’re applying, and your planned applicant status (freshman or transfer).

Complete the application, the personal statement, and list the college and major you prefer. You may pay the application fee online. If you apply with the paper application, attach a check or money order to cover the application fees with your application materials. Mail the application materials and fee during the priority filing period for the quarter in which you are interested; do not attach any other documents.

Keep a copy of your application and personal statement.

Keep the notices you receive from both the Undergraduate Application Processing Service and the Undergraduate Admissions office, including those received by e-mail.

If you are applying from high school, do not send a preliminary transcript unless asked to do so by Undergraduate Admissions. Please arrange to have official test scores forwarded by the testing agency. If you are applying as a transfer student, arrange to have all official college or university transcripts sent to each UC campus to which you applied.

High school applicants for the fall quarter should take the ACT Assessment plus Writing or the SAT Reasoning Test (critical reading, mathematics and writing). In addition, all applicants must complete two SAT Subject Tests in two different subject areas: history/social science, English literature, mathematics, laboratory science or language other than English. All exams must be taken no later than December of the year before you plan to enroll at UC Davis. We strongly encourage you to complete these tests before or on the November test date.

Undergraduate Admissions may request additional information, such as official transcripts, or confirmation of work in progress. Send this information right away so your application can be evaluated without delay. Your eligibility for admission cannot be evaluated until all your application materials are received; i.e., completed application form, filing fee, essay, official transcripts (if required), work in progress, and test scores (if required).

If you are admitted, keep your admission letter for your records.

Use MyAdmissions at http://myadmissions.ucdavis.edu to check your admission status to UC Davis. If you have been admitted, declare your Statement of Intent to Register (SIR), check your financial aid and scholarship status, and pay your nonrefundable advance deposit of $100 (if required). Sign up for an e-mail account, complete your “Statement of Legal Residence” (SLR), Hepatitis Immunization form (if applicable), and other required forms. Once you complete these forms, you will be able to complete registration and obtain housing. You will also be linked to information regarding the student health insurance coverage requirement.
FEES, EXPENSES AND FINANCIAL AID
FEES AND EXPENSES

Give 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://www.ormp.ucdavis.edu/studentfees. At the time of registration each quarter, every student must pay the quarterly fees. A Registration Fee Deferred Payment Plan (RFDPP), which allows students to pay quarterly fees in three monthly installments, is available.

Course Materials 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 of 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 and Registration Guide (CSRG).

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 the Educational Fee. Part-time nonresidents pay one-half of the Nonresident Tuition Fee. Undergraduates file their part-time petition with the Office of the University Registrar in 12 Mrak Hall. Graduate students file their petition with Graduate Studies in 250 Mrak Hall.

### Student Fees

Certain fees are subject to regental, legislative and gubernatorial action, these fees may change without notice. For the most up-to-date information, see http://www.ormp.ucdavis.edu/studentfees.

<table>
<thead>
<tr>
<th>Fee</th>
<th>Undergraduate</th>
<th>Graduate</th>
<th>Law^{(Semester)}</th>
<th>Medicine</th>
<th>Management</th>
<th>Veterinary Medicine</th>
<th>Master of Public Health</th>
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</thead>
<tbody>
<tr>
<td>Registration Fee</td>
<td>$245.00</td>
<td>$245.00</td>
<td>$245.00</td>
<td>$367.50</td>
<td>$245.00</td>
<td>$245.00</td>
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<tr>
<td>Educational Fee</td>
<td>$1,802.00</td>
<td>$1,974.00</td>
<td>$2,054.00</td>
<td>$3,203.50</td>
<td>$2,135.00</td>
<td>$2,136.00</td>
<td>$2,054.00</td>
</tr>
<tr>
<td>ASUCD Fee</td>
<td>$35.00</td>
<td>$35.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GSA Fee</td>
<td>$12.00</td>
<td>$12.00</td>
<td></td>
<td>$12.00</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LSA Fee</td>
<td>$10.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memorial Union Fee</td>
<td>$28.50</td>
<td>$28.50</td>
<td>$28.50</td>
<td>$42.75</td>
<td>$28.50</td>
<td>$28.50</td>
<td>$28.50</td>
</tr>
<tr>
<td>Facilities and Campus Enhancements Fee</td>
<td>$126.00</td>
<td>$126.00</td>
<td>$126.00</td>
<td>$126.00</td>
<td>$126.00</td>
<td>$126.00</td>
<td></td>
</tr>
<tr>
<td>Legal Education Enhancement and Access Program Fee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$183.50</td>
</tr>
<tr>
<td>Campus Expansion Initiative</td>
<td>$132.00</td>
<td>$132.00</td>
<td>$22.00</td>
<td>$22.00</td>
<td>$22.00</td>
<td>$22.00</td>
<td>$22.00</td>
</tr>
<tr>
<td>Student Services Maintenance Fee and Student Activities &amp; Services Initiative Fee</td>
<td>$97.00</td>
<td>$97.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Facilities Safety Fee</td>
<td>$22.00</td>
<td>$22.00</td>
<td>$22.00</td>
<td>$22.00</td>
<td>$22.00</td>
<td>$22.00</td>
<td>$22.00</td>
</tr>
<tr>
<td>Student Health Services Fee</td>
<td>$44.00</td>
<td>$44.00</td>
<td>$44.00</td>
<td>$66.00</td>
<td>$44.00</td>
<td>$44.00</td>
<td>$44.00</td>
</tr>
<tr>
<td>Health Insurance^{2}</td>
<td>$224.00</td>
<td>$224.00</td>
<td>$457.00</td>
<td>$457.00</td>
<td>$457.00</td>
<td>$457.00</td>
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<tr>
<td>Disability Insurance Fee^{3}</td>
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<td></td>
<td></td>
<td></td>
<td>$61.00</td>
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</tr>
<tr>
<td>Professional School Fee</td>
<td>$7,318.00</td>
<td>$3,266.00</td>
<td>$4,759.00</td>
<td>$3,628.00</td>
<td>$3,628.00</td>
<td>$3,628.00</td>
<td>$1,400.00</td>
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<tr>
<td>Special Fee</td>
<td>$188.00</td>
<td>$94.00</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Veterinary Medicine Course Materials Fee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$667.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School of Medicine Course Materials Fee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$125.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Full-time Student Fees, CA Resident</td>
<td>$2,755.50</td>
<td>$3,010.50</td>
<td>$12,127.55</td>
<td>$6,169.50</td>
<td>$7,851.50</td>
<td>$7,375.50</td>
<td>$4,410.50</td>
</tr>
<tr>
<td>Nonresident Tuition</td>
<td>$6,057.00</td>
<td>$4,898.00</td>
<td>$6,122.50</td>
<td>$4,081.00</td>
<td>$4,082.00</td>
<td>$4,082.00</td>
<td>$4,082.00</td>
</tr>
<tr>
<td>Total Full-time Student Fees, Nonresident</td>
<td>$8,894.50</td>
<td>$7,997.50</td>
<td>$18,230.05</td>
<td>$10,250.50</td>
<td>$11,933.50</td>
<td>$11,457.50</td>
<td>$8,492.50</td>
</tr>
<tr>
<td>Total Part-time Student, CA Resident</td>
<td>$1,854.50</td>
<td>$1,983.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Part-time Student, Nonresident</td>
<td>$4,824.50</td>
<td>$4,477.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Employee-Student</td>
<td>$733.50</td>
<td>$817.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 The Law School operates on the semester system. Fees reflected above are spring semester fees.

2 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. More information is available at http://healthcenter.ucdavis.edu/insurance/. Medical School students should contact the Office of Medical Education at (530) 752-6625 for information.

3 The Disability Insurance Fee is assessed annually fall quarter at $61. This fee applies only to medical students, not interns, residents or health science academics.

4 Students enrolled in the Graduate School of Management Working Professionals Program pay a flat rate per course in lieu of the fees above. More information is available at http://www.gsm.ucdavis.edu/programs/wpmba/.

5 A course materials fee may apply to some undergraduate courses. See the Schedule of Classes in the Class Schedule and Registration Guide.

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*Fees, Expenses and Financial Aid* 39
UC Employee-Student Fees

Reduced fees are available to UC career employees and certain UC retirees who are qualified for admission to the university. Once admitted, the employee-student must file a petition for the reduction in fees before each quarter of enrollment. Employee-students pay one-third of the full-time Registration Fee and one-third of the full-time Education Fee. 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 on the Internet.

Motor Vehicle Parking Permit and Bicycle Licensing Fees

Parking permit rates are available at Parking Services, http://www.taps.ucdavis.edu or call (530) 752-8277.

A California State bicycle license fee is required for all bicycles on campus (initial license, $8; renewals, $4). For more information, call (530) 752-2453.

Costs for a Year at UC Davis

The costs listed in Average Student Costs Annually, on page 40, are average costs and your own living expenses may differ somewhat from these. Cost of living expenses are adjusted annually and fees are subject to change without notice. More information on living expenses can be found in the section on housing or from the Financial Aid Office.

International Student Expenses

International students are responsible for all of their expenses while studying at UC Davis. The expenses include non-resident tuition, educational fees, room and board and a modest amount for personal expenses. For the 2006-2007 academic year, we estimate the cost will be $42,300. Because the exact cost for tuition and fees is not determined until just before the beginning of the academic year, $42,300 is only a preliminary figure. This minimum allowance may be increased without advance notice.

During the admission process, most international undergraduate students are required to complete the “Financial Statement for Students Seeking Nonimmigrant Status” form certifying that funds are available for twelve months support. 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.

All students need to be aware that there are numerous initial expenses during the first few months, including tuition and fees, an initial down payment for housing, food and personal expenses. We suggest that you have a minimum of $7,000 available for immediate 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 don't submit a Cancellation/Withdrawal form, you will be liable for fees according to university policy (below). No exceptions will be made to this policy.

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 41.

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 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 enrolled in classes, you will be dropped from all of your courses automatically when the Cancellation/Withdrawal form is processed. If you enrolled but have not paid fees in full by the tenth day of instruction, your registration will be cancelled for non-payment and you will be officially withdrawn from the university.

Average Student Costs Annually

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fees*</td>
<td>$8,299</td>
</tr>
<tr>
<td>Books and supplies</td>
<td>$1,514</td>
</tr>
<tr>
<td>Housing and Food</td>
<td>$11,239</td>
</tr>
<tr>
<td>Personal expenses</td>
<td>$1,419</td>
</tr>
<tr>
<td>Transportation</td>
<td>$748</td>
</tr>
<tr>
<td><strong>Total</strong> (on-campus residence)</td>
<td>$23,219</td>
</tr>
<tr>
<td><strong>Total</strong> (off-campus residence)</td>
<td>$20,256</td>
</tr>
<tr>
<td>Graduate (single; living off campus)</td>
<td>$24,755</td>
</tr>
<tr>
<td>Graduate School of Management (first/second year)</td>
<td>$39,839</td>
</tr>
<tr>
<td>* Undergraduate fees include a $706 Health Care Allowance. Nonresident Undergraduate fees total $26,984.</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: These costs are accurate as of February 2006; however, they are subject to change when the California State budget passes in July. Students are advised to visit the Financial Aid Web site at http://financialaid.ucdavis.edu for the most current information.
New Undergraduate Students

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

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

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 registration 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 75 in the Academic Information chapter.

Schedule of Refunds

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

The Schedule of Refunds refers to calendar days beginning with the first day of instruction. The number of days elapsed is determined from the date the completed Notice of Cancellation/Withdrawal form is returned to the Office of the University Registrar. Percentages listed (days 1-35) should be applied respectively to University Registration Fee, Educational Fee, Nonresident Tuition and other student fees.

<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>
</tr>
<tr>
<td>8–18 days</td>
<td>50%</td>
</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.

Health Insurance (SHIP) Coverage and Refund of SHIP Fees

If you file a completed Notice of Cancellation/Withdrawal form or PELP form before the quarter begins, your Student Health Insurance Plan (SHIP) coverage will be cancelled as of your status change (first day of the quarter) and your SHIP fee will be fully refunded. If you file your registration status change on or after the first day of the quarter, your SHIP coverage will continue to the end of the quarter and your SHIP fee will not be refunded. SHIP fee refunds will not be granted for retroactive status changes. Note that the first day of the quarter is not the same date as the first day of classes. Refer to the Office of the University Registrar’s academic calendar for applicable dates at http://registrar.ucdavis.edu/html/academic_calendar.html.

Students who go on PELP and who qualify for a SHIP refund may elect to continue their SHIP coverage for one quarter only. You must apply within five business days of your registration status change. For more information, contact Insurance Services at Cowell Student Health Center, (530) 752-6055.

Students who cancel or withdraw their registration and receive a refund of SHIP fees are not eligible to continue SHIP coverage.

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 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. Paper FAFSAs are also available at local high schools, community colleges and the Financial Aid Office. UC Davis students can obtain the FAFSA from the Financial Aid office in December.

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 Finance Policy 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 assigned by the federal processor based on the FAFSA
3. Federal and state grant eligibility based on the FAFSA
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 applications, see Undergraduate Scholarships and Awards, on page 43.

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). Financial need is based on the information provided on the FAFSA and the student is sent a Student Aid Report (SAR) with the Student Contribution (SC) assigned by the federal processor. The SC is subtracted from the UC Davis Student Expense Budget (for the student’s graduate pro-
gram) 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 for Financial Aid concerning units, grade point average and maximum quarters of attendance allowed to obtain a degree. A copy of these standards is available at [http://financialaid.ucdavis.edu/sap.html](http://financialaid.ucdavis.edu/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 least half time 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 Financial Aid Notice (FAN) informs the student of the Pell Grant award amount. All undergraduate financial aid applicants who are California residents are encouraged to apply for a Cal Grant by submitting the FAFSA 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. For more information, see [http://www.csac.ca.gov](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 determined and awarded through their academic programs.

**Bureau of Indian Affairs (BIA) Grants** are awarded to students who are at least one-fourth American Indian, Eskimo or Aleut as recognized by a tribal group served by the Bureau of Indian Affairs and who show financial need. Applicants must submit a Free Application for Federal Student Aid (FAFSA) and provide supporting documents. Students are advised to write to the agency that administers their tribal affairs to request a BIA Higher Education Assistance application. The BIA Financial Aid officer on campus can help complete the application. The amount of BIA grant depends on need and availability of funds at each BIA agency.

**Loans**

Financial Aid almost always includes a long-term loan. 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.

**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)

**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 all applicants regardless of age and dependency status.

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

**Federal Direct Subsidized and Unsubsidized William D. Ford 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.
• Undergraduate students may borrow up to annual maximums of $2,625 for freshmen, $3,500 for sophomores, and $5,500 for juniors and seniors, up to a maximum aggregate indebtedness of $23,000.

• Independent undergraduate students may borrow unsubsidized Direct Loans up to annual maximums of $4,000 for freshmen and sophomores, and $5,000 for juniors and seniors.

• Graduate and professional students with need-based eligibility may borrow up to $8,500 per year in subsidized direct loan, not to exceed a maximum aggregate of $65,500 for combined undergraduate and graduate borrowing.

• Graduate and professional students may borrow unsubsidized Direct Loans up to an annual maximum of $10,000.

• Variable interest rate is adjusted annually, capped at 8.25 percent.

• A 3% loan fee is charged on all Direct Loans. 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. These loans will also be available directly to graduate students beginning in the 2006-2007 year.

• Parents may borrow Direct PLUS up to the cost of education minus other financial aid received during the years the dependent student is an undergraduate.

• The maximum interest rate is 9%. There is no interest subsidy for this loan.

• A 4% loan fee is charged and deducted proportionately from each disbursement.

• Repayment begins within 60 days after loan disbursement.

Short-Term Loans meet temporary or emergency financial needs of registered students. 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: $300 maximum. The maximum repayment period is 30 days.

• Short-Term Loans: $300 maximum; exceptions to the maximum amount can be made if financial aid funds are expected. The maximum repayment period is five months or the end of the academic year.

• Assistant Loans: graduate students who are in the teaching assistant, research assistant, readership, associate-instructor or post-graduate 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.

Federal Work-Study

Student Employment Center
1210 Dutton Hall
(530) 752-0520; sec@ucdavis.edu; http://jobs.ucdavis.edu

Undergraduate Work-Study

The Federal Work-Study program allows students to earn part of their financial aid through part-time employment. To participate, students must file a Free Application for Federal Student Aid (FAFSA) and receive Work-Study as a part of their financial aid package. 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. The Student Employment Center coordinates the Federal Work-Study program 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.

Graduate Work-Study

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 and have financial need to be considered for Work-Study funding.

Undergraduate Scholarships and Awards

Undergraduate Scholarship Office:
Dutton Hall
(530) 752-2804; ugscholofc@ucdavis.edu; http://financialaid.ucdavis.edu/schol.htm

Mailing address:
Undergraduate Scholarship Office
University of California
One Shields Avenue
Davis, CA 95616-8696

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 students and faculty choose scholarship recipients. 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 geographic 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 for the fall quarter are considered for scholarships using the same forms completed for admission purposes. Winter and spring quarter admission applicants should contact the Scholarship Office for instructions no later than November 1. The undergraduate scholarship application for continuing students becomes available online in October and is due in early December. See the Scholarship Office Web site for
instructions and the application. Scholarship recipients will be notified beginning in April.

Graduate students are also eligible for various scholarships and fellowships; see the Graduate Studies chapter.

**Regents Scholarships** are 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.

- Dollar amounts vary, but the stipend may cover up to the full cost of attendance for California residents
- 2-year and 4-year renewable scholarships

**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.

- $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. Free scholarship search services are available through our Web site.

- Generally $300 to $4,500

**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
LIVING AT DAVIS

ON-CAMPUS HOUSING

Residence Halls

Student Housing Office
(530) 752-2033; studenthousing@ucdavis.edu

Living on campus adds a measure of convenience to your life and helps familiarize you with the campus. Some 4,500 undergraduate students live on campus each year, including about 90 percent of freshman students. In each of the residence hall complexes, students and staff help create and maintain an environment conducive to personal growth and educational achievement.

Rooms are furnished with a bed and mattress, desk and chair, bookcase, chest of drawers, study lamp and wastebasket for each resident. Cost depends on room occupancy (single, double or triple) and which of the eight meal plans you choose. Rates for the next academic year have not yet been formally approved.

All new freshmen whose Statements of Intent to Register (SIR) are received on time are guaranteed residence hall housing as long as they complete all of the instructions that accompany their contracts and return the materials and reservation fee by the due date. Freshmen housing contract offers will be mailed out between May 3 and May 19. Student Housing has designated three hundred spaces in Castilian Hall for transfer students. Transfer students that have submitted their Statement of Intent to Register will be offered a housing contract beginning the week of April 3. Once the designated transfer student housing offers are filled, subsequent transfer student housing contract offers will be made on a space available basis. Student Housing information is included with your admissions packet. If you have a special need, such as a medical condition, disability, dietary requirement, or circumstance that requires special accommodation, or consideration, please send a detailed letter of explanation to Student Housing, 160 Student Housing One Shields Avenue, University of California, Davis, CA 95616-8712, once you have submitted your housing contract.

Student Housing

Orchard Park/Solano Park Apartments
(530) 752-2033

Orchard Park and Solano Park Apartments offer 476 university-operated, unfurnished on-campus apartments located in serene park surroundings for UC Davis students with children.

- Orchard Park; two-bedroom unfurnished apartments
- Solano Park; one-and two-bedroom unfurnished apartments

New rates subject to approval by the UC Regents will be available in mid-May. The new rates will be listed at http://housing.ucdavis.edu/parks. Once approved, they will be effective starting August 1. While our first priority is to house students with children, Student Housing supports the University’s commitment to provide on-campus housing to graduate students. Our waiting list is prioritized as follows: students with children; married or domestic partnership students, graduate students; undergraduate students. Vacancies in Orchard Park/Solano Park Apartments are filled from a waiting list based on the date the application is received. For a fall assignment, you should apply at least six to nine months in advance. For an assignment during the remainder of the year, the waiting period is usually shorter. You may submit an application before you are admitted to the university. If a member of your family has a physical disability that requires special housing accommodation, please attach a detailed letter of explanation to your application.

Russell Park
(530) 753-7322

Privately owned and managed on-campus living accommodations are available for student families. Russell Park features one-, two- and three-bedroom unfurnished units.

Primero Grove
(530) 754-8455
primero@ucdavis.edu

Privately owned and operated, Primero Grove offers affordable on-campus housing for continuing undergraduate, graduate and professional students. Apartment sizes range from studios through four bedrooms.

Graduate Student Apartment Housing

The Atriums
(530) 753-0659

The Atriums offers on-campus living accommodations for single graduate students. The privately owned and managed apartments feature studio and two-bedroom unfurnished units.

Leadership and Professional Development Program at The Colleges at LaRue
(530) 754-9433
http://thecolleges.ucdavis.edu/

This program is a unique partnership between the University of California, Davis and Tandem Properties. The program fosters intellectual and social growth through student participation in enriched learning experiences centered upon a Leadership and Professional Development theme. Residents of this community focus upon contemporary leadership issues, public policy and service, communication and professional preparation. We provide professional development programs for students to enhance their scholarship, improve communication skills, interact effectively across diverse cultures and be more effective in their employment/academic careers.

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.

TRANSPORTATION AND PARKING

Transportation and Parking Services (TAPS)
Extension Center Drive
(530) 752-8277; http://www.taps.ucdavis.edu
Motorist Assistance Program: (530) 752-8277
Bicycle Program: (530) 752-BIKE

The central campus is closed to motorized 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 and pods. The Bicycle Program rents bicycle lockers on a quarterly or annual basis for...
storage of bicycles only. The ASUCD Bike Barn offers repairs and rentals, and sells used bikes, bicycle parts and accessories. Students can also check out tools to do their own repairs or maintenance.

Parking. If you park a vehicle (including a motorcycle or moped) on campus, you must 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. You may purchase a daily visitor permit at permit dispensers in any visitor parking lot or at Parking Services. Visitor permits are valid in visitor lots and in “C” areas. All other lots require long-term permits, which you may purchase at Parking Services. Parking lots on campus are financed solely by user fees collected from parking permits sales and meter use.

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

Ridesharing. UC Davis encourages ridesharing. Registered carpools and vanpools receive reduced parking rates and preferential parking. For information on transportation alternatives, public transit, or commuter match assistance, call (530) 752-MILE (6453).

Shuttles. The UC Davis/UC Davis Medical Center Shuttle provides hourly service Monday through Friday between the 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 Parking Services or the Cashier’s Office. Departmental business passes are available at Parking Services.

The Intracampus Bus provides transportation between the Davis campus and the Berkeley campus for university employees, registered students and other university affiliates. Call Fleet Services at (530) 752-8287 for schedule information and reservations.

Buses
Unitrans
3 South Hall
(530) 752-BUSS, http://www.unitrans.com

Unitrans, operated entirely by undergraduate students, provides year round public transit service on 13 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 $1.00 cash fare or by purchasing discounted multi-ride passes from TAPS or at the Campus Box Office. Full service is provided each UC Davis school day (Monday through Friday, 7:00 a.m. to 7:30 p.m.) and at nights (Monday through Thursday, 7:30 a.m. to 11:30 p.m.) during the regular school year. Reduced schedule service operates during the summer, finals week, all academic break periods and on Saturdays. Unitrans also operates a shuttle from Amtrak on 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.edu.

STUDENT EMPLOYMENT
Student Employment Center
First Floor,utton Hall
(530) 752-0520, http://jobs.ucdavis.edu

The Student Employment Center advertises student employment opportunities both on and off campus. 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. Full-time, part-time and temporary jobs are available year-round. New listings are posted daily. Listings of employment opportunities for the summer with government agencies, camps and resorts throughout California are located on the Web site. Registered students may access employment opportunities at the Internet address given above and use their student identification number as their password.

CHILD CARE AND FAMILY SERVICES

Human Resources Administration Building
(530) 752-5415; http://www.hr.ucdavis.edu/childcare

Child Care and Family Services is the principal resource on campus for information, referrals, and advising, and serves as the university’s liaison with the on-campus day care centers and City of Davis Child Care Services.

On-Campus Child Care Programs and Resources
• LaRue Park Child Development Center; (530) 753-8716; laruecdc@ucdavis.edu
• Russell Park Child Development Center; (530) 753-2487; russelldc@ucdavis.edu

Privately owned and operated with university oversight, serving infants through kindergarten-age children.

• The Center for Child and Family Studies; (530) 752-2888; A teaching and research laboratory for the Department of Human and Community Development, offers part-time programs for children aged six months to five years. Children are selected from a waiting list according to criteria designed to meet academic goals.

• The UC Davis Breastfeeding Support Program; (530) 752-5415; Provides lactation sites with electric breast pumps, registration and orientation sessions, private consultation, and sales of supplies for mothers who wish to continue breastfeeding their infants after returning to school or work.

• The Women’s Resources and Research Center; (530) 752-3372; Sponsors the Child Emergency Notification Service, which offers schools and child care providers a way to contact student parents in class if their child has a health-related emergency.

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

Posts listings for parents seeking license-exempt providers.

Community Child Care Programs
City of Davis Child Care Services
600 A Street
Davis, CA 95616
(530) 757-3695; http://www.city.davis.ca.us/pcs/childcare

City of Davis Child Care Services maintains information on licensed family child care homes, day care centers, nursery schools, playgroups, support groups and other family-related services for all of Yolo County. Additional services include parenting workshops and handouts; a bi-monthly newsletter; a parenting resource library; and a book, video and toy lending library. The program provides referrals to licensed family child care homes and administers the UC Davis Child Care Subsidy Program and the Child Care Grant, both of which can help low-income families pay for child care. Applications for subsidies are available at the grant office in 600 A Street.
COUNSELING AND HEALTH SERVICES

Counseling And Psychological Services (CAPS)

219 North Hall
(530) 752-0871; http://www.caps.ucdavis.edu

Counseling and Psychological Services (CAPS) offers free, confidential psychological and psychiatric services to all registered students experiencing problems or concerns that affect their academic progress and sense of well-being. Staff members provide short-term individual counseling and group counseling for academic, personal and interpersonal concerns. Students often seek counseling to examine issues such as relationships, family problems, stress, cultural differences, assertiveness, self-esteem, intimacy, depression and anxiety. Additionally, staff can assist with educational concerns such as coping with university life, academic performance, test anxiety and reentry adjustment. Career testing and counseling are available to help students explore and clarify career concerns and options. Services for relationship issues are also offered to students and their partners. Psychiatry services are available to students by referral. Staff can provide assistance with off-campus referrals.

Confidentiality is strictly maintained in accordance with state laws and ethical standards. To use CAPS’ services, students should contact the receptionist for an appointment. Walk-in (emergency) services are available Monday through Friday from 8:00 a.m. - 5:00 p.m. if immediate assistance is needed. Peer counseling services are also available Monday through Friday from 8:00 a.m. - 5:00 p.m. through The House and the Educational Opportunity Programs (EOP) information office.

Students, faculty or staff who are concerned about a student or desire consultation or assistance in making a referral are encouraged to contact CAPS. Parents who are concerned about their UC Davis student’s emotional reactions or behavior can also call CAPS to discuss their concerns.

Cowell Student Health Center

Cowell Student Health Center
(530) 752-2300; http://healthcenter.ucdavis.edu

Cowell Student Health Center is conveniently located on campus and provides UC Davis students with wellness, illness and injury care. Student health services are available to all registered students regardless of insurance coverage. Student fees subsidize the services of Cowell Student Health Center and students pay small fees for most services.

Advice Nurse, Acute Care and After Hours (530) 752-9649.
Services are available for acute medical illness and injury care.
Appointments are not required, but students are encouraged to call the Advice Nurse before coming for care. Patients are seen according to severity and urgency.

Primary Care Clinics & Specialty Clinics (530) 752-2349.
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 dermatology, gynecology, internal medicine, orthopedics, minor surgery, podiatry, neurology and endocrinology.

Other Services. Laboratory, x-ray, pharmacy, physical therapy, massage therapy, acupuncture and dietitian services are also available at Cowell Student Health Center.

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

- If you want to be enrolled in SHIP, you are automatically enrolled—no action is required.
- If you have comparable insurance and do not want to be enrolled in SHIP, you must apply for a SHIP waiver by the published deadlines. If your waiver is approved, your SHIP enrollment will be waived through the end of the academic year. The services at Cowell Student Health Center are available to all students, even if you waive SHIP.

More information can be found at http://healthcenter.ucdavis.edu/insurance or by visiting the Insurance Services office at Cowell Student Health Center (530) 752-6055.

Health Education and Promotion

Cowell Student Health Center, Cowell Annex
(530) 752-9652; http://healthcenter.ucdavis.edu/hep

Health Education and Promotion (HEP) helps you achieve wellness to meet your academic goals through student-centered education and creating health-promoting environments. HEP covers topics such as nutrition, exercise, sexual health, contraception, alcohol, tobacco and other drugs, wellness and stress management. Call or drop by to talk with HEP staff to get your questions answered. HEP also offers educational programs on various college health topics. All services are confidential and provided free of charge to registered students and organizations.

Birth Control Education (530) 752-9652. Birth Control Education (BCE) is provided to individuals or couples, by trained peer health educators. Education sessions help students consider various contraceptive options.

Anonymous HIV Counseling and Antibody Testing Program (530) 754-7000. HEP offers anonymous HIV counseling and antibody testing during the academic year for registered UC Davis students.

Alcohol and Drug Abuse Prevention and Treatment (530) 752-6334. Alcohol and Drug Abuse Prevention and Treatment (ADAPT) provides assessments, education and referrals for students with identified needs related to alcohol or other drug (AOD issues). ADAPT conducts educational programs and one-on-one educational treatment. ADAPT offers Education Groups where students discuss AOD issues, alcohol poisoning, how to help a friend and decision-making skills. This student-led group provides a confidential, safe and nonjudgmental environment. ADAPT also provides trainings on safe party management, how to be a good host and how to help students with addiction issues. For more information on safer partying, see http://safeparty.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. Call for a complete list of programs offered or to schedule a program.

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(530) 754-7000.

Advice Nurse, Acute Care and After Hours (530) 752-9649.

Primary Care Clinics & Specialty Clinics (530) 752-2349.
Student Internships. HEP provides 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. The internship requires a three quarter commitment. Check our Web site in winter quarter regarding internship opportunities.

The House
Temporary Building 16 (two-story house by Student Housing)
(530) 752-2790
The House is a professionally supervised peer counseling program of CAPS. Students receive confidential support, information and referrals regarding personal or social problems. Well-trained student volunteers assist fellow students through individual peer counseling and a wide variety of workshops held in an informal setting. Stress reduction and wellness resources include a meditation room, a video and listening room with relaxation and educational compact discs and an automatic massage chair. No appointment is necessary and services are offered on a drop-in or telephone basis from 8:00 a.m.-5:00 p.m., Monday-Friday, during fall, winter and spring quarters.

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

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

RECREATION
The Department of Campus Recreation
The following facilities are managed through The Department of Campus Recreation:

The University Recreation facilities include:

The ARC
The Pavilion
The Equestrian Center
The Outdoor Center
The Craft Center
Hockey Pool
Recreation Pool
Intramural Fields

The following programs are offered through The Department of Campus Recreation:

Campus Recreation Memberships, Informal Recreation and Fitness & Wellness Programs

The ARC
(530) 752-1730
The ARC information desk is the place to purchase memberships, ask about informal recreational opportunities and sign up for healthy fitness and wellness programs offered through The Department of Campus Recreation. For more information on the above programs, please consult the Web site listed above.

Conferences & Events
The ARC & The Pavilion
The Department of Campus Recreation staff manages all conference and event needs related to the meeting rooms and ballroom located in the Activities and Recreation Center. The Pavilion, formerly called Recreation Hall, is a 150,000 square-foot reservable arena, as well as the home court for UC Davis NCAA Basketball & Volleyball. From concerts to career fairs, it’s the ideal space to host any large event. For more information, please consult The Department of Campus Recreation Web site.

Intramural Sports and Sport Clubs
The ARC
(530) 752-1730
The mission of the Intramural Sports and Sport Club office is to provide the students, faculty and staff of UC Davis the opportunity to participate in a variety of competitive and recreational sports on campus.

The UC Davis Sport Club program promotes student participation in a wide variety of athletic activities, provides opportunity for student competition at various levels of play and fosters the development of student leadership. Sport Clubs are comprised of student, faculty and staff of the University.

Outdoor Adventures
The Barn (on the corner of California and Hutchison)
(530) 752-1995
Outdoor Adventures will help you develop your outdoor skills and plan your outdoor excursion. You can rent equipment of professional quality and arrange for custom-designed trips and group rates. An up-to-date library contains topographic maps, trail guides and other materials. Classes, excursions and clinics in backpacking, rock-climbing, whitewater rafting, sea kayaking, mountaineering, cross-country skiing and other sports are offered. Outdoor Adventurers also offers training classes in wilderness first aid, EMT, CPR and swift water rescue. Outdoor Adventurers Retail Store has items you might need for your next trip.

Equestrian Programs
Garrod Dr. (southwest of Veterinary Medical Teaching Hospital)
(530) 752-2372
The Equestrian Center is open year round, offering trail rides, practice sessions and instruction in both English and Western riding. Group and private lessons are available for beginning through advanced levels, along with training in horse care and stable management. The Equestrian Center sponsors clinics, horse shows, summer youth equestrian camps and special events, and coordinates the Equestrian Club.
Craft Programs

South Silo
(530) 752-1475/1730

The Craft Center is an ideal place to channel your creative energy. Facilities are available on a day or quarter use basis. Ceramics is available for quarter use only. 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.

Aquatics

Recreation Pool, Corner of La Rue Road and Hutchison Drive
(530) 752-2693, (530) 752-1706—Aquatic Director

Located on campus, the Rec Pool's unique organic 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 offers aqua aerobics and swim lessons for all ages. The pool opens for the season in mid-April and closes in mid-October.

Hickey Pool, located in the courtyard of Hickey Gymnasium Building (central campus)
(530) 752-3893, (530) 752-1706—Aquatic Director

Hickey Pool is a seven-lane, 33 and 1/3 yard pool with a moveable bulkhead previously used as the competitive pool on campus, housing six Intercollegiate Athletic teams, physical education classes, Intramural Sports and Club Sports, and University extension classes. With the addition of the new Ted and Rand Schall Aquatic Center, Hickey Pool's schedule now accommodates limited lap swimming hours that vary during the academic year. Entrance is free to currently registered students and at a minimal fee for staff and faculty.

UNIONS

Memorial Union Auxiliary Services
457 Memorial Union, One Shields Ave, Davis CA 95616
(530) 752-2524; http://muauxiliaries.ucdavis.edu

Memorial Union Auxiliary Services manages a number of programs and facilities to serve the campus:

Games Area

Games Area
(located below the UC Davis Bookstore)
(530) 752-2580/1730

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

The Memorial Union (MU)

MU Campus Information Center
(530) 752-2222

The MU complex serves as the community center for the campus. The MU Campus Information Center’s student staff can refer you to people, places, programs and services on and off campus and maintains an up-to-date database of 1,000 on and off campus organizations. The complex houses the UC Davis Corral gift shop, Coffee House, MU II Conference Center, Campus Box Office (where you can purchase tickets for campus events), Campus Events and Services (CES) and the MU Business Office.

Freeborn Hall, a 1,250-seat assembly hall in the MU complex, is used for performing arts, dances, banquets, lectures and conferences.

The Memorial Union operates several facilities that can be rented for group gatherings. With its wood-paneled interior and ceiling-high windows, Rec Pool Lodge is an ideal location for meetings, lectures or dances. The covered patio surrounding the lodge offers a shaded environment for outside dining during the warm weather. Putah Creek Lodge, secluded in the Arboretum, provides a relaxing atmosphere for lectures, banquets, weddings or dances. The spacious lawn surrounding the lodge is suitable for volleyball and games, receptions, and picnics. The lodge has kitchens and outdoor barbecues.

Silo Union

The Silo Union houses food services, meeting/conference facilities, lounges and the campus pub. In the South Silo are the ASUCD Experimental College, (530) 752-2568; Student Special Services (530) 752-2007; Graduate Student Association, (530) 752-6108; and a branch of the Bookstore serving the School of Law (530) 752-2961. To reserve space in the Silo, call Campus Events and Information at (530) 752-2813.

THE UC DAVIS ACTIVITIES AND RECREATION CENTER (ARC)

(530) 752-6071; http://arc.ucdavis.edu

The Activities and Recreation Center (ARC) hosts many recreational activities for UC Davis students, faculty and staff. The building itself has 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, student lounges with computer terminals and wireless access points, a large ballroom, and small conferencing center. Food service is provided in the lobby area along with a pro shop. The building is separated into three distinct areas: the controlled area, the conferencing/union 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 and staff members can purchase membership to the ARC for an annual or monthly fee. The conferencing/union area is open-use and 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 (formally 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 ARC can be found by visiting the ARC Web site, calling the number listed or by stopping by the information desk located in the lobby area.
UC DAVIS INTRAMURAL SPORTS AND SPORT CLUBS

UC Davis Activities and Recreation Center (ARC)  
(530) 752-3500; http://imsports.ucdavis.edu

The UC Davis Intramural Sports and Sport Club Program offers over 30 different Intramural Sports activities ranging from the traditional team sports like football, basketball and soccer to individual or duel sports such as racquetball, table tennis and golf. Additionally, we offer some non-traditional activities like inner tube water polo, floor hockey and Quickball (our version of Wiffleball). All UC Davis students are eligible to participate in intramural activities. The majority of our activities are free; however there are a few sports that require an entry fee for participation. Each club is formed, developed, directed and controlled by its members within University guidelines. Stop by the office or check our Web site for a complete list of clubs.

INTERCOLLEGIATE ATHLETICS

264 Hickey Gymnasium  
(530) 752-1111

Although Intercollegiate Athletics at UC Davis benefits the campus by fostering school spirit, its primary role is to provide personal development opportunities for as many student-athlete participants as facilities and resources permit. Currently, the program consists of varsity teams in 12 men’s sports and 14 women’s sports. UC Davis is in the transition process from NCAA Division II to Division I and will become an active member of Division I effective 2007-08. A majority of the varsity sports will compete in the Big West Conference. Approximately 775 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

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

The Mondavi Center brings a wide variety of world-class performing artists to UC Davis to serve the campus and surrounding communities. During the academic year, Mondavi Center offers concerts and recitals by classical, jazz and folk music artists; drama; classical and modern dance; and lectures by eminent public figures. Tickets for events may be purchased at the Mondavi Center Ticket Office at (530) 754-ARTS or toll free at (866) 754-ARTS.

Music

Department of Music  
(530) 752-5337; http://music.ucdavis.edu

The Department of Music sponsors the UC Davis Symphony Orchestra, Chorus and Chamber Singers, Early Music Ensemble, Gospel Choir, Concert Band and Wind Ensemble, Jazz Band 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.

Dramatic Art and Dance

Department of Theatre and Dance  
(530) 752-0888; http://theatredance.ucdavis.edu

The Department of Theatre and Dance has one of the finest theater 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, the Granada Artists-in-Residence program (which brings a major director, choreographer or playwright to the department each quarter), Shakespeare's Globe, London, exchange program, and graduate students working on Master of Fine Arts degrees in acting, directing, choreography or design, and Ph.D. degrees in 20th Century Performance and Culture, all of whom contribute to the fine quality of UC Davis drama and dance productions.

Each year’s schedule includes undergraduate festivals in theatre, dance and film; opportunities to work with professional directors and choreographers in three main stage productions; and performance projects and established scripts developed by M.F.A. students. These productions take place on our proscenium (Main), thrust (Wyatt), black box (Arena), performance studio (University Club) stages as well as in the Mondavi Center’s 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

Memorial Union Art Gallery

Second floor of the MU; (530) 752-2885

The Memorial Union Art Gallery features a changing series of contemporary and historical art exhibits throughout the academic year. Works by professional artists as well as students are on display for periods of approximately six weeks. The gallery sponsors print sales, special programs and lectures, and offers internships for those interested in career work in an art gallery or museum.

Design Museum

First floor, Walker Hall; (530) 752-6150; http://designmuseum.ucdavis.edu

The Design Museum is known for its exhibits of national and international design-related material. These world-class theme exhibitions are available to the campus community and surrounding region. Changing installations of architecture, interiors, graphic design, costumes, textiles, folk art, and popular culture reflect the curriculum of the Design program and the multi-faceted nature of design. Through exhibitions and accompanying curator lectures, the Design Museum introduces visitors to the breadth of design found in technological societies and in third world cultures.

Richard L. Nelson Gallery

First floor, Art Building; (530) 752-8500

The Richard L. Nelson Gallery, named in honor of the first chair of the Department of Art, organizes regularly changing exhibitions of historical and contemporary works of art. The gallery’s program reflects and complements the teaching program of the Department...
of Art and brings art to the university community and the Northern California area at large.

**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 Davis campus's 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. There are approximately three shows per quarter.

**C.N. Gorman Museum**

1316 Hart Hall; (530) 752-6567; [http://gormanmuseum.ucdavis.edu](http://gormanmuseum.ucdavis.edu)

Monday-Friday 12-5

The C.N. Gorman Museum is committed to exhibiting contemporary artworks by leading Native American artists from throughout North America, as well as Indigenous artists globally. Established in 1973, the museum is named after Carl Nelson Gorman, a Navajo artist, World War II code talker and one of the founders of the Department of Native American Studies.

### 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 $9 million used to enhance the student experience. Graduate and law students also have access to all ASUCD commercial activities. Funds allocated to ASUCD provide activities and services that make life as a student a little easier, less expensive or just more fun.

ASUCD operates more than 40 activities, including the Unitrans bus system, The California Aggie newspaper, the Bike Barn repair services, travel service, free legal advice for undergraduate students, The Aggie Student Store, Campus Copies, Classical Notes, Project Compost, Cal Aggie Camp, Book Exchange, 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. Radio KDVS stereo 90.3 FM, the student-run campus radio station, broadcasts at 5,000 watts. Other ASUCD activities include Housing Viewpoint, Homecoming, 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 their Web site [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 federal form of government, the 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 you serve year-long terms with election 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.
- **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 (the regents, UC Office of the President, City Council, etc.).
- **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 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://chancellor.ucdavis.edu/aac/default.htm

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 athletics, childcare, disability issues, 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 the Graduate School of Management. Services include new student orientation, legal service, fax service, travel awards, newsletters and assorted social events. Other professional students are eligible to join GSA by paying a fee.

GSA General Assembly representatives are designated by other students in 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.

STUDENT ORGANIZATIONS

Student Programs and Activities Center (SPAC)

Student Programs and Activities Center (SPAC)
4th floor, Memorial Union
(530) 752-2027; http://spac.ucdavis.edu

More than 450 student organizations are registered at UC Davis. They consist of cultural, social, religious, political, ethnic, academic, international, recreational, performing and service groups, who provide students and the entire campus with important educational experiences. The Student Programs and Activities Center (SPAC) registers these diverse groups and provides educational programs, advising and support for activities, event planning, leadership development, conflict resolution, resources and campus policies.

In addition, SPAC administers a number of campus programs including the Activities Faire, Club Finance Council, Danzantes del Alma folklorico dance troupe, campus service awards and acts as liaison to fraternities and sororities. Anyone interested in participating in student organizations or becoming involved in unique activities is encouraged to visit the SPAC office.

Cultural Days is a series of annual programs celebrating the diverse ethnic cultures of the university community. Programs include Asian Pacific Culture Week, Black Family Week, La Raza Cultural Days and Native American Culture Days. Everyone is invited to share in these programs featuring speakers, workshops, films, entertainment and family events.

The Student Recruitment and Retention Center, located at 16 South Hall, is a student-run program serving traditionally under-represented students. Programs include Southeast Asians Furthering Education (SAFE); (BRIDGE) Filipino Outreach and Retention; American Indians for Recruitment and Retention (Ne’ Ue); African Americans and Africans Cultivating Education (ACE); Outreach and Retention; Yik’al Kuyum—The Chicano and Latino Holistic Student Support Program; and Graduate Academic Achievement and Advocacy Program (GAAAP). These programs provide outreach to high schools and community colleges and provide tutoring and study halls to current students.

The Cal Aggie Marching Band Uh! entertains spectators at athletic, campus and community events. As one of the few student-run bands in the nation, the band has a style and personality indicative of UC Davis.

Cal Aggie Student Alumni Association (SAA)

Cal Aggie Student Alumni Association (SAA)
Walter A. Buehler Alumni and Visitors Center
(530) 752-0115 or (530) 752-0286; http://www.alumni.ucdavis.edu

All UC Davis students are encouraged and welcome to become SAA members. SAA follows the mission of “advancing student-alumni relations” by building community between past and present Aggies, providing student leadership opportunities, upholding Aggie traditions and offering benefits and services. Programs include Aggie Diner, Take an Aggie to Lunch, Take an Aggie to Work, alumni panels, Distinctly Davis Tours, Aggie Welcome events, Pajamarino and community service opportunities. You may join SAA any time during the academic year; the annual membership cost is $20 and includes 10 percent off UC Davis imprinted merchandise at the UC Davis Bookstore, a 10 percent discount at Watermelon Music, 15 percent off at Woodstock’s Pizza, access to our Aggie Flower Club and $100 off Kaplan test prep, just to name a few.
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 in 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.

COLLEGE ADVISING

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 bachelor’s, and limited and regular status.
- Advice and action on petitions.
- Other services including college English requirement check, release of holds on registration packets and final evaluation for graduation.

Associate Dean of Undergraduate Academic Programs

Diane Ullman, 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 64, in the Academic Information chapter.

College of Biological Sciences

Dean’s Office
202 Life Sciences Addition
(530) 752-0410; http://biosci.ucdavis.edu/

The Associate Dean and staff in the Dean’s office offer complete academic advising services for students working on a major administered by the College of Biological Sciences. We advise on 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 office is also 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 one of the advisers in the Dean’s office.

Advising for the Major. Students who declare or intend to declare majors in Biochemistry and Molecular Biology; Cell Biology; Evolution, Ecology and Biodiversity; Exercise Biology; Genetics; Microbiology; Neurobiology, Physiology, and Behavior; or Plant Biology should contact the specific section office for academic advising services, where both faculty and staff advisers are available.

Students who declare or intend to declare a major in Biological Sciences or students who are in the Undeclared-Life Sciences program should consult with the staff in the Dean's office for program planning and major requirements.

Peer Advisers. Peer advisers are available in each section office. Biological Sciences houses its peer advisers in the Dean’s Office.

College of Engineering

Undergraduate Advising Office
1050 Kemper Hall
(530) 752-1979

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 and degree certifications.

Advising. Before you register for courses for your first quarter, you should consult with your departmental staff adviser, whose name and office hours you can obtain at the department office. The departmental staff adviser is aware of the requirements for your major and can assist you with planning your program.

Mandatory Advising. The College has implemented a mandatory advising system through the online registration system. 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 Hold; H-N = Winter Hold; O-Z = Spring Hold). Students are notified of the hold by checking SISWEB 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 from registering for future quarters. If you meet with your adviser during this quarter and have your hold released, there will be no difficulties with subsequent registration. You have approximately four months to clear an advising hold. For more information on mandatory advising, call the Undergraduate Advising office at (530) 752-1979.
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
Office of the Deans/Undergraduate Education and Advising Office
200 Social Sciences and Humanities Building
(530) 752-0392; http://www.ls.ucdavis.edu/Students
The deans 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. The office also provides a number of additional services:

• Determines how your transfer credits from other institutions apply towards completion of breadth and unit requirements for the bachelor's degree. Applicability of transfer credit toward the major is determined by your major faculty adviser.
• Provides degree checks to identify remaining 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.

Faculty Advisers. New students are assigned to a faculty adviser during their first term of enrollment. If you indicated an interest in a particular program on your application, your adviser will be a faculty member associated with that major. If you change your major, you will be reassigned.

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. If you did not indicate an initial commitment to a particular major program on your application, you will participate in the Academic Options Program, which provides academic advising to lower division students. You will be assisted by an advising team available at sites in each of the university residence hall complexes. Students living off campus may contact the Letters and Science Advising Office for advising assistance prior to declaring a major.

Advising Checkpoints. 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 135 units of degree credit, including transfer work, you may pick up Degree Check materials from the Letters and Science Advising Office and consult your adviser concerning course selection and satisfaction of requirements in the major.

• Before you complete 195 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.

ADvising SERVICES
South Hall
1st floor, South Hall
(530) 752-3000; http://advisingservices.ucdavis.edu

Academic Peer Advising (APA) places peer advisors in over 50 departments to help students find the answers to their questions about major requirements, courses and university regulations. The academic peer adviser complements faculty advising by providing a student perspective on the department. The Academic Peer Advising staff is trained to provide information and assistance about graduate schools, career opportunities and college requirements.

Health Sciences Advising is an important resource if you are preparing for a profession in the health sciences. Staff and student advisers can provide information on requirements, application procedures, professional school curricula and related options. The Pre-Health Professions Advisory Committee (PHPAC) file service is a system of compiling academic and personal information, and coordinates letters of recommendation for students who plan to apply to dental, medical, optometry and dental schools.

Orientation and Summer Advising coordinates the Summer Advising Program, fall quarter Orientation activities and other student assistance and orientation programs for new students. 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.
Pre-Graduate School Advising assists students interested in M.A., M.B.A., Ph.D. or teaching credential programs. Services include help in locating graduate school programs in specific fields, completing application forms and statements of purpose, and planning financial options. This unit also coordinates the MUARLS and the Undergraduate Research Conference, an annual event open to all undergraduate UC Davis researchers. The Graduate Letter Service (GLS) is a system that compiles letters of recommendation for students who plan to attend graduate programs (master’s, Ph.D.), business schools and law schools.

Pre-Law Advising offers help with admission requirements and program planning to students interested in the legal profession. You can learn about preparing for law school and a legal career through the many seminars and workshops held each year.

Health Sciences Advising is an important resource if you are preparing for a profession in the health sciences. Staff and student advisers can provide information on requirements, application procedures, professional school curricula and related options.

The Career and Graduate Study Resource Center, 114 South Hall, is an extensive reference library managed by Advising Services and the Internship and Career Center. Resources include numerous graduate and professional school catalogs and program directories, admission test materials, fellowship directories, videotapes, and books and journals related to health education. Also available are job listings, general career information materials and information about companies who recruit at UC Davis. Several personal computers are available to search the Internet for information on graduate and professional study and job opportunities.

The First Resort, (530) 752-2807, has drop-in peer advising resources for all students to assist with registration procedures, course selection, choosing a major or other general advising questions. The student advisers here can either answer your questions or put you in contact with others who can. The staff can give you advice and assistance from the point of view of someone who has “been there.” Peer advisers from The First Resort are also part of an extensive network of academic support services available to first-year students living in the campus residence halls. The First Resort maintains a referral service, a listing of courses of 1 to 3 units and other valuable resources. These peer advisers also serve as a First Resort for transfer students and can assist with transfer student services. If you have a problem, remember—start with The First Resort.

Transfer Student Services, (530) 752-2200, helps students who have transferred from other institutions of higher education, coordinating transfer student matters among existing student services units to aid in an easy and smooth transfer to the university. It also sponsors special receptions and workshops for new transfers and annually publishes an online Transfer Guide of available campus services.

Veterans Affairs, (530) 752-2020, assists veterans, dependents and reservists with a number of services, including certifying course attendance to the Department of Veterans Affairs, coordinating a tutorial assistance program, providing advice and support, and helping with educational fee waivers, work study and financial aid concerns. To initiate a benefit claim, write or drop by with your letter of admission.

South Silo

Reentry Student Services, (530) 752-2005, helps students who have returned to the university after several years of life and work experience. The office provides information, orientation and peer support, and provides referral assistance through the Reentry Resource Network. The office sponsors an annual Reentry Day for prospective reentry students on the last Saturday in February.

Student Disability Center, (530) 752-3184 (voice) or (530) 752-6833 (TTY); http://sdc.ucdavis.edu, provides services to students with disabilities who are eligible for reasonable accommodation under Section 504 of the Rehabilitation Act, the Americans with Disabilities Act or state law. The staff of Disability Specialists assists students with disabilities in identifying accommodations that will ensure the student has equal access to educational opportunities at UC Davis. For information about SDC services, please call us or see our Web site.

The Leading Roles Program coordinates several campus-wide student leadership development initiatives and provides information on academic, co-curricular and employment opportunities that promote the attainment of leadership skills and knowledge. Among the offerings are a summer leadership institute, an Academic Theme Program in the residence halls and various workshops and campus events that aid students in developing their leadership skills.

Educational Opportunity Program (EOP)

228 North Hall
(530) 752-3472

The Educational Opportunity Program serves students by assisting them with their academic, social and personal adjustments to the university environment; coordinates EOP new student orientation programs; and serves as liaison to staff, faculty and administrators. The office’s diverse peer staff is particularly sensitive to differing social, cultural and ethnic concerns. Students interested in pursuing a career in the helping professions can receive training and experience through the Peer Advising Counselor training program.

EOP Information Office services are also accessible at various locations on campus, such as the Colleges of Agricultural and Environmental Sciences, Letters and Science and Engineering; Learning Skills Center; The Cross Cultural Center; and all ethnic studies departments. You are invited to telephone or stop by the EOP Information Office on the second floor of North Hall or at any of the outreach locations to find out more about the peer support services.

STUDENT CONDUCT AND GRIEVANCES

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

The Office of Student Judicial Affairs (SJA) is charged with administering the student discipline system. SJA supports campus standards by resolving alleged violations of university policies or campus regulations. The office also coordinates the informal student grievance resolution process and provides information and assistance about how to file formal complaints of alleged unfair policies or practices, arbitrary treatment, and prohibited discrimination or harassment (based on sex, race, religion, disability, etc.). The office can 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 consistent with the university's function as an educational institution. 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. Rules concerning student conduct, student organizations, use of university facilities and related matters are set forth in both University policies and campus regulations; they apply to on-campus and University-related conduct or activities, and also to certain off-campus behavior.

Standards for student conduct are included in the UC Davis Code of Academic Conduct, the Student Activities Handbook, the Guide to Residence Hall Life and the University of California Policies Applying to Campus Activities, Organizations and Students. The operation of the campus student disciplinary system is outlined in the publication, the Administration of Student Discipline. These policies and regulations are available on the Internet. For assistance, contact SJA.

Misconduct for which students are subject to discipline includes, but is not limited to, plagiarism, cheating, or other dishonest or unfair academic misconduct; furnishing false information to the university; sexual or other physical assault; threats of violence or conduct that threatens health and safety; misuse of university property or resources, including electronic communications; possession of weapons; harassment, including stalking and sexual harassment; forger; theft; vandalism; possession, use, distribution or sale of drugs or alcohol that is illegal or against University policy; hazing; obstruction or disruption of university activities or functions; and alteration or misuse of university documents, records, keys or identification.

Disciplinary sanctions that may be imposed range from censure to dismissal from the university and may include restitution and/or disciplinary sanctions that may be imposed range from censure to dismissal from the university and may include restitution and/or compensation. The operation of the campus student disciplinary system is outlined in the publication, the Administration of Student Discipline. These policies and regulations are available on the Internet. For assistance, contact SJA.

Disciplinary sanctions that may be imposed range from censure to dismissal from the university and may include restitution and/or disciplinary sanctions that may be imposed range from censure to dismissal from the university and may include restitution and/or those that threaten health and safety; misuse of university property or resources, including electronic communications; possession of weapons; harassment, including stalking and sexual harassment; forgeries; theft; vandalism; possession, use, distribution or sale of drugs or alcohol that is illegal or against University policy; hazing; obstruction or disruption of university activities or functions; and alteration or misuse of university documents, records, keys or identification.

Disciplinary sanctions that may be imposed range from censure to dismissal from the university and may include restitution and/or disciplinary sanctions that may be imposed range from censure to dismissal from the university and may include restitution and/or those that threaten health and safety; misuse of university property or resources, including electronic communications; possession of weapons; harassment, including stalking and sexual harassment; forgeries; theft; vandalism; possession, use, distribution or sale of drugs or alcohol that is illegal or against University policy; hazing; obstruction or disruption of university activities or functions; and alteration or misuse of university documents, records, keys or identification.

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Those that threaten health and safety; misuse of university property or resources, including electronic communications; possession of weapons; harassment, including stalking and sexual harassment; forgeries; theft; vandalism; possession, use, distribution or sale of drugs or alcohol that is illegal or against University policy; hazing; obstruction or disruption of university activities or functions; and alteration or misuse of university documents, records, keys or identification.

Those that threaten health and safety; misuse of university property or resources, including electronic communications; possession of weapons; harassment, including stalking and sexual harassment; forgeries; theft; vandalism; possession, use, distribution or sale of drugs or alcohol that is illegal or against University policy; hazing; obstruction or disruption of university activities or functions; and alteration or misuse of university documents, records, keys or identification.

Those that threaten health and safety; misuse of university property or resources, including electronic communications; possession of weapons; harassment, including stalking and sexual harassment; forgeries; theft; vandalism; possession, use, distribution or sale of drugs or alcohol that is illegal or against University policy; hazing; obstruction or disruption of university activities or functions; and alteration or misuse of university documents, records, keys or identification.
Committee on Student-Faculty Relationships

Academic Senate Office
303 Voorhies Hall
(530) 752-2231

If students with a grievance feel they cannot get satisfaction through normal procedures, they may contact the Committee on Student-Faculty Relationships for assistance. The committee is advisory and can make recommendations to the office having authority to resolve the problem. The chair and/or other designate may also meet informally with the students involved with the grievance.

TUTORING AND LEARNING RESOURCES

EOP Services

Learning Skills Center
2205 Dutton Hall
(330) 752-2013

The Learning Skills Center offers pre- and co-classes in mathematics and physics for EOP students. Pre-classes help prepare EOP students for the regular university class they usually take the following quarter. Co-classes provide supplementary instruction for EOP students enrolled in the regular class. The LSC offers pre-classes for Mathematics 16A, 21A and Physics 9A. The LSC 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.

Tutoring is a free service available to students. If you are having difficulty with your course work or just want to improve your grades, the Learning Skills Center offers tutoring in many course areas. Tutoring is provided in pre-arranged groups and one-to-one and on a drop-in basis. The tutoring program is staffed by students carefully selected for both their knowledge of course content and their sensitivity to the needs of students being tutored.

Learning Skills Center
2205 Dutton Hall
(330) 752-2013

At the Learning Skills 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, time-management and test-taking skills and test anxiety reduction.

Learning specialists can help you individually, in small groups, or you may participate in workshops covering specific areas of study. A Learning Resource room is available that provides subject tapes, instructional materials, reference books and preparation exams for a variety of tests such as the GRE, MCAT and LSAT. Most materials may be checked out.

Undergraduate tutors offer group and individual sessions on a pre-arranged and drop-in basis. Come in and ask about our services, which are free to all UC Davis students.

Special Transitional Enrichment Program

Learning Skills Center
2205 Dutton Hall
(330) 752-2013

Freshman EOP students are invited to participate in the Special Transitional Enrichment Program (STEP). The program begins in the summer and continues through the first two academic years, offering preparatory course work, developing academic skills and providing 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.

Learning Resource Centers

Student Housing
(530) 754-6258

Learning Resource Centers are located in the Segundo, Tercero and Cuarto residence hall areas. They provide residents with a variety of academic resources in close proximity to their living areas. Technical resources include PCs with direct Internet connections and contemporary software titles, printers, scanners, CD ROM drives, and headsets which students can use to listen to online lessons for their foreign language courses. Other resources include dictionaries, thesauri, writing reference guides, digital encyclopedias and areas for group study. In addition to these resources the helpful LRC staff offer free tutoring on all computer software used in the centers.

INTERNSHIPS AND CAREER SERVICES

Internship Programs

The Internship and Career Center
2nd and 3rd floors, South Hall; Buehler Alumni and Visitors Center
(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)
2nd and 3rd floors, South Hall; Buehler Alumni and Visitors Center
(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. If you are considering dropping out of the university for a term or longer, an adviser can also give you information about internships and employment opportunities.

The Career and Graduate Study Resource Room (1st floor, South Hall) contains materials that can help you learn how your major field of study can be translated into job opportunities and data concerning types of employment graduates have obtained. Useful to job-seekers—and available free of charge—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’s Career Recruiting Programs, located in the Buehler Alumni and Visitors Center, maintains job vacancy listings, arranges employment interviews and schedules on-campus recruiting by employers.
Graduate Student and Postdoctoral Career Services

The Internship and Career Center
3rd floor, South Hall
(530) 752-7841

Any student enrolled in the teaching credential program or pursuing a master's or doctoral degree in order to teach should register with the Educational Placement Office.

Services include teaching job vacancy listings, placement files (professional dossiers), special workshops on writing teaching resumes and curriculum vitae, on preparing for interviews and individual advising.

Advisers maintain contact with school district personnel and work with undergraduate students to explore teaching through internships. The office sponsors the Graduate Career Options Program for advanced degree candidates originally planning a teaching career and now considering other career options.

Human Corps Program

The Internship and Career Center
2nd floor, South Hall
(530) 752-3813

Human Corps is the student community services program at UC Davis. Public service work can be a rewarding and satisfying experience that may also improve your qualifications for the job market. Community service may or may not be compensated through wages, academic credit or transcript notation and can vary from a one-day activity to a long-term commitment. The Human Corps is a referral center for students who want to perform community service and as a resource for agencies and campus units with service opportunities. The office has a database and directories with information about nonprofit agencies in California, community service opportunities throughout the world and employment in the nonprofit or public sectors after graduation. This office also coordinates the AmeriCorps Bonner Leaders Program at UC Davis.

ACADEMIC RESOURCES

Education Abroad Center

207 Third Street, Suite 130
(530) 297-4633; Fax (530) 758-8472;
http://eac.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. The reasons for studying abroad include the desire to see the world, to learn a language, to prepare for a job in the global economy and to have an academic experience that will add distinction to an application for graduate or professional school.

The Education Abroad Center (EAC) 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 (freshman through senior year). The EAC advisers also have information about financial aid, fellowships and which programs have internship possibilities.

The EAC is home to the University of California Education Abroad Program, to UC Davis Quarter Abroad and to UC Davis Summer Abroad.

Freshman Seminar Program

17 Wellman
(530) 752-3249; http://trc.ucdavis.edu/trc

The UC Davis Freshman 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 freshman seminars emphasize student participation, providing intense intellectual exchange among students and between student and teacher.

STUDENT RESOURCE AND INFORMATION CENTERS

Campus Violence Prevention Program

Police / TAPS Building
200 Dairy Road Bikeway
(530) 752-3299; jmbeeman@ucdavis.edu

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 service as a resource for information regarding sexual assault, intimate partner violence, stalking and bias related crime; and to collaborate with other campus units and community agencies to provide a safer campus community and a concerted integrated efforts.

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.

Cross-Cultural Center

Steven Baissa, Director
Corner of East Quad and Shields Avenue
(530) 752-4287; jmbeeman@ucdavis.edu

The mission of the Cross-Cultural Center Department, comprising both the Cross-Cultural Center (CCC) and the Lesbian, Gay, Bisexual, Transgender Resource Center (LGBTRC), 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.
Lesbian, Gay, Bisexual and Transgender Resource Center

Sheri Atkinson, Director
University House Annex
(530) 752-2452; http://lgbtcenter.ucdavis.edu

The LGBT 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 and transgender students, staff, faculty, their family and friends and the entire campus community. The LGBT Resource Center offers a library of over 1,100 books, most of which can be borrowed for 2 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 LGBT Resource Center is open Monday–Friday, 10 a.m.–5 p.m.

Services for International Students and Scholars (SISS)

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 each week. Students and scholars should report to SISS as soon as possible after arriving in Davis.

Women’s Resources and Research Center (WRRC)

North Hall, First Floor
(530) 752-3372; Fax (530) 752-0222; http://wrrc.ucdavis.edu

The Women’s Resources and Research Center (WRRC) educates the campus community about women’s issues and concerns, promotes an understanding of the role and impact of gender in our lives and in our society, helps women of diverse backgrounds achieve their intellectual, professional, and personal goals, and advocates for women’s full inclusion, equality and advancement.

The WRRC’s staff can answer questions, locate resources and help you with personal, academic or work-related concerns. Services and resources include lectures, workshops and forums; a library staffed by a full-time librarian; resource listings of campus and community services such as health care, counseling, child care, women’s organizations and legal resources; child emergency notification service for student parents; and specialized programs, discussion groups and individualized consultation for faculty and graduate students on research, academic, career and personal topics.
REGISTRATION AT UC DAVIS

REGISTRATION

Office of the University Registrar
12 Mrak Hall
(330) 752-2973; http://registrar.ucdavis.edu

Registration is the way you become a student at the university. Every UC Davis student must register each quarter. Registration includes enrolling in classes, paying fees and other financial obligations, filing your current address with the Office of the University Registrar, and completing and filing other forms.

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

- Have a student ID card produced; consult the appropriate quarter Class Schedule and Registration Guide (CSRG) for times and locations.
- Submit a Statement of Legal Residence; see the Appendix.
- Return the completed Medical History form, evidence of rubella and hepatitis B immunity, results of a tuberculin skin test and the Insurance Information Request form. These forms are mailed to each new student by the Student Health Center.

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

Change of Name. Petitions to change your name on official university records can be obtained from the Office of the University Registrar. (Students planning to graduate should file this petition no later than the 5th week of the quarter in which they intend to graduate.)

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 of $50.00 to defray the extra clerical 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 the registration fee must be paid with cash, cashier's check, credit union check or fee credit.

ENROLLING IN COURSES

SISWeb Web Registration. Students enroll in courses by using SISWeb on the Internet; see http://sisweb.ucdavis.edu.

The Class Schedule and Registration Guide, available one week before the start of registration for the quarter, explains registration procedures, gives class meeting times and locations, and provides updated information on fees and registration.

The Schedule of Classes, an open-courses list and other registration information is 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 study list. You are responsible for completing each of the courses. View your study list (class schedule) using SISWeb.

Adding and Dropping Courses

You can adjust your schedule by adding or dropping courses until the deadlines published in the CSRG.

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 a $3.00 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.

The CSRG for each quarter lists the add and drop deadlines and explains how to use SISWeb to adjust your schedule and what add/drop procedures and fees apply after the published deadlines. The academic calendar in the front of this catalog also lists the course add and drop deadlines.

Late Drop

To drop a course after the deadline (but before the day of the scheduled final examination), 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 $3.00 fee applies to late drops. Permission to drop courses after the deadline may be granted only in exceptional circumstances.

Late Add

To add a course after the deadline (but before the day of the scheduled final examination), you need approval of the department. A $3.00 fee applies to late adds.

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. Petitions are subject to approval by the Grade Change Committee of the Davis Division Academic Senate. Petitions 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. The instructor's signature is required on the petition. A $3.00 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 Grade Change Committee of the Davis Division Academic Senate.

Petitions for retroactive adds 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. The petition must be supported by the instructor's signed approval, together with a statement from the instructor.
indicating knowledge of the student's participation and performance during the presentation of the course in question and the instructor's understanding as to the reason for the student's failure to add the course before the end of the quarter. A course grade must be assigned by the instructor. A $3.00 fee is applicable on all retroactive adds.

**COURSE LOAD**

**Expected Progress.** 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 academic standing 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. Please refer to the Probation and Dismissal: Quantitative Standards section, on page page 71, for more information.

**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 for insurance and financial aid purposes.

**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 in order to be certified as full-time students for insurance and financial aid purposes.

**Course Load Limits in the College of Engineering.** Because of the large number of units in engineering programs, many students must take more than 15 units per quarter 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. You must file for part-time status each quarter. 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 status. Undergraduate petitions are available at the Office of the University Registrar and require approval by the University Registrar. Graduate petitions are available at Graduate Studies and approved by the Dean of Graduate Studies. 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 10.

**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 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 a student's registration if he/she is still undeclared after completing 90 units. Students can obtain a Change of Major petition from the Dean's office or the Office of the University Registrar or dean's office Web site. 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 Dean's Office. 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 2.00 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. Their freedom to change majors thereafter may be limited. Requirements for changing to a College of Engineering major vary by major and can be found at http://engineering.ucdavis.edu 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 deans' office. Petitions can be obtained from faculty advisers, department offices or the Office of the University Registrar Web site. 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 dean 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, as well as a C average in the upper division courses you have taken toward the major. With the approval of the College Executive Committee, additional requirements, such as completion of a par-
ticular 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. 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 2.00.

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). 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. The above provisions may not apply to students in the College of Engineering, whose freedom to change majors is limited. Requirements for changing to a College of Engineering major vary by major and can be found at http://engineering.ucdavis.edu or by contacting the Undergraduate Advising Office (530) 752-1979.

Change of Major Accompanied by Change of College

A change petition, available at the dean's office and Office of the University Registrar, must be endorsed by a faculty adviser of the new major you are selecting and signed by the dean of the college from which you wish to transfer. In addition, admission to the new college will require that dean's approval. To obtain that approval, you must be in good academic standing, meet all minimum GPA criteria, including those for the major, and satisfy any other admission requirements established by the new college.

College of Biological Sciences. Students who wish to change their major and college 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 vary by major and can be found at http://engineering.ucdavis.edu or by contacting the Undergraduate Advising Office (530) 752-1979.

Multiple Majors

College of Agricultural and Environmental Sciences. A student choosing to major in multiple majors must petition the depart-
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.

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 dean's 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 and at least two upper division courses in each major must have been successfully completed.

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 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. Cross-college programs will not be approved if the majors involved are available within a single college as well. For example, cross-college programs between the colleges of Letters and Science and Agricultural and Environmental Sciences will not be approved if one of the majors is biochemistry and molecular biology; biological sciences; cell biology; evolution and ecology; genetics; microbiology; neurobiology; physiology; and behavior; or plant biology.

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 must be filed in the Undergraduate Advising Office and is subject to approval. 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 approval. Submit the proposed program to the committee prior to reaching 90 units, or by the fourth full week of the fifth quarter before graduation, whichever is earlier. If you wish to undertake an individual major, request the appropriate forms from your dean's office. Program requirements are outlined under Individual Major, on page 310. The College of Engineering does not offer an individual major.

The Minor

If you are interested in two or more areas of study, you should consider completing one or more minor programs. Minor program requirements are listed in the chapter of this catalog under the department that offers them. You will find a complete list of the minors offered at UC Davis under Minor Programs Offered by UC Davis, on page 12.

A minor consists of 18 to 24 units in upper division courses specified by the department or program offering the minor. Courses used to satisfy the requirements of a minor, including those completed elsewhere, must be approved by an adviser in the sponsoring 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 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 section or curriculum committee in charge of the student’s major.

To request certification of a minor, you must have a grade point average of 2.00 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, these 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 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.** There is one minor program in the College of Engineering. Information about the minor in Computational Applied Science can be obtained by contacting the Undergraduate Adviser in the Department of Applied Science (530) 754-8858

Students in Engineering may, with the approval of the Engineering dean’s office and the adviser in the minor department, elect a minor in the College of Letters and Science, the College of Biological Sciences, the College of Agricultural and Environmental Sciences, or the Graduate School of Management. You must file a petition for your minor which is available on the College of Engineering Web site, http://engineering.ucdavis.edu. 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.

**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 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 by a fee of $5.00, 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 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. The final 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.

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 and Outreach Services 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 2.00 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.
Summer Sessions

207 3rd Street Suite 220
Davis, CA 95616-8715
(530) 757-3305
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.

Summer Sessions offers more than 700 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 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 Programs that either occur off-campus or take place outside the normal six-week terms.

Summer session dates are listed in the Academic Calendar, on page 1 Academic Calendar, on page 1, at http://summer-sessions.ucdavis.edu and in the Class Schedule and Registration Guide (CSRG).

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 service counter at 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/open-campus

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 available in the Open Campus brochure—obtained online, by mail or from the UC Davis Extension office. Students may apply credit for courses taken in the Open Campus (Concurrent) program towards the 180-unit undergraduate degree requirement. 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 adult continuing education in numerous professional and academic fields. Details on the courses available from Extension may be obtained by visiting the Extension Web site, calling or coming to the Extension office. Students enrolled at UC Davis who wish to use UC Davis Extension courses other than Open Campus (Concurrent) towards degree requirements must obtain written approval from the dean's office of their college before enrolling in the Extension courses. Upon approval students may apply a limited number of credits towards the 180-unit undergraduate 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 as published in the Class Schedule and Registration Guide (CSRG). 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 Class Schedule and Registration Guide (CSRG) lists the regulations and times that final examinations are to be held. These are set up according to the day-and-hour periods in which the classes are given during the quarter. This information is available in the CSRG each term so that you can avoid final examination conflicts. A student who has multiple exams on the same day may discuss the situation with the instructors of the courses. Students are responsible for ensuring they do not have conflicting exams. There is no regulation mandating a change.

Requirements. Except under certain specified circumstances, Academic Senate Regulations require that final examinations be given in all undergraduate courses. Final examinations may be given in graduate courses. Exceptions to the regulation would be independent study courses, courses that consist of laboratory work only and courses in which the examination has been waived.

At the instructor's option, the final examination in any course other than an on-line course may be wholly or in part of the take-home type. All examinations for on-line courses must be proctored to ensure that the person taking the examination is the stu-
dent 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 Class Schedule and Registration Guide (CSRG).

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 a 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.

GRADERS

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:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grade Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A++</td>
<td>4.000</td>
</tr>
<tr>
<td>A+</td>
<td>4.000</td>
</tr>
<tr>
<td>A</td>
<td>3.700</td>
</tr>
<tr>
<td>A–</td>
<td>3.300</td>
</tr>
<tr>
<td>B+</td>
<td>3.000</td>
</tr>
<tr>
<td>B</td>
<td>2.700</td>
</tr>
<tr>
<td>B–</td>
<td>2.300</td>
</tr>
<tr>
<td>C+</td>
<td>2.000</td>
</tr>
<tr>
<td>C</td>
<td>1.700</td>
</tr>
<tr>
<td>C–</td>
<td>1.300</td>
</tr>
<tr>
<td>IP</td>
<td>n/a</td>
</tr>
<tr>
<td>P/NP</td>
<td>n/a</td>
</tr>
<tr>
<td>S/U</td>
<td>n/a</td>
</tr>
</tbody>
</table>

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, P, 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 71.

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 Davis campus. Consequently, at least two thirds of the units completed in residence at 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 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. Per university regulations, all courses used to fulfill General Education requirements must be taken for a letter grade.

**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. 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 enrolled 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 69.

**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.

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, are automatically granted. 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 this catalog and the Class Schedule and Registration Guide (CSRG), 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/NC grading basis. (Courses in which a grade of NP was received may be repeated on a P/NC 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, F or NP 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. Departments may restrict the repetition of a course if it is a prerequisite to a course the student has already completed 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; see http://sisweb.ucdavis.edu.

**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 that office for $6.00 a copy. Application for a transcript of record should be made at least two weeks in advance of the time needed. For more information, see the University Registrar Web page at http://registrar.ucdavis.edu.

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 or
- 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, or
- The student's grade point average is less than 1.500 for all
A student will be placed on probation or subject to disqualification 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 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 and 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 13 units per 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 probation or subject to disqualification, for either qualitative or quantitative reasons, the official transcript will state “not in good standing.” Once a student has met qualitative and 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 Davis campus. Should a former Davis student later wish to be readmitted to the 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 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**

**Scholarships**

1100 Dutton Hall
(530) 752-2804; http://financialaid.ucdavis.edu

By mail:
Scholarship Office
University of California
One Shields Avenue
Davis, CA 95616-8696

Students with outstanding academic records who show promise of continued scholarly achievement are encouraged to apply for scholarship recognition and awards. Awards include a financial honorarium or stipend.

**Deans’ Honors Lists**

According to 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 outside deans’ offices or on the dean’s office Web sites and a notation of these honors will be placed on each...
honors with the bachelor’s degree if more than eight units of grade 
Thesis was completed. Graduating students will not be awarded 
student's official transcript indicating that the 194H Honors 
ments for graduation with high honors or highest honors on the 
manship Program is 
ents in the major 
ents for graduation 
orders and highest honors at graduation.

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 addi-
tional criteria be met for high and highest honors; see the table 

<table>
<thead>
<tr>
<th>Total Quarter Units Completed at UC</th>
<th>Highest Honors</th>
<th>High Honors</th>
<th>Honors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-89</td>
<td>2%</td>
<td>next 2%</td>
<td>next 4%</td>
<td>8%</td>
</tr>
<tr>
<td>90-134</td>
<td>3%</td>
<td>next 3%</td>
<td>next 6%</td>
<td>12%</td>
</tr>
<tr>
<td>135+</td>
<td>4%</td>
<td>next 4%</td>
<td>next 8%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Grade point averages from the winter quarter prior to graduation 
are used to determine the averages that will earn an honors desig-
nation. Following are the averages for winter quarter 2006. These 
averages will be used through winter 2007.

<table>
<thead>
<tr>
<th>Percent Determining Cut-Off Point</th>
<th>Agricultural and Environmental Sciences</th>
<th>Engineering</th>
<th>Letters and Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>2%</td>
<td>3.908</td>
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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 require-
ment 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 Col-
lege of Letters and Science, may be recommended by their depart-
ments 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. A notation shall appear on 
the student’s official transcript indicating that the 194H Honors 
Thesis was completed. 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 
Honors may consider exceptions to this condition. Petitions for 
this purpose should be submitted to the deans' 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 sig-
nificantly beyond that defined by the normal curriculum. It repre-
sents 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 pro-
gram consists of a project whose specific nature is determined by 
consultation with the student's major adviser. It may involve com-
pletion 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.

Davis Honors Challenge

The Davis Honors Challenge (DHC) is a campuswide program for 
highly motivated students who are interested in enhancing their 
education through special courses, closer contact with faculty and 
dynamic interaction with academic peers.

DHC courses are limited in size so that participants receive sub-
stantial individual attention from faculty. In return, students are 
expected to participate actively in analyzing real world problems. 
Honors courses and small honors sections of regular courses also 
encourage individual student participation and self-challenge. Stu-
dents satisfactorily completing the program will receive transcript 
notation for each academic year of participation.

First- and second-year students take two honors courses and one 
problem-oriented interdisciplinary seminar per academic year. 
Second-year students have the option to substitute an honors con-
tract for an honors course. Third-year students are required to 
complete two honors contracts and one upper division honors 
seminar, a team-based project in conjunction with an outside 
interested party. Fourth-year students participate in a year-long 
team project to identify real world problems, apply research, criti-
cal thinking, problem-solving and communication skills to 
develop viable solutions for their outside party.

Other components of the DHC include honors living learning 
communities, a mentorship program and a service learning pro-
gram. Each of these programs is designed to enhance students' col-
lege experience.

Entering first-year students who file a “Statement of Intent to Reg-
ister” at UC Davis will be mailed detailed information about the 
DHC application process. Continuing students may obtain infor-
mation and an application from the DHC office after the start of 
spring quarter.

Integrated Studies Honors Program

The Integrated Studies Honors Program is a campuswide, invita-
tional, first-year residential honors program, now in its fourth 
decade. The Integrated Studies Honors Program offers specially 
designed, interdisciplinary honors courses that satisfy General 
Education requirements. Approximately 110 students live in an 
Academic Residential Community on campus and take three lim-
ited-enrollment honors courses (open only to Integrated Studies 
Honors Program students) and two seminars.

Holders of Regents Scholarships, the university’s most prestigious 
 journalistic awards, are guaranteed places in the Integrated Studies 
Honors Program. Other highly qualified students are also invited 
to participate and are selected to create a balanced community of 
students from all four undergraduate colleges.
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 or winter quarter 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. For additional information regarding college awards, please contact the Dean's Office.

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. The Zuhair Munir Award is given to the student who has submitted the year's best engineering doctoral dissertation. Established in 1999, the award honors former Dean of the College, Zuhair Munir, who led the UC Davis College of Engineering from 2000 to 2002 and acted as its Associate Dean for Graduate Studies for 20 years. More than 25 faculty, staff and friends of the College of Engineering contribute to this endowed fund.

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 graduating 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 award recognizes students who have distinguished themselves through their excellence in and contribution to undergraduate research and encourages others to become involved in these types of efforts. Recipients of the award receive a certificate of commendation and inscribed plaque from the Chancellor of the university.

In conjunction with the Chancellor's Award, Professor Dean Simon of UC Davis' Department of Psychology established an endowment for funding a cash prize for each year's student recipient. A research award is also given to a faculty mentor along with a certificate of commendations.

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)
- Delta Phi Alpha (German)
- Gamma Sigma Delta (College of Agricultural and Environmental Sciences; College of Biological Sciences)
- Golden Key (All colleges and schools)
- Kappa Omicron Nu (Family and Consumer Sciences)
- 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 the quarterly Class Schedule and Registration Guide (CSRQ).

Students in the College of Agricultural and Environmental Sciences must have their Major Certification form 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.
Students in the College of Engineering must register at the College of Engineering Web site (http://engineering.ucdavis.edu) in addition to filing with the Office of the University Registrar (http://registrar.ucdavis.edu). See the College of Engineering Web site or call the Undergraduate Advising Office at (530) 752-1979 for Engineering filing deadlines.

**Leave of Absence: Planned Educational Leave Program (PELP)**

The Planned Educational Leave Program allows any registered student-undergraduate or graduate-to temporarily suspend academic work at UC Davis. Undergraduates may take one such leave during their academic career at UC Davis and 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. 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 refund of fees paid, 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 of $60 is charged to your account when you enroll in the PELP program. This fee is identical to that paid by a student who withdraws and is required to pay a readmission fee upon return. After filing your PELP form, you must file an exit form with Student Accounting.

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.

Readmission is guaranteed assuming you resume academic work by enrolling in courses, satisfying any holds that may have been placed on your registration and paying your registration fees by the established deadlines for the quarter specified for return on your approved PELP application. Students who do not return by the specified quarter will be automatically withdrawn from the university.

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 purchase a health care card from the Student Health Service and may retain library privileges by purchasing a library card. 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**

Withdrawals may be granted by the university for emergency reasons or for good cause. Petitions for withdrawal (Notice of Cancellation/Withdrawal) are available at the Office of the University Registrar. A percentage of fees paid may be refunded, in accordance with 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 withdrawal form is filed with the Office of the University Registrar. After filing your withdrawal form, you must then file an exit form with Student Accounting to complete your withdrawal.

If you are receiving financial aid, you must report your change of status immediately, in person or by mail, to the Financial Aid and Student Accounting Offices. If you are receiving veterans benefits, you must also report your withdrawal to the Veterans Affairs Office.

**Retroactive Withdrawals.** Petitions for retroactive withdrawals may be obtained from the Office of the University Registrar. 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.
UNDERGRADUATE EDUCATION
UNDERGRADUATE EDUCATION

Students may choose from over 150 major programs and more than 90 minor programs in a wide variety of disciplines offered by the four undergraduate colleges.

COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES

Office of the Dean
150 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 collegewide degree programs and two collegewide 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 Management and Rangeland Resources, B.S.
- Animal Biology, B.S.
- Animal Science, B.S.
- Avian Sciences, B.S.
- Biotechnology, B.S.
- Crop Science and Management, B.S.
- Entomology, B.S.
- Plant Biology, B.S.
- Viticulture and Enology, B.S.

Minors:
- Agricultural Entomology and Bee Biology (Entomology)
- Applied Computing and Information Systems (Agronomy)
- Animal Biology (Animal Science)
- Animal Genetics (Animal Science)
- Apicultural Entomology (Entomology)
- Aquaculture (Animal Science)
- Avian Sciences
- Dairy/Livestock (Animal Science)
- Entomology
- Environmental Horticulture
- Fungal Biology and Ecology (Plant Pathology)
- Insect Biology (Entomology)
- Insect Ecology and Evolution (Entomology)
- 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:
- Atmospheric Science, B.S.
- Environmental and Resource Sciences, B.S.
- Environmental Biology and Management, B.S.
- Environmental Horticulture and Urban Forestry, B.S.
- Environmental Policy Analysis and Planning, B.S.
- Environmental Toxicology, B.S.
- Hydrology, B.S.
- Landscape Architecture, B.S.
- Soil and Water Science, 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 (Environmental Horticulture)
- Soil Science (Land, Air, and Water Resources)

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:
- 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.
- 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

**Collegewide Programs**

The collegewide 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. Collegewide 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.
- International Agricultural Development, B.S.

**Minors:**
- International Agricultural Development
- Science and Society

**Non-degree programs:**
- Undeclared/Exploratory
- Science and Society

**COLLEGE OF BIOLOGICAL SCIENCES**

Dean's Office
202 Life Sciences Addition
(530) 752-0410; http://biosci.ucdavis.edu/

The College of Biological Sciences administers undergraduate programs in fundamental aspects of biology. The college is organized into five sections that represent major themes of modern biology: Evolution and Ecology; Microbiology; Molecular and Cellular Biology; Neurobiology; Physiology, and Behavior; and Plant Biology. The individual sections offer a total of eight specialized majors, 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 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 and Ecology; Marine Biology; Microbiology; Molecular and Cellular Biology; Neurobiology; Physiology, and Behavior; and Plant Biology.

**Major:**
- Biological Sciences, A.B., B.S.

**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.

**Microbiology**

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 Section 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 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, B.S.
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 Davis before declaring a major may be admitted to the college through the Undeclared—Life Sciences program. These students use the College of Biological Sciences Dean's Office for their advising center. Students in this program must declare a major before completing 90 units.

Bodega Marine Laboratory Program

http://bml.ucdavis.edu/

A full quarter of undergraduate course work in marine biology is available each spring quarter at the Bodega Marine Laboratory (BML) located in Bodega Bay, CA. 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 120, 120P, 122, 122P, 123; Neurobiology, Physiology, and Behavior 141, 141P). 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. This is a 15-unit program. Course offerings and instructors may vary from year to year. Additional information is available 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

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.

Sixteen undergraduate engineering curricula, including three formal combined major programs, are offered. Each of these is a four-year program leading to the degree of Bachelor of Science. Eleven programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), the nationally recognized accrediting body for engineering curricula: Aeronautical Science and Engineering, Biological Systems Engineering, Biochemical Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Computer Science and Engineering, Electrical Engineering, Electrical Engi-
neering/Materials Science and Engineering, Materials Science and Engineering, and Mechanical Engineering.

**Minor Programs.** The College of Engineering currently offers one minor program in Computational Applied Science.

## The Undergraduate Programs

### Applied Science

The Department of Applied Science offers two majors, one in Optical Science and Engineering and one in Computational Applied Science. The objective of the Optical Science and Engineering program is to provide a basic education in the fundamental principles of optics combined with key courses in physics, mathematics and the engineering applications of optics. There is a rapidly growing national demand for engineers educated in optical science and engineering. Much of the high-technology infrastructure is based upon optics and its applications, the most prominent being optical digital information transmission. In addition, engineers trained in optical science and engineering are in strong demand in health care and life science, optical sensing for environmental and weather applications, energy-use reduction, commercial camera and space-program optical applications, and national defense applications. Computational Applied Science deals with the interplay between the mathematics of models that arise from physical science and engineering and the numerical techniques for their computational implementation and subsequent solution. The major provides a comprehensive background in mathematics and physical science. The specific objective of the major is to enable students to construct practical numerical solutions to problems in science and engineering. Strong components of the program are the development, analysis and integration of numerical algorithms and an appreciation for the interaction among numerical simulations, theoretical models and experiments.

**Majors:**
- Computational Applied Science, B.S.
- Optical Science and Engineering, B.S.

### 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.

**Majors:**
- Biological Systems Engineering, B.S.

### Biomedical Engineering

The Department of Biomedical Engineering advances fundamental medical concepts; creates knowledge from the molecular to the organ systems levels; and develops innovative biologics, 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.

### Chemical Engineering and Materials Science

The Department of Chemical Engineering and Materials Science offers five majors, including two combined 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.
- Chemical Engineering/Materials Science and Engineering, B.S.
- Materials Science and Engineering, B.S.
- Electrical Engineering/Materials Science and Engineering, B.S.

### 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.

**Majors:**
- Civil Engineering, B.S.

### 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, phys-
ics, 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. The major requires more humanities and social science electives than other college majors, in order to produce the verbal skills and intellectual breadth demanded by today's employers.

**Major: Computer Science and Engineering, B.S.**

**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.

**Mechanical and Aeronautical Science Engineering**

Aeronautical 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:**
- Aeronautical Science and Engineering, B.S.
- Mechanical Engineering, B.S.
- Mechanical Engineering/Materials Science and 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.letters.ucdavis.edu](http://www.letters.ucdavis.edu)

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 collegewide 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 20 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.
- Nature and Culture, 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
Undergraduate Education

Chicana/Chicano Studies
Chinese
Classical Civilization
Comparative Literature
Dramatic Art
English
Film Studies
French
German
Global and International Studies
Greek
Italian
Japanese
Latin
Medieval and Early Modern Studies
Music
Native American Studies
Nature and Culture
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 ten 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.
- Chemistry, A.B., B.S.
- Computer Science, B.S.
- Geology, A.B., B.S.
- Mathematical and Scientific Computation, B.S.
- Mathematics, A.B., B.S.
- Natural Sciences, B.S.
- Physics, A.B., B.S.
- Statistics, A.B., B.S.

Minors:
- Chemistry
- Computer Science
- Environmental Geology
- Geology
- Geophysics
- Mathematics
- 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 more than a 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.
- 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
- Communication
- East Asian Studies
- Economics
- History
- History and Philosophy of Science
- Jewish Studies
- Latin American and Hemispheric Studies
- Linguistics
- Middle East/South Asia Studies
- Philosophy
- Political Science
- Psychology
- Sociology
- War-Peace Studies

Collegewide 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, on page 83. The four groups are:

- University requirements, which apply to all colleges;
- General Education requirement, which applies to all colleges;
- College requirements; and
- Major requirements.

Every student is responsible for seeing that all of their degree requirements are fulfilled.

Detailed information on university requirements, the General Education requirement and college requirements can be found in this chapter.

Bachelor’s Degree Requirements

<table>
<thead>
<tr>
<th>University Requirements</th>
<th>General Education Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>All students must fulfill the following University of California requirements:</td>
<td>Students must complete three courses in the two areas of topical breadth outside the assigned area of their major. Students also must complete three writing experience courses and one social-cultural diversity course.</td>
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<tr>
<td>Entry-Level Writing Requirement</td>
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<tr>
<td>American History and Institutions Requirement</td>
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<tr>
<td>Unit Requirement</td>
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<tr>
<td>Residence Requirement</td>
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<tr>
<td>Scholarship Requirement</td>
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College Requirements

<table>
<thead>
<tr>
<th>College of Agricultural and Environmental Sciences</th>
<th>College of Biological Sciences</th>
<th>College of Engineering</th>
<th>College of Letters and Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Residence Scholarship English Composition Foreign Language (only A.B. &amp; B.A.S. degrees) Breadth (only A.B. &amp; B.A.S. degrees)</td>
<td>Unit Residence Scholarship English Composition Design Engineering General Education Current Catalog Curriculum</td>
<td>Unit Residence Scholarship English Composition Area (Breadth) Foreign Language (A.B. &amp; B.A.S. degrees)</td>
<td></td>
</tr>
</tbody>
</table>

Major Requirements

Course requirements for each major are listed in the Programs and Courses section of this catalog.

UNIVERSITY REQUIREMENTS

All students must fulfill the following University of California requirements:

Entry-Level Writing Requirement

The university requires every undergraduate student to demonstrate college-level proficiency in English composition. Satisfaction of the Entry-Level Writing Requirement is a prerequisite to all other undergraduate courses in English.

The requirement, as determined by Undergraduate Admissions, may be met in one of the following ways:

- By earning a score of 680 or higher on the writing section of the new SAT Reasoning Examination, or on the old SAT-II Writing Test.
- By earning a score of 3, 4 or 5 on either College Board Advanced Placement Examination in English.
- By earning a score of 30 or higher on the Combined English/Writing section of the ACT Assessment.
- By earning a score of 5 or above on the International Baccalaureate's Higher Level English A Examination.
- Enter the university with credentials showing the completion of an acceptable 3 semester-unit or 4 quarter-unit college-level course in English composition with a grade of C or better.
- Write a passing essay on the Analytical Writing Placement Examination. This examination may be taken only once prior to enrollment. It is offered in the spring at local sites throughout California; a student admitted for fall quarter who has not already satisfied the Entry-Level Writing Requirement must take this examination. An out-of-state student or any California freshman admitted after mid-April will take another form of the Analytical Writing Placement Examination, which will be offered on the UC Davis campus during the orientation period each quarter. For the time and location, consult the Class Schedule and Registration Guide (CSRG), published before the beginning of each quarter.

If you have not satisfied the requirement in one of the ways described above, you must enroll in Workload 57 during your first quarter of residence at the university, or as soon thereafter as space is available in the course. Workload 57, offered by Sacramento City College on the Davis campus, counts as 4.5 units on your study list and toward minimum progress but is not transferable as units toward graduation. To satisfy the requirement, students must pass the Analytical Writing Placement Examination offered as the final
examination for Workload 57. Students failing the examination must repeat Workload 57. If the requirement has not been satisfied by the end of your third quarter, and you were not required to take courses for non-native speakers of English in the Linguistics program, you may be disenrolled from the University.

Students whose native and 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 Linguistics and the Entry-Level Writing programs. The results of the Analytical Writing Placement Examination and a special examination in English administered during the orientation period each quarter determine whether a student has met the Entry-Level Writing Requirement or must take specific course work in the Linguistics program. Students held for Linguistics course work have three quarters to meet the Entry-Level Writing Requirement plus the number of quarters required in Linguistics.

**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, 120, 121
  - Asian American Studies 1, 2
  - Economics 111A, 111B
  - Native American Studies 1, 10, 55, 116, 130A, 130B, 130C
  - Political Science 1, 5, 100, 101, 102, 103, 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 Examination in American History or American Government and Politics.

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 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.

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 2.000 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 intellectual growth by providing students with knowledge not only of the content but also of the methodologies of different academic disciplines. It involves students in the learning process by its expectation of considerable writing and class participation. It encourages students to consider the relationships between disciplines.
The GE requirement has three components: **Topical Breadth**, **Social-Cultural Diversity** and **Writing Experience**.

**Topical Breadth**

A GE course in topical breadth addresses broad subject areas that are important to the student's general knowledge. It takes a critical, analytical perspective on knowledge, considering how knowledge has been acquired and the assumptions, theories, or paradigms that guide its use.

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.

**Social-Cultural Diversity**

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.

**Writing Experience**

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.

**Fulfilling the General Education Requirement**

**Topical Breadth Component: 6 courses**

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, refer to the chart at the back of this catalog. 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 your college dean's office.

- **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.

**Social-Cultural Diversity Component: 1 course**

To fulfill the social-cultural diversity component of the GE requirement, you must successfully complete one course from the approved list at the back of this catalog.

**Writing Experience Component: 3 courses**

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.

- **Entry-Level Writing Requirement (formerly Subject A).** You must satisfy the university Entry-Level Writing Requirement 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.

**Fulfilling the General Education Requirement**

<table>
<thead>
<tr>
<th>Student Type</th>
<th>Requirements</th>
</tr>
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<tbody>
<tr>
<td>Freshman student, or Transfer student* who has not completed TCC or IGETC†</td>
<td>6 GE courses in topical breadth—3 courses in each of the two subject areas other than your major's assigned area</td>
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* Transfer work comparable to approved UC Davis GE courses may be used to satisfy the GE requirement, as determined by the college dean's office.

† Transfer Core Curriculum (TCC) or Intersegmental General Education Transfer Curriculum (IGETC); completion must be certified by the community college. College of Engineering students still have General Education requirements to complete.

- **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.
- **A course approved in more than one topical breadth subject area** may only be offered in satisfaction of one of those subject areas.
• 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, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 104A, 104B, 104C, 104D, 104E

Remember: You must satisfy the university Entry-Level Writing Requirement before you take any writing experience course for GE credit.

• 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.

• Approved GE courses. You cannot claim GE credit for any course you completed before it was an approved GE course.

College of Engineering. Students seeking a degree in a College of Engineering major must complete 24 units of general education coursework (33 units are required for Computer Science and Engineering majors) and two upper division courses from the campus approved list of approved courses in Arts and Humanities or Social Science. The list of approved courses appears at the back of this catalog.

GE Exemption

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 “Interssegmental General 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 in the College of Engineering and have satisfied IGETC or TCC, you are still required to complete two upper-division General Education courses at UC Davis to satisfy College of Engineering requirements.

Approved General Education Courses

A list of the courses that provide General Education credit for 2006–07 appears in the back of this catalog. Please note that you cannot claim GE credit for a course you completed before it was an approved GE course. This list is subject to change. For the most current information, you should check the Class Schedule and Registration Guide (CSRG) each quarter.

General Education Theme Options

General Education theme options are sets of GE courses sharing a common intellectual theme. Faculty from the College of Agricultural and Environmental Sciences have 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.

GE Scholars

GE Scholars is a certificate program related to the GE theme options. In addition to completing three approved courses in a GE theme option, students choose a capstone experience (either a seminar course or curriculum related internship) that integrates concepts introduced in the theme courses. Students are awarded a certificate upon completion of their capstone experience. The GE Scholars program allows you to participate in the application of knowledge gained in GE courses, focus your academic experience beyond your major and develop a secondary body of knowledge while working towards completing your GE requirement.

For more information, contact the GE Scholars Project Manager at (530) 752-9710, gamartinez@ucdavis.edu or see http://gescholars.ucdavis.edu.

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 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 UCD students who plan to use academic credit earned in a UC Davis Extension course other than Open Campus (Concurrent) towards their UCD 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 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. 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

The English Composition requirement can be met in one of two ways:

1. Either two courses emphasizing written expression or one course emphasizing written expression and 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, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 104A, 104B, 104C, 104D, 104E, 104F 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);

   OR

2. 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 examination is typically offered on Saturday mornings in mid-October, late January and late April; see the Class Schedule and Registration Guide for specific dates.

There are no examinations given during the summer. Sign-up rosters will be posted on the bulletin board near the main English Department office in 114 Voorhies Hall, Monday until Friday at noon (or until they are filled) just preceding each Saturday examination date. You must sign up, in person, by noon Friday. The English Composition Examination form, available at the UC Davis Bookstore, is required.

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 the section “General Education Theme Options” in the General Education section at the back of this catalog.

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 64.

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 and will notify you with a copy of the Major Certification form.

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 catalog in effect either during the three years immediately preceding your transfer to 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 83 and General Education Requirement, on page 84.

Unit Requirements

Total Units. Complete no less than 180 units incorporating 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 Dean's Office 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.
- 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. Courses numbered 200-299 may only be counted towards the degree with approval of the Dean prior to enrolling in the course. These courses may not be applied toward the 64-unit upper division requirement.
- Professional and teaching courses. Maximum of 9 units in courses numbered 300-399 and 400-499. These courses 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.
- 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, 189, 190C, 191, 192, 192C, 193, 194H, 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, 197T, 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.

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. A list of acceptable courses is available in the Dean's Office.

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 Dean's Office before choosing this option.

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 2 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 as approved by the faculty.*
   - Attain a minimal score 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 faculty.*
• 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. Complete one of the following options:

• At least three upper division courses in the humanities or social sciences, which are not offered in satisfaction of major, college English composition or General Education requirements. Each course must be at least 3 units and may not include internship, research, tutoring, other non-standard courses or directed group study courses.

• At least three lower or upper division courses in the fine arts, which are not offered in satisfaction of major, college English composition or General Education requirements. Each course must be at least 3 units and may not include internship, research, tutoring, other non-standard courses or directed group study courses.

• A certified minor or an additional major in the humanities, social sciences, or fine arts from any UC Davis college or program. Minors and all majors must be completed before accumulating 225 total units.

*Please see the Dean's Office for specific details on these requirements.

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 with Biological Sciences majors and students who are Undeclared—Life Sciences use the College of Biological Sciences Dean’s Office for advising on their program. All other students who are enrolled in a major administered by the College of Biological Sciences should see the master or staff adviser in the section office that houses their major, as listed in the catalog. All students, regardless of their college affiliation, working on a major administered by the College of Biological Sciences should obtain university, general education, college and other non-major academic advising from the College of Biological Sciences Dean’s Office.

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 an academic adviser at two points in their academic careers:

• Before accumulating 90 units.
• Before accumulating 135 units.

• In addition, if a student is taking courses which, if passed, will cause his/her unit total to exceed 200 units and the student intends to register for the next quarter, the student must file a plan with his/her adviser that leads to graduation within 225 units. If the plan anticipates registering after he/she has accumulated 225 units, the plan must be submitted to the Dean for approval.

A hold may be placed on your registration if you do not meet any of these advising requirements.

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 84 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, and were matriculated to a regular quarter prior to Fall 2006, you may follow the requirements as stated in any UC Davis catalog in effect either during the three years immediately preceding your transfer to 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

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 where the catalog specifically indicates otherwise). Detailed requirements for the approved curricula are given in the Undergraduate 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, from 180 to 195. 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, which are available in the Undergraduate Advising Office, can be a valuable aid in resolving individual program conflicts or other special problems. Such petitions are subject to approval by the Committee on Student Petitions, a body of eight faculty members and non-voting staff advisers and student representatives. A negative decision by the committee may be appealed to the Executive Committee of the College for action at a regular meeting.

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 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.


California Community college students should consider a Transfer Admission Agreement (TAA), 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 TAA program, see your community college counselor or consult http://why.ucdavis.edu.

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 admission, you will be classified as having upper division status, but you will be obligated to complete all lower division course requirements for your major before your lower division requirements are considered complete. You may, however, start your upper division coursework while completing your lower division requirements provided you meet all prerequisites for the upper division courses.

The College of Engineering does NOT recommend completion of the IGETC (IGETC).

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 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. Open Campus is not available to students that have been enrolled at UC Davis within the last 12 months and not graduated, unless an exception letter is provided to Extension by the dean of the student’s college.

Credit for UC Davis Extension Courses. Registered UCD students who plan to use academic credit earned in a UC Davis Extension courses other than Open Campus (Concurrent) towards their UCD 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 requirement.

Residence Requirement

In addition to fulfilling the university residence requirement, you must complete at least 33 of the final 45 units characteristic of your curriculum in engineering while registered in the College.

Scholarship Requirement

In addition to meeting the university scholarship requirement, you are required to maintain a 2.000 grade point average for all course work within Engineering.

English Composition Requirement; Upper Division

The upper division composition requirement can be satisfied by passing the Upper-Division English Composition exam or through an approved upper-division writing course when a student has satisfied the lower-division writing requirement and has 70 or more units. Consult your program's degree requirements for the list of courses approved for your major.

The Upper-Division Composition Examination is administered through the College of Letters and Science. It is typically offered on Saturday mornings in mid-October, late January and late April. See the Class Schedule and Registration Guide for specific dates. Registration for the exam is done on-line (http://writingprogram.ucdavis.edu) beginning the Monday before each exam date until Friday at noon or until the exam slots are filled. You must obtain the English Composition Examination form, available at the UC Davis Bookstore, to take the exam. (Units of credit are not given for passing this examination.) This requirement is in addition to the expository writing course requirement (English 3; Comparative Literature 1, 2, 3 or 4; Native American Studies 5; or University Writing Program 1).

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 curricula 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 curriculum: General Education, technical and unrestricted. Some transfer students have an additional set of electives; Physical and Biological Sciences electives.

**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 will need to take a minimum of 24 units of credit in meeting the General Education requirement (or 33 units for majors in Computer Science and Engineering).

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 electives.

In addition, to ensure that your GE program has a degree of depth and coherence, you must take at least two Arts and Humanities or Social Science topical breadth courses that are upper division 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.

**Technical electives.** Technical electives permit you to tailor a program to your own academic and career objectives. For some, technical electives offer the opportunity to prepare for a specific occupation. For others, they offer an opportunity to broaden a background in the sciences and engineering. You may receive technical elective credit up to a maximum of 6 units for any combination of engineering courses numbered 190C, 192, 198, and 199. (You should note that academic credit for 199 courses is limited to a maximum of 5 units for each substantially different project). Academic credit for engineering internship courses (192) is limited to a maximum of 5 units per quarter. (Individual departments may allow fewer units.) With the exception of the following courses, upper-division courses in chemistry, engineering, mathematics, physics, and statistics may be taken as technical electives.

The courses which may not be used are:
- Chemistry 194HA, 194HB, 194HC, 195, 197, 198, 199
- Engineering Computer Science 188
- Engineering 191
- Engineering 198: Gearing Up for Grad School
- Engineering 160 (restricted to one unit of technical elective)
- Mathematics 192, 194, 197TC, 198, 199
- Physics 137, 160 (both are restricted to one unit of technical elective), 194HA, 194HB, 195, 197T, 198, 199
- Statistics 100, 102, 103, 104, 106, 108

In addition to the upper-division chemistry, engineering, mathematics, physics and statistics courses not excepted above, the following courses, when not used to satisfy other degree requirements, may be taken as technical electives.

- Agricultural Management and Rangeland Resources: any upper division course except 120 and 190 through 199
- Animal Biology 102, 103
- Animal Genetics 101, 105, 107, 111, 120
- Animal Science 103, 104, 105, 106, 115, 118, 119, 120, 120L, 123, 124, 125, 126, 127, 128, 129 131,136, 137, 140, 142, 143, 144, 145, 146, 147, 149, 149L
- Applied Biomedical Systems Technology 101, 110L, 121, 142, 161, 163, 165, 175, 180, 182, 185
- Atmospheric Science 110, 111, 115, 116, 120, 121A, 121B, 124, 128, 133, 149, 150, 158, 160
- Avian Sciences 100, 103, 115, 121, 123, 149, 150, 160, 170
- Biological Sciences 1A, 1B, 1C, 101, 101D, 102, 103, 104, 120, 120P, 122, 122P, 132
- Chemistry 2B, 2BH, 2C, 2CH, 8A, 8B
- Economics 100, 101, 102, 103, 122, 140
- Engineering 17, 35
- Entomology 100, 100L, 101, 102, 103, 104, 107, 109, 110, 116, 117, 119, 123, 135, 153, 156, 156L
- Environmental Horticulture 100, 102, 105, 120, 125, 129, 130, 133, 144, 145, 150, 160
- Environmental and Resource Sciences 100, 100L 121, 131, 136, 140, 141, 144, 185, 186, 186L,
- Environmental Toxicology 101, 102A, 102B, 103A, 103B, 111, 120, 127, 128, 131, 135, 138, 146
- Exercise Biology 101, 102, 103, 107, 109, 110, 111, 122, 113, 115, 116, 117, 118, 129, 126
- Fiber and Polymer Science 100, 150, 161, 161L
- Hydrologic Science 110, 115, 122, 122L, 124, 134, 141, 142, 143, 144, 146, 151, 182
- Management 11A, 11B, 100, 120, 140, 150, 160, 170, 180
- Microbiology 102, 102L, 105, 120, 120L, 140, 150, 155L, 160, 162, 170
- Molecular and Cellular Biology 120L, 121, 122, 123, 126, 140L, 142, 143, 144, 145, 150, 150L, 160L, 161, 162, 163, 164
- Nematology 100, 110
- Neurobiology, Physiology, and Behavior, 100 through 169

Physics: Any units from the Physics 9 series not used to satisfy other degree requirements.


Plant Pathology 120, 123, 130, 140, 148, 150, 151A, 151B, 155, 185

Soil Science 100, 102, 105, 107, 109, 111, 112, 118, 120

Wildlife, Fish, and Conservation Biology 100, 101, 101L, 102, 102L, 110, 110L, 111, 111L, 120, 120L, 121, 122, 130, 136, 141, 151, 152, 153, 154, 155, 156, 157, 158

You are urged to discuss the selection of technical elective courses with your academic adviser.

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 in the Undergraduate Advising Office (1050 Kemper Hall). The Undergraduate Advising Office will prepare only one unofficial preliminary degree check for you (preferably at the end of your junior year). You should also file for a follow-up degree check the quarter before you plan to graduate. You can get further information about these services and the forms for requesting a degree check, a follow-up degree check or an exit interview in the Undergraduate Advising Office, 1050 Kemper Hall.

Current Curriculum Requirement

Since engineering is a rapidly developing profession, curricular changes are made by the faculty from year to year. To ensure that you benefit from these changes, the College of Engineering has established a policy that you must fulfill the degree requirements stated in the College of Engineering Bulletin for the year in which you complete degree work or in the Bulletin for the year immediately preceding. The Bulletin is available at the College of Engineering Web site, http://engineering.ucdavis.edu/.

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 normally 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), 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 the Academic Information, on page 62, 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 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 Davis campus. This limitation applies to all Davis undergraduates, including Letters and Science students.
Limitation on Credit for University Extension Courses. Students may apply credit earned through UC Davis Extension courses towards the 180-unit requirement only with written approval from the dean prior to registration. The degree credit allowed by the dean for UC Davis Extension courses with designators other than “XD” or “XDC” is usually less than the unit value listed in the course description. Additional limitations on UC Davis Extension 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. Beginning in Fall 2003, grade points earned when enrolled in Open Campus (concurrent) courses through UC Davis Extension will count toward the calculation of a student’s UC GPA upon his/her admission or readmission to regular student status at UC Davis.

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, 141, 142, 143, 144, 145, 146, 147, 154 (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 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 averages 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 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
   a. One course from English 3, Comparative Literature 1, 2, 3, 4, Native American Studies 5, or University Writing Program 1, 18, 19;
   and
   b. University Writing Program 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 104A, 104B, 104C, 104D, 104E, or 104F; 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, 18, 19, 101, 104A, 104B, 104C, 104D, 104E, 104F, will be accepted toward satisfaction of the English Composition requirement. Note that University Writing Program 101 and 104A, 104B, 104C, 104D, 104E and 104F 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 University Writing Program 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 104A, 104B, 104C, 104D, 104E or 104F at UC Davis.

English Composition Examination. The no-fee examination is typically offered on a Saturday morning in October, January and April; see the Class Schedule and Registration Guide for specific dates.

Students are advised to complete this requirement in their junior year. Sign-up for the English Composition Examination at http://writingprogram.ucdavis.edu/compexam/ from the Monday before the exam date until Friday at noon or until the sign-up sheets are filled. The English 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 Subject A Office (530) 752-0450 at least two weeks prior to the exam date to arrange accommodations. There are no examinations given during the summer.

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 and, in the case of the A.B. degree, provides students the opportunity to become acquainted with performance in the fine arts.

A.B. Degree. Satisfaction of the campus General Education requirement plus completion of one of the following options:

a. A “Mini Minor” consisting of a minimum of three approved upper division courses in a single Letters and Science department or program other than the major (and which are not offered in satisfaction of major requirements);

OR

b. A minimum of three approved lower or upper division courses in Art, Music, or Dramatic Art from outside the student’s major;
OR

c. A certified minor from any UC Davis college or program.

The Letters and Science faculty believes that the completion of a certified minor is often the best way for a student to obtain structure and coherence in pursuit of intellectual breadth.

For the purposes of options a and b above, all courses are considered as approved except: courses bearing less than 3 units of credit, internship courses, non-standard courses, directed group study courses and courses used to satisfy the College English Composition Requirement.

B.S. Degree. A total of 90 units in natural sciences/mathematics; and satisfaction of the General Education 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. Courses used to satisfy the English Composition and Foreign Language requirements may not 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, 15V, 151, 152, 153, 154A, 154B, 155, 156, 157, 158
Astronomy
Avian Sciences 13
Biological Sciences
Cell Biology and Human Anatomy 101, 101L
Chemistry
Engineering 6, 10, 35, 102
Engineering: Electrical and Computer 70, 170
Entomology 10, 100, 153
Environmental and Resource Sciences 131
Environmental Science and Policy 30, 100, 121, 126
Environmental Toxicology 101
Evolution, Ecology, and Biodiversity
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, 111A, 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, 128, 129, 130, 131, 135, 146, 180B
Statistics
Wildlife, Fish, and Conservation Biology 10

Foreign Language Requirement; A.B. and B.A.S. Degrees

The Foreign Language requirement may be satisfied in any language offered at UC Davis, or for which transfer credit is allowed from another academic institution (including American Sign Language).

You may also satisfy this requirement by examination in a language not offered on the Davis campus. In this case, the Dean's Office will assist you in making arrangements to take an examination on another University of California campus, with a faculty member who teaches the language in question.

Satisfaction of the Requirement. Plan to complete the Foreign Language Requirement by the end of your first or second year, as program priorities permit. This is particularly important if you plan to apply for the university's Education Abroad Program. The Foreign Language requirement may be satisfied by examination or completion of language courses as follows:

1. Foreign Language Placement Test. This 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.

You may validate your knowledge of a language learned in high school by taking this test. A test may not be taken, however, in a language for which you have already received degree credit. If you are a transfer student, consult your Graduation Requirement Degree Check, which is issued by the Dean's Office within a quarter after enrollment.

2. College Board SAT II: 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 and Outreach Services, notify the Letters and Science Dean's Office so that satisfaction of the College requirement can be noted on your record.

3. 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.

4. International Baccalaureate Higher Level Examination. A score of 7, 6, or 3 on the French A1, A2 or B Examination, or the Latin A1 Examination taken in high school will satisfy the Foreign Language requirement.

5. Course Completion in College; or the equivalent. A.B. and B.A.S. degrees—equivalent of 15-unit level of proficiency in one language at UC Davis (e.g., Spanish 3 or Japanese 3). B.S degree—none, but as is required in the major program.

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 Passed/Not Passed (P/NP) Grading in the Academic Information chapter.
6. **Proficiency Examination.** If you have not completed the required level language course, but assume you have attained equivalent knowledge, you may satisfy the language requirement by passing a proficiency examination. For more information, consult the appropriate foreign language department.

**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 6 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 Web site informational materials and instructions on how to evaluate your progress on college and university requirements; see [http://www.ls.ucdavis.edu/students](http://www.ls.ucdavis.edu/students). Many departments provide similar information regarding your major requirements.

Once you have completed 135 units of degree credit, you should contact your faculty 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.ls.ucdavis.edu/students](http://www.ls.ucdavis.edu/students) 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 you may choose to fulfill the university and College requirements (see General Education requirement for an exception) as stated in any UC Davis General Catalog in effect at any time you were registered in 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) 752-0630; http://www.gradstudies.ucdavis.edu

UC Davis offers advanced degrees in more than 80 graduate programs. Students’ graduate study is guided by either departments or graduate groups. Graduate groups are composed of individual faculty members with similar disciplinary or research interests. The group structure, used extensively at Davis, permits faculty to be affiliated with graduate programs in more than one discipline and offers students flexibility and breadth by crossing 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 expansion of established degree programs and facilitates the development of new ones. More than half of the graduate programs at Davis are organized as graduate groups. You will find a complete list of graduate degrees under Degrees Offered By UC Davis, on page 10.

Graduate study is administered by the Graduate Council, a standing committee of the Davis Division of the Academic Senate and by the dean of Graduate Studies. A universitywide 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 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 primarily on the basis of your transcript to assure that your qualifications meet minimum standards as set by universitywide and UC Davis Graduate Councils. Generally, you must have a minimum B average in undergraduate course work from an institution of acceptable standing to be considered for admission. Graduate programs frequently require submission of additional materials such as a separate application form, Graduate Record Examination (GRE) scores, letters of recommendation, portfolios or examples of written work to assist in selecting from among 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. Criteria also attempt to take into account any prior disadvantages applicants have experienced that may bear on future achievements and services.

Applying for Admission

Applications for admission; http://www.gradstudies.ucdavis.edu/prospective/apply_online.html.

January 15. Deadline for all students applying for fellowships. The application for admission must be received at the same time as the fellowship application. If the program to which you are applying has an earlier application deadline, the earlier deadline applies.

March 1. Deadline for international students to file applications for admission to graduate standing, with complete credentials, with the program or department, or as required by program.

April 1. Deadline for United States residents to file applications for admission to graduate standing, with complete credentials, with the program or department, or as required by program.

Applications are accepted for fall quarter only. You may apply for admission to graduate study at http://www.gradstudies.ucdavis.edu/prospective/apply_online.html. If you apply electronically, the $60 nonrefundable application fee and official transcripts from each college and university you have attended must be mailed directly to the program to which you are applying. You may pay the application fee online using a major credit card.

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 greatly enhanced by applying early. The application deadlines are as noted above, unless otherwise indicated by the program, or until your proposed graduate program is full, whichever occurs first. Many programs have earlier deadlines.

You are strongly encouraged to apply electronically. If this is not possible, you may request the application for admission and fellowship from the Office of Graduate Studies, University of California, One Shields Avenue, Davis, CA 95616. The completed application form and official transcripts must be sent directly to the program to which you are applying as well as the application fee if you do not pay online. Supplemental application materials required by the graduate program must be sent directly to the graduate adviser for that program.

The Graduate Admissions Advisory Committee for the program will submit its recommendation and evaluation to 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 and Master of Preventive Veterinary Medicine must be filed directly with the appropriate professional school.

Readmission

April 1. Deadline to file applications for readmission to graduate status with Graduate Studies.

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 $60. The readmission application must be filed with Graduate Studies by April 1 (or earlier if the program specifies an earlier date). Readmission to quarters other than fall is granted on an exception basis by special petition to the dean of Graduate Studies. 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://www.gradstudies.ucdavis.edu/prospective/apply_online.html, or obtain an application from the Graduate Studies office. Transcripts of all work undertaken since you were last registered in graduate status at 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

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 a 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. Graduate Studies will determine your eligibility using U.S. guidelines for credential evaluation. Completed applications from international students along with the nonrefundable $60 application fee must be received by the program to which you are applying by March 1, unless your proposed program has an earlier deadline.

International students are also encouraged to apply at http://www.gradstudies.ucdavis.edu/prospective/apply_online.html.

English Requirement. Applicants whose native language or language of instruction is not English must take the TOEFL or IELTS. The minimum score required for admission to UC Davis is 550 on the paper test, 213 on the computer-based test, and a minimum total score of 60 based on the reading, listening and writing categories on the Internet-based test for TOEFL, or at least 7 on a 9-point scale for IELTS. Scores from tests taken before 2000 will not be accepted. Some programs require higher scores; for more information, see http://www.gradstudies.ucdavis.edu/programs/. There is no conditional admission. The score report is required before application processing begins. You may send a photocopy; however, an official copy is required before registration if you are admitted.

TOEFL Scores. The Test of English as a Foreign Language (TOEFL) is given by Educational Testing Service (ETS), TOEFL Services, PO Box 6131, Princeton NJ 08541-6131, (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, consult the IELTS Web site (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 61, in the Academic Advising chapter.

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 published in the Graduate Program Directory, or as documented by the program. 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 Davis who plan to pursue graduate study should consult with their major adviser early in 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 in residence for at least three 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 Davis campus. With the consent of the graduate adviser and the dean of Graduate Studies, however, some work taken elsewhere may be...
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 in Graduate Studies 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://www.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.

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://faoman.ucdavis.edu/gradfao.htm.

Fellowships and graduate scholarships are awarded primarily on the basis of scholarship and promise of outstanding academic and professional achievement. Fellowship awards can include a stipend, fees and/or nonresident 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 tuition fellowships or in-state fee award is 3.000 (A=4.000). U.S. citizens and permanent residents are only eligible for nonresident tuition fellowships for their first three quarters at UC Davis. New international students may be awarded nonresident tuition fellowships, in addition to some stipend fellowships, in their first three quarters.

Applications for fellowships and graduate scholarships are due by January 15 for awards beginning fall quarter. If the program to which you are applying has an earlier application deadline, the earlier deadline applies. Information for both new and continuing students and application materials for fellowships and graduate scholarships are available at http://www.gradstudies.ucdavis.edu/ssupport/. You may print the application forms, complete them and submit them by mail. The fellowship applications may not be submitted electronically. All students submit the “Internal Fellowship Application for New or Continuing Students” directly to their graduate programs (http://www.gradstudies.ucdavis.edu/programs/).
GRADUATE CERTIFICATE PROGRAM FOR ENGINEERS

For engineers who already have a degree, the College of Engineering offers a Graduate Certificate Program. This program consists of course work in selected engineering subjects and requires 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 program 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 Program may be found in the College of Engineering Bulletin.

SEMINAR IN COLLEGE TEACHING

Teaching Resources Center
17 Wellman Hall
(530) 752-6050; http://trc.ucdavis.edu/trc/ta/courses.html

The Seminar in 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, writing tests, evaluating student work and employing effective class management strategies.

Seminar participants meet weekly for a two-hour session. Participants also select and complete several assignments, such as developing a syllabus, preparing a lesson plan, practicing classroom presentations 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 and timely manner receive a certificate of completion that is appropriate to note in a curriculum vitae.
SCHOOL OF EDUCATION

The School of Education offers a wide range of academic and professional development programs that prepare teaching and administrative leaders for the world of public education (K-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, advancing research and scholarship and improving education policy. In our credential programs (Teaching Credential/M.A. and UC Davis/CSU Sacramento Joint Elementary Teaching Credential Program), 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, obtain a master's degree in education or a related field, pursue a doctoral degree in education, enter a profession that focuses on work with people, or develop a better understanding of issues confronting education today.

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 begin conducting 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 program offers three areas of emphasis: Instructional Studies; Educational Psychology; Socio-cultural Studies. The program also offers the option of completing the M.A. in conjunction with the Teaching Credential program, as described below.

The Teaching Credential/M.A. Program offers an opportunity for qualified students to obtain both the Master of Arts in Education and a Multiple Subject or Single Subject Credential (optional BCLAD emphasis) in a combined five-quarter program. UC Davis offers Teaching Credential programs in elementary education as well as secondary English, mathematics, social studies, science (biology, chemistry, geo-science, physics) and agricultural education.

As part of the graduate offerings at UC Davis, the Teacher Credential Program is designed to prepare credential candidates for the teaching profession by immersing them in the total environment of a public school classroom. The program provides coursework that is grounded in public school student teaching experience and incorporates a theoretical-practical approach to the teaching-learning process. The Program’s culture is one that encourages close interactions between each teacher candidate and teacher education faculty as well as among the teacher candidates of each year’s class. Additional course work leading to a Master’s Degree introduces the integration of classroom inquiry into teaching practice, making teachers more informed and pro-active practitioners.

The UC Davis/CSU Sacramento Joint Elementary Teaching Credential Program offers accelerated course work for the Multiple Subject credential during two consecutive summers; the supervised field experience is completed during part of the academic year. This program is designed to meet the needs of emergency credential holders and professionals who plan to change careers. Applicants will need to meet admission requirements for both participating institutions.

The Joint Doctoral Program in Educational Leadership (JDPEL) leads to the Doctor of Education (Ed.D.) degree. This joint doctoral program between UC Davis and California State University Fresno develops educational leaders in the Central Valley. The program is designed to be completed in four to five years. Previous professional experience in an area of education is essential. The JDPEL program offers four areas of specialization: Organizational Studies; Supervision, Curriculum and Instruction; Assessment and Evaluation; Socio-cultural Contexts.

The Capital Area North Doctorate in Educational Leadership (CANDEL) is a collaborative program of UC Davis, Sonoma State University and California State University, Sacramento. The program, leading to a Doctor of Education (Ed.D.) degree, is intended primarily for working professionals in leadership positions and can be completed within three years. Graduates of this program will be prepared to lead in educational environments that promote learning, equity and achievement for all students. Armed with real-world, problem-based learning, program graduates will be 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 course work, 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: Mathematics Education; Science Education; Educational Psychology; Language, Literacy and Culture; School Organization and Educational Policy.

PREPARING FOR THE STUDY OF EDUCATION

Teaching Credential/ M.A. Degree and UC Davis/CSU Sacramento Joint Elementary Teaching Credential Program. Academic preparation for the Teacher Credential Programs includes a completed Bachelor's Degree and a GPA of at least 3.000 (2.700 for UCD/CSUS Joint Program). For multiple subject candidates many undergraduate majors are appropriate preparation for the program. For single-subject candidates we recommend undergraduate majors in the intended area of secondary teaching. In addition to these general requirements the following are essential for entering a Teacher Credential Program.

- Classroom experience in the appropriate grade levels
- U.S. Constitution course
• Specific preparatory course work; 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 course work or the California Subject Examination for Teachers (CSET) for the appropriate subject

The CBEST examination needs to be attempted by the time of admission and passed prior to being recommended to the Commission on Teacher Credentialing for a credential. The CSET or approved subject matter course work needs to be completed prior to beginning full-time student teaching; for details, see advising staff. Applicants are encouraged to have both of these requirements completed at the time of 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. Degree. Applicants to the Master’s in Education Degree program must have completed an undergraduate degree with a major in a field that supports their intended area of emphasis. A minimum undergraduate GPA of 3.00 is necessary for graduate admission at the University of California, Davis.

Ed.D. Degree (JDPEL). Because the JDPEL program is jointly administered by UC Davis and CSU Fresno, applicants must meet the general admission requirements for both universities. These include: (a) a master's degree or equivalent from an accredited institution; and (b) a grade point average of at least 3.200 in upper division undergraduate and master's degree course work. Applicants must demonstrate high potential for educational leadership and scholarly achievement through professional experience, academic achievement and professional recommendations. Applicants possessing graduate degrees in fields other than education are encouraged to apply.

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) form an accredited institution, a GPA of at least 3.000. In addition, applicants will have demonstrated prior experience in administrative or leadership roles in educational institution or related areas.

Ph.D. Degree. Applicants to the Ph.D. program in Education 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 graduate course work 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 students are admitted for fall term only, with the exception of the UC Davis/CSU Sacramento Joint Elementary Teaching Credential Program. Applicants for the joint credential program are admitted in summer only. Applications are available each year after October 1. Application deadlines and requirements vary by program. Applicants with underrepresented or non-traditional backgrounds are encouraged to apply.

**Minor in Education**

No admission deadline.

For more information, see our Web site at [http://education.ucdavis.edu](http://education.ucdavis.edu) or contact the School of Education Student Services Office at (530) 752-0757 or [eduavising@ucdavis.edu](mailto:eduavising@ucdavis.edu).

Steps in declaring a minor in education:

- Consult with the education undergraduate advisor in 2060 Academic Surge
- 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: Deadline dependent on program, see advisor.

For more information or application instructions, see our Web site at [http://education.ucdavis.edu](http://education.ucdavis.edu) or contact the School of Education Student Services Office at (530) 752-0757 or [eduavising@ucdavis.edu](mailto:eduavising@ucdavis.edu).

Steps in the admission process:

- Complete the School of Education Program Application
- Complete the UC Davis Graduate Studies Application
- Include $60 non-refundable application fee payable to UC Regents.
- Submit two official transcripts for all college and university work completed.
- Submit any supporting documentation; verification of classroom 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 Graduate Studies Office for admission or denial
- Notified of admission or non-admission by the Graduate Studies Office

**UC Davis/CSU Sacramento Joint Elementary Teaching Credential Program**

Application Deadline: Variable deadline. See advisor.

For more information see our Web site at [http://education.ucdavis.edu](http://education.ucdavis.edu) or contact the School of Education Student Services Office at (530) 752-0757 or [eduavising@ucdavis.edu](mailto:eduavising@ucdavis.edu).

Steps in the admission process:

- Complete the School of Education Program Application
- Complete the UC Davis Graduate Studies Application
- Include $60 non-refundable application fee made payable to UC Regents
- Submit three official transcripts for all college and university work completed
- Submit any supporting documentation; verification of classroom experience, copies of test scores, etc.

Applicants will be:

- Screened and scheduled for an admissions interview
• Evaluated and reviewed by a joint admissions committee
• Recommended to UC Davis and CSUS Graduate Studies Offices for admission or denial
• Notified of admission or non-admission by the UC Davis and CSUS Graduate Studies Offices.

**M.A. Degree**

Application deadline: December 15

For more information or application instructions, see our Web site at [http://education.ucdavis.edu](http://education.ucdavis.edu) or contact the School of Education Student Services Office at (530) 752-0757 or eduavising@ucdavis.edu.

Steps in the application process:

• Complete the UC Davis Office of Graduate Studies Application
• Include $60 application fee made payable to UC Regents
• Complete School of Education M.A. Program Application
• Submit official score(s) for the Graduate Record Examination (GRE) General Test
• Include three letters of recommendation; have these letters mailed to you in a signed sealed envelope and include them in your application packet
• Submit two official transcripts from all institutions attended

**Ed.D. Degree**

Joint Doctorate in Educational Leadership (JDPEL)

Application deadline: December 15

For more information, see the program Web site at [http://jdpel.csufresno.edu](http://jdpel.csufresno.edu) or call (559) 278-0427 or diane_rivera-pasillas@csufresno.edu.

Steps in the application process:

• Complete the Program Application Form for the Joint Doctoral Program in Educational Leadership
• Include application fee of $55 (non-refundable) made payable to California State University, Fresno
• Complete the CSU Residency Questionnaire, unless you have lived in California since birth
• Submit two 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 letters of recommendation (3) written by three employers, professors or others in a position to assess the applicant's potential for graduate work
• Complete Statement of Purpose—a separate document describing the reasons for pursuing a doctoral degree in educational leadership and describing the applicant's interests in education
• Include a statement 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 Joint Doctoral Program Admissions Committee.

**Capital Area North Doctorate in Educational Leadership (CANDEL)**

Application deadline: December 15

For more information, see the program Web site at [http://candeljtdoc.org](http://candeljtdoc.org) or contact the School of Education at (530) 752-0757 or eduavising@ucdavis.edu.

Steps in the application process:

• Complete the Program Application Form for the Capital Area North Doctorate in Educational Leadership
• Complete UC Davis Office of Graduate Studies application
• Include application fee of $60 (non-refundable) made payable to UC Regents
• Submit two 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 letters of recommendation (3) written by three employers, professors or others in a position to assess the applicant's potential for graduate work
• Complete Statement of Purpose—a separate document describing the reasons for pursuing a doctoral degree in educational leadership and describing the applicant's interests in education
• Include a statement 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: December 15

For more information or an application package, see the program Web site at [http://education.ucdavis.edu/gradgroup](http://education.ucdavis.edu/gradgroup) or contact the School of Education Student Services Office at (530) 752-0757 or eduavising@ucdavis.edu.

Steps in the application process:

• Complete UC Davis Office of Graduate Studies Application
• Include $60 application fee made payable to UC Regents
• Complete School of Education Ph.D. Program Application
• Submit official score(s) for the Graduate Record Examination (GRE) General Test
• Include three letters of recommendation; have these letters mailed to you in a signed sealed envelope and include them in your application packet
• Submit two official transcripts from all institutions attended
• Submit a writing sample (typically a seminar paper, thesis, or published article)
SCHOOL OF LAW

School of Law, Admission Office
(530) 752-6477; lawadmissions@ucdavis.edu, http://www.law.ucdavis.edu

The School of Law offers a three-year professional curriculum leading to the degree of Juris Doctor. In addition to the traditional professional curriculum, the School provides professional skills training in interviewing and counseling, negotiation and dispute resolution and trial practice. It also offers 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. The School seeks to promote critical evaluation of law and legal institutions in a broad perspective, integrating non-legal disciplines with professional legal education.

The 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. They should gain an understanding of people and institutions and know how to gather and weigh facts, to solve problems and think creatively. They 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 111 South Hall, (530) 752-3000.

For additional information, see the Official Guide to ABA-Approved Law Schools, a publication of the Law School Admission Council and the American Bar Association. This book 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 http://www.LSAC.org.

APPLYING FOR ADMISSION

Deadline for filing applications for admission to the School of Law: February 1

1. Request the school catalog or complete the electronic application form at http://www.law.ucdavis.edu. Return your completed application to the Office of Admission, School of Law, University of California, 400 Mrak Hall Drive, Davis, CA 95616-5201, plus a $75 non-refundable application fee, in the form of a check or money order made payable to the Regents of the University of California.

The last date for filing completed application forms, together with all supporting documents, including LSAT scores, Law School Data Assembly Service (LSDAS) reports and letters of recommendation, is February 1 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 Law School Data 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 December preceding the year in which admission is sought; the February 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 and December. The completed test application blank, accompanied by the required fee, should be postmarked approximately six weeks before the date of the test to ensure that you will be registered for that test date.

To obtain application forms, information about the test, specific test dates and the location of testing centers, you can contact the Law School Admission Council (LSAC) at lsacinfo@lsac.org. The LSAT and LSDAS Information book is also available in the Law School Admission Office and the Pre-Law Advising Office on campus.

3. Register with the Law School Data Assembly Service (LSDAS) no later than December 1 at the LSAC Web site. Have a transcript from each college or university you have attended sent directly to LSAC. Complete instructions and a mailing envelope are available in the book.

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 to whom you are well known. At least one of these letters should come from a faculty member under whom you studied while in college. There are two options for submission of recommendations: (1) the preferred method—submit recommendations to the LSDAS Letter of Recommendation Service for inclusion with your LSDAS report; (2) have your recommender, career center, prelaw office, or other campus recommendation service send the letters directly to the School or of Law. Your application cannot be considered until two letters have been received.

Your application will be reviewed by the School of Law Admissions Committee, which seeks students of demonstrated academic ability, as evidenced by LSAT scores, 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 in August.
6. When accepted by the School of Law, you are simultaneously admitted to Graduate Studies on the 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 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 June 1–30. No application for advanced standing will be considered until the Office of Admissions has received transcripts for all prior law school work.

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 LSDAS 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. Committee decisions on advanced standing will be normally made in late 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 this 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) 216-4343 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. 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. Courses taken in summer sessions at other accredited law schools may, with prior permission, be credited toward the units required for the professional degree.

Combined Degree Programs

Students may find a combined degree involving law and another discipline such as economics, business, sociology, or science advantageous. To encourage 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. In some instances it may be possible to work on a Ph.D. degree as well. 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 can 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.

The LL.M. Program

http://www.law.ucdavis.edu/internprogram/LLM_program.shtml, llm@unexmail.ucdavis.edu

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 2006–2007**

The School of Law operates on a semester system rather than the quarter system used on the remainder of the Davis campus.

<table>
<thead>
<tr>
<th>Event</th>
<th>Fall 2006</th>
<th>Spring 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction Week</td>
<td>Mon.–Fri., Aug 14-18</td>
<td>Mon. Jan 8</td>
</tr>
<tr>
<td>Law School instruction begins</td>
<td>Mon., Aug 21 Mon., Sep 4</td>
<td></td>
</tr>
<tr>
<td>Labor Day holiday</td>
<td>Mon., Sep 4</td>
<td></td>
</tr>
<tr>
<td>Veteran’s Day holiday</td>
<td>Thurs., Nov 10</td>
<td></td>
</tr>
<tr>
<td>Thanksgiving holiday</td>
<td>Thurs.-Fri., Nov 23-24</td>
<td></td>
</tr>
<tr>
<td>Martin Luther King, Jr., holiday</td>
<td>Mon., Jan 15</td>
<td></td>
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<tr>
<td>President’s Day holiday</td>
<td>Mon., Feb 19</td>
<td></td>
</tr>
<tr>
<td>Spring recess</td>
<td>Mon.–Fri., Mar 19-23</td>
<td></td>
</tr>
<tr>
<td>Law School instruction ends</td>
<td>Fri., Dec 1 Fri., Apr 27</td>
<td></td>
</tr>
<tr>
<td>Reading period</td>
<td>Sat.–Tues., Dec 2-6 Sat.–Wed., Apr 28-May 2</td>
<td></td>
</tr>
<tr>
<td>Law School examination period</td>
<td>Wed.–Thurs., Dec 7-22 Thurs.–Fri., May 3–18</td>
<td></td>
</tr>
<tr>
<td>Law School Commencement</td>
<td>Sat. May 19</td>
<td></td>
</tr>
</tbody>
</table>

*Thursday, February 22 is treated as a Monday for class schedule purposes.*
GRADUATE SCHOOL OF MANAGEMENT
GRADUATE SCHOOL OF MANAGEMENT

Graduate School of Management
106 AOB IV
(530) 752-7658; http://www.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
December 1
February 1
April 1

Admission is for the fall quarter only. Application materials can be obtained in the following ways:

- Print the application materials http://www.gsm.ucdavis.edu or contact the Graduate School of Management at admissions@gsm.ucdavis.edu.
- Call (530) 752-7658.

Complete and return your application, with all supporting documents, by the deadlines given above. The application fee is $100.00.

In addition to your application, you need to submit:

- Transcripts from all colleges or universities previously attended
- Graduate Management Admission Test (GMAT) taken within the last five years of the admission date. For further information and registration forms contact: Graduate Management Admission Council; (932) 681-3680; http://www.mba.com
- Two letters of recommendation
- Three essays on specific topics

To schedule an informational interview or visit, call (530) 752-7658, or contact admissions@gsm.ucdavis.edu.

International Students

International applicants for whom English is a second language must take the Test of English as a Foreign Language (TOEFL) within the last two years and receive a minimum score of 600/paper-based or 250/computer-based test. To receive registration forms, contact TOEFL, Educational Testing Service; (877) 863-3546; http://www.toefl.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 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 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 six core courses and then choose three breadth courses to prepare them for in-depth study in their concentration. The series of core courses in the first year focuses on all basic disciplines of business—accounting, economics, finance, marketing, organizational behavior and statistics.

As early as the first year of study, students are able to integrate elective courses into their personal curriculum. Elective courses place an emphasis on real-world application of management principles. Students can focus on one or more of the “standing” concentrations, or may design their own concentration. The concentrations include accounting, agricultural management, entrepreneurship, finance, management of information systems, marketing, not-for-profit management, operations strategy, strategic management and technology management.
MBA Program for Working Professionals

In addition to the full-time program, the Graduate School of Management offers two Working Professional part-time MBA programs in Sacramento and in the Bay Area. Students enrolled in the MBA Program for Working Professionals pay a flat rate per course. Fees are available at http://www.gsm.ucdavis.edu.

Application Deadline

April 1

Interviews may be scheduled once your application is submitted.

If you would like more information about the working professional program, please contact the Graduate School of Management Admissions at (530) 752-7658, or see http://www.gsm.ucdavis.edu.
SCHOOL OF MEDICINE

School of Medicine
(330) 753-2717; http://som.ucdavis.edu

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 before August 2004 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 or Canada. 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. Completed satisfactorily before matriculation each of the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Quarter Units</th>
<th>Semester Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>English, 1 year or equivalent</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Biological science, 1½ years*</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>General chemistry, 1 year</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Organic chemistry, 1 year</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Physics, 1 year</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Mathematics, college level</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

* Upper Division Science Requirements for Admission. One semester or two quarters of upper division biology. This can be satisfied by courses in Biochemistry, Molecular Biology, Cell Biology or Genetics. Admission to medical school requires that the applicant will have an understanding of fundamental concepts of biomedical science. Although a biochemistry course is not absolutely required for admission, it is strongly recommended.

C. Demonstrate the potential to perform academically at least as well as the average of the current first year class. This reflects the School of Medicine's generally higher standards and our emphasis on potential as judged from the application as a whole, including but not limited to MCAT and GPA scores.

For additional information, contact the School of Medicine Admissions Office.

APPLYING FOR ADMISSION

Deadline for filing applications for admission to the School of Medicine

November 1

The School of Medicine participates in the centralized American Medical College Application Service (AMCAS). For information on admission to medical school, see the Association of American Medical Colleges (AAMC) at http://www.tomorrow'sdoctors.org. You need to submit only one application and one set of official transcripts to AMCAS, regardless of the number of member schools to which you are applying.

Submit the completed application and other required credentials directly to AMCAS for verification, reproduction and immediate distribution to the medical schools you have indicated.

After your AMCAS application has been received by the School of Medicine, the Admissions Office will notify you and may request a secondary application and two letters of recommendation along with a nonrefundable application fee of $560. Send these items directly to the Assistant Dean, Office of Admissions and Outreach, School of Medicine, University of California, One Shields Avenue, Davis, CA 95616-8661, and not to AMCAS. Recommendations can be in the form of a report by a premedical advisory committee at the college or university where you are enrolled or letters from two faculty members who are familiar enough with you and your abilities to make a meaningful evaluation. We recommend that one letter be from a science instructor and the other from a non-science instructor—three to five letters of recommendation suggested.

Applications are accepted by AMCAS between June 1 and November 1. We strongly recommend that you make an early request for application materials from AMCAS and see that the necessary supporting items reach the Committee as soon as possible after the School of Medicine requests them. The Committee reviews only complete application files and schedules interviews for highly qualified applicants throughout the application period and beyond.

A personal interview is usually required before a place in the first-year class can be offered. However, because of the large number of applicants, it is not possible to interview each one and for this reason interviews are held only at the invitation of the Admissions Committee. Interviews take place at the medical school in order to provide you with first-hand knowledge of programs and facilities and give you the opportunity to meet some of the students.

As decisions are made, letters of acceptance are sent; this can be as early as mid-October and as late as September of the following year.

Applicant Selection. The class entering in the fall will be limited to 93 students selected on the basis of academic achievement, academic promise and personal characteristics. The Admissions Committee uses these criteria to determine if a candidate will be able to complete satisfactorily the requirements of the medical curriculum and become excellent medical practitioners. Factors taken into consideration include scholastic records, Medical College Admission Test performance and reports of teachers, advisers and interviewers with regard to intellectual capacity, motivation, emotional stability and personal dedication.

The majority of openings in the entering class will be awarded to students who are California residents. However, the School of Medicine participates in the program of the Western Interstate
Commission for Higher Education (WICHE) and residents of participating states will be considered as residents for purposes of admission. For more information, write the WICHE at Post Office Drawer P, Boulder, CO 80302.

The School of Medicine selects students for admission with a view to meeting the needs of society, of the medical profession and of the School. Because we live in a pluralistic society, and the educational experience is enhanced by the interaction of students from various backgrounds, the School desires diversity in its student body. This is reflected in the School's commitment to expand opportunities in medical education for individuals from groups underserved in medicine as the result of socioeconomic disadvantage and to increase the number of physicians practicing in underserved areas. Therefore, the Admissions Committee, composed of individuals from a variety of backgrounds and representative of a broad spectrum of medical sciences, evaluates applicants in terms of all relevant factors. These include academic credentials, with due regard to how they may have been affected by disadvantages experienced by the applicant, such personal traits as character and motivation, experience in the health sciences and/or the community, career objectives, and the ability of the individual to make a positive contribution to society, the profession and the School.

Transfer with Advanced Standing

Currently enrolled students (U.S. citizens or permanent residents) in good standing at an accredited ALLOPATHIC medical school in the United States or Canada may apply for admission to the third year of study. In order to provide the best facilities and clinical resources, however, we must limit the number of students in our clinical clerkships. Therefore, applications for transfer to the third year are considered on a space-available basis.

Deadline for application is April 1 of the year of transfer. Applicants must provide medical school transcripts along with other materials and if accepted, must pass Part I of the United States Medical Licensing Examination (USMLE) at their current institution. Available spaces may be filled by the Admissions Committee based upon the entire content of an application, or they may request additional information including letters of recommendation and a personal interview. All applicants for transfer must meet the usual requirements for admission, as well as satisfactorily completing the equivalent of two years of study at the medical school. Applicants will be notified of the Admissions Committee's decision starting April 30.

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.

Combined Degree Program. In addition to the Doctor of Medicine degree, the School of Medicine at 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 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 Edward D. Dagang, Office of Admissions, School of Medicine, University of California, One Shields Avenue, Davis, CA 95616-8661.

Family Nurse Practitioner/Physician Assistant Program. The Family Nurse Practitioner/Physician Assistant (FNP/PA) credential program educates health care professionals to act as members of a health care team and improves the availability of culturally relevant primary health care in underserved populations throughout central and northern California. Enrollment in these courses is limited to students who are enrolled in the FNP/PA program; see Medicine, School of, Department of Family and Community Medicine.

Academic Calendar

The School of Medicine operates on a different schedule from the rest of the campus. A detailed academic calendar may be viewed at http://som.ucdavis.edu.

The program is a continuous four-year academic experience, with the first year commencing in fall quarter. A six-week break is scheduled between the first and second year academic schedule following spring quarter. The second year concludes with a three- to four-week period for preparation for USMLE Step 1 examination. The third and fourth year clinical experiences begin in summer and continue through spring.

With approval, students may extend the first two years over three years and use the additional time to individualize their programs. This alternative time is highly suitable for including research experiences and/or meeting other academic objectives. Flexibility in the third and fourth years also permits alternate scheduling.
The mission of the School of Veterinary Medicine is to provide the best possible health care for animals 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.

**PREPARING FOR THE STUDY OF VETERINARY MEDICINE**

To be considered for admission to the School, you must have completed 108 quarter units (72 semester units) in an accredited college or university and have completed the following courses:

<table>
<thead>
<tr>
<th>Lower Division Required Sciences</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Chemistry</td>
<td>15</td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>6</td>
</tr>
<tr>
<td>Physics</td>
<td>6</td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Upper Division Required Sciences</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genetic</td>
<td>4</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>Physiology</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional Courses</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required English</td>
<td>12</td>
</tr>
<tr>
<td>Required Humanities and Social Sciences</td>
<td>12</td>
</tr>
<tr>
<td>Required Statistics</td>
<td>4</td>
</tr>
</tbody>
</table>

To convert semester units to quarter units, multiply by 3/2. For example, a four-unit semester course is equivalent to a six-unit course in the quarter system.

You should plan your pre-veterinary medical education carefully. The required courses should be spaced to permit maximum scholastic achievement. An undergraduate major should be selected on the basis of individual interest and aptitude; there is no advantage gained toward admission by selecting one major over another. If you have definite areas of interest within the general field of veterinary medicine, you are encouraged to take courses (for example, computer science, agricultural economics, molecular and biochemical genetics) that will broaden your background in these areas. Some specialized areas include laboratory animal medicine, exotic animal medicine, public health, food animal practice and biomedical research.

**Examinations.** You must take the General Aptitude Test of the Graduate Record Examination (GRE) no later than October 1st of the year you apply for admission. Applications for the exams and additional information may be obtained from the Educational Testing Service, Box 23470, Oakland CA 94623-0470.

**Grade Point Average.** To be considered for admission, you must have a minimum grade point average of 2.500 for both the required sciences and the cumulative grade point average. Applicants who do not meet the minimum grade point average can qualify for admission by receiving GRE scores in the upper 30th percentile for the combined General Aptitude Test scores. Applicants who do not have transcripts with letter grading can qualify for consideration with these same scores or by receiving a bachelor's degree with honors.

**Practical Experience.** Admission to the School requires extensive experience with animals. This experience must entail more than having family pets and should include experience with several animal species if that experience includes activities that give you an appreciation and understanding of the veterinary profession. The minimum requirement for animal, veterinary and biomedical science experience is 180 hours (4.5 weeks). This experience should also include working with veterinarians, to give you an understanding of the duties and responsibilities of a practitioner and the breadth of veterinary medicine.

**APPLYING FOR ADMISSION**

October 1 is the deadline for filing applications for admission to enter the School of Veterinary Medicine the following fall quarter.

Students are admitted to the School of Veterinary Medicine in the fall only. Applications are available any time after July; see [http://www.vetmed.ucdavis.edu/studentprograms/default.html](http://www.vetmed.ucdavis.edu/studentprograms/default.html). Applications must be submitted online for California applicants.

Students interested in admission to the School of Veterinary Medicine are urged to request an Announcement of the School of Veterinary Medicine at an early date so that all minimum academic requirements and deadlines are met.

Applicants with disadvantaged backgrounds (cultural, economic, social, educational, disabled and other factors) are encouraged to apply to the Veterinary Medical Opportunity Program (VMOP). For further information and advising services, call the Office of the Dean—Student Programs at (530) 752-1383.

**Letters of Evaluation.** Three letters of evaluation are required. Letters should be requested from those who know you well, who understand academic and professional demands and have had the opportunity to evaluate your personal qualities and potential as a professional person. The evaluator should be willing to write a thorough, comprehensive letter on your behalf.

**Interviews.** Interviews may be requested, as deemed necessary, by the Dean and Admissions Committee to obtain additional information. The Dean and Admissions Committee may require additional evaluation procedures for selecting candidates for admission.

**Out-of-State and Foreign Applicants.** California residents are given priority for admission to the school. A small number of uniquely qualified applicants who are not California residents may be admitted as nonresidents. The criteria for determining residency are explained in Residence for Tuition Information in the Appendix of this catalog. Specific questions should be addressed to the Legal Analyst—Residence Matters, 111 Franklin St., 8th Floor, Oakland, CA 94607-5206. No other persons are qualified to give rulings on residency.

If you are from a country other than the United States, you must include a certified English version of your college transcript and, if English is your second language, the official scores from the Test of English as a Foreign Language (TOEFL) taken within five years of the date when your application is submitted.
CRITERIA FOR SELECTION

I. Academic Factors (50-60%)
A. College course work:
   • Overall GPA in undergraduate/graduate course work
   • GPA of required pre-veterinary medical science courses
   • GPA of last two years of undergraduate/graduate work; minimum of 72 quarters or 45 semester units)
B. Graduate Record Examination (GRE):
   • General Aptitude Test (Verbal, Quantitative and Analytical Writing)

II. Non-Academic Factors (40-50%)
A. Personal Statement
B. Letters of Evaluation
C. Veterinary and Animal Experience
D. Interview

Non-academic factors will be evaluated based on the following criteria: understanding of the veterinary profession and the responsibilities of being a veterinarian; a demonstrated interest in serving the public through the profession of veterinary medicine; and the possession of maturity, motivation and other qualities needed for successful academic and professional work.

PROGRAM OF STUDY

Doctor of Veterinary Medicine. To receive a Doctor of Veterinary Medicine degree, students must study veterinary medicine for the equivalent of 13 quarters. A grade point average of 2.000 (C), computed on all courses taken while in the School, is required and students must satisfactorily complete all required work as determined by the faculty of the School.

Master of Preventive Veterinary Medicine. Applicants for candidacy to the Master of Preventive Veterinary Medicine (M.P.V.M.) degree program must have completed the Doctorate in Veterinary Medicine or the equivalent; final admission decisions rest with the Admissions Committee, M.P.V.M. program. Application deadline for August admission is March 31. International applicants are encouraged to apply as early as possible.

The M.P.V.M. degree normally takes one year to complete; however, some students may require as much as two years to finish the program. Students who intend to complete the program in one calendar year must begin the program in August. Candidates for the M.P.V.M. degree must satisfactorily complete a total of 40 units of course work while in residence. This includes 27 units of required courses in epidemiology, biostatistics, information management and a minimum of 13 units of approved electives. Students must also complete a research study which culminates in a written report and oral presentation. A committee consisting of three faculty members reviews each paper for acceptability and assigns an appropriate grade.

Application forms and information about the program are available from the Director, M.P.V.M. Program, Office of the Dean, School of Veterinary Medicine, University of California, One Shields Avenue, Davis CA 95616, or see http://www.vetmed.ucdavis.edu/mpvm/mpvm.htm.

Combined Degree Programs. Students may enroll in combined degree programs. General information regarding these degrees can be found in the Announcement of Graduate Studies, available from Graduate Studies, University of California, One Shields Avenue, Davis CA 95616. For more detailed information, write to the chairperson of the department in which you want to study and the School of Veterinary Medicine.

ACADEMIC CALENDAR 2006–2007*

Summer Quarter 2006
4th Year Orientation Session Monday, Jun 19
4th Year Senior/Summer Clinics begin Monday, Jun 19

Fall Quarter 2006
Labor Day Holiday Monday, Sep 4
Orientation for 1st-year students Sep 1 and 5-9
Instruction begins for 1st-, 2nd- and 3rd-year students Monday, Sep 11
Yom Kippur Holiday Monday, Oct 2
Veteran’s Day Holiday Friday, Nov 10
Thanksgiving Holiday Thur.-Fri., Nov 23-24
Instruction ends Friday, Dec 8
Finals end Friday, Dec 15
4th Year Clinics end Friday, Dec 15

Winter Quarter 2007
Instruction begins for 1st-, 2nd- and 3rd-year students Monday, Jan 3
4th Year Clinics begin Monday, Jan 3
M. L. King Holiday Monday, Jan 15
President’s Day Holiday Monday, Feb 19
Instruction ends Friday, Mar 16
Finals end Thursday, Mar 23

Spring Quarter 2007
Instruction begins Monday, Apr 2
Awards Ceremony Wednesday, May 16
Memorial Day Holiday Monday, May 28
Instruction ends Friday, Jun 9
4th Year Clinics ends Wednesday, Jun 13
Finals end Thursday, Jun 14
Commencement Friday, Jun 15

*All dates are subject to change without notice.
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 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. Theses 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: course 111; senior standing. 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 for credit with consent of instructor. (P/NP grading only.)—I, II, III. (I, II, III) Smith

Top line is course number; title; units.

Paragraph following is course instructional format; prerequisite; course description; grading if other than letter grading; quarter offered 2006–07; quarter offered 2007–08 (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) for students in the School of Medicine only

The quarter a course is offered is subject to change. For more information, consult the Class Schedule and Registration Guide (CSRG) or contact the department.

Alternate Year Designation

Some course descriptions will include the phrase “Offered in alternate years.” If the course will be offered in the 2006–07 academic year, the quarter designation immediately follows the description.

If the course will be offered in the 2007–08 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, advisers' offices, advising centers, departmental offices and at The First Resort. A limited number of expanded course descriptions are also available in the archive at http://registrar.ucdavis.edu/cafinfo.

The course offerings and instructors listed in this catalog are subject to change without notice. For more current quarter offerings and instructors, refer to the General Catalog Supplement at http://registrar.ucdavis.edu/UCDWebCatalog.
African American and African Studies

(Chair of Committee on African American and African Studies)

Moradeow Adejumobi, Ph.D., Director

Program Office, 2201 Hart Hall
(530) 752-1548, http://cougar.ucdavis.edu/aas

Committee in Charge
Christine Acham, Ph.D.
(African American and African Studies)
Moradeow Adejumobi, Ph.D.
(African American and African Studies)
Milmon Harrison, Ph.D.
(African American and African Studies)
Carl C. Jorgensen, Ph.D. (Sociology)
Betina Ng’weno, Ph.D.
(African American and African Studies)
Angela Onwuachi-Willig, J.D. (Law)
Halifu Osumare, Ph.D.
(African American and African Studies)
Donald Rothchild, Ph.D. (Political Science)
Patricia A. Turner, Ph.D.
(African American and African Studies)

Faculty
Christine Acham, Ph.D., Associate Professor Moradeow Adejumobi, Ph.D., Associate Professor Milmon F. Harrison, Ph.D., Associate Professor Betina Ng’weno, Ph.D., Assistant Professor Halifu Osumare, Ph.D., Assistant Professor Patricia A. Turner, Ph.D., Professor

Emeriti Faculty
John Stewart, Ph.D., Professor Emeritus

Affiliated Faculty
Kristee Haggins, Ph.D., Adjunct Assistant Professor

The Major Program
African American and African Studies is a field of study in the humanities, arts, and social sciences that provides students with a multi-disciplinary learning experience. In addition to courses offered within African American and African Studies, students have the option of taking selected courses in other programs and departments that complement courses offered within African American and African Studies. Majors and minors are also encouraged to take advantage of internship opportunities.

The Program. The purpose of this program is to give students a sense of the individual characteristics and common concerns of Black people in the United States. The African Diaspora emphasis enables students to study the way Black communities 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 using religion, theater and dance, literature and film. The African Diaspora emphasis allows students to focus on Africa’s recent history, social issues, and contemporary culture.

Career Alternatives. Students completing the African American and African Studies major are well prepared for graduate study in psychology, education, sociology, human development, history, and the like. Majors in African American and African Studies can also pursue professional training in fields such as psychology, social work, education, law. Graduates with this major have also pursued employment opportunities in the federal and state government, in international development agencies, in human service units, in county social service programs, and counseling services. African American and African Studies is also an appropriate background for work in community organizations like the Urban League, NAACP, Urban Affairs, and the Office of Economic Opportunity, and for teaching at all levels.

A.B. Major Requirements:
The major program must be developed in consultation with an African American and African Studies faculty member and approved by the program's Major Adviser.

Preparatory Subject Matter: 18

Course requirements for students for the major program must be taken in consultation with the major adviser and chosen to reflect the student's major emphasis.

Depth Subject Matter: 12

One course from African American and African Studies 107A, 107B, 107C, 110, 120, 150, 151, 152, 155A, 155B, 158, 159, 170, 171 .... 4
One course from African American and African Studies 121, 122, 152, 157, 170, 171, 173, 190, 191, 192
One course from African American and African Studies 181A, 181B, 181C, 181D
One course from African American and African Studies 190A, 190B, 191, 192, 193, 194

Related Upper Division Courses: 6

The following courses are offered by faculty members who are not in the major program, and may provide useful background for study in the major.

Courses in African American and African Studies (AAS)

Lower Division Courses

10. African-American Culture and Society (4)
Lecture—4 hours. Introduction to African American Studies which will focus on the various disciplinary perspectives through which African American culture and society are generally studied. A survey of methods, resources, and primary sources for the study of Africa. GE credit: ArtHum, Div, Wrt.—II. (I) Adejumobi

12. Introduction to African American Humanities (4)
Lecture—3 hours. Introduction to the humanist tradition developed by writers, philosophers, and artists of African descent in the West. Attention given to African sources, as well as European, Caribbean, Latin-American, and American variations on this tradition. GE credit: ArtHum, Div, Wrt.—II. (I) Adejumobi

15. Introduction to African American Humanities (4)
Lecture—3 hours. Introduction to the humanist tradition developed by writers, philosophers, and artists of African descent in the West. Attention given to African sources, as well as European, Caribbean, Latin-American, and American variations on this tradition. GE credit: ArtHum, Div, Wrt.—II. (I) Adejumobi

16. 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 aesthetics of oral performance in Africa. GE credit: ArtHum, Div, Wrt.—II. (I) Adejumobi

17. Women in African Societies (4)
Lecture/discussion—4 hours. Gender relations in traditional and contemporary African society. Involve- ment of African women in politics, religion, the economy, the arts. African responses to feminist theory. Images of women in African literature. GE credit: Div, Wrt.—I. (I) Adejumobi

50. Black Images in Popular Culture (4)
Lecture—2 hours. Discussion—2 hours. A survey of the depictions of Blacks in popular culture (popular press, stage, radio, film, television, advertising) from the middle of the sixteenth century to the present. GE credit: ArtHum, Div, Wrt.—II. (III) Turner, Acham

51. History of Afro American Dance (4)
Lecture—2 hours. Discussion—2 hours. Evolution of African American dance, tracing its history and development from West Africa through the Carribean and to the United States. Investigates the social relevance of African American dance and the artistic merits and contributions of African American choreographers and performers. GE credit: ArtHum, Div, Wrt.—II. (III) Osumare

52. African Traditional Religion (4)
Lecture—2 hours. Discussion—2 hours. Introduction to the traditional religions of the sub-Saharan African peoples: emphasis on music, ritual, and symbols in West, East, Central and South African indigenous religions. Examines themes such as sacred kingship, division system, women, prophecy, conversion and adaptation to Islam and Christianity. GE credit: ArtHum, Div, Wrt.—II. (III) Olupona

54. University Gospel Choir (2)
Rehearsal—4 hours. Prerequisite: consent of instructor; open to any student in the university. Rehearsal, study, and performance of Gospel music. May be repeated for credit. (Same course as Music 54S.) (P/NP grading only)—II, III, (II, III, I) Lymos

80. Introduction to Black Politics (4)
Lecture—4 hours. Introduction to the analysis of Afro-American politics, using conceptual frameworks from political science and other social sciences. GE credit: SocSci, Div, Wrt.—II. (III) Harrison

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer, 2007/2008 offering in parentheses

General Education (GE) credit: ArtHum—Arts and Humanities, SciEng—Science and Engineering; SocSci—Social Sciences; Div—Social-Cultural Diversity; Wrt—Writing Experience
Upper Division Courses

100. Survey of Ethnicity in the U.S. (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing or consent of instructor. Sociological 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, Div.—II. Harrison

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.—II. (III.) Harrison

107A. African Descent Communities and Culture in the Caribbean and Latin 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 Caribbean and Latin America: (a) the evidence for pre-Columbian arrivals, (b) the African slave trade and its aftermath, (c) the emergence of the African-creole cultures. Offered in alternate years. GE credit: ArtHum, Div, Wrt.—II. (I.) 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. (I.) Ng’weno

110. West African Social Organization (4)
Lecture—4 hours. Prerequisite: course 101 or consent of instructor. Ecology, population, social organization, and survival culture of West Africa in the pre-colonial, colonial, and post-colonial periods. GE credit: SocSci, Div.—II. (II.) Adejunmobi

111. Cultural Politics in Contemporary Africa (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing or course 12. Themes and styles 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, Div, Wrt.—II. (I.) Adejunmobi

123. Black Female Experience in Contemporary Society (4)
Lecture—4 hours. Prerequisite: upper division standing or consent of instructor. Black female social, intellectual, and psychological development. Black women’s contributions in history, literature, and social science; life experiences of Black women and philosophical underpinnings of the feminist movement. GE credit: ArtHum, Div.—II. (III.) Acham

130. Education in the African-American Community (4)
Lecture—2 hours; discussion—1 hour; fieldwork—3 hours. Prerequisite: course 10 or 100, and 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. (Former course 140.)—I. (I.) Turner

133. The Black Family in America (4)
Lecture—4 hours. Prerequisite: upper division standing or consent of instructor. Analysis of social science research to examine relationships between Black family structures, patterns of functioning, and political, economic, and social conditions. Examination of role differentiation within families by race and social class. GE credit: SocSci, Div.—II. (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 frameworks. Emphasis on Optimal Theory, a psychological theory based on an Afro-centric worldview.—II. (III.) Haggins

145A. Black Social and Political Thought (4)
Lecture—4 hours. Prerequisite: course 10 or 80, 145A, or consent of instructor. Exploration and critical analysis of selected theoretical writings of Black intellectuals, and especially political and social thinkers, in the Americas. GE credit: SocSci, Div.—II. (III.) Harrison

150A. 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. (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 Reconstruction to the present. 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 Afro-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.—II. (III.) Turner

152. Major Voices in Black World Literature (4)
Lecture—2 hours; discussion—1 hour; term paper. Prerequisite: upper division standing, completion of course 15 or comparable course in literature or the humanities. The recurrence of cultural tropes in the works of major black world authors and formation of an African-oriented canon. Principal activities include critical reading and discovery of literature as a cultural resource. GE credit: ArtHum, Div, Wrt.—II. (II.) Adejunmobi

154. University Gospel Choir (2)
Rehearsal—4 hours. Prerequisite: consent of instructor; open to any student in the University. Rehearsal, study, and performance of Gospel music. May be repeated for credit. (Same course as Music 154.) (P/NP grading only.)—I., II., III., II., III., II., III., II., III., Lymos

155A. African-American Dance and Culture in the United States, Brazil and the Caribbean (4)
Lecture/discussion—4 hours. A 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 Dramatic Art 155A.)—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, transitional language forms, and related verbal arts like preaching, toasting, rapping, and discuss selected works. GE credit: ArtHum, Div.—II. (III.) Adejunmobi

157. Literature and Society in South Africa (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing or course 12. Political and social developments in 20th-century South Africa as illustrated by a range of South African writing. Response of different writers to racial oppression, impact of government policy on types and context of writing. Offered in alternate years. GE credit: Div, Wrt.—II. (II.) Adejunmobi

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 folklife, including music, material culture, oral narrative, proverbs, and humor. African and Caribbean folklife in New World folk genres will be probed. GE credit: ArtHum, Div—II. (III.) Turner

162. Islam in Africa and the Americas (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course in African American Studies; preferably course 12 or 110 or Religious Studies 60. A comparative and historical survey of Islam in the regional and cultural settings of Sub-Saharan Africa and the Americas. GE credit: ArtHum, Div, Wrt.—II. (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 heritage in the Americas: Jamaica, Trinidad, Cuba, U.S.A., Haiti, and Brazil. Emphasis on the origins and development of Candomble, Santeria, Shango, Vodun, and Rastafarianism in the New World. (Former course 153.) GE credit: ArtHum, Div, Wrt.—II. (III.)

165. Afro-Christianity and the Black Church (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 10, 13, or consent of instructor, upper division standing. 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. GE credit—SocSci, Div.—II. (III.)

166. Black Documentary Theory and Practice (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Humanities 10, course 170 and consent of instructor; course 50 recommended. Preference given to African American and African Studies majors and minors. A study of black documentary history and understanding of the use of documentary form for political purposes. A discussion of documentary theory. Each student, singly or in a team, will create and carefully edit a documentary project. Offered in alternate years. GE credit: ArtHum, Div, Wrt.—II. (II.) Acham

169. History of African-American Television (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 50 recommended. History of the representation of African Americans in television, how the representations reflect social and political forces in American society. Role of African Americans in actively shaping their representation. GE credit: ArtHum, Div.—II. (II.) Acham

170. African-American Film and Video (4)
Lecture/discussion—2 hours; term paper; film viewing—2 hours. Prerequisite: one of courses 15, 50, or English 160, or 162. A comparative approach in the study of fictional film and video produced and directed by African Americans, drawing on the social sciences and black feminist theory to examine and discuss selected works. GE credit: ArtHum, Div, Wrt.—II. (II.) Acham
Agricultural and Environmental Chemistry (A Graduate Group)

Andrew J. Clifford, Ph.D., Chairperson of the Group Group Office. 4177 Meyer Hall (530) 752-1415

Faculty

Douglas O. Adams, Ph.D., Associate Professor (Viticulture and Enology)
Cari Anastasidis, Ph.D., Associate Professor (Land, Air, and Water Resources)
Charles W. Bamforth, Ph.D., Professor (Food Science and Technology)
Deborah Bengston, Ph.D., Adjunct Professor (Public Health Sciences, School of Medicine)
Linda F. Bisson, Ph.D., Professor (Viticulture and Enology)
Roger B. Boulton, Ph.D., Professor (Viticulture and Enology)
William H. Casey, Ph.D., Professor (Land, Air, and Water Resources)
Andrew J. Clifford, Ph.D., Professor (Nutrition)
Carroll E. Cross, M.D., Professor (Internal Medicine)
Susan E. Ebeler, Ph.D., Professor (Viticulture and Enology)
Robert G. Flocchini, Ph.D., Professor (Land, Air, and Water Resources)
Edwin N. Frankel, Ph.D., Adjunct Professor (Food Science and Technology)
J. Bruce Germann, Ph.D., Professor (Food Science and Technology)
Peter G. Green, Ph.D., Lecturer (Civil and Environmental Engineering)
Bruce D. Hammond, Ph.D., Professor (Entomology)
William R. Horwath, Ph.D., Professor (Land, Air, and Water Resources)
You-Li Huie, Ph.D., Professor (Textiles and Clothing)
Norman Y. Kado, Ph.D., Associate Adjunct Professor (Environmental Toxicology)
Peter B. Kelly, Ph.D., Professor (Chemistry)
Annie J. King, Ph.D., Professor (Animal Science)
Michael J. Kleeman, Ph.D., Associate Professor (Civil and Environmental Engineering)
Mark J. Kurth, Ph.D., Professor (Chemistry)
Fumio Matsuura, Ph.D., Professor (Environmental Toxicology)
Michael J. McCarthy, Ph.D., Professor (Food Science and Technology)
Alyson E. Mitchell, Ph.D., Associate Professor (Chemistry)
David S. Reid, Ph.D., Professor (Food Science and Technology)

James R. Sanborn, Ph.D., Researcher (Entomology/Parasite Regulation)
Neil E. Schore, Ph.D., Professor (Chemistry)
Takayuki Shibamoto, Ph.D., Professor (Environmental Toxicology)
Charles F. Shoemaker, Ph.D., Professor (Food Science and Technology)
Gary M. Smith, Ph.D., Professor (Food Science and Technology)
Randal J. Southard, Ph.D., Professor (Land, Air, and Water Resources)
Gang Sun, Ph.D., Professor (Textiles and Clothing)
Ronald S. Tjedermas, Ph.D., Professor (Environmental Toxicology)
Dean J. Tantillo, Ph.D., Assistant Professor (Chemistry)
Anita L. Wathouse, Ph.D., Professor (Viticulture and Enology)
Thomas M. Youngh, Ph.D., Professor (Civil and Environmental Engineering)
Robert J. Zasoski, Ph.D., Professor (Land, Air, and Water Resources)

Emeriti Faculty

Donald G. Crosby, Ph.D., Professor Emeritus
Al L. Tappe, Ph.D., Professor
John R. Whitaker, Ph.D., Professor
S. Haig Zeronian, Ph.D., D.Sc., Professor

Affiliated Faculty

Lowell L. Ashbaugh, Ph.D., Associate Researcher (Crocker Nuclear Lab)
Diane M. Barrett, Ph.D., Specialist (Food Science and Technology)

Graduate Study. The Graduate Group in Agricultural and Environmental Chemistry offers programs of study and research leading to the M.S. and Ph.D. degrees. Study relates to the chemical and biochemical aspects of foods, wine, fibers/polymers, pesti-
cides, and environmental pollution. Detailed information regarding graduate study may be obtained at http://agchem.ucdavis.edu/

Graduate Advisers. D.O. Adams (Viticulture and Enology), D.S. Reid (Food Science and Technology), Y.-L. Hsieh (Textiles and Clothing), T. Shibamoto (Environmental Toxicology), T. Young (Civil and Environmental Engineering), R.J. Zasoski (Land, Air, and Water Resources)

Courses in Agricultural and Environmental Chemistry (AGC) Graduate Courses

290. Seminar (1) Seminar—1 hour. Selected topics in agricultural and environmental chemistry, presented by students. (S/U grading only.)—I, II, III. [I, II, III.] 298. Group Study (1-5) Prerequisite: consent of instructor. The chemistry and biochemistry of foods, nutritional chemicals, pesti-
cides, and other special topics as they apply to agri-
cultural and environmental chemistry.

299. Research (1-12) Arrangements should be made well in advance with a faculty member of the Group in Agricultural and Environmental Chemistry. (S/U grading only.)

Agricultural Computing and Information Systems

See Applied Computing and Information Systems, on page 143.
Agricultural Education

[College of Agricultural and Environmental Sciences and School of Education]

Undergraduate Program. Various undergraduate majors can provide the preparatory subject matter to satisfy entrance requirements into the graduate teaching credential program. Various undergraduate majors can provide the preparatory subject matter to satisfy entrance requirements into the graduate teaching credential program. For questions relating to the undergraduate program and/or undergraduate preparation, contact Lynn Martindale (530) 754-6655 or martindale@ucdavis.edu, or Stacie Hewitt (530) 754-9083 or swheelit@ucdavis.edu.

Teaching Credential Subject Representative. You may make an appointment with a credential counselor from the School of Education and obtain a statement of the general requirements for the credential in Agricultural Education with Lynn Martindale (530) 754-6655 or martindale@ucdavis.edu. Because many majors in the college do not offer the minimum preparation necessary for entering the Agriculture Teaching Credential program, you should seek counseling as early as possible. See also the Teaching Credential/M.A. Program on page 102.

Graduate Study. For graduate study, see the Graduate Announcement.

Graduate Adviser. C.J. Trelxler

Courses in Agricultural Education (AED)

Questions pertaining to the following courses should be directed to the instructor or Lynn Martindale (530) 754-6655 or Stacie Hewitt (530) 754-9083.

Lower Division Courses

92. Internship (1-12)
Internship—3-36 hours. Prerequisite: lower division standing; consent of instructor. Supervised internship off and on campus in areas of agricultural education. (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)
Prerequisite: consent of instructor. (P/NP grading only.)

Upper Division Courses

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.) Martindale

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.—II. (II.)

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.—III. (III.)

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)
Prerequisite: course 190. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: course 190. (P/NP grading only.)

Professional Courses

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 once for credit. (P/NP grading only.)—I, II, III. (I, II, III.)

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.—II. (III.) Trelxler

302. Teaching Methods in Agricultural Education (3)
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.—I. (I.)

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.—I, II, III. (I, II, III.)

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 300, 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.—I, II, III. (I, II, III.)

323. Resource Development: Agricultural Education (3)
Lecture—3 hours. Prerequisite: courses 306A, 306B. Selection and implementation of community resources in teaching.—I. (I.)

390. Seminar: Issues in Agricultural Education (2)
Discussion/laboratory—4 hours. Prerequisite: acceptance into a teacher education program and courses 306A, 306B. Discussion and evaluation of current issues, theories and research in agricultural education. (S/U grading only.)—III. (III.)

Master Advisor. C.J. Trelxler, Ph.D., Assistant Professor

Advising Center for the major, including peer advising, is located in 1202 Meyer Hall (530) 754-7915.

Agricultural Management and Rangeland Resources

[College of Agricultural and Environmental Sciences]

Faculty. See Plant Sciences, on page 419.

The Major Program

This major is designed for students who are interested in understanding agricultural systems, their management, and their relationship to the environment. Courses are selected to provide an interdisciplinary background that encompasses both natural science and social science. Students will acquire a core understanding of agricultural production systems as managed ecosystems, how they function, how they interact with the natural environment and how they are intimately connected with human society and social changes. In addition, students will develop an area of specialization. Within the two areas of specialization, students chose between a broad-based education and one focused in selected areas.

The Program. The Sustainable Production Systems specialization covers food and agriculture production, agroecology, pest ecology and management, crop improvement and propagation. Students may also develop an emphasis in particular production areas such as agronomy, environmental horticulture, pomology, vegetable crops or viticulture. The Range and Natural Resources specialization emphasizes the theory and practice of natural resource management in grazed ecosystems.

All students gain practical experience through a combination of internships and practice. 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 various technical and management positions in agricultural and business enterprises; farming; consulting; private, state and federal agencies concerned with rangeland and natural resource management; Cooperative Extension; international development; teaching; agricultural and environmental journalism, information and communication services. Graduates are qualified to pursue graduate studies in the natural and social sciences, such as agroecology, environmental studies, pest management, education, business management.

B.S. Major Requirements:

Written/oral expression 8-12
See college English requirement. 

General Education (GE) credit: ArthHum—Arts and Humanities, SciEng—Science and Engineering, SocSci—Social Sciences, Div—Social-Cultural Diversity; Wrt—Writing Experience

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer. 2007-2008 offering in parentheses.
Agricultural and Managerial Economics

Perspectives on Agriculture and the Environment .................................................. 13
- Plant Sciences 1 ........................................ 3
- Plant Sciences 2 ........................................ 4
- Applied Biological Systems Technology 49 .......................................................... 2
- Animal Science 1 ........................................ 2

Preparatory Subject Matter ........................................ 41-43
- Biological Sciences 1A-1B ........................................ 10
- Chemistry 2A-2B ........................................... 10
- Physics 1A-1B or Physics 7A-7B .............................. 6-8
- Mathematics 16A ........................................... 3

Core Courses (54-58 units)
- Plant Sciences 101 ........................................... 3
- Plant Sciences 92, 99, or 137, or Applied Biological Systems Technology 145, or International Agricultural Development 195A, 195B ................................................................. 3
- Plant Sciences 192, 199 .................................... 3

Area of Specialization (choose one):
Sustainable Production Systems ..........................54-58

- Includes food and agricultural production, agroecology, crop improvement, propagation, and pest management. Students may choose between a broad education in sustainable agriculture or focus on one or two areas of agriculture (e.g., agricultural management, agronomy, crop improvement, environmental horticulture, pest management, pomology, vegetable crops, viticulture).

- Crop biology and ecology depth requirement must be met with Plant Biology 142.
- Plant Biology 152 or Biological Sciences 84 101 .................................................. 4
- Soil Sciences 100 ........................................... 5
- Restricted elective courses chosen from the following groups with approval of the academic adviser: (minimum 24 units)
  - Plant improvement and propagation
    - Plant Sciences 118; Biotechnology 171; Plant Biology 143, 152, 153, 154, 160, 171
  - Plant physiology or plant nutrition
    - Environmental Horticulture 102; Plant Biology 111, 146, 157, 158, 172; Viticulture and Enology 110
  - Atmospheric, soil or water science
    - Environmental Science 133; Environmental and Resource Sciences 100; Hydrologic Science 110, 124; Soil Science 107, 109, 111
  - Pest ecology and management
    - Plant Biology 176; Entomology 110, 135; Nematology 100; Plant Pathology 120; Viticulture and Enology 118

- Agricultural economics
  - Agricultural and Resource Economics 100A, 120, 130, 147; International Agricultural Development 110

- Agricultural management
  - Agricultural and Resource Economics 100B, 140, 145, 150, 157; Applied Biological Systems Technology 142, 147; Plant Sciences 121

- Animal production
  - Animal Science 41, 41I, 104

- Policy, social science and ethics
  - Agricultural and Resource Economics 147, 176; Plant Sciences 121; Environmental Science and Policy 161, 175; International Agricultural Development 103, 104; Plant Pathology 140; Political Science 107

- Unrestricted Electives ........................................ 12-23

Range and Natural Resources ..........................49-54

This specialization brings together courses that provide a unified understanding of the interaction between livestock production and environmental quality in rangelands.

- Plant Sciences 112, 121, 130, 131, 134, 135, Plant Biology 102 or 145 ........................................ 21-23
- Soil Science 100 ........................................... 5
- Environmental and Resource Sciences 100 or 121 or Hydrologic Science 141 or 143 .................................................. 4
- Wildlife, Fish, and Conservation Biology 110, 111, 120, 151 .................................................. 6-7
- Animal Science 118 ........................................ 6
- Plant Sciences 180, Applied Biological Systems Technology 180, 182, Environmental and Resource Sciences 186, or Hydrologic Science 185 .................................................. 3-5
- Environmental Science and Policy 172 .................................................. 4
- Unrestricted Electives ........................................ 17-29

Total Units for the Major ........................................ 180

Advising Center

Major Adviser, T. Foin (Plant Sciences)

Major Program Requirements: UNITS

Agricultural Systems and Environment ..........................18-19

Preparatory material: Statistics 13, 32, Plant Sciences 120 or Sociology 428, or the equivalent.

Select one of the following tracks:
- Sustainable Agriculture track
  - Plant Sciences 105, 150, Plant Biology 142, Soil Science 100 ........................................... 16
  - Minimum of three units from the following:
  - Range and Natural Resources track
  - Plant Sciences 121 ........................................ 7
  - Minimum of 11 units from the following:
    - Plant Sciences 131, 134, 135, 150, Environmental Science and Policy 123, 172 .................................................. 11

Minor Advisers, T.C. Foin (Plant Sciences), K.J. Rice (Plant Sciences)

Advising Center located in 1220A Plant and Environmental Sciences (530) 752-1715.

Minor Program Options:

Agricultural and Managerial Economics

See Managerial Economics, on page 338.
Related Courses. See Environmental Biology and Management 110; Environmental Science and Policy 160, 168A, 168B, 173; and courses in Economics.

Courses in Agricultural and Resource Economics (ARE)

Lower Division Courses

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 and labor markets; economic and social problems of agriculture in an urban and industrialized economy emphasizing California. GE credit. SocSci.

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 and labor markets; economic 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 101. Not offered every year.—Alston

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.—III. (I.)

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.—I, II, III, IV. (I, II, III, IV)

98. Directed Group Study (1-5)
   Prerequisite: consent of instructor. (P/NP grading only.)—I. (I)

99. Special Study for Undergraduates (1-5)
   Prerequisite: consent of instructor. (P/NP grading only.)

Upper Division Courses

100A. Intermediate Microeconomics: Theory of Production and Consumption (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A, 1B, Mathematics 168. 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.)—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 or equivalent. Theory of production and consumption, market determination, and employment of resources under conditions of monopoly, oligopoly, and monopolistic competition.—I, II, III, IV. (I, II, III)

106. Quantitative Methods in Agricultural Economics (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A, Statistics 103. Statistical methods for analyzing quantitative agricultural economics data: linear and nonlinear regression and correlation analysis.—I, II, III, IV. (I, II, III)

112. Fundamentals of Business Organization (4)
   Lecture—4 hours. Discussion—2 hours. Prerequisite: upper division standing or consent of instructor. The role of organizational design and behavior in business and public agencies. Principles of planning, decision making, individual behavior, motivation, leadership, informal groups; conflict and change in the organization.—I, II, III. (I, II, III)

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-product relationships, pricing and demand; new product development 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.)—I, II, III. (I, II, III)

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 shift in population growth and health, labor markets and international migration. Important issues of policy concerning international trade and industrialization. (Same course as Economics 115A.) GE credit: SocSci. Div.—I, II, III, IV. (I, II, III, IV)

115B. Economic Development (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A and 1B. Macroeconomic issues of developing countries. Issues include problems in generating capital, conduct of monetary and fiscal policies, foreign aid and investment. Important issues of policy concerning international borrowing and external debt in developing countries. (See course as Economics 115B.) GE credit: SocSci.—I, II, III. (I, II, III)

118. Tax Accounting (4)
   Lecture—4 hours. Prerequisite: Management 11A, 11B; 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 entities with emphasis on tax planning, using income and deduction strategies, retirement plans, and choice of business entity for tax minimization.—I, II, III. (I, II, III)

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 and historical conceptual understanding of the economics of agriculture; how public policy influences the nature and performance of American agriculture. GE credit: SocSci.

120S. 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 American agriculture. Uses of economic and historical conceptual understanding of the economics of agriculture; how public policy influences the nature and performance of American agriculture. Taught in Australia under the supervision of a UC Davis faculty member. Not open for credit to students who have completed course 120. Not offered every year.—Alston

130. Agricultural Markets (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A. The nature, function, organizational structure, and operation of agricultural markets; prices, costs, and margins; market information, regulation, and controls; cooperative marketing.—I, II, III. (I, II, III)

132. Cooperative Business Enterprises (3)
   Lecture—3 hours. Prerequisite: Economics 1A. Study of cooperative business enterprises in the United States and elsewhere; economic theories of behavior, principles of operation, finance, decision-making, and taxation.—I, II, III.

133. 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.)—I.

135. Managerial Marketing (4)
   Lecture—4 hours. Prerequisite: course 100A; Statistics 103. Application of economic theory and statistics in the study of marketing. Marketing measurement and forecasting, market planning, market segmentation, determination of optimal product market mix, sales and cost analysis, conduct of marketing research, marketing models and systems.—I, II, III. (I, II, III)

138. International Commodity and Resource Markets (3)
   Lecture—3 hours. Prerequisite: course 100A, Economics 100 or 104. Basic nature and scope of international trade in agricultural commodities, agricultural inputs, and natural resources. Market dimensions and policy institutions. Case studies to illustrate the import and export commodity trade with different regions and commodities.—II. (II)

139. Futures and Options Markets (3)
   Lecture—3 hours. Prerequisite: course 100A; Statistics 103. 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.—I, II, III.

140. Farm Management (5)
   Lecture—3 hours. Prerequisite: Economics 1A, Economics 1A and 1B. Macroeconomic issues of developing countries. Issues include problems in generating capital, conduct of monetary and fiscal policies, foreign aid and investment. Important issues of policy concerning international borrowing and external debt in developing countries. (Same course as Economics 115A.) GE credit: SocSci. Div.—I, II, III. (I, II, III)

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 from the perspective of the investor.—I, II, III.

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, multifamily, industrial and office real estate markets.—I, II, III. (I, II, III)

145. Farm and Rural Resources Appraisal (4)
   Lecture/discussion—4 hours. Principles, procedures, and practice of the valuation process with specific emphasis placed on farm real estate. Concepts of value, description of land, identification of the major physical and economic determinants of value, the three primary appraisal approaches to valuation, discussion of appraisal activity and practice.—I, II, III.

146. Government Regulation of Business (3)
   Lecture—3 hours. Prerequisite: course 100A or the equivalent. Nature, variety and multiple aspects of government regulation: anti-trust laws and economic and...
social regulation. Nature of the legislative process, promulgation of regulations, and their impact, espe-
cially as analyzed by economists. GE credit: Soc-
Sci.—I. (I.)

147. Resource and Environmental Policy
Analysis (3)
Lecture—3 hours. Prerequisite: Economics 1A; enroll-
ment 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; in and private public
resource use problems; and public issues. (Students
who have had or are taking course 100A, Econom-
ics 100, or the equivalent, may receive only 2 cr.
of credit, so must enroll in course 147M instead.) GE
credit: SocSci. —II. (III.)

147M. Resource and Environmental Policy
Analysis (2)
Lecture—3 hours. Prerequisite: Economics 1A; enroll-
ment 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, Econom-
ics 100, or the equivalent, may receive only 2 cr.
of credit, so must enroll in course 147M instead.) GE
credit: SocSci. —II. (III.)

150. Agricultural Labor (4)
Lecture—3 hours; discussion—1 hour. Importance of
family and hired labor in agriculture, farm labor
market; unions and collective bargaining in Califor-
ia agriculture; simulated collective bargaining exer-
cise; effects of unions on farm wages and earnings.
GE credit: Div. Wrt.—I. (I.)

153. Quantitative Analysis for Business
Decisions (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 100A; Statistics 103. Introduction to selected
topics in management science and operations
research: decision analysis for management, mathe-
matical programming, competitive analysis, and oth-
ers.—I, II, III (I, II, III.)

156. Introduction to Mathematical
Economics (4)
Lecture—4 hours. Prerequisite: courses 100A and 152;
Mathematics 16C or 21C recommended (stu-
dents should note that the formal mathematical con-
tent of this course is higher than other courses in the
curriculum). Linear algebra for economists; neces-
sary and sufficient conditions in static optimization
problems; implicit function theorem; economic meth-
ology and mathematics; comparative statics;
envelope theorem; Le Chatelier principle; applica-
tions to production and consumer models.—I, II, III.

157. Analysis for Production Management
(4)
Lecture—4 hours. Prerequisite: course 100A; statis-
tics 103. Application of economic theory and quan-
titative methods to analysis of production man-
agement problems including inventory control,
production scheduling, quality control, simulation,
systems approach, and work measurement.—II, III.

171A. Financial Management of the
Farm (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 106; Management 11A-11B. Financial anal-
ysis at the firm level: methods of depreciation;
impact 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; open
for credit to students who have completed Eco-
nomics 134.—I, II, III, (I, II)

171B. Financial Management of the
Farm (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 in finance.—II, III, (I, II, III)

175. Natural Resource Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 100B or Economics 100. Role of the environ-
ment in economic activity and methods for protecting
and enhancing environmental quality; implications
of market failure for pub lic policy; design of envi-
ronmental policy; theory of welfare measurement;
measuring the benefits of environmental improve-
ment. GE credit: SocSci.—I. (I.)

176. Environmental Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
course 100B or Economics 100. Role of the environ-
ment in economic activity and methods for protecting
and enhancing environmental quality; implications
of market failure for public policy; design of envi-
ronmental policy; theory of welfare measurement;
measuring the benefits of environmental improve-
ment. GE credit: SocSci.—II. (II.)

192. Internship (1-6)
Internship—3–18 hours. Internship experience off
and on campus in all subject areas offered in the
Department of Agricultural and Resource Economics.
Internships are supervised by a member of the staf.
(P/NP grading only.)

194HA-194HB. Special Study for Honors
Students (4-6)
Independent Study—3 hours; seminar—1 hour. Pre-
 requisite: Minimum GPA of 3.500; course 100B;
courses 106 or 152 can be taken concurrently;
major in Agricultural and Managerial Economics or
Managerial Economics; senior standing. A program
of research culminating in the writing of a honors
thesis under the direction of a faculty adviser.
(Deferred grading only, pending completion of
sequence.)—I, II, (I, II)

197T. Tutoring in Agricultural Economics
(1-3)
Hours and duties will vary depending upon the
course being tutored. Prerequisite: senior standing in
Agricultural and Resource Economics and consent of
Department Chairperson. Tutor will lead small dis-
cussion groups affiliated with one of the depart-
ment’s regular courses, under the supervision of,
and at the option of the instructor in charge of the
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. (P/NP grading
only)

Graduate Courses

200A. Microeconomic Theory (5)
Lecture—4 hours; discussion—1 hour. Prerequisite:
graduate standing. Linear and non-linear optimiza-
tion applied to theory of the profit maximizing firm and
the utility-maximizing consumer. (Same course as
Economics 200A.)—I. (I.)

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 failures. (Same course as Economics
200B.)—II, III (II, III)

200C. Microeconomic Theory (5)
Lecture—4 hours; discussion—1 hour. Prerequisite:
course 200B. Uncertainty and information econom-
ics. Individual decision making under uncertainty.
Introduction to game theory, with emphasis on appli-
cations to market behavior of firms that are imperfectly
competitive or consumers that are imperfectly informed.
(Same course as Economics 200C.)—II, III.

202A. Introduction to Applied Research
Methods (3)
Lecture/discussion—3 hours. Prerequisite: courses
204A and 256, or the equivalent; course 200A con-
currently. Study of philosophy and methodology of
applied research in agricultural economics. Methods
of conceptualization of researchable topics. Method
of communication and constructive criticism.—I. (I.)

202B. Applied Microeconomics II: Consumer
and Producer Behavior (3)
Lecture/discussion—3 hours. Prerequisite: courses
200A and 202A; course 200B concurrently. Appli-
cation of consumer and producer theory in models
of individual behavior and market-level phenomena.
Implications of consumer and producer theory for
specification of empirical models of supply and de-
dependence for inputs and outputs in market equilib-
rium displacement models.—II, (II.)

202C. Applied Microeconomics II: Welfare
Analysis and Imperfect Competition (3)
Lecture/discussion—3 hours. Prerequisite: course
202B; course 200C concurrently. Methods of
applied welfare economics with emphasis on prob-
lems arising in agriculture and the environment.
Models of imperfectly competitive markets and their
application to industries and institutions in the agri-
cultural sector.—II, (II.)

204A. Microeconomic Analysis I (4)
Lecture—4 hours. Prerequisite: course 100B or Eco-
nomics 100; advanced undergraduates with consent
of instructor. Behavior in imperfectly competitive
markets and producers and purchasers and their inter-
actions, tools and methods needed to analyze economic behavior in the marketplace.
Application of those methods to real-world prob-
lems.—I, II, Paul

204B. Microeconomic Analysis II (4)
Lecture—4 hours. Prerequisite: course 204A or con-
sent of instructor. Behavior in imperfectly competitive
markets-monopoly and price discrimination, oligo-
poly. Introduction to noncooperative game theory.
Analysis of decisions made under risk and uncer-
tainty and imperfect information. The economics of externalities and public goods.—II, (II.)

Sexton

214. Development Economics (4)
Lecture—4 hours. Prerequisite: course 100A, 100B,
Economics 101; course 204A and Economics
160A, 160B recommended. Review of the principal
theoretical and empirical issues whose analysis has formed development economics. Analysis of eco-
nomic development theories and development strate-
gies and their application to specific policy issues in
developing country contexts. (Same course as Eco-
nomics 214.)—I, (II.)

215A. Microdevelopment Theory and
Methods I (4)
Lecture—3 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 imperfections and uncertainty.
Analysis of rural land, labor, credit and insurance
markets, international markets and trade.—II, (II.)

215B. Microdevelopment Theory and
Methods II (4)
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 in the macroeconomic framework
of an open economy. Basic theoretical focus is real exchange rate and its impact on sec-
toral allocation of resources. (Same course as Eco-
nomics 215B.)—II, (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 of exogenous and endogenous
influence, and the role of the private and public
sector, including household and regional equilib-
rium models. Computational general equilibrium and
applied methods of applied research. (Same course as Economics 215C.)—III, (III.)

Agricultural and Resource Economics 127
Agricultural Systems and Environment

215D. Environment and Economic Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200A, 204A or consent of instructor. Interdisciplinary course drawing on theoretical and empirical research on interactions between environmental resource use and economic processes. Analysis of issues emerging at the interface of environmental and development economics. (Same course as Economics 215D.)—II, III. (III.)

222. International Agricultural Trade and Policy (4)
Lecture—3 hours. Prerequisite: course 100B or 204A; Economics 160A or the equivalent. Analysis of country interdependence through world agricultural markets. National policy choice in an open economy study the impacts of national intervention on world markets, national policy choice in an open economy focus on the role of the Asian, European, and Latin American nations. Partial equilibrium analysis is used to study the role of country interdependence through world agricultural markets. (Same course as Economics 222.)—II. (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 relationships, in conducting applied analysis of supply and demand at the firm and industry level.—II. (III.)

232. Agricultural Commodity Markets (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 200A, 202A, and 240A or consent of instructor. Economic analysis of industries that produce, market, transport, store, and process basic commodities. Analysis of market equilibrium under perfect and imperfect competition, with and without government intervention.—I. (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 economic policy applied to agriculture, agricultural, and rural issues. Examples for detailed consideration include food security, commodity issues, and trade policy. Analytical approaches include static and dynamic welfare analysis, policy design, and political-economic analysis.—III. (III.)

239. Econometric Foundations (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in undergraduate-level econometrics. The course provides a theoretical base for econometric theory and empirical work by examining the statistical foundations 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 Economics 239.)—I. (I.)

240A. Econometric Methods (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Statistical 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 Economics 240A.)—II. (II.)

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 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.)—II. (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; time series models for higher order moments and transition data; state-space models. (Same course as Economics 240C.)—II, III. (III.)

240D. Cross Section Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 240B. Estimation and inference for nonlinear 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.)—II. (III.)

240E. Topics in Applied Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 240A and 240B. Examination of modern econometric technique used in applied fields of economic research, such as demand analysis, environmental economics, macroeconomics/finance, etc. Emphasis on selection of appropriate tools for individual fields. Course focus will expand topics covered in courses 240A and 240B. (Same course as Economics 240E.)—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. Prerequisite: course 200C. Optimization techniques and methods including linear and nonlinear programming. Empirical applications to household, firm, general equilibrium and economic growth problems.—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.—II. (II.)

255. Advanced Topics in Economic Dynamics (3)
Lecture—3 hours. Prerequisite course 254. Local stability analysis, steady state comparative statics and comparative dynamics, dynamic duality theory and the principle of optimality, differential games, numerical solution of deterministic and stochastic dynamic models using GAMS, stochastic optimal control, plus other advanced topics in economic dynamics. Offered in alternate years.—III. (III.)

256. Applied Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 104, Economics 140, or equivalent, or consent of instructor. Application of statistical tools to economic and business analysis. Emphasis on regression analysis, problems of specification, and model development. (Same course as Economics 256.)—II. (II.)

258. Demand and Market Analysis (3)
Lecture—3 hours. Prerequisite: courses 204A and 256 or consent of instructor. Quantitative and theoretical analysis of the factors affecting supply, demand and price determination for agricultural products. Emphasis on analytical tools for assessing the impacts of changes in government policies and macroeconomic variables.—III. (III.)

275. Economic Analysis of Resource and Environmental Policies (4)
Lecture/discussion—4 hours. Prerequisite: course 240A. Development of externality theory, market failure concepts, the theory of renewable and non-renewable resource use, and political economic models. Applications to policy issues regarding the agricultural/environment interface and economic analysis in the public domain. (Same course as Environmental Science and Policy 275.)—III. (III.)

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.—I. (I.)

277. Natural Resource Economics (4)
Lecture—4 hours. Prerequisite: course 254 or consent of instructor. Application of capital 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. Not offered every year.—II, III, I, II, III.

293. Analysis of California Agriculture and Resources (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 farmer and industry decisions in an applied setting. ($/U grading only.)—II, III.

298. Directed Group Study (1-5)
Lecture—3 hours. Selected topics in agricultural and resource economics, focusing on current research. May be repeated 4 times for credit. Not offered every year.—II, III, I, II, III.

299. Directed Study (1-5)
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 farmer and industry decisions in an applied setting. ($/U grading only.)—II, III.

300. 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. Not offered every year.—II, III, I, II, III.

Professional Course

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. ($/U grading only.)—I, II, III, I, II, III.

Agricultural Systems and Environment

See Agricultural Management and Rangeland Resources, on page 124.

Agronomy

See Plant Sciences, on page 419.

Agricultural and Range Science

See Plant Sciences, on page 419.
American Studies

(College of Letters and Science)
Jay Meckling, Ph.D., Program Director
Program Office: 2134A Hart Hall
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Committee in Charge
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Laura Grindstaff, Ph.D. (Sociology)
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Jay Meckling, Ph.D. (American Studies)
Michael L. Smith, Ph.D. (American Studies)
Eric Smooldin, Ph.D. (American Studies)
Julie Sze, Ph.D. (American Studies)
Patricia Turner, Ph.D. (African American and African Studies)
Jan Wagner, Ph.D. (Education)
Grae Wang, Ph.D. (American Studies)

Faculty
Carolyn Thomas de la Peña, Ph.D., Assistant Professor
Jay Meckling, Ph.D., Professor, Academic Senate Distinguished Teaching Award
Michael L. Smith, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Eric Smooldin, Ph.D., Professor
Julie Sze, Ph.D., Assistant Professor
Patricia Turner, Ph.D., Professor
Grace Wang, Ph.D. (American Studies)

Emeriti Faculty
David Scafield Wilson, Ph.D., Senior Lecturer Emeritus

Affiliated Faculty
Eric Schroeder, Ph.D., Lecturer, Academic Federation Excellence in Teaching Award

The Major Program
American Studies offers an alternative approach to the study of American experience for students who feel too limited by departmental approaches. Lower division, introductory classes explore the ways in which cultural systems shape and reflect life in the United States. These classes pay close attention to the ways in which differences of class, race, gender, generation, ethnicity, religion, and sexual orientation unevenly affect American lives.

The Program. American Studies majors take five upper division, in-depth classes and seminars devoted to close study of major thinkers and of issues crucial to the practice of American Studies. Advanced work in at least two other departments or programs allows each student to emphasize a period, a problem, or a subject tailored to his or her own individual education goals. 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 education and sciences undergraduate education. American Studies maximizes a student’s contact with a variety of subject matter and approaches. Graduates have moved into a broad range of career settings, including journalism, law, medicine, nursing, law enforcement, teaching, environmental planning, library science, museum curatorship, and business. Some students discover new career possibilities through their internships in American institutions.

A.B. Major Requirements:

Preparatory Subject Matter……………... 24
Preparatory Subject Matter……………... 24
American Studies 100……………... 4
One additional lower division American Studies course……………... 4

One course from African American and African Studies 10; American Studies 1, Chicana/o Studies 10, Native American Studies 1, or an equivalent course in racial and ethnic diversity……………... 4
One course from Anthropology 2, Sociology 2, Women’s Studies 50, or an equivalent course in social science approaches to culture……………... 4
One course from History 17A, 17B, 72A, 72B……………... 4
One course from English 30A, 30B, Film Studies 1, or an equivalent course introducing critical approaches to literary and visual texts in the humanities……………... 4

Depth Subject Matter……………... 40
American Studies 100 and 160……………... 8
American Studies Electives: Three additional upper-division American Studies courses……………... 12

Emphasis……………... 20
In consultation with the American Studies Undergraduate Adviser, the student designs a program of 20 units (typically five courses) of upper division course work 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 remaining 12 units outside the program.

Totals for the Major……………... 64

Recommended
Completion of the college requirement in English composition before enrollment in American Studies 190A.

Minor Program Requirements:

UNITS

American Studies……………... 20
American Studies, upper division courses……………... 20
No more than 8 units of course 192 may be counted toward this total.

Faculty Advisers. C. de la Peña, J. Meckling, M. Smith, E. Smooldin, J. Sze, G. Wang
Teaching Credential Subject Representative. J. Meckling; see the Teaching Credential/M.A. Program on page 102.

Courses in American Studies (AMS)

Lower Division Course

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 common sense. GE credit: ArtHum, Div. Wrt.—I. (I.) Meckling

1B. Religion in American Lives (4)
Lecture—3 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 impacts of colonization, colonization and culture contact on religious systems. GE credit: ArtHum or SocSci, Div. Wrt.—II. (I.)

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 course. GE credit: ArtHum or SocSci, Div. Wrt.—II.

18. Nature and Culture in America (4)
Lecture—3 hours; fieldwork—3 hours. Uses and abuses of nature in American culture; patterns of human interaction, exploitation, appreciation, and neglect; attention to California; emphasis on metaphor as a key to understanding ourselves and the natural world; attention to models of healing, stewardship, ecology, the “rights” movement. Offered in alternate years. GE credit: ArtHum or SocSci, Div. Wrt.—III. Smith

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, (II, 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.—I. (I.) Smith

10. Introduction to American Studies (4)
Lecture—3 hours; discussion—1 hour. United States history, culture and society. Examination of cultural, social, and political topics including popular culture (film, TV, Internet), cultural diversity, social activism, play, and communication. GE credit: ArtHum or SocSci, Div. Wrt.—III. de la Peña

21. Objects and Everyday Life (4)
Lecture—2 hours; discussion—1 hour. Term paper. Prerequisite: completion of Subject A requirement. Material culture (objects and artifacts ranging from everyday objects like toys and furnishings to buildings and constructed landscapes) as evidence for understanding the everyday (vernacular) lives (gender, social class, ethnicity, region, age, and other factors); collecting and displaying material culture; commodity capitalism of individuals and communities in colonial North America and the United States. Offered in alternate years. GE credit: ArtHum, Div. Wrt.—I. de la Peña

23. United States as a Business Culture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: completion of Subject A requirement. Business as a cultural system and its relation to religion, politics, arts, science, technology, and material culture; business themes of success, creativity, invention, and competition in American autobiographies, fiction, advice literature, film, and television; cultures of the workplace; multinational business. GE credit: ArtHum, SocSci, Div. Wrt.—I. (I.) de la Pena, Meckling

30. Images of America and Americans in Popular Culture (4)
Lecture—3 hours; discussion—1 hour. Investigation of verbal and visual discourses about American identity in various popular culture products, including film, television, radio, music, fiction, art, advertising, and commercial experiences; discussions about the United States in the popular culture of other societies. Offered in alternate years. GE credit: ArtHum or SocSci, Div. Wrt.—I

55. Food in American Culture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: completion of Subject A requirement. Food as cultural system in the United States; food in the performance of individual and group identity, including gender and ethnicity; food in literature, art, popular culture (film, television, advertising), and folk culture; the food industry and business. GE credit: ArtHum, SocSci, Div. Wrt.—II. (I.) de la Pena, Meckling

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)
100. Interdisciplinary Skills (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 and Internet research skills, project/problem definition, methods of study of texts, individuals, communities. Hands-on, skill-building, focused research seminar.—I. (I.)

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. Content will vary according to the instructor and in accord with 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 Interrelation 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.—I, II, III. (I, II, III.)

110. A Decade in American Civilization (4) Lecture—2 hours, discussion—2 hours. Prerequisite: one of courses 1A, 1B, 1C, 1D, 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, conversations on 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.—I. (I.)

111. Theories of Everyday Life in the United States (4) Lecture—3 hours; discussion—1 hour. Prerequisite: upper division status; preparatory courses for the American Studies major or the equivalent interdisciplinary experience. Introduction to the interpretive and critical theories and practices that seek to understand everyday life in the United States, with special attention to uncovering the vernacular theories guiding these practices.—I. (I.)

115. Living in Bodies: Body Politics in the United States (4) Lecture—3 hours; discussion—1 hour. Prerequisite: upper division status; preparatory courses for the American Studies major or the equivalent interdisciplinary experience. Examination of human bodies as sites for cultural constructions of identities and "selves" in the United States; attention to bodily norms, conventions, and taboos; the relation between disciplining the body and controlling social categories, including race, gender, class and sexualities.—II. (II.)

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 various folk communities, including families, ethnic institutions, voluntary organizations, and occupational groups. GE credit: ArtHum or SocSci, Div, Wrt.—II. (II.)

125. Corporate Cultures (4) Lecture—2 hours, discussion—1 hour; fieldwork—1 hour. Prerequisite: one course chosen from course 120, Anthropology 2, Psychology 16, or Sociology 1; or consent of instructor. Exploration of the small group corporate workplace as a cultural system, and the relationship between this system and elite and folk cultures. Exploration of the theories and methods for discovering and interpreting patterns of meaning in American popular culture. GE credit: ArtHum or SocSci, Div, Wrt.—II. (II.)

132. Critical Approaches to Media Culture (4) Lecture/discussion—4 hours; film viewing—2 hours. Critical approaches to the study of contemporary media culture, focusing on television, film, television, computer, and print media and their products and on the various interrelationships between media and U.S. culture. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt.—II. (II.)

133. Rhetoric of Media on Social Issues (4) Lecture/discussion—4 hours. An introduction to the rhetorical analysis of social issues as depicted in media culture, with specific emphasis on the way media frame mental and moral problems. Not open to students who have taken Rhetoric and Communication 124. Offered in alternate years. GE credit: SocSci, Div, Wrt.—III. (III.)

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, Wrt.—III. (III.)

151. American Landscapes and Places (4) Lecture—2 hours; discussion—1 hour; fieldwork—3 hours. Prerequisite: course 1, upper division standing. American cultural landscapes as sites of human activity and interaction; the populations inhabiting a region, including their relationships to a shared biological, physical, and social environment, their intercultural relations, and their relationships to the dominant American popular and elite culture and folk traditions. GE credit: ArtHum or SocSci, Div, Wrt.—II. (II.)

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 historical, literary, artistic, and social scientific approaches. GE credit: ArtHum or SocSci, Div, Wrt.—III. (III.)

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, and the conflicts between those tensions and the emerging social changes. GE credit: ArtHum or SocSci, Div, Wrt.—II. (II.)

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, Wrt.—I. (I.)

155. Symbols and Rituals in American Life (4) Lecture—2 hours; discussion—2 hours. Prerequisite: course 1. Interdisciplinary examination of selected, richly expressive topics (flags, symbols, holidays) and symbols (flags, memorials, temples) which encode nationwide values and understandings (Thanksgiving, New Year’s, etc.) or which realize more limited, special meanings (Mardi Gras, rodeos, Kwanza, graduation, bar mitzvah, etc.). Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt.—III. de la Peña

156. Revolution and Society in the United States (4) Lecture—2 hours; discussion—2 hours. Prerequisite: course 1. Interdisciplinary examination of the significance of the role of the making of the United States; how race shapes events and makes and unmake public lives in the United States; the interweaving of race with gender, class and national identity in self and community. GE credit: ArtHum or SocSci, Div, Wrt.—II. (II.)

157. Animals in American Culture (4) Lecture—3 hours; discussion—1 hour. Animals as symbols and images in American folk and popular culture, literature, and art; customs and stories around human-animal interactions, including hunting, religion, foodways, pets, zoos, circuses, ranches, theme parks, and scientific research on animals. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt.—III. Mechling

158. Technology and the Modern American Body (4) Lecture/discussion—3 hours; term paper. Prerequisite: Technocultural Studies 1 and either course 1A or 5. The history and analysis of the relationships between human bodies and technologies in modern society. The dominant and eccentric uses of human bodies and technologies influence one another and reveal underlying cultural assumptions. (Same course as Technocultural Studies 158.) GE credit: ArtHum.—I, II, de la Peña

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; emphasis on theory and its application to American material. Limited enrollment. May be repeated once for credit when content differs.—II, III. (II, III.)

190A. Senior Thesis Research Seminar (4) Seminar—2 hours; extensive writing. Prerequisite: senior standing in American Studies major. Research and prospectus writing for senior thesis.—I. (I.)

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 or a topic proposed in course 190A.—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, museums, schools, historical societies, governmental and social agencies, etc., with attention to the techniques of participant observation and the collection of ethnographic 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 Courses

207. The Critical Study of Whiteness (4) Seminar—4 hours; term paper. Prerequisite: Graduate standing in social science, humanities, arts, or cultural studies. Critical study of the emergence and significance of the social and racial status “whiteness” and its cultural practices. The colonial legacy and its endurance for emergence of whiteness, its centrality to class, race, gender formation, and to social, cultural, legal, and educational processes. Offered in alternate years.—II.

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 cus-
Anatomy

See Anatomy, Physiology and Cell Biology, on page 131; and Courses in Cell Biology and Human Anatomy (CHA), on page 354.

Anatomy, Physiology and Cell Biology

See Veterinary Medicine, School of, on page 469.

Anesthesiology and Pain Medicine

See Medicine, School of, on page 345.

Animal Behavior (A Graduate Group)

Joy Mechling, Ph.D., Chairperson of the Group
Group Office, 310 Life Sciences Addition
(530) 752-8201; Fax (530) 752-8822; animalbehavior@biosci.ucdavis.edu; http://www.dbs.ucdavis.edu/gradgroups/ab

Faculty. The Group includes faculty from 11 departments in three schools and colleges.

Graduate Study. The Ph.D. program in Animal Behavior is an interdisciplinary program that trains students for teaching and research in a variety of areas, including anthropology, animal science, ecology, entomology, neurobiology, psychology, physiology, veterinary science, wildlife biology, and zoology. Students choose one of five areas of specialization: (1) ethology and evolutionary bases of animal behavior, (2) physiological basis of animal behavior, (3) behavior and conservation of wild animals, (4) behavior and management of domestic animals, and (5) integrative studies. All five specializations emphasize the adaptive and evolutionary bases of animal behavior. Resources available to students, in addition to various departmental facilities, include those of the California Regional Marine Biology Center, Bodega Marine Laboratory, and the Agricultural Field Stations.

There is an application deadline of December 15 for fall quarter.

Preparation. Appropriate preparation is a bachelor’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 100

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:

Comparative psychology: Psychology 250
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

Ecology (1)

201. Scientific Approaches to Animal Behavior Research (3)
Lecture—3 hours. Prerequisite: consent of instructor. Philosophical issues, goals, strategies and tools in field and laboratory research. May be repeated for credit when topics differ. (II, III, IV)

205, Agronomy 205, 206
204C, or 204D, Statistics 106, 108, 138
Science: Biological Sciences 310, Psychology 290A, 290B

Comparative psychology:

Comparison: 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

Ecology (1)

Prerequisite: consent of instructor. Analysis of literature in behavior and an allied discipline or disciplines that offer the potential, in combination, to advance the understanding of a topic in animal behavior conceptually and empirically. Topics will vary from year to year. (II, III)

208. Interdisciplinary Approaches to Animal Behavior (5)
Workshop—4 days total; discussion—3 hours; term paper. Prerequisite: course 230A the previous quarter. Development of an empirical or theoretical interdisciplinary approach to research on a current topic in animal behavior.

209. Seminar in Animal Behavior (1-3)
Seminar—2 hours. Prerequisite: graduate standing. May be repeated twice for credit. (S/U grading only.)—I, II, III

210. History of Animal Behavior (1)
Discussion—1 hour. Prerequisite: consent of instructor. Classic, seminal papers in animal behavior. Discussion of readings and broader historical context in which papers were written. (S/U grading only.)—II. Capitani

211. Animal Behavior, Ecology and Evolution (3)
Lecture—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 102, Evolution and Ecology 100, 101 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 Population Biology 221.) (S/U grading)

213. Behavioral Development Group (1-5)
Lecture—2 hours. Prerequisite: consent of instructor. Analysis of literature in behavior and an allied discipline or disciplines that offer the potential, in combination, to advance the understanding of a topic in animal behavior conceptually and empirically. Topics will vary from year to year. (II, III)

230A. Interdisciplinary Approaches to Animal Behavior (3)
Seminar—3 hours; term paper. Prerequisite: consent of instructor. Analysis of literature in behavior and an allied discipline or disciplines that offer the potential, in combination, to advance the understanding of a topic in animal behavior conceptually and empirically. Topics will vary from year to year. (II, III)

230B. Interdisciplinary Approaches to Animal Behavior (5)
Workshop—4 days total; discussion—3 hours; term paper. Prerequisite: course 230A the previous quarter. Development of an empirical or theoretical interdisciplinary approach to research on a current topic in animal behavior.

270. 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. Limited enrollment. May be repeated for credit. (S/U grading only.)—I, II, III

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 ecology (Evolution and Ecology 101 or the equivalent). Reading, reports and discussion on current topics in animal behavior, with a focus on topics that lie at the interface between animal behavior, ecology and evolution. (Same course as Population Biology 287.) May be repeated twice 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

294. Seminar in 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 predator 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 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: consent of instructor. (S/U grading only.)

Professional Course

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering; SocSci=Social Sciences; Div=Social-Cultural Diversity; Wrt=Writing Experience
Animal Biology

[College of Agricultural and Environmental Sciences]

Faculty. Faculty includes members of the Department of Animal Science, on page 134; Entomology, on page 255; Nematology, on page 391; and Wildlife, Fish, and Conservation Biology, on page 483.

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, systematics, ecology, physiology and molecular biology. Students are not restricted to the study of a particular group of animals. Emphasis is on biological 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 a curriculum that builds an understanding of animal biology from the molecular to the ecological and evolutionary levels of organization. After completing these core courses, students are able to specialize in various interdisciplinary aspects of animal biology, and plan their chosen emphasis of study as part of a required discussion course and in consultation with their adviser. The Animal Biology major requires courses on biological principles as opposed to courses on animal care and husbandry. This program includes a senior thesis, which each student designs to bridge the disciplines of the major.

Internships and Career Alternatives. The program 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 regulation, health or agriculture as each relates to the integrative 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. Students may in the major gain research experience and may continue to train their throughout the graduate or professional level in a variety of biological disciplines.

B.S. Major Requirements:

<table>
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<tr>
<th>Units</th>
<th>Description</th>
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<td>8</td>
<td>English Composition Requirement</td>
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Preparatory Subject Matter

Biological Sciences 1A-1B-1C 15
Chemistry 2A-2B-2C, 8A-8B or 118A 118
Mathematics 16A-1B-1C or 17A-1B-1C or 21A-2B-2C 21-23
Physics A7/B7/C7 12
Statistics 13 or 100 or 122 12
Agricultural Management Resources 120 12
Animal Biology 50A, 50B, 50C 8
Breadth/General Education 24

Depth Subject Matter

Biology 101 4
Animal Biology 102 and 103 or Biological Sciences 102 and 103 12
One from Neurobiology, Physiology, and Behavior 117, 172, Entomology 102, Wildlife, Fish, and Conservation Biology 121 3-5
One from Anatomy, Physiology and Cell Biology 101, or Ecology 101, Neurobiology, Physiology, and Behavior 123 3-4
Evolution and Ecology 100 4

Restricted Electives

25

One from Environmental Science and Policy 100, 121; Evolution and Ecology 101, 102 4
Animal Biology 187 2
Animal Biology 189 and 189D 4-6

Unrestricted Electives

10-18

Total Units for the Degree 180

Master Adviser. J. Granet

Advising Center for the major, including peer advising, is located in 1202 Meyer Hall (530) 754-7912.

Courses in Animal Biology (ABI)

Lower Division Courses

50A. Animal Biology Laboratory (2) Lecture/laboratory—4 hours. Scientific methods for answering questions about animal biology by doing exercises to demonstrate hypothesis testing and reporting, short laboratory, population and field experiments. Maintain notebooks, analyze data, interpret results and write reports. —I. (J.) Kimsey, Kueitz

50B. Animal Biology (3) Lecture—3 hours. Prerequisite: Biological Sciences 1A, Biological Sciences 1B (may be taken concurrently). Basic biological disciplines important to an understanding of practical animal biology issues including the evolution of animal groups, genetic mechanisms, animal physiology as it relates to maintenance and production, and aspects of comparative anatomy, behavior and ecology.—II. (III.) Woodruff, Ferris, Lanzaro

50C. Animal Biology (3) Lecture—3 hours. Prerequisite: Biological Sciences 1B, 1C, courses 50A, 50B, Animal management and conservation. Societal concerns arising from management and conservation issues, including economics, aesthetics, regulations, safety, public perspectives and advocacy.—III. (II.) Woodruff, Ferris, Lanzaro

92. Internship in Animal Biology (1-12) Internship—3-36 hours. Prerequisite: completion of Biological Sciences 2A, 2B, 2C, 8A-8B. Water and biological buffers. Water 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 Undergraduates (1-5) (P/NP grading only.)

Upper Division Courses

102. Animal Biochemistry and Metabolism (5) Lecture—4 hours; discussion—1 hour. Prerequisite: Chemistry 2A-2B, 8A-8B. Water and biological buffers, thermodynamics of metabolism; structure and function of biomolecules; enzyme kinetics and feedback; membrane biology, digestion and absorption, carbohydrate metabolism, lipids. Open to credit for students who have completed Biological Sciences 102. —I. (II.) Calvert

103. Animal Biochemistry and Metabolism (5) Lecture—4 hours; discussion—1 hour. Prerequisite: course 102. Physiological function and metabolism of lipids and amino acids; integrative metabolism; biochemical basis for nutrient requirements; structure and function of vitamins; mineral metabolism and requirements. Not open for credit to students who have completed Biological Sciences 103.—II. (III.) Calvert

187. Animal Biology Seminar (2) Seminar—1 hour; discussion—1 hour. Prerequisite: junior standing, courses 50A, 50B, 50C. Seminar leading to development of the Major Proposal for the Animal Biology major.—I. (II.) Granet, Wilson

189. Senior Practicum (2) Independent study—6 hours. Prerequisite: junior standing, courses 50A, 50B, 50C, and 187. Course 189D concurrently the first time course 189 is taken. The practicum may be an experimental research project, a library research project or some other creative activity that will serve as a capstone experience for the Animal Biology major. May be repeated once for credit. (P/NP grading only.)—I, II, III. (II, III.)

189D. Senior Practicum Discussion (1) Discussion—1 hour. Prerequisite: junior standing, courses 50A, 50B, 50C, and 187. Course 189D required concurrently. Course helps prevent or solve problems during the students’ senior practicum activity. (P/NP grading only.)—I, II, III. (II, III.)

192. Internship in Animal Biology (1-12) Internship—3-36 hours. Prerequisite: completion of Biological Sciences 2A, 2B, 2C, 8A-8B. Water and biological buffers. Water 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.)

198. Directed Group Study (1-5) (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.)

Animal Biology

(A Graduate Group)

Trish Berger, Ph.D., Chair of the Group

Group Office. 1202 B Meyer Hall (530) 752-2382; Fax: (530) 754-4359

http://animalbiology.ucdavis.edu

Faculty

Thomas E. Adams, Ph.D., Professor (Animal Science)

Gary B. Anderson, Ph.D., Professor (Animal Science)

Barry A. Ball, Ph.D., Professor (Population Health and Reproduction; School of Veterinary Medicine)

Damon D. Banks, Ph.D., Assistant Professor (Population Health and Reproduction; School of Veterinary Medicine)

Trish Berger, Ph.D., Professor (Animal Science)

Steven L. Berry—Extension Dairy Management and Health Specialist (Animal Science)

Chris C. Calvert, Ph.D., Professor (Animal Science)

Ernie Chang, Ph.D., Professor (Animal Science; located at Bodega Marine Lab)

Douglas E. Conklin, Ph.D., Associate Professor (Animal Science)

Alan J. Conley, Ph.D., Professor (Population Health and Reproduction; School of Veterinary Medicine)

Mary J. Delany, Ph.D., Associate Professor and Chair (Animal Science)

Edward J. DePeters, Ph.D., Professor (Animal Science)

Serge I. Daraskevich, Ph.D., Professor (Animal Science)

James G. Fadel, Ph.D., Professor (Animal Science)

Thomas R. Famula, Ph.D., Professor (Animal Science)

Silas S.O. Hung, Ph.D., Professor (Animal Science)

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Social-Cultural Diversity; Wrt—Writing Experience
Michael L. Johnson, Ph.D., Associate Research Scientist (College of Agricultural and Environmental Sciences, Animal Science; biotechnology, on page 134).

Animal Genetics (College of Agricultural and Environmental Sciences)

The Graduate Group in Animal Biology offers programs of study and research leading to the M.S. and the Ph.D. degrees. The Animal Biology Graduate Group focuses on integrated animal biology. Each student individually tailors his/her program of study to his/her individual needs. The Animal Biology Graduate Group is unique in encouraging a multidisciplinary or interdisciplinary approach involving physiology, nutrition, genetics, ecology and behavior within the context of organismal animal biology.

Graduate Advisers. Consult the Animal Biology Graduate Group Office.

Courses in Animal Biology (AB) and Graduate Courses

200A. Integrated Animal Biology I (3)
Lecture/discussion—3 hours. Prerequisite: prerequisite standing, Biological Sciences 101 or the equivalent or the 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.—II. (III. Delany)

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. (III. Delany)

290. Seminar in Animal Biology (1)
Seminar—1 hour. Prerequisite: graduate standing. Seminar on advanced topics in animal biology. Presentations by members of the Animal Biology Graduate Group and guest speakers. May be repeated for credit. (S/U grading only)—II, II, III, II, III.

299C. Research (1-11)
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.

300. Methods in Teaching Animal Biology (2)
Lecture/discussion—2 hours. Prerequisite: prerequisite 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 supervision of instructor. May be repeated up to three times for credit. (S/U grading only)—I, II, III, IV, I, II, III, IV.

350. Seminar on Advanced Topics in Animal Biology (2)
Discussion—2 hours. Prerequisite: graduate standing; first pass Animal Biology graduate group students. Case studies and discussion of ethical and professional issues for animal biologists, including the use of animals in research and teaching, patenting and intellectual property, consulting and conflict of interest, scientific integrity, dealing with the media, and mentoring relationships.—III. (III. Mendenhall, Oberbauer; II, II, III, IV, I, II, III, IV.

401. Ethics and Professionalism in Animal Biology (2)
Discussion—2 hours. Prerequisite: graduate standing; first pass Animal Biology graduate group students. Case studies and discussion of ethical and professional issues for animal biologists, including the use of animals in research and teaching, patenting and intellectual property, consulting and conflict of interest, scientific integrity, dealing with the media, and mentoring relationships.—III. (III. Mendenhall, Oberbauer; II, II, III, IV, I, II, III, IV.

415. Advanced Animal Breeding (3)
Lecture—2 hours. Laboratory—6 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 reference to current breeding practices.—II. (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.—II. (II. Murray, Williamson, Kuehlt)

120. Introduction to Statistical Genomics (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1C, 101, 102, 103. Introduction to statistical genetics, 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. (III. Delany)

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 in alternate years.—III.

206. Advanced Domestic Animal Breeding (3)
Lecture—3 hours. Prerequisite: course 107 and Animal Science 205; 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.—III. (III. Mendenhall, Oberbauer; II, II, III, IV, I, II, III, IV.

208. Estimation of Genetic Parameters (3)
Lecture—3 hours. Prerequisite: course 107 and Animal Science 205; course 204 recommended. General methods for the estimation of components of variance and covariance and their application to the estimation of heritability, repeat-
ability and genetic correlations are considered. Specific emphasis is given to procedures applicable to livestock populations under selection.

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. Students study 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.)—II. Medrano

212. Sequence Analysis in Molecular Genetics (2)
Lecture/laboratory—2 hours. Prerequisite: Biological Sciences 101 or the equivalent; graduate standing or consent of instructor. The use of computer algorithms and online databases to analyze nucleic acid and protein sequences in molecular genetics research. Offered in alternate years.—II. Medrano

298. Group Study (1-5)
Prerequisite: consent of instructor. Lectures and discussions of advanced topics in animal genetics. (S/U grading only.)—(S/U grading only.)

299. Research in Animal Genetics (1-12)
(S/U grading only)

Animal Physiology

See Animal Biology, on page 132; Animal Science, on page 134; Neurobiology, Physiology, and Behavior, on page 392; Philosophy, on page 403; and Molecular, Cellular, and Integrative Physiology (A Graduate Group), on page 382.

Animal Science

[College of Agricultural and Environmental Sciences]
Mary E. Delany, Ph.D., Chairperson of the Department
Robert D. Sainz, Ph.D., Associate Professor
Wolfgang Pittroff, Ph.D., Assistant Professor
James R. Millam, Ph.D., Professor
Joy A. Mench, Ph.D., Professor
Yu-Bang Lee, Ph.D., Professor
Barry W. Wilson, Ph.D., Professor
Richard A. Zinn, Ph.D., Professor
G. Eric Bradford, Ph.D., Professor Emeritus
Hans Abplanalp, Ph.D., Professor Emeritus
Ursula K. Abbott, Ph.D., Professor Emeritus
James W. Oltjen, Ph.D., Lecturer and Specialist in Cooperative Extension
Elizabeth A. Maga, Ph.D., Assistant Researcher and Lecturer
Barry P. May, Ph.D., Adjunct Professor
Deanne Meyer, Ph.D., Specialist in Cooperative Extension
Frank M. Milloefrner, Ph.D., Associate Specialist in Cooperative Extension
James W. Olijen, Ph.D., Lecturer and Specialist in Cooperative Extension
Peter H. Robinson, Ph.D., Specialist in Cooperative Extension
Gideon Zeidler, Ph.D., Specialist in Cooperative Extension

The Major Program

The Animal Science major is devoted to the sciences central to understanding biological function of domestic and captive animals including birds, 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 in an objective and effective manner for the betterment of animals and society.

The Program

The curriculum provides depth in the biological and physical sciences and allows students to specialize within the broad field of applied animal science. 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, captive, equine, laboratory, livestock, 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. degree; 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:

Written and Oral Expression

Preparatory Subject Matter

Animal Science

Neurobiology, Physiology, and Behavior

Philosophy

Molecular, Cellular, and Integrative Physiology

A Graduate Group

General Education (GE) credit: Arts and Humanities, SocSci=Science and Engineering; Div=Socio-Cultural Diversity; Wrt=Writing Experience

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2009-2008 offering in parentheses

Animal Physiology

See Animal Biology, on page 132; Animal Science, on page 134; Neurobiology, Physiology, and Behavior, on page 392; Philosophy, on page 403; and Molecular, Cellular, and Integrative Physiology (A Graduate Group), on page 382.

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The Major Program

The Animal Science major is devoted to the sciences central to understanding biological function of domestic and captive animals including birds, 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 in an objective and effective manner for the betterment of animals and society.

The Program

The curriculum provides depth in the biological and physical sciences and allows students to specialize within the broad field of applied animal science. 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, captive, equine, laboratory, livestock, 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. degree; 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:

Written and Oral Expression

Preparatory Subject Matter

Animal Science

Neurobiology, Physiology, and Behavior

Philosophy

Molecular, Cellular, and Integrative Physiology

A Graduate Group

General Education (GE) credit: Arts and Humanities, SocSci=Science and Engineering; Div=Socio-Cultural Diversity; Wrt=Writing Experience
Animal Science—Animal Biology .................. 20
Animal Science 15, 42, and 41L or 41, and 21
Animal Science 103 or 104.................. 3-4
Animal Science 123, 124, or Neurobiology,
Physiology, and Behavior 121 and
121L
Select additional upper division courses ........ 8-10
Select additional units to complete the 20-unit
Total units from upper division Animal Science
courses, Animal Genetics, Physiology, and Behavior
121, 121L, Nutrition 115, 122, 123, 123L.
Variable unit courses (92, 99, 192, 197, 198, 199)
are not allowed for the completion of this
requirement.
Animal Science—Genetics .................. 20
Animal Science 15, 42, and 41L or 41, and 21
Additional upper division courses ........ 8-10
Select additional units to complete the 20-unit
Total units from upper division Animal Science
courses, Animal Genetics, Physiology, and Behavior
121, 121L, Nutrition 115, 122, 123, 123L.
Variable unit courses (92, 99, 192, 197, 198, 199)
are not allowed for the completion of this
requirement.
Animal Science—Aquaculture .................. 20
Animal Science 18, 18A
Animal Science 118, 119
Additional upper division courses ........ 8
Select additional units to complete the 20-unit
Total units from upper division Animal Science
courses, Animal Genetics, Physiology, and Behavior
121, 121L, Nutrition 115, 122, 123, 123L.
Variable unit courses (92, 99, 192, 197, 198, 199)
are not allowed for the completion of this
requirement.
Animal Science—Dairy/Livestock .................. 20
Animal Science 41 and 41L or 21
Animal Science 104.................. 4
Additional upper division courses ........ 12
Select 4 or 8 units from Animal Science 143,
144, 146
Select additional units to complete the 20-unit
Total units from upper division Animal Science
courses, Animal Genetics, Physiology, and Behavior
121, 121L, Nutrition 115, 122, 123, 123L.
Variable unit courses (92, 99, 192, 197, 198, 199)
are not allowed for the completion of this
requirement.
Animal Science—Equine .................. 21
Animal Science 15
Animal Science 103 or 104.................. 3-4
Animal Science 115, 141.................. 8
Animal Science 125 or 126.................. 3
One additional upper division course 2-3
Select from upper division Animal Science
courses, Animal Genetics, Physiology, and Behavior
121, 121L, Nutrition 115, 122, 123, 123L.
Variable unit courses (92, 99, 192, 197, 198, 199)
are not allowed for the completion of this
requirement.
Minor Adviser, T. R. Famula
Graduate Study, The Department of Animal
Science offers a program of study and research leading
to the M.S. degree. Admission to a second Master's
degree, Master of Agriculture and Management
(M.A.M.) is currently suspended. Detailed informa-
tion may be obtained by contacting the Advising
Center.
Graduate Adviser, D.E. Conklin

Courses in Animal Science (ANS)
Lower Division Courses
1. Domestic Animals and People (4)
Lecture—3 hours; laboratory—3 hours. Animal
domestication and factors affecting their characteris-
tics and distribution. Animal use for food, fiber,
work, drugs, research and recreation; present and
future roles in society. Laboratory exercises with beef
dairy cattle, sheep, poultry, swine, laboratory
animals, fish, horses, meat and dairy products. GE credit:
SciEng, Writ—II, III
2. Introductory Animal Science (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite:
course 1 and Biological Sciences 1A recommended.
Growth, reproduction, lactation, inheritance, nutri-
tion, and disease control in domesticated animals
and species used in aquaculture; the application
of sciences to animal production. GE credit: SciEng,
Writ—III, III
3. Introductory Horse Husbandry (3)
Lecture—3 hours. Prerequisite: course 2 recom-
manded. Introduction to care and use of light horses
emphasizing the basic principles for selection of
horses, responsibilities of ownership, recreational
use and raising of foals. GE credit: SciEng—II
4. Aquacultural Science and Technology (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite:
course 2 or the equivalent. Emphasis on the biology
and production principles of aquatic environments
and governmental policies on the development of
aquaculture. Interaction of aquacultural practices
with larger societal goals. GE credit: SciEng—II, III

15. Livestock and Dairy Cattle Judging (2)
Laboratory—6 hours. Prerequisite: course 1 or 2 rec-
ommended. Evaluation of type as presently applied
to light horses, meat animals and dairy cattle. Rela-
tionship between form and function, form and car-
 cass quality, and form and milk production. —III, III
V. L. Vian
22A. Animal Evaluation (2)
Laboratory—3 hours; fieldwork—30 hours (total).
Prerequisite: course 21 or the equivalent. Attent-
dance 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 accurate writ-
ten and oral descriptions of evaluations. Prerequisite
to intercollegiate judging competition. Offered in
alternate years. (P/NP grading only—III, III)
V. L. Vian
22B. Animal Evaluation (2)
Laboratory—3 hours; fieldwork—30 hours (total).
Prerequisite: course 22A or the equivalent. Attent-
dance at 3 one-day weekend field trips required.
Continuation of course 22A with emphasis on spe-
cific species: swine, beef cattle and sheep. Applica-
tion of animal science principles to selection and
management problem-solving scenarios. Prerequisite
to intercollegiate judging competition. Offered in
alternate years. (P/NP grading only—III, III)
V. L. Vian
41. Domestic Animal Production (2)
Lecture—2 hours. Principles of farm animal manage-
ment, including dairy and beef cattle, sheep, and
swine. Industry trends, care and management, nutri-
tion, and reproduction—II, III
41L. Domestic Animal Production Laboratory (2)
Discussion—1 hour; laboratory—3 hours. Prerequi-
tive: course 41 may be taken concurrently). Animal
production principles and practices, including select-
ive field trips to dairy cattle, beef cattle, sheep, and
swine operations and campus labs. (P/NP grading only—II, II, II
42. Introductory Companion Animal Biology (4)
Lecture—3 hours; discussion—1 hour. Companion
animal domestication. Historical, contemporary per-
spectives. Legislation concerning companion ani-
mals. Selected topics in anatomy, physiology,
genetics, nutrition, behavior and management.
Scientific methods in studying the human-animal bond.
Discussions: application of biological concepts to problems related to companion animals. GE credit: SciEng.—II. (II.)

49A-J. 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 types of species covered are: Aquaculture, (B) Beef, (C) Dairy, (D) Goats, (E) Horses, (F) Laboratory Animals, (G) Meats, (H) Poultry, (I) Sheep, (J) Swine. Up to four different topics may be taken. (P/NP grading only.)—I, II, III, (II., III.)

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/NP grading only.)—I, II, III, (II., III.)

92. Internship in Animal Science (1-12)
Internship—3-18 hours. Prerequisite: consent of standing, consent of instructor. Weekly conference discussion—1 hour. Prerequisite: lower division (G) Meats, (H) Poultry, (I) Sheep, (J) Swine. Up to four different topics may be taken. (P/NP grading only.)—I, II, III, (II., III.)

98. Directed Group Study (1-5)

104. Principles of Domestic Animal Behavior (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A or 1B or the equivalent. Basic principles of animal behavior as applied to domesticated species. Emphasis will be placed on behavioral development and social behavior. External (exogenous) and physiological mechanisms influencing behavior will be discussed. GE credit: SciEng. —II. (II.)

105. Domestic Animal Behavior (2)
Lecture—2 hours. Prerequisite: an introductory animal behavior course (e.g., course 104, Psychology 150, Neurobiology, Physiology, and Behavior 102) or consent of instructor. Application of the principles of animal behavior in the management of domestic animals. Includes reproductive behavior, feeding behavior, agonistic behavior, animal handling and human-animal interactions. GE credit: SciEng. —I. (I.)

106. Domestic Animal Behavior Laboratory (2)
Laboratory—6 hours. Prerequisite: course 104 or the equivalent. Research experience with the behavior of large domestic animals. Experimental design, methods of data collection and analysis, and report of experimental results. GE credit: SciEng. Wrt.—II. (II.)

115. Advanced Horse Production (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 15, Biological Sciences 101; Nutrition 115; Neurobiology, Physiology, and Behavior 101; or consent of instructor. Feeding, breeding, and management of the horse. Emphasis of the basic principles of animal science to problems of production of all types of horses. Designed for students who wish to become professionally involved in the horse industry. GE credit: SciEng. —I. (I.)

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 biological aspects of a species and the production systems, husbandry, management, and marketing practices utilized. Emphasis on species currently reared in California.—II. (II.)

119. Invertebrate Aquaculture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1B. Management, breeding and feeding of aquaculture invertebrates, application 120 and 121. 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 efficiencies.—II. (II.)

120. Principles of Meat Science (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A. Anatomical, physiological, developmental, and biochemical aspects of the conversion of muscle to meat. Includes muscle processing, preservation, microbiology, and public health issues associated with meat products. (Same course as Food Science and Technology 120.) GE credit: SciEng. —III. (III.) Lee, Bandman

122. Meat Science Laboratory (2)
Discussion—1 hour; laboratory—3 hours. Prerequisite: Biological Sciences 1A; course 120 (may be taken concurrently). Students and student participation in transformation of live animal 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. (Same course as Food Science and Technology 120.)—II. (II.) Lee, Bandman

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 organ function. GE credit: SciEng.—III. (III.) Sainz

124. Lactation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Animal Biology 103 or Biological Sciences 103. Animal Biology 103 [may be taken concurrently]; or the equivalent background knowledge. Consideration of the biochemical, genetic, physiological, nutritional, and structural factors in the development of the mammary gland development, the initiation of lactation, the composition of milk and lactational performance. GE credit: SciEng. Wrt.—II. (II.)

125. Equine Exercise Physiology (3)
Lecture—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101. Exercise physiology. Techniques (3)

131. Reproduction and Early Development (3)
Lecture—3 hours; 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.—I. (I.)

132. Agricultural Applications of Linear Programming (4)
Lecture—2 hours; laboratory—2 hours; discussion—1 hour. Prerequisite: upper division standing and Agricultural Systems and Environment 120, or equivalent. Applications of linear programming in agriculture, emphasizing resource allocation problems and decision making. Problems include crop production, ration formulation, and farm management. Hands-on experience in developing linear programs and interpreting the results.—II. (II.)

133. Environmental Stewardship in Animal Production Systems (3)
Lecture—3 hours. Prerequisite: Biological Sciences 10 or 1A and 1B, Chemistry 2A, 2B, 8A, 8B. Management principles of environmental stewardship for grazing lands, animal feeding, operations and response to growth trials, resource management, applications of linear programming and efficiency.—III. (III.)

134. Animal Biochemistry (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: Biological Sciences 1A and Chemistry 8B or the equivalent. Daily care and maintenance of fish in the personal aquarium, research, and commercial facilities. Biological and environmental factors important to sound fish management. Laboratories focus on fish culture and include growth trials. GE credit: SciEng. Wrt.—II. (II.)

135. Techniques and Practices of Fish Culture (2)
Laboratory—2 hours; lecture—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.—I. (I.)

136. Techniques and Practices of Fish Culture (2)
Laboratory—2 hours; lecture—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.—I. (I.)

137. Animal Biochemistry Laboratory (2)
Laboratory—2 hours; lecture—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.—I. (I.)

138. Advanced Animal Biochemical Techniques (3)
Laboratory—6 hours. Lecture—1 hour. Prerequisite: Biological Sciences 102 and 103 or Animal Biology 102 and 103. Theory and advanced practices of biochemistry techniques used in animal research. Topics include laboratory and radiation safety, experimental design, diet preparation, dose response, statistical analysis, biological sampling and instrumentation in radio-immuno-assay, enzyme-linked immuno-sorbent assay, spectrophotometry, chromatography, electrophoresis, and reporting.—II. (II.)

140. Management of Laboratory Animals (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101. Labora- tory animal management procedures in view of animal physiology, health and welfare, government regulations, and experimental needs. Clinical techniques using rodents and rabbits as models.—I. (I.)

141. Equine Enterprise Course (3)
Lecture/discussion—4 hours. Prerequisite: course 115; 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: SciSoc, Wrt.—II. (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 behavior, genetics, nutrition, and physiology as related to the care of companion animals. — (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 environmental physiology, nutrition and metabolism, disease management and reproduction. Offered in alternate years. — (I.) King

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 instructor; a course in Range Science and a course in microcomputer use are recommended. Genetics, physiology, nutrition, economics and business in beef cattle and sheep production. Resources used, species differences, range and feedlot operations. Emphasis on integration and decision making needed in methods for management of livestock enterprises. — (II, III.) Sainz

145. Meat Processing and Marketing (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 143 or 144 or consent of instructor. Distribution, processing and marketing of meat and meat products. Meat and meat animal grading and pricing. Government regulations and social/consumer concerns. Future trends and impact on production management practices. Includes poultry. — (II, III.) Lee

146. Dairy Cattle Production (4)
Lecture—3 hours; laboratory—3 hours; one mandatory Saturday field trip. Prerequisite: course 124, 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 well-being. GE credit: SciEng. Wrt.—(II, 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. — (II.)

148. Enterprise Analysis in Animal Industries (4)
Lecture/discussion—4 hours. Prerequisite: course 141 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 decision making will be examined in terms of the total enterprise. GE credit: SocSci. Wrt.—(III.)

149. Farrier Science (3)
Lecture—3 hours. Prerequisite: course 115. Distance learning: Pass/Fail permission from California Polytechnic State University San Luis Obispo, California Polytechnic State University Pomona, and California State University Fresno. In-depth examination of the structure and function of the equine hoof and how it relates to conformation, injury, and performance. — (III.)

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 horses 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 relating to animal use in contemporary society. Integration of ethical theories with scientific evidence relating to animal behavior, mentality, and welfare. Uses of animals in agriculture, research, and as companions. Ethical responsibilities concerning wildlife and the environment. (Same course as Veterinary Medicine 170.) GE credit: SocSci, Wrt.—(II, III.) Tannenbaum

190C. Research Group Conference (1)
Discussion—1 hour. Prerequisite: advanced standing; consent of students in lower class conference of research problems, progress and techniques in the animal sciences. May be repeated for credit. (P/NP grading only.)—(I, II, III, IV, III, III)

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 other animal enterprises. All requirements of Internship Approval Form must be met. (P/NP grading only)—(I, II, III, IV, III, IV)

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 preparation of a 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, IV, III, IV)

194HA-194HB-194HC. Undergraduate Honors Thesis in Animal Science (4-4-4)
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.)

197T. Tutoring in Animal Science (1-2)
Prerequisite: consent of instructor. (S/U grading only.)—(I, II, III, IV, III, IV)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (S/U grading only.)—(I, II, III, IV, III, IV)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Graduate Courses

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. — (I.)

206. Models in Agriculture and Nutrition (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Mathematics 168; Statistics 108. Basic model building principles and techniques for historical and systems simulation models. Optimization techniques for non-linear experimental designs and management models are presented. Quantitative analysis and evaluation of linear and non-linear equations used in agriculture and nutrition. Offered in alternate years. — (I.)

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)—(I, II, III, IV, III, III)

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, IV, III, 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, IV, III, 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, IV, III, 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, IV, III, III)

298. Group Study (1-5)
Prerequisite: consent of instructor. (S/U grading only.)—(I, II, III, IV, IV, IV)

Research (4-12)
(S/U grading only.)

Animal Science and Management

(137)

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 of economics and humanities. After completing preparatory courses, students focus on both the animal species that interest them (horses, cattle, sheep, 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 services, Peace Corps, and farms of all scales. Most Animal Science and Management graduates are well prepared for professional study (medical, law, veterinary, 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
Anthropology

B.S. Major Requirements:

**Units**

Written and Oral Expression .......... 8-16

See College requirement .............. 0-8

At least two additional courses (minimum 8 units) selected with approval of adviser from:

- Agriculture and Rangeland Sciences
- Biological Sciences
- Business Management and Rangeland Resources
- Dairy
- Equine
- Individualized (if not selected for English college requirement) from Communication 130, 134, 135, 136, 140; Nematology 150; University Writing Program 101, 102A, 102B, 102C, 102D, 102G, 102O, 104A, 104B, 104C, 104D, 104E, 104F

Preparatory Subject Matter .......... 69-72

- Animal Science 1 and 2 .......... 8
- Biological Sciences 1A, 1B .......... 16
- Agricultural Management and Rangeland Resources 2, 110A, 112, or Environmental Horticulture 6 ......... 13-15
- Chemistry 2A, 2B, 8A, 8B .......... 16
- Agricultural Management and Rangeland Resources 21 or Computer Science Engineering 15 .......... 3-4
- Economics 1A, 1B; Management 11A, 11B .......... 11
- Mathematics 16A, 16B, and 16C or the more advanced mathematics courses .......... 9
- Agricultural Management and Rangeland Resources 110A, 110B, Statistics 100 or 103, or other courses in quantitative skills with prior approval of the Master Adviser .......... 4

Breadth/General Education Subject Matter ........ 12-24

- Biological Sciences 101 .......... 4
- Nutrition 115 .......... 4
- Neurobiology, Physiology, and Behavior 101 .......... 5
- Business Management 14-17
- Agricultural and Resource Economics 100A, 100B, 100C, 100D, 100E
- 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 or Agricultural and Resource Economics 155

Unrestricted Electives ................. 12-42

Total Units for the Degree ............ 180

Major Adviser: J.G. Fadel

Advising Center for the major (including peer advising) is located in 1202 Meyer Hall (530) 754-7915. Students must secure their faculty adviser through this office upon entering the major.

Anthropology

(For the College of Letters and Science)

Bruce Winterhalder, Ph.D., Chairperson of the Department

Department Office, 330 Young Hall (530) 752-0745/0746; http://www.anthro.ucdavis.edu

Faculty

Robert L. Bettinger, Ph.D., Professor
Monique Borgerhoff Mulder, Ph.D., Professor
Christyann Darwent, Ph.D., Assistant Professor
Mariana de la Chena, Ph.D., Associate Professor
Donald L. Dominy, Ph.D., Professor
Joseph Dumit, Ph.D., Associate Professor
(Anthropology and Science and Technology Studies)
Jelmer W. Eerkens, Ph.D., Associate Professor
Alexander H. Harcourt, Ph.D., Professor
Lynne A. Isell, Ph.D., Professor
Suad Joseph, Ph.D., Professor
(Anthropology, Women and Gender Studies)
Alan Klitzman, Ph.D., Associate Professor
Richard McBride, Ph.D., Associate Professor
Henri M. McHenry, Ph.D., Professor
UC Davis Prize for Undergraduate Teaching and Scholarly Achievement

Suzana M. Sawyer, Ph.D., Associate Professor
Janet S. Shibamoto Smith, Ph.D., Professor
Carol A. Smith, Ph.D., Professor
David G. Smith, Ph.D., Professor
Smiti Srivastava, Ph.D., Associate Professor
Teresa Steele, Ph.D., Assistant Professor
Timothy D. Weaver, Ph.D., Assistant Professor
Bruce P. Winterhalder, Ph.D., Professor
Aram A. Yengoyan, Ph.D., Professor
Li Zhang, Ph.D., Associate Professor

Emeriti Faculty

David J. Boyd, Ph.D., Professor Emeritus
Richard T. Corley, Ph.D., Senior Lecturer Emeritus
William G. Davis, Ph.D., Professor Emeritus
Jack D. Forbes, Ph.D., Professor Emeritus
Sarah B. Hrdy, Ph.D., Professor Emerita
David L. Olmsted, Ph.D., Professor Emeritus
Peter S. Rodman, Ph.D., Professor Emeritus
G. William Skinner, Ph.D., Professor Emeritus
Carolyn F. Wall, Senior Lecturer Emerita

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, history, and evolution of humans and non-human primates as individuals and as societies. The many useful approaches to these topics bring together archaeology, human behavioral ecology, molecular anthropology, paleoanthropology, biogeography, conservation biology, and primatology. Anthropology is the study of the history or prehistory by analysis of a people’s artifacts, or their material culture, with the goal of constructing culture history and reconstructing human behavior. Human behavioral ecology is the study of how variation in ecology and social organization can help us understand variation in human behavior. Molecular 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 understand what morphological changes occurred during the course of human evolution. Biogeography investigates the biology behind the geographic distribution of species, and also of human cultures. Conservation biology explores the causes of loss of biological diversity—in this department, it focuses on threatened non-human primates and the conservation of their habitats. Evolutionary anthropology uses intrusion 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 traits 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 principal method is extended field research, which combines attention to global issues with the close study of human relations and culture. Among the themes addressed in this department’s undergraduate courses are globalization and transnationalism; human ecology and environmental change; the global spread of media and technology; migration, multiculturalism and urban life; colonialism, neocolonialism and development; race, class and gender, rebellion, resistance and the cultural politics of everyday life; language use and discourse, and self, identity and family. The study of sociocultural anthropology thus offers an unusually rich set of resources for understanding and engaging pressing issues in a globalizing world characterized by new forms of intercultural 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. To obtain a B.A. 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 ancient archaeological primary studies, or human biology, ecology or origins should follow the Evolutionary Track. The B.A. degree offered by the Evolutionary Track provides general training 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 Education Abroad Center) 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 and to have these courses count toward the student’s 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 conflict, 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-veterinary 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 with appropriate courses in education is 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:

UNITS

Evolutionary Track:
Preparatory Subject Matter: 19-21
Anthropology 1, 2, 3 .......................... 12
Anthropology 15 or 23 ..................... 4-5
Anthropology 13, Statistics 13, 32, 100 or 102 .................................. 3-4

Depth Subject Matter: 42-47
Two courses from Anthropology 101, 102, 103, 105, 122A, 128A, 154A, 154B, 158, 178 ........................................... 7-9
Anthropology 153 or 157 .................. 3-5
Anthropology 151 or 152 .................. 3-4
One course from Anthropology 170, 171, 172, 173, 176, 180 or 184 .................. 4
One course from sociocultural track in consultation with evolutionary track undergraduate adviser ........................................... 4
Select 20 additional units from any upper division evolutionary track Anthropology courses [see list below] chosen in consultation with an evolutionary track undergraduate adviser ........................................... 20

Total Units for the Major: 61-68
Note: Evolutionary track courses at the upper division level are courses 101, 102, 103, 105, 122A, 128A, and 151 to 184

Sociocultural Track:
Preparatory Subject Matter: 16-22
Anthropology 1, 2, 3 .......................... 12
Select one of the following three options:
1) Two upper division area-focus sociocultural track courses .......................... 8
2) Two additional from Anthropology 130A, 130B, 130C
3) Pass exam in a language at fifth-quarter level of competence and complete one additional upper division area-focus sociocultural track course .......................... 4

Depth Subject Matter: 38-41
Anthropology 100, 110 ................................ 8
Two upper division area-focus sociocultural track courses .......................... 8
Select one of the following two options in consultation with, and only after prior written approval of, sociocultural track undergraduate adviser [see list below

identifying upper division sociocultural; see list above identifying evolutionary track courses
(1) Six additional upper division anthropology courses (two courses may be in the evolutionary track, and up to six units can be internship) .......................... 22-25

Total Units for the Major: 54-63
Note: Sociocultural track courses at the upper division level are those with numbers from 100 to 149B, with the exception of 101, 103, 105, 15A, 15B. Area-focus sociocultural track courses are those that refer in their titles to one or more peoples or regions of the world.

B.S. Major Requirements:

UNITS

Preparatory Subject Matter: 55-59
Anthropology 1, 2, 3 .......................... 12
Biological Sciences 15, 16, 17, 18 .......... 9-12
Chemistry 2A, 2B, 8A, 8B .................. 8
Mathematics 16A-16B, 20A-20B, 21C .................. 9-12
Anthropology 13, Statistics 13, 32, 100 or 102 .................................. 3-4

Depth Subject Matter: 45
Anthropology 152, 153, 154A .............. 15
Three additional courses in anthropology chosen in consultation with evolutionary track undergraduate adviser ........................................... 8-12
Biological Sciences 101 ........................ 4
Evolution and Ecology 100 .................. 4
Additional units from the list below to achieve a minimum of 45 upper division units ........................................................................ 10-14
Anthropology 101, 102, 103, 105, 122A, 128A, 154A, 154B, 158, 178, 179, 180, 181, 182, 183, 184 .........3-5
One course from Anthropology 170, 171, 172, 173, 176, 180 or 184 .................. 4
One course from sociocultural track in consultation with evolutionary track undergraduate adviser ........................................... 4
Select 20 additional units from any upper division evolutionary track Anthropology courses [see list below] chosen in consultation with an evolutionary track undergraduate adviser ........................................... 20

Total Units for the Major: 100-104
Recommended
Anthropology 5, 15, 50; Geology 1; Psychology 1

Minor Program Requirements:

UNITS

Anthropology: 19-23

General emphasis: 19-21
One course from Anthropology 101, 102, 103, 105, 122A, 128A, 151, 152, 153, 154A, 155, 156, 157, 158, 159 .......................... 3-5

One course from Anthropology 170, 171, 172, 173, 176, 180, 183, 184 .......................... 4
One course from Anthropology 140A/B through 149B, 178 or any other sociocultural track course that refers in its title to one or more peoples or regions of the world .......................... 4
Two courses from Anthropology 100 through 139B, excluding 101, 103, 105, 128A, and 141B .......................... 8

Evolutionary emphasis: 20-23
Anthropology 152, 153, 154A .............. 15
Two additional upper division Anthropology courses chosen in consultation with evolutionary track undergraduate adviser ........................................... 5-8

Sociocultural emphasis: 19-21
Anthropology 100, 110, 113, 151, 154A .............. 4
One upper division area-focus sociocultural track course .......................... 4
[area-focus sociocultural track courses are those that refer in their titles to one or more peoples or regions of the world]
Two courses from Anthropology 102 through 139B, excluding 103, 105, and 128A .......................... 8
One additional upper division Anthropology course chosen in consultation with sociocultural track undergraduate adviser ........................................... 3-5

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 194H. Only students who, at the end of their junior year (135 units), have attained a cumulative grade point average of 3.5 in Anthropology 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. Interested students should see the Teaching Credential/M.A. Program on page 102.

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 Courses

1. Human Evolutionary Biology (4)
Lecture—3 hours; discussion—1 hour. Processes and course of human evolutionary biology and the social and cultural diversity within Homo sapiens; human paleontology. GE Credit: SciEng, Div. Wrt.—I, II, III. (I, II, III) Bettinger, Darwendung

2. Cultural Anthropology (4)
Lecture—3 hours; discussion—1 hour. Introduction to cultural diversity and the methods used by anthropologists to account for it. Family relations, economic activities, politics, gender, and religion in a wide range of societies. Current problems in tribal and peasant societies. GE credit: SocSci, Div. Wrt.—I, II, III. (I, II, III) Klima, Sawyer

3. Introduction to Archaeology (4)

4. Introduction to Anthropological Linguistics (4)
Lecture—3 hours; discussion—1 hour. Exploration of the role of language in social interaction and world view, minority languages and dialects, bilingualism, literacy, the social motivation of language change. Introduction of analytical techniques of linguistics and demonstration of their relevance to language in sociocultural issues. GE credit: SocSci, Div. Wrt.—I. (I) Shibamoto Smith

Quarter Offered: I = Fall, II = Winter, III = Spring, IV = Summer; 2007-2008 offering in parentheses.
symbolic interpretations relate to cultural and linguistic universals and to the philosophical basis of relativity and determinations. (Former course 125.) GE credit: SocSci, Div.

125B. Postmodernism(s) and Culture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. The U.S.-European postmodern condition: ‘Momoculture’. Complete project for subdivi-
sed groups. The economic, social, technological and political conditions leading to postmodern aes-
thetics, in comparison with postcolonialism, feminism and minority discourse. GE credit: SocSci, Div, Wrt.

126A. Anthropology of Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Theories of develop-
ment and current critiques. Colonial legacies and post-colonial realities. Roles of the state and NGOS, popula-
tion migrations, changing gender identities, cash-earning strategies, and sustainability issues. Stresses importance of cultural understandings in development strategies. Complete studies in non-industrial societies. Not open for credit to stu-
ents who have completed course 126. (Former course 126.) GE credit: SocSci, Div, Wrt. —II.

126B. World Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Current Third World and Western development issues concerning women in agriculture, industry, international division of labor, politics, revolutions, participation in health, education, family and reproduction. Impact of colonialism, capitalism, the world system, and international feminism on women and development. Not open for credit to students who have completed course 131. (Former course 131.) GE credit: SocSci, Div, Wrt. —I.

127. Urban Anthropology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Survey of ap-
proaches to urban living: political structures, or ga-
nization of labor, class relations, world views. The evolution of urban life and its contemporary dilem-

128A. Kinship and Social Organization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Comparative examination of personal kin-
ship, descent, marriage, household and family organi-
izations; 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. —II. Winterhalder

128B. Self, Identity, and Family (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Exploration of self, identity, and group structure across cultural and geographic regions. Not open for credit to students who have completed course 129. (Former course 129.) GE credit: SocSci, Div, Wrt.

130A. Cultural Dimensions of Globalization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. The cultural dimensions of recent economic and political developments frequently termed "glo-
balization." GE Credit: SocSci, Wrt. —II.

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, eco-
nomical, and cultural effects of spatial mobility and displacement. Explores the interplay 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, Wrt.

130C. Latino Migration to the United States (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. The experiences of people involved in migration between Latin America and the United States; most significant factors shaping those experi-

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 and political processes employing the emerging approach of political ecology. Case studies of envi-
ronmental degradation (e.g., desertification, log-
ing, mineral extraction, petroleum, water) from various cultural and geographic regions. GE credit: SocSci, Div.

132. Ethnohistory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 and one other course in either history or anthropology. Survey of historical and ethnographic approaches to urban living: political structures, orga-
ning, retrieving, and analyzing information. Prerequisite: course 2 or consent of instructor. GE credit: SocSci, Div, Wrt.

134. Buddhism in Global Culture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one lower division course in Anthropology, Sociol-
ogy, History, or Religious Studies. Buddhist medita-
tion 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. GE credit: SocSci, Div.

135. Peasant Society and Culture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Comparative study of peasant communi-
ties, utilizing historical and ethnographic sources; analysis of urban-rural relations; problems of eco-
mic development and culture change. GE credit: SocSci, Div, Wrt. —III. C. Smith

136. Ethnographic Film (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Overview of the use of film in anthropol-
yogy and its advantages and limitations in compar-
sion 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.

138. Ethnographic Research Methods in Anthropology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 2 and 136. Techniques in and approaches to ethnographic field research. Problem formulation, research design, qualitative and quanti-
tative data collection procedures, and techniques for organizing and interpreting information. Ethnographic description and constructed inference. Students will organize and conduct individual research projects. GE credit: SocSci.

139AN. Race, Class, Gender Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Comparative analysis of class/race/gen-
der inequality, concentrating on the ways in which beliefs about descent, “blood,” and biological differ-
ences interact with property and marital systems to a-
ffect 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. —III. C. Smith

139BN. Gender and Sexuality (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Gender and sexual-
ity in foraging bands, agricultural and pastoral tribes, agricultural and industrial states. Debates on cultural evolution and distribution of gender hierar-
chies. Impact of politics, economics, religion, social practices, women’s movements on gender and sexu-
ality. Culture, nature, and sexuality. Not open for credit to students who have completed course 130. (Former course 130.) GE credit: SocSci, Div, Wrt.

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 emphasis on the societ-
ies which illustrate problems of general theoretical concern. Major consideration will be given to continuities and discontinuities between periods prior to Euro-
pean contact and the present. GE credit: SocSci, Div, Wrt. —III. Staff

140B. Cultures and Societies of East and South Africa (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Ethnographic survey of Eastern and South-
ern Africa with analyses of selected societies which illustrate problems of interest to anthropologists. Major consideration will be given to continuities and discontinuities between periods prior to Euro-
pean contact and the present. GE credit: SocSci, Div, Wrt. —II. Donham

141A. Indians of North America (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Introductory survey of the Indians of North America: origins, languages, civilizations, and history. GE credit: SocSci, Div, Wrt.

141B. Ethnohistory of California and the Great Basin (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Introductory survey of the Indians of North America: origins, languages, civilizations, and history. GE credit: SocSci, Div, Wrt.

142. Peoples of the Middle East (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Peoples of the Middle East (including North Africa). Discussions of class relations, kinship organization, sex/gender systems, religious beliefs and behavior, ethnic relations, political systems. Impact of world systems, political and religious movements and social change. (Former course 136.) GE credit: SocSci, Div, Wrt.

143A. Ethnology of Southeast Asia (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Patterns of culture and social organization from prehistory to the present, in the context of his-

143B. Philippine Societies and Culture (4)
Laboratory/discussion—4 hours. Prerequisite: course 2. Introduction to the ethnology of the Philip-
ines. Nature and distribution of ethnic groups, social organizations, cultural patterns and social issues. Emphasis on ethnic minorities, rural popula-
tions, effects of modernization, and relation of the state to local groups. GE credit: SocSci, Div, Wrt.

144. Contemporary Societies and Cultures of Latin America (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Introduction to contemporary social struc-
ture of Latin America. Origins, maintenance and changes in inequality: economic responses to pov-
erty, sociocultural responses to discrimination, and political responses to powerlessness. GE credit: Soc-
Sci, Div, Wrt.

145. Performance, Embodiment, and Space in South Asia (4)
Lecture/discussion—4 hours. Prerequisite: course 2 or consent of instructor. South Asian cultures and societ-
es with a focus on performance, embodiment, and space from several disciplinary fields. Topics may include colonialism, nationalism, religious tradi-
tions, media, popular culture, cities, social move-
ments, modernity, body-cultures, identity, gender, and diasporas. GE credit: ArtHist or SocSci, Div, Wrt. —III. Sinivas
146. Peoples and Politics of Mexico and Central America (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or the equivalent. Geographical and political history of Mexico and Central America with special attention to recent developments. GE credit: SocSci, Div, Wrt.

147. Peoples of the Pacific (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Ethnographic survey of the major indigenous groups of Oceania. Comparison of origins, prehistory, and traditional social organization of peoples of Polynesia, Micronesia, and Melanesia. Consideration of recent changes associated with colonialism and national independence. GE credit: SocSci, Div, Wrt.

148A. Culture and Political Economy in Contemporary China (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Examination of contemporary Chinese culture and political economy through reading ethnographic studies on recent transformations in rural and urban Chinese society. Special attention to state power, popular culture, spatial mobility, city space, and gender. GE credit: SocSci, Div, Wrt. III. Zhang

148AS. Culture and Political Economy in Contemporary China (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or consent of instructor. Examination of contemporary aspects of Chinese culture and political economy through reading ethnographic studies on recent transformations in rural and urban areas. Special attention to state power, privatization, popular culture, migration, consumption, village life, city space, class, and gender relations. Taught in China. GE credit: SocSci, Div, Wrt.

148B. Family, Gender, and Population in Contemporary China (4)

148C. Ethnic Diversity of China (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Analysis of China’s ethnic diversity through time and space. Interethnic relations in changing state systems examined among Han majority subethnic groups (e.g., Cantonese, Hakka) and borderlands (e.g., Han, Mosuo, Meo, Hmong, Tibetans). Emphasis on the gender and class with race/ethnic/nationality. GE credit: SocSci, Div, Wrt.

149A. Traditional Japanese Society (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Patterns of culture and social organization from prehistoric to early twentieth-century Japan. Origins, prehistory, and traditional religious and political systems, marriage and kinship, language and culture. Changes and continuities in traditional and contemporary Japanese culture are addressed. GE credit: SocSci, Div, Wrt.

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, contemporary religious beliefs and behavior, conflict, consensus, and cultural stereotypes. GE credit: SocSci, Div, Wrt. II. Shibamoto Smith

151. Primates Evolution (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or Biological Sciences 1B. Origin and relationships of the primates, monkeys, and apes. GE credit: SciEng, Wrt. III. McHenry

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 hominid. GE credit: SciEng, Wrt. II. McHenry

153. Human Biological Variation (5)
Lecture—5 hours; discussion—1 hour. Prerequisite: course 1 or Biological Sciences 18. Origin, adaptive significance and methods of analysis of genetic differences among human 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.—II. D.G. Smith

154A. The Evolution of Primate Behavior (5)
Lecture—3 hours; discussion—1 hour, term paper. Prerequisite: course 1. Examines ecological diversity and evolution of social systems of primatans, monkeys, and apes, placing the social behaviors of the primates in the context of appropriate ecological and evolutionary theory. GE credit: SciEng, Wrt. II. Harcourt

154B. Behavior and Ecology of Primates (3)
Lecture—2 hours, term paper. Prerequisite: course 154A, Statistics 13 or the equivalent, or consent of instructor. Continuation of course 154A. Scientific methods of studying and analyzing the behavior and ecology of primates. Quantitative analysis of data. GE credit: Wrt. III. Isbell

154BL. Laboratory in Primate Behavior and Ecology (2)
Lecture—6 hours. Prerequisite: course 154A (may be taken concurrently), Statistics 13 or the equivalent, or consent of instructor. Continuation of course 154A and 154B. Direct observation and study of captive primates in social groups at the California Regional Primate Research Center. Not open for credit to students who have completed course 154B prior to fall 2003. (P/NP grading only.) III. Isbell

155. Comparative Primate Anatomy (4)

156. Human Osteology (4)
Lecture—2 hours; laboratory—4 hours. Prerequisite: course 1 or the equivalent. Introductory study of the human skeleton, bone growth, pathology, radiology, evolution, dentition, and variations in race, sex, and age. GE credit: SciEng.—III. Weaver

157. Anthropological Genetics (3)
Lecture—3 hours. Prerequisites: course 1 or Biological Sciences 1A, and Genetics 100, 103, 105, or 106. Processes of micro-evolution responsible for biological differences among human populations. Special attention will be given to the adaptive significance of genetic variation in blood group antigens, serum proteins and red cell enzymes. GE credit: SciEng.

157L. Laboratory in Anthropological Genetics (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 1 or Biological Sciences 1A, and either Genetics 100 or enrollment in course 157B concurrently or following). Methods for identifying genetic variation in human blood group antigens, serum proteins and red cell enzymes (hemaglutination), genetical electrophoresis on starch, cellulose acetate and polyacrylamide, immunofluiddusion and immunoelectrophoresis on agarose. GE credit with concurrent enrollment in course 157—Wrt.

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 construction of gender roles. GE credit: SciEng, Wrt.-III. McHenry

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 among prehistoric population replacements and migrations to and within the Americas. Integration with craniometric, archaeological, paleoenvironmental, linguistic and ethnological evidence.

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.—II. Bettinger

171. Geoarcheology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or consent of instructor. Survey of data relating to the prehistoric environment of North and South America. GE credit: SocSci, Div, Wrt.

172. New World Prehistory: The First Arrivals (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or consent of instructor; course 170 recommended. Introduction to and survey of prehistoric hunting and gathering adaptations across North America with particular emphasis on the East, South, Southeast, Midwest, Plains, Southwest, and Northwest. GE credit: SocSci, Div, Wrt.

173. New World Prehistory: Archaic Adaptations (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or consent of instructor; course 170 recommended. Introduction to and survey of prehistoric hunting and gathering adaptations across North America with particular emphasis on the East, South, Southeast, Midwest, Plains, Southwest, and Northwest. GE credit: SocSci, Div, Wrt.

174. 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. GE credit: SocSci, Div, Wrt.

175. Andean Prehistory: Archaeology of the Incas and their Ancestors (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or consent of instructor; course 137 recommended. Introduction to and survey of prehistoric hunting and gathering adaptations within the Andean region, especially Peru, from the earliest hunting and gathering societies through the Incas. Focus on the use of archaeological data to reconstruct ancient human adaptations to the varied Andean environments. I. 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. GE credit: SocSci, Div, Wrt.

178. Hunter-Gatherers (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Study and interpretation of the ancient and modern lifestyle in which people live with primitive technologies and without benefit of domesticated plants and animals. GE credit: SocSci, Div, Wrt.—III. Bettinger

179. Ethnoarchaeology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3. Relationships between behavior and its archeological consequences. Ethnography by archeologists examines residence patterns, foraging processes, hunting/fishing processes, creation of artifacts and materials, and how these contribute to modern archeological thinking. GE credit: SocSci, Div, Wrt.

180. Zooarcheology (4)
Lecture—2 hours; discussion/laboratory—3 hours. Prerequisite: course 1 and 3 or consent of instructor. Theories and methods for studying animal skeletal
remains from archaeological sites. Identification and quantification of zooarchaeological material, cultural and natural processes affecting animal bones pre and postburial, and use of faunal remains for determining past human diets and past environments. Offered in alternate years.—II. Darwent

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, Nevada, California, or Nevada. Introduces basic methods of archaeological survey, mapping, and excavation. GE credit: Sci-Eng.—IV.

182. Archaeometry (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course 3. Statistics 13 or the equivalent recommended. Scientific techniques used to study the chemical and physical properties of archaeological materials. Types of archaeological questions that can be addressed with different methods. Preparation and analysis of archaeological materials.

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.—I.

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. GE credit: SocSci.—III. Eerkens

Special Study Courses

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 once for credit when topic differs.—III. Steele

192. Internship in Anthropology (1-12)
Internship—3-36 hours. Prerequisite: Upper division standing; consent of instructor. Work experience off and on campus in all subject areas offered in the Department of Anthropology under the supervision of a member of the faculty. Limited to Anthropology majors. May be repeated for a total of 12 units including 192 courses taken in other departments. (P/NP grading only)

194H. Special Study for Honors Students (1-12)
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. (P/NP grading only)

197T. Tutoring in Anthropology (1-5)
Tutorial—1-1.5 hours. Prerequisite: upper division standing with major in Anthropology and consent of Department Chairperson. Leading of small voluntary discussion groups associated with one of the department’s regular 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 Undergraduate Students (1-5) (P/NP grading only)

Graduate Courses

201. Critical Readings in Ethnography (4)
Seminar—3 hours; term paper. Critical readings of selected ethnographies that examine a wide range of important topics and analytical issues in social and cultural anthropology. Emphasis on how and why methodological writing has changed over time and its relationship with contemporary theoretical explorations.

202. History and Theory of Biological Anthropology (4)
Seminar—3 hours; term paper. History of thought in biological anthropology and analysis of major theoretical problems in the field. Suggested for all first-year graduate students lacking intensive preparation in biological anthropology.—I. Mckinley

203. History and Theory of Archaeology (4)
Seminar—3 hours; term paper. History of archaeology and archaeological theory and analysis of archaeological research methodology. Generally restricted to graduate students; outstanding undergraduates with extensive training in archaeology with consent of instructor.—I. Beltinger

204. Contemporary Issues in Anthropological Theory (4)
Seminar—3 hours, term paper. Prerequisite: course 2, 137 or consent of instructor. Advanced consideration of fundamental issues in anthropological theory. Emphasis on critical examination of major contemporary debates between proponents of competing theories.

205. History and Theory in Anthropological Linguistics (4)
Seminar—3 hours; term paper. History of thought in anthropological linguistics. Consideration of the historical development of fundamental ideas in anthropological linguistics, of major theoretical issues, and of research methodology.

206. Research Design and Method in Social Anthropology (4)
Seminar—4 hours; individual student-instructor session (in-depth work on proposal writing). Prerequisite: consent of instructor. Formulation of research problems and preparation of research proposals; relationships between theory and method, funding, pre-fieldwork preparations, entering the community, field research techniques, and problems of ethics; intensive work on proposal writing. May be repeated once for credit. Limited enrollment.

207. Ethnographic Writing (4)
Seminar—3 hours; term paper. Prerequisite: courses 137, 201, or the equivalent. Relationship between conducting participant observation of others and writing it up, especially the rift between the reality of fieldwork and its written representation. Study of various literary genres and textual strategies used in cultural anthropological. May be repeated for credit.

210. Aspects of Culture Structure (4)
Seminar—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.

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 structures, environmental degradation, and resistance movements. Case studies of desertification, deforestation, mining, conservation, development.

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.—II. Steele, III. Darwent

218. Topics in North American Prehistory (4)
Seminar—3 hours; term paper. Advanced study on current problems in North American prehistory and archaeology. May be repeated for credit only if material is unique for that student, and with consent of instructor.—II. Eerkens

220. Field Course in Linguistics (4)
Seminar—2 hours; laboratory—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 global and economic interaction between national elites and rural regional and local populations under varying conditions of induced change in postcolonial societies. Attention will be given to the interaction for rapid economic growth. May be repeated for credit.

222. Cities and Citizenship (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing. The nature of urban societies, urban socio-economic life, and urban culture and politics from an anthropological perspective.

223. Economic Anthropology (4)
Seminar—3 hours; term paper. Prerequisite: course 122 or consent of instructor. Selected methodological and theoretical problems in the analysis of nonindustrial economic systems.

224. Problems in Comparative Religion (4)
Seminar—3 hours; term paper. Advanced study of 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, with 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 study of social inequality, and responses of subordinate groups. Emphasis on situations in which contemporary social theory, concrete research problems, and political strategies. Topics: formation 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 distinct theoretical perspectives—Marxism, post-Marxism, structuralism, post-structuralism, and feminism—have examined the mutually constitutive nature of culture and power.

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 interfaces with sexuality, race, class, work, national, minority, and majority identities under different historical, cultural, and social structural conditions. May be repeated for credit when topic differs.—III. Joseph

Lecture—1.5 hours; seminar—1.5 hours; term paper. Prerequisite: graduate standing in one of the social sciences including History: Comparative
232. Political Movements (4) Seminar—3 hours; term paper. Prerequisite: completion of first-year graduate work recommended. An interdisciplinary approach to the study of political movements, protest, reform, and revolution emphasizing historical comparison and evaluation of major theoretical approaches including world systems, resource mobilization, state and culture, rational choice, moral economy, social class and gender.

239. Problems in African Society and Culture (4) Seminar—3 hours; term paper. Diachronic analyses of traditional institutions in sub-Saharan Africa.

241. Topics in North American Ethnology (4) Seminar—3 hours; term paper. Advanced study on current problems in North American ethnography and culture history. May be repeated for credit with consent of instructor.

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 Caspian Sea area. Supervised study of the primary and secondary sources. Work with informants when available.

246. Ethnology of Europe (4) Seminar—3 hours, term paper. Prerequisite: reading knowledge of a European language other than English. Supervised study of the primary and secondary sources dealing with the ethnography and ethology of the peoples 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 the social sciences, history, or the humanities. Selection of topics in the anthropology of Chinese society. Focus on one or more of the following topics: state-society dynamics, family and gender, city formation and urban life, social movement, labor politics, and religion and ideology in Chinese society. May be repeated for credit when topic differs.

250. Behavioral Ecology of Primates (4) Seminar—3 hours, term paper. Prerequisite: course 154A (may be taken concurrently or the equivalent), graduate standing or upper division undergraduate with consent of instructor. Application of understanding of primate biology to conservation of primates and their habitat. Topics include evolutionary anthropology, behavioral ecology, biogeography, macroecology, population biology, and socioecology of primates. May be repeated once for credit if term paper differs. (S/U grading only.)

261. Modeling the Evolution of Social Behavior (4) Lecture—3 hours; extensive problem solving. Prerequisite: Mathematics 16C or the equivalent or consent of instructor. Tools and techniques in the modeling of social behavior in humans and other animals. Game theory, basic population genetics, animal conflict, altruism, reciprocity, signaling, and group selection.

262. Evolution and Human Behavior (4) Seminar—3 hours, term paper. Prerequisite: graduate standing or consent of instructor. Exploration of the links between behavioral ecological theory and human cultural variation, focusing on reproduction, marriage, parental investment, and family structure; implications of evolutionary theory for social organization in human communities, historical and contemporary. —III. Borgerhoff Mulder

263. Human Applications of Foraging Theory (4) Discussion—3 hours; laboratory—3 hours. Foraging theory models and their use in ethnographic and archaeological analyses of human behavior, with a focus on hunter-gatherers and resource selection, patch use, population and habitat, central places, sharing, stochastic processes, population dynamics, and conservation behavior. Not open for credit to students who have completed course 258. —I. Winterhalder

265. Language, Performance, and Power (4) Seminar—3 hours; term paper. Exploration of the intersection between linguistic and social theories in the language state relation and the performance of identity. Ideological sources of language differentiation, nation-building and linguistic difference. Political economy, sociolinguistic, and ethnographic approaches to understanding linguistic inequality. [Same course as Linguistics 265.—I. Shibamoto Smith]

270. Anthropology Colloquium Seminar (1) Seminar—1 hour. Reports and discussions of recent advances in the four subfields of anthropology. To be presented by guest speakers. May be repeated twice for credit. (S/U grading only.) —I, II, III. Borgerhoff Mulder

280. Current Anthropology Journal Editorial Workshop (4) Workshop—1 hour; independent study—3 hours. Students must enroll for 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 published comments 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 Ecology 280.] May be repeated for 12 units of credit with consent of instructor. (S/U grading only.) —I, II, III. Orlove

291. Advanced Topics in Human Behavioral Ecology (4) Discussion—3 hours; term paper. Prerequisite: course 261, 262, or 263, or comparable experience in anthropology or related disciplines and consent of instructor. Topics include critical discussion of recent topics in human behavioral ecology, giving special attention to theory, concepts, models, and methods for the evolutionary analysis of ethnographic and archaeological evidence. May be repeated one time for credit if topic differs.

292. Seminar in Linguistic Anthropology (4) Seminar—3 hours; term paper. Selected topics in linguistic anthropology. May be repeated for credit when topic differs.

298. Group Study (1-4) (S/U grading only)

299. Research (1-12) (S/U grading only)

299D. Dissertation Research (1-12) (S/U grading only)

Professional Course

390. Teaching Anthropology (4) Seminar—3 hours, laboratory—1 hour. Prerequisite: graduate standing in Anthropology or closely related discipline. Intellectual and practical elements of college teaching in the field of Anthropology, from curriculum design and the syllabus through grading and course evaluations, including classroom and information technology methods, and problems and rewards of teaching in higher education. Offered in alternate years. —I. Winterhalder

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.) —I, II, III.

Applied Behavioral Sciences

See Community and Regional Development, on page 177.

Applied Biological Systems Technology

[College of Agricultural and Environmental Sciences] Faculty. See under Department of Engineering: Biological and Agricultural, on page 213.

Courses in Applied Biological Systems Technology (ABT)

Lower Division Courses

15. Wood Properties and Fabrication (2) Lecture—1 hour; laboratory—3 hours. Physical principles and properties of wood as related to strength, design procedures, and selection and use of wood-working equipment. Experience in working with wood. (P/NP grading only.) —III. (I) Girgis

16. Metal Properties and Fabrication (2) Lecture—1 hour; laboratory—3 hours. Study of metal properties and of techniques for fabricating in metal. Physical principles, design considerations, effects of techniques on quality and appearance, and evaluation procedures. Experience in working with metals. (P/NP grading only.) —I, II, III.

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.) —III. (I) Jenkins

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, cultivation, thinning, and planting equipment. Typical sequences in croping practices. (P/NP grading only.) —III. (I, II, III)

52. Field Equipment Welding (2) Lecture—1 hour; laboratory—3 hours. Prerequisite: course 16 or consent of instructor. Intermediate welding to include hardfacing and inert gas welding.
87. Directed Study Group (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 Courses

101. Engine Technology (3)
Lecture—2 hours; laboratory—3 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.—II. (II.) J. Rumsey

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.—II. (II.) Singh

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.—II. (II.) Zhang

142. Equipment and Technology for Small Farms (2)
Lecture—1 hour; laboratory—3 hours. Types and characteristics of agricultural equipment and technologies appropriate for small commercial farming. Adjacent and recommended equipment selection and budgeting for equipment. (Same course as International Agricultural Development 142)—III. (III.)

161. Water Quality Management for Aquaculture (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1B, Mathematics 16B, Chemistry 2B. Basic principles of water chemistry and water treatment processes as they relate to aquatic systems. Offered in alternate years.—II. (II.) Piedrahita

163. Aquaculture Systems Engineering (3)
Lecture—3 hours. Prerequisite: course 161. Design of aquacultural systems: design methodology, principles, fluid mechanics, site selection and facility planning, management operations, computer modeling. Offered in alternate years.—III. (III.) Piedrahita

165. Irrigation Practices for an Urban Environment (2)
Lecture—2 hours. Prerequisite: Physics 1A or 5A. Basic design, installation, and operation principles of irrigation systems for turf and landscape: golf courses, parks, highways, public buildings, etc. Emphasis on hardware association with sprinkler and drip/trickle systems.—III. (III.) Hills

175. Introduction to Precision Agriculture (3)
Lecture—2 hours; laboratory/discussion—3 hours. Prerequisite: Agricultural Systems and Environment 21 or the equivalent computer experience. Concepts of precision agriculture. Variability in yield, yield monitors and mapping, remote sensing, variability in plant and soil conditions, global positioning system (GPS), geographic information system (GIS), sensors and actuators, map controlled variable rate application (VRT), socio-economic aspects of precision agriculture.—I. (I.) U. Upadhyaya

180. Introduction to Geographic Information Systems (4)
Lecture—3 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 Agricultural Management and Rangeland Resources 180)—II. (II.) Plant

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. Ecological and landscape modeling with emphasis on hydrology and solute transport. Spatial analysis of environmental risk analysis including ecological risk assessment, natural resource management. Spatial database structures, scripting, data models, and error analysis in GIS. Offered in alternate years.—III. Zhang

185. Concepts and Methods in Geographic Information Systems (4)
Lecture/labatory—8 hours. Prerequisite: course 180 or Agricultural Management and Rangeland Resources 180 or Landscape Architecture 50 or consent of instructor. Major concepts and methods in representation of data in geographic information systems (GIS). Methods to create spatial data sets from analog and digital data sources such as aerial photography and maps; data structures, data management, data design, georectification, surface models, analysis, and visualization of spatial data. (Same course as Landscape Architecture 185)—II. (II.) Greco, Plant

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)—I, II, III, I, II, III

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)

197L. 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 department’s regular courses. Not repeatable 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)
(P/NP grading only)

Graduate Courses

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.

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)—I, II, III, II, II

298. Group Study (1-5)

299. Research (1-12)
(S/U grading only)

Professional Course

317. Teaching Agricultural Mechanics (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: a course in physics; 6 units related to agricultural mechanics; enrollment 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 agricultural structures areas.—II. (II.)

Applied Computing and Information Systems

(Recommended only for students interested in transferring to modern computer technology to management problems in agriculture, resource management, and other areas. Course work provides knowledge of the use of information technology and the methodology of applied quantitative and systems analysis. The minor is offered by the Department of Plant Sciences.)

Minor Program Requirements:

<table>
<thead>
<tr>
<th>Applied Computing and Information Systems</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Two or three of the following courses:</td>
<td>18</td>
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<tr>
<td>(The third course may be taken in substitution for a course from either of the elective groups.)</td>
<td></td>
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<tr>
<td>Remains of the units to be made up of courses in one or both of the following groups</td>
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<tr>
<td>Applied Computing and Information Systems</td>
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<td>Environmental Sciences</td>
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<td>Communication and business organization:</td>
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<tr>
<td>Agricultural and Resource Economics 112, Community and Regional Development 168, Communication 103, 130, 134, 135, 136, International Agricultural Development</td>
<td></td>
</tr>
<tr>
<td>Minor Adviser: T.C. Foin (Plant Sciences), T.F. Famula (Animal Science)</td>
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<tr>
<td>Advising Center is located in 1220A Plant and Environmental Sciences (530) 752-1715.</td>
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</tbody>
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Applied Mathematics (A Graduate Group)

Group Office. 1130 Mathematical Sciences Bldg. (530) 752-8131; studentservices@math.ucdavis.edu; http://www.math.ucdavis.edu/grad/ggam

Faculty. The Group includes approximately 65 faculty members, of whom about one third are in the Department of Mathematics. Membership comprises chemists, biologists, physicists, geologists, statisticians, engineers, computer scientists, and aeronautical engineers. Research interests include biology, atmospheric sciences, mechanics, solid and fluid dynamics, optimization and control, theoretical chemistry, computer and

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: Arts and Humanities, SciEng = Science and Engineering; SocSci = Social Sciences; Div = Social-Cultural Diversity; Wrt = Writing Experience
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 on our Web page.

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 national research laboratories. For further information, please contact: studentservices@math.ucdavis.edu or (530) 752-8131.

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. Advanced calculus skills. Undergraduate courses should include calculus 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 national research laboratories. For further information, please contact: studentservices@math.ucdavis.edu or (530) 752-8131.

Applied Physics

See Physics, on page 408.

Aquaculture

See Animal Biology, on page 132; Animal Science, on page 134; Applied Biological Systems Technology, on page 144; and Wildlife, Fish, and Conservation Biology, on page 483.

Arabic

See Middle East/South Asia Studies, on page 375.

Art History

[College of Letters and Science] Lynn Roller, Ph.D., Program Director
Department Office, 101 Art Building (530) 752-0105; http://arthistory.ucdavis.edu
Faculty
Katharine Burnett, Ph.D., Assistant Professor
Douglas Kahn, Ph.D., Professor
Dianne Sachko Macleod, Ph.D., Professor
Lynn Roller, Ph.D., Professor [Classics, Art History]
Jeffrey Ruda, Ph.D., Associate Professor
Simon Sadler, Ph.D., Assistant Professor
Blake Stimson, Ph.D., Assistant Professor
Diana Strazdes, Ph.D., Assistant Professor
Hegnarr Watenaugh, Ph.D., Associate Professor
Emeriti Faculty
Mary H. Fang, Ph.D., Professor Emerita
Robert J. Grigg, Ph.D., Professor Emeritus
Seymour Howard, Ph.D., Professor Emeritus
The Major Program
Art History studies the changing visual expression of values, beliefs and experiences across diverse cultures and over time. It provides training in historical, social and aesthetic understanding, critical thinking, scholarly research, and lucid, thoughtful analysis and writing. More than any other discipline art history sharpens its students’ visual acuity and deepens their visual literacy. In so doing, it prepares them to face the increasingly complex visual world we find ourselves in today.

The Program. The major begins with a series of courses that surveys major landmarks in the history of visual culture, art and architecture in Asia, Europe, and the United States. More advanced lecture courses and seminars focus on particularly important periods and issues. Students are encouraged to personalize their training with internships, independent study, and focused upper-division study. Top students considering graduate study are encouraged to engage in more advanced study in the Honor program.

Career Options. A major in Art History develops critical thinking and the integration of research, interpretation and understanding. It provides an excellent liberal arts basis for professions as far ranging as advertising, law, medicine, policy and business. The major prepares students for advanced study in Art History, Architecture, Museum Studies and Cultural Studies. It also serves as the foundation for careers in teaching, arts, administration, museums, 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: UNITS
Preparatory Subject Matter .................. 20
Art History 1A, 1B, 1C, and 1D (Art History 25 may be substituted for one of the above) ........................................... 16
One Art Studio course .................. 4
Depth Subject Matter .................. 40
One course in each of the following areas:............................... 16
(a) Ancient Mediterranean: Art History 172A, 172B, 173, 175; Classics 171, 174
(b) Asian: Art History 163A, 163B, 163D, 164
(c) European and American before 1865: Art History 178A, 178B, 178C, 179B, 182, 183A, 188D
(d) European and American since 1865: Art History 183B, 183C, 185, 186, 188E, 189
One additional non-Western area may be substituted for any of these four areas, with consent of the major adviser. Art History 190A-H .................................. 4 Five additional upper division Art History courses ................................................. 20
Students may choose any other five upper division Art History courses or may wish to focus on one of the following areas of emphasis:
(a) Comparative Visual Cultures: choose one additional course in each of the four subfields plus one upper division elective.
(b) Architectural History: choose three upper division courses from Art History 154C, 173, 175, 188A, or 188B, plus up to two upper division electives not used in satisfaction of other major requirements.
(c) Museums, Collecting, and Patronage: Art History 182, and 110, plus three upper division electives not used in satisfaction of other major requirements. Art History 401 and 402 strongly recommended. Appropriate course substitutions may be made with the prior consent of the major adviser.

Total Units for the Major .................. 60

Minor Program Requirements:
UNITs
Art History .............................................. 20
One course each in three of the following four areas:............................... 12
(a) Ancient Mediterranean: Art History 172A, 172B, 173, 175; Classics 171, 174
(b) Asian: Art History 163A, 163B, 163D, 164
(c) European and American before 1865: Art History 178A, 178B, 178C, 179B, 182, 183A, 188D
(d) European and American since 1865: Art History 183B, 183C, 185, 186, 188E, 189
Two additional Art History courses; Art History 190A-H 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 listed course options 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 have a grade point average of 3.7 in the major or consent of the major adviser. In addition to meeting the standard major requirements, the honors student completes at least one quarter of language in German or Chinese, one undergraduate prosemir (course 190), and writes an honors thesis (course 194H). Students participating in this Program are congratulated for Departmental recommendation for graduation with High or High-Honors. See the Academic Information chapter, Letters and Science honors section, of this catalog and consult the department for more information.

Teaching Credential Subject Representative. Department Chairperson; see the Teaching Credential/M.A. Program on page 102.

Graduate Study. The Program in Art History offers studies leading to the Master of Arts degree in History of Art as preparation for graduate study or professional work. For more information, contact the Graduate Staff Adviser at (530) 752-0616 or see the Graduate Announcement.

Courses in Art History (AHI) Lower Division Courses 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: ArtHum.——II.; II. (L) Ruda
151. Arts of the Indians of the Americas (4)  
Lecture—3 hours; term paper or gallery studies and review.  
Description and analysis of Native American art, focusing on cultural contexts. GE credit: ArtHum, Div, Wrt.—Ill. (III) Macleod, Strazdes

152. Arts of Oceania and Prehistoric Europe (4)  
Lecture—3 hours; term paper. Traditions of aboriginal Australia, Melanesia, Polynesia, and Micronesia seen in their cultural contexts. Prehistoric art of Europe and the Near East. GE credit: ArtHum, Div.

153. Art, Storytelling and Cultural Identity in the Pacific (4)  
Lecture/discussion—3 hours; term paper. Representation of the cultural identities of indigenous and migrant groups of the Pacific in visual arts and storytelling. Offered in alternate years. GE credit: ArtHum, Div.

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 the newly discovered through archaeology in China. GE credit: ArtHum, Div, Wrt.—II. (II) Burnett

163B. Chinese Painting (4)  
Lecture—3 hours; term paper or gallery studies and review. The unique formal qualities of Chinese art, with outstanding 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.

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 interactions 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 the formation of contemporary Chinese painting. GE credit: ArtHum, Div, Wrt.—Burnett

164. The Arts of Japan (4)  
Lecture—3 hours; term paper and/or gallery studies and review (determined by instructor for 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.—II. Burnett

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.

172A. Early Greek Art and Architecture (4)  
Lecture—3 hours; term paper. Examination of the origins and development of the major monuments of Greek art and architecture from the eighth century B.C. to the 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.—II. (II) Ruda

172B. Later Greek Art and Architecture (4)  
Lecture—3 hours; term paper. Study of the art and architecture of classical Greek civilization, from the fifth century to the first century B.C. Not open for credit to students who have completed course 154B. (Same course as Classics 172B.) Offered in alternate years. GE credit: ArtHum, Wrt.—II. (II) Ruda

173. Roman Art and Architecture (4)  
Lecture—3 hours; term paper. The art and architecture of Rome and the Roman Empire, from the founding of Rome through the fourth century C.E. Open for credit to students who completed course 155. (Same course as Classics 173.) Offered in alternate years. GE credit: ArtHum, Wrt.—III. Ruda

175. Architecture and Urbanism in Mediterranean Antiquity (4)  
Lecture—3 hours; extensive writing. Prerequisite: a lower division Classics 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 Greco-Roman urbanism. (Same course as Classics 175.) Offered in alternate years. GE credit: ArtHum, Div, Wrt.—II. (II) Ruda

176A. 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 the early Christian era and Byzantine Empire: through the later Roman Empire in the West and to the final collapse of Constantinople in the East. GE credit: ArtHum, Wrt.

176B. Art of the Middle Ages: Gothic (4)  
Lecture—3 hours; term paper or gallery studies and review. Painting, sculpture and architecture in northern Europe from the twelfth through the fifteenth centuries. GE credit: ArtHum, Wrt.

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.

177B. Northern European Art (4)  
Lecture—3 hours; term paper or gallery studies and review. Painting and sculpture of the sixteenth century in Germany, France and the Lowlands, including such artists as Albrecht Dürer and Pieter Bruegel. GE credit: ArtHum, Wrt.

178A. Italian Renaissance Art (4)  
Lecture—3 hours; term paper or gallery studies and review. Painting and sculpture in Italy from Nicola Pisano through Lorenzo Monaco, with emphasis on Duccio, Giotto, and other leading artists of the early fourteenth century. GE credit: ArtHum, Wrt.—Ruda

178B. 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.—Ruda

178C. Italian Renaissance Art (4)  
Lecture—3 hours; term paper or gallery studies and review. The High Renaissance: Leonardo, Michelangelo, Raphael, and Titian in their artistic and cultural settings—Florence, Rome, and the Lowlands in the early sixteenth century. GE credit: ArtHum, Wrt.—I (III) Ruda

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.—I (II) Ruda
182. British Art and Culture, 1750–1900 (4)  
Lecture—3 hours; term paper. Prerequisite: course 1C recommended. British painting in relation to the position of women in society and the rise of the middle-class art market. Topics include Hogarth and popular culture, Queen Victoria and the female gaze, and Pre-Raphaelite artists. Not offered every year. GE credit: ArtHum, Writ.—III. Macleod

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 middle of the 19th century. Major artistic events viewed against a revolutionary backdrop of changing attitudes toward identity, race, and gender. Not offered every year. GE credit: ArtHum.—II. Macleod

183B. Impressionism and Post-Impressionism: Manet to 1900 (4)  
Lecture—3 hours; discussion—2 hours. 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 19th century. Not offered every year. GE credit: ArtHum, Writ. —II. (II.) Macleod

Lecture—4 hours; discussion—2 hours. 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, Writ.—II. (II.) Macleod

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, aesthetic, and theoretical 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-theoretical inquiry into questions of modernism, modernity, and avant-gardism. Offered in alternate years. GE credit: ArtHum, Div, Writ.—I and II. (II.) Macleod

190. Undergraduate Seminar (4)  
Lecture—3 hours; term paper. Prerequisite: consent of instructor. Intended primarily for senior and junior students in the history of art. Assigned readings, discussions, and a substantial paper in a particular area of art history will introduce the student to methodology and techniques of art historical research. May be repeated once for credit. GE credit: ArtHum, Div, Writ.—II. (II.) Stimson

190A-H. Undergraduate Proseminar in Art History (4)  

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.] GE credit: ArtHum, Div, Writ.—I, II, III, IV. (IV.) Macleod

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. GE credit: ArtHum, Div, Writ.—I. (I.) Stimson

198. Directed Group Study (1-5)  
[P/NP grading only.]

Graduate Courses

200A. Visual Theory and Interpretive Method (4)  
Discussion—3 hours; extensive writing. Close study of selected recent developments in interpretive methodology 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 once for credit.—I. (I.) Macleod, Stimson

208. 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.—I. (II.) Burnett, Ruda, Stimson

200C. Thesis Writing Colloquium (4)  
Discussion—3 hours; term paper. Prerequisite: course 200B concurrently. Restricted to graduate students in art history. Structured, supportive environment for second-year art history graduate students writing masters' theses. Students produce substantive sections of their theses, contributing to them the group writing and editing exercises. May be repeated twice for credit. [S/U grading only.]—II. (II.) Burnett, Ruda, Stimson

220. 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. Stimson

221. 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 topics differ and with consent of instructor.—I. Ruda

224. 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.—I. Ruda

226. 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

227. 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.—II. Ruda

228. Seminar in Visual Culture and Gender (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. Ruda

235. Seminar in Visual Culture and Gender (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.—II. Ruda

238. 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. (II.) Stazides

239. 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
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 (530) 752-0616.

Courses in Art Studio (ART)
2. Drawing I (4)
   Studio—6 hours. Form and composition in black and white.—I, II, III, (II, III)
3. Drawing II (4)
   Studio—6 hours. Prerequisite: course 2. Form and composition in color.—II, (II)
4. Life Drawing (4)
   Studio—6 hours. Prerequisite: course 2. Form composition in human figure as subject.—I, II, III, (I, II, III)
5. Sculpture (4)
   Studio—6 hours. Form in space using plaster and other media.—I, II, III, (I, II, III)
7. Beginning Painting (4)
   Studio—6 hours; independent study—3 hours. Introduction to a variety of techniques and concepts as related to the practice of painting, to establish a solid base which can be expanded on in upper division painting.—I, II, (II)
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.
16. Descriptive Drawing (4)
   Studio—6 hours. Objective drawing and rendering; representations of space.—(III)
30. Introduction to Contemporary Visual Culture (4)
   Lecture—3 hours; discussion/lab—1 hour. Building 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.—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 Courses
Preenrollment in upper division courses is restricted to art majors. Art minors may obtain permission to preenroll by contacting the Undergraduate Staff Adviser in the Art office.
101. Painting: Materials and Carriers (4)
   Studio—6 hours. Prerequisite: courses 2, 3, 4, 5, or consent of instructor. Experimentation in media and their supports.—I, II, III, (II, III)
102. Painting (4)
   Studio—6 hours. Prerequisite: course 1 or consent of instructor. Advanced painting in various media including oil and polymers. May be repeated once for credit with consent of instructor.—II, (II, III)
103. Advanced Drawing (4)
   Studio—6 hours. Prerequisite: courses 2, 3, 4, 6, or consent of instructor. Advanced drawing, composition and form in black and white and color. May be repeated once for credit with consent of instructor.—I, III, (II)
104. Figure Drawing and Painting (4)
   Studio—6 hours. Prerequisite: courses 4 and 101, or consent of instructor. Advanced figure drawing and painting using the human figure as subject. May be repeated once for credit with consent of instructor.—II, (II)


The Major Program
The studio art major provides the knowledge and experience necessary for a broad understanding of practice and interpretation of the visual arts.

The Program. For the beginning student, the major offers an introduction to visual methodologies through drawing, sculpture, and art history. Students may then advance to upper division coursework and specialization in drawing, painting, sculpture, print making, ceramics, photography, video production, electronic arts, as well as theory and criticism in upper division.

Portfolios. Portfolios are not required for admission to the major. However, admitted students, once enrolled, should keep a continuing portfolio of their art work, which can be evaluated at such times as when the student is requesting independent study courses and scheduling an exhibition in the student gallery.

Career Alternatives. The studio art graduate is prepared for graduate work in the visual arts or continuing development as a professional artist or art teacher. Students who have career aspirations in the commercial aspects of the visual arts can acquire a broad general education and a creative foundation in the art studio major, establishing a basis for further specialization in commercial art.

A.B. Major Requirements:

Preparatory Subject Matter. Courses from Art Studio 2, 3, 4, 5, 6; see prerequisites required for upper division courses. Two courses from ArtHistory 1A, 1B, 1C, 1D, Art Studio 30. Depth Subject Matter.

Eight courses, under three different instructors, chosen from Art Studio 101, 102, 103, 104, 110, 111, 113, 114, 115, 116, 117, 120, 125, 126, 127, 128, 141, 142, 143, 144, 145, 146, 147, 148, 150, 151, 171...24


Total Units for the Major. Recommended:
(a) Students interested in drawing and painting should take Art Studio 2, 3, 4, or 7 (course 5 is recommended);
(b) Students interested in sculpture should take Art Studio 2, 3, 5 (course 4 is recommended); and
(c) Students preparing for graduate work in any of the environmental design professions should take Art Studio 2, 5, 16.

Major Advisers. Information on the current Academic Advisors can be obtained by contacting the Undergraduate Staff Adviser (530) 752-0105.

Minor Program Requirements:

Prerequisite courses must be taken prior to enrollment in upper division courses. Independent study courses are not applicable.

Upper division art studio courses chosen in consultation with a faculty adviser (one lower division substitute course permitted). A teaching credential subject representative who has obtained the Teaching Credential/M.A. Program on page 102.

Art Studio

(Office of Letters and Science)
Lucy Puls, M.F.A., Chairperson of the Department
Department Office, 101 Art Building (530) 752-0105; http://art.ucdavis.edu

Faculty
Tom Bills, M.F.A., Professor
William Henderson, M.F.A., Professor
Rabin Hill, B.F.A., Assistant Professor
David Hollowell, M.F.A., Professor
Malaquias Montoya, B.F.A., Professor
(Chico Art Studies, Art Studio)
Hearne Pardee, M.F.A., Assistant Professor
Annabeth Rosen, M.F.A., Associate Professor
Gina Werfel, M.F.A., Professor
Emeriti Faculty
Conrad Atkinson, R.A. (honors), Professor Emeritus
Ray DeForest, M.A., Professor Emeritus
Lynn Hashman, M.A., Professor Emeritus
Harvey Himelfarb, M.A., Professor Emeritus,
Academic Senate Distinguished Teaching Award
Maunel Neri, Professor Emeritus
Roland C. Petersen, M.A., Professor Emeritus
Cornelia Schulz, M.F.A., Professor Emerita,
Academic Senate Distinguished Teaching Award

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer, 2007/2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Social-Cultural Diversity, Wrt=Writing Experience
110. Photography I (4)
Studio—6 hours. Prerequisite: courses 2, 3, 4, or consent of instructor. Photography as an art form. Experiments with camera and light sensitive materials.—I, II, III, I, II, III.

111. Photography II (4)
Studio—6 hours. Prerequisite: course 110 or consent of instructor. Art of camera and light sensitive materials: tonal control, multiple exposure, synthetic negatives, etc. May be repeated once for credit with consent of instructor.—I, II, III, I, II, III.

113. Interdisciplinarity (4)
Studio—6 hours. Prerequisite: one course in Art History or Art Studio. The notion of "self," "portraiture" and "identity" as it is defined in an electronic world in which media alters perceptions of belief as individuals and society. Hands-on projects plus theoretical analysis of media.—II, II.

116. Video Practice and Theory (4)
Studio—6 hours. Prerequisite: 12 units of lower division art studio classes. Production techniques of video, including shooting, editing, lighting, sound and effects. A conceptual framework for video-art techniques.—II, II.

117. Experimental Documentary (4)
Studio—6 hours. Prerequisite: upper division standing. Study of the documentary form with particular attention to hybrid forms of film, video and computer genres. May be repeated once for credit with consent of instructor when topic differs.—III, I, III.

121. Reinterpreting Landscape (4)
Studio—6 hours; lecture/discussion—2 hours. Prerequisite: course 2 or Nature and Culture 100 or consent of instructor. Investigation of landscape through painting, drawing and related media, with emphasis on the integration of historical, cultural, natural and artistic contexts. Course includes field work culminating in an independent project. Not offered every year.—III.

125. Printmaking: Relief (4)
Studio—6 hours. Prerequisite: courses 2, 3, 4, 5, or consent of instructor. Woodcut, linocut, metal-plate relief and experimental use of other materials.—II.

126. Printmaking: Intaglio (4)
Studio—6 hours. Prerequisite: courses 2, 3, 4, 5, or consent of instructor. Introduction to color, as well as glazing and use of kiln. May be repeated once for credit with consent of instructor.—II, I, III.

143. Sculpture: Ceramics I (4)
Studio—6 hours. Prerequisite: course 2, 3, 4, 5 or consent of instructor. Sculpture in various media using the humid environment and color. Clay sculpture in relief and round. May be repeated once for credit with consent of instructor.—II, I, III.

147. Theory and Criticism of Photography (4)
Lecture—3 hours; term paper. Prerequisite: course 2 or 5 and one art lecture course. Development of camera vision, ideas, and aesthetics and their relationship to the fine arts from 1839 to the present. GE credit: ArtHum, Wrt.—II.

148. Theory and Criticism: Painting and Sculpture (4)
Lecture—3 hours; term paper. Prerequisite: course 2 or 5, and one art lecture course. Study of forms and symbols in historic and contemporary masterpieces. GE credit: ArtHum, Wrt.—II.

150. Theory and Criticism of Electronic Media (4)
Lecture—3 hours; term paper. Prerequisite: course 2 or 5, and one art lecture course. Study of electronic media as an artistic mode of expression. GE credit: ArtHum, Wrt.—II, I, III.

151. Intermediate Sculpture (4)
Studio—6 hours. Prerequisite: course 5. Builds on the basic skills and concepts covered in Art 5. Individualized explorations through multiple projects in a variety of media and techniques. Contemporary art theory and its relationship to the studio practice. May be repeated two times for credit when topic differs.—I, II, III, I, II, III.

152. Sculpture: Special Topics (4)
Studio—6 hours. Prerequisite: courses 5 and 151. Special topics related to sculpture and contemporary art practice. Multiple projects in a variety of media. May be repeated two times for credit when topic differs.—I, II, III, I, II, III.

153. Metals (4)
Studio—6 hours. Prerequisite: courses 5 and 152. Technical and theoretical aspects of the use of metals in contemporary art practice. Students will produce primary works which demonstrate the evolution of a concept and process. May be repeated three times for credit when topic differs. Restricted enrollment.—I, II, III, I, II, III.

154. Site-Specific Public Art (4)
Studio—6 hours. Prerequisite: courses 5 and 151. Place and site-specificity in contemporary sculpture. Students will work collaboratively to individually conceive of and fabricate sculpture in a public space. May be repeated two times for credit when topic differs. Hill, Bills.

171. Mexican and Chicano Mural Workshop (4)
Studio—8 hours; independent study—1 hour. Prerequisite: Chicana/o Studies 70 and/or written consent of instructor. The Mural: a collective art process that empowers students and people through design and execution of mural paintings in the tradition of the Mexican Mural Movement; introduces materials and techniques. May be repeated once for credit. (Same course as Chicana/o Studies 171.)—II, II.

192. Internship (1-2)
Internship. Supervised program of internships in artists' studios and at professional art institutions such as museums, galleries, and art archives including collections of slides and photographs. May be repeated for credit for a total of 12 units. (P/NP grading only.)

193. Seminar in Art Practice (4)
Discussion/laboratory—8 hours; variable—4 hours. Prerequisite: courses 2 and 3; upper division standing: taking or having taken courses in upper division drawing, painting, and sculpture. Work (painting, sculpture, drawing, etc.) done for group discussion and criticism, as well as group discussion of contemporary topics in the visual arts. May be repeated once for credit.

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 Courses
290. Seminar (4)
Seminar—3 hours. Original works produced for group discussion and criticism; associated topics of a contemporary and historical nature. May be repeated for credit.—I, II, III, I, II, III.

291. Seminar: Critical Evaluation (1)
Seminar—1 hour. May be repeated for credit. (S/U grading only.)—II, II.

292. Seminar: Comprehensive Qualifying (1)
Seminar—1 hour. Further critical evaluation of the student's work to determine his eligibility to begin the Comprehensive Project. May be repeated for credit. (S/U grading only.)—II, II.

299. Individual Study (1-6)
(S/U grading only.)

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum, SciEng, Social and Cultural Diversity, Wrt="Writing Experience"
Asian American Studies

Asian American Studies (College of Letters and Science)

Wendy Ho, Ph.D., Program Director
Program Office, 3102 Hart Hall
(530) 752-3625; http://as.ucdavis.edu

Committee in Charge
Darrell Y. Hamamoto, Ph.D.
(Asian American Studies)
Bill Ong Hing, J.D.
(School of Law, Asian American Studies)
Wendy Ho, Ph.D. (Asian American Studies, Women and Gender Studies)
Richard S. Kim, Ph.D. (Asian American Studies)
Sunaina Maira, Ed.D. (Asian American Studies)
Susette Min, Ph.D.
(Art History, Asian American Studies)
Rhacel S. Parreñas, Ph.D. (Asian American Studies)
Karen Shimakawa, Ph.D., J.D.
(Asian American Studies)
Stanley Sue, Ph.D.
(Psychology, Asian American Studies)
Caroline Kieu Linh Valverde, Ph.D.
(Asian American Studies)
Nolan Zane, Ph.D.
(Psychology, Asian American Studies)

Faculty
Darrell Y. Hamamoto, Ph.D., Professor
Bill Ong Hing, J.D., Professor
Wendy Ho, Ph.D., Associate Professor
Richard S. Kim, Ph.D., Assistant Professor
Sunaina Maira, Ed.D., Associate Professor
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Rhacel S. Parreñas, Ph.D., Associate Professor
Stanley Sue, Ph.D., Professor
Caroline Kieu Linh Valverde, Ph.D., Assistant Professor
Nolan Zane, Ph.D., Professor

Emeriti Faculty
Isao Fujimoto, M.A., Senior Lecturer Emeritus

The Major Program
The Asian American Studies 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, and gender contexts for Asian Americans.

A.B. Major Requirements:

- Humanities Emphasis
  - Preparatory Subject Matter............................34
  - Asian American Studies 1, 2, 20, 21, 22
  - One Asian American language or 15
  - Chinese 1, 2, 3; Japanese 1, 2, 3; or equivalent Asian American language
  - Note: For courses in Asian languages, see Chinese and Japanese (under East Asian Languages and Cultures). For other Asian courses, see East Asian Languages and Culture and East Asian Studies.
  - At least two lower division courses from the following departments or programs: African American and African Studies, Chicano/o Studies, Native American Studies, Women and Gender Studies (all lower division courses of at least 4 units are acceptable except those numbered 97T, 97Q, 97P, and 99)

- Social and Psychological Perspectives of Asian Americans
  - At least seven upper division Asian American Studies courses (excluding 197T, 198, 199) and not more than 6 units of internships

- Depth Subject Matter.................................44-47
  - At least seven upper division Asian American Studies courses (excluding 197T, 198, 199) and not more than 6 units of internships

Total Units for the Major...............................78-81

- Social Science Emphasis
  - Preparatory Subject Matter............................32
  - Asian American Studies 1, 2, 20, 21
  - Select four courses from the following: Anthropology 2, 4, 20; Communication 1, 3; Human Development 30; Psychology 41; Sociology 46A, 46B, Statistics 13 (at least two of the courses must be methodological/statistical in nature and selected from Anthropology 2, Psychology 41; Sociology 46A, 46B, or Statistics 13)

- At least two lower division courses from the following departments or programs: African American and African Studies, Chicano/o Studies, Native American Studies, Women and Gender Studies (all lower division courses of at least 4 units are acceptable except those numbered 92T, 97T, 98, and 99)


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)

Direct questions pertaining to the following courses to the instructor or to Asian American Studies Program in 3102 Hart Hall (530) 752-3625.
can literature and see art, theater and film. GE credit: AnthHum, Div. Wrt.—I. (I.) Hamamoto, Ho, Min

92. Internship (1-3) 
Internship—3-9 hours. Prerequisite: enrollment dependent on availability of intern positions and consent of instructor. Supervised internship in community and institutions related to Asian American concerns. (P/NP grading only.)

98. Directed Group Study (1-5) 
Primarily intended for lower division students. (P/NP grading only)

99. Special Study for Undergraduates (1-5) 
(P/NP grading only)

Upper Division Courses

100. 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 contexts. Presentation of the analytical skills, theories, and concepts needed to describe, explain, and understand the diversity of Asian American communities within the larger, dominant society. GE credit: SocSci, Div.—II. (II.) Hamamoto, Kim, Parreñas, Valverde

110. Theoretical Perspectives in Asian American Studies (4) 
Lecture/discussion—4 hours. Prerequisite: course 1 or 2, upper division standing. Theories of race and ethnic difference as tools for understanding the Asian American experience with the society as the unit of analysis. GE credit: SocSci, Div.—Hamamoto, Kim, Parreñas, Valverde

111. Ethnicity, Culture, and the Self (4) 
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1, 2, or 3. Cultural and social psychological influences on Asian Americans with the individual as the major unit of analysis. GE credit: SocSci, Div.—Sue, Zone

112. 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 as they are examined in their social, economic, and historical contexts using theoretical perspectives from social sciences, humanities/arts: identity, racialization, immigration, gender, sexuality, labor, socialization, cultural expression, social movements and feminist theorizing. GE credit: AnthHum or SocSci, Div.—Ho, Parreñas

113. Asian American Sexuality (4) 
Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3. Restitution laws, labor exploitation, race-based exclusionary laws, removal and internment, anti-miscegenation laws, and other examples of social control are surveyed to assess their role in shaping the sexuality of the different Asian American groups. —Hamamoto

114. 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. Community building, cyberspace, gender issues, labor, transnational practices, effects of globalization, political considerations, and community activism. GE credit: AnthHum, Div.—Maira

120. Multiracial Asian Pacific American Issues (4) 
Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Introduction to the experiences of multiracial Asian Pacific people in the U.S., concentrating on theories of race, racial identity formation, culture, media, and anti-racist struggles. Critical approaches to the analysis of popular arts and representations. Offered in alternate years. GE credit: Div.—Valverde

130. 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, examined in their social, economic and historical contexts. Intertextual analysis of their thematic and formal significance. Offered in understanding of Asian American literary traditions. GE credit: AnthHum, Div.—Ho, Min

136. Asian American Performance (4) 
Lecture/discussion—4 hours. Prerequisite: course 1, 2, 3, or consent of instructor. Performance work by, for, and/or about Asian Pacific Americans including dramatic literature, performance art, dance, and film. Ethnicity, gender and sexuality, class and age as they intersect with Asian Pacific American identities in and through dramatic performance. Offered in alternate years. (III.) Min

140. Asian Americans and the Media (4) 
Lecture—3 hours; term paper. Prerequisite: course 1. Exploration of how racial identity, class politics, and gender issues are mediated through Asian American figures in print, radio, television, film and new media. GE credit: SocSci, Div. Wrt.—Hamamoto, Maira

150. 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 a critical evaluation of the historical and contemporary conditions, problems and prospects of Filipinos in the U.S.—III. Parreñas

150B. Japanese American Experience (4) 
Lecture—3 hours; term paper. Prerequisite: course 1 and upper division standing or consent of instructor. Analytical approaches to understanding Japanese American history, culture and society. Offered in alternate years. GE credit: SocSci, Div. Wrt.—Hamamoto

150C. Chinese American Experience (4) 
Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Survey of the historical and contemporary experiences of Chinese in the United States, starting with the gold rush era and concluding with the present-day phenomenon of Chinese transnational movement to the United States and its diasporic significance. Offered in alternate years. GE credit: SocSci, Div.—Hing, Ho

150D. Korean American Experience (4) 
Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Interdisciplinary survey of the historical and contemporary experiences of Koreans in the United States from the late nineteenth century to the present. Offered in alternate years. GE credit: SocSci, Div.—Kim

155. Asian American Legal History (4) 
Lecture/discussion—4 hours. Prerequisite: course 1, 2, or 3, or consent of instructor. Legal history of Asian Americans, from the mid-19th century to present. Laws and administrative policies affecting Asian Americans, and the role of those governing immigration, social and economic participation, WWII internment, and affirmative action. —Hing

171. Health Issues Confronting Asian Americans and Pacific Islanders (4) 
Lecture/discussion—4 hours. Health issues confronting Asian Americans and Pacific Islanders. (Same course as Epidemiology and Preventive Medicine 171J.) —Chen

189A-l. Topics in Asian American Studies (4) 
Lecture—4 hours. Prerequisite: course 1, 2, or 3 and upper division standing, or consent of instructor. Intensive treatment of Asian American Studies. (A) History; (B) Culture; (C) Physical and Mental Health; (D) Policy and Community; (E) Comparative Racial Studies; (F) Asian Studies and Asian American Studies; (G) Race, Class, Gender, and Sexuality. (H) Society and Institutions; (I) Politics and Social Movements. May be repeated for credit when topic differs. Not offered every year.

192. Internship (1-5) 
Internship—3-15 hours. Prerequisite: enrollment dependent on availability of intern position with priority to Asian American Studies minors. Supervised internship in community and institutional settings related to Asian American concerns. (P/NP grading only)

197T. Tutoring in Asian American Studies (1-5) 
Prerequisite: consent of instructor. Primarily intended for upper division students. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5) 
Prerequisite: consent of instructor. (P/NP grading only)

Courses in Cantonese (CAN)

Lower Division Courses

1-2-3. Elementary Cantonese (5-5-5) 
Lecture—3 hours; recitation—3 hours. Introduction to Cantonese grammar and development of conversational skills in a cultural context. Approximately 250 Chinese characters will be introduced during Cantonese 2 and 3. (Not open to native speakers.) —Chung

4-5-6. Intermediate Cantonese (3-3-3) 
Lecture—2 hours; recitation—2 hours. Prerequisite: course 1-2-3 or the equivalent. Development of conversational skills in a cultural context. Communally-oriented language materials in health care, social service, and bilingual education will be introduced. —Chung

Asian Studies

See Asian American Studies, on page 151; East Asian Languages and Cultures, on page 192; and East Asian Studies, on page 195.

Astronomy

See Physics, on page 408.

Atmospheric Science

[College of Agricultural and Environmental Sciences] 
Faculty. See under Department of Land, Air, and Water Resources, on page 320.

The Major Program

Atmospheric science is the study of the layer of air that surrounds the planet. It includes all weather phenomena, such as frontal systems and clouds, as well as severe weather events such as hurricanes and tornadoes. The effects of human and other biotic activity on the quality of the air we breathe, and on 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 oriented. In addition to the study of daily weather events, the program deals with fundamental physical processes that involve the general circulation of the atmosphere, including mass and energy transfers at the planetary surface and within the atmosphere; solar and terrestrial radiation; atmospheric interaction with the biosphere; climate variations; and developing meteorological instrumentation. In addition, the program has significant expertise in the areas of air quality and atmospheric chemistry. As well as providing a broad background science, 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. Numerous career opportunities exist in the federal and state governments, research and development in the private sector, and education. Examples of career areas are weather forecasting, agricultural meteorology, air-pollution control, weather modification, hurricane and severe weather forecasting and research, weather satellite meteorology, environmental consulting, and weather research. About half of our graduates continue their education by seeking the M.S. or Ph.D. degree in atmospheric science.

B.S. Major Requirements:

**UNITS**
- **English Composition Requirement**: 3-11
- **See College requirement**
- **0.8 English 19, Communication 1, Dramatic Art 10, or University Writing Program 104E**
- **3 Preparatory Subject Matter**
  - **59 Biological Sciences 1C**
  - **4 Chemistry 2A, 2B**
  - **10 Computer Science Engineering 30 or course selected with adviser’s approval**
- **4 Mathematics 21A, 21B, 21C, 21D, 22A, 22B**
  - **22 Atmospheric Science 60**
  - **4 Physics 9A, 9B, 9C**
- **12 Statistics 13**
- **3 Breadth/General Education**
  - **28 Satisfaction of General Education requirement; additional units in social sciences and humanities to total 28 units.**
- **Depth Subject Matter**
  - **36 Atmospheric Science 110, 111, 111L, 120, 121A, 121B, 124, 128**
  - **28 Upper division Atmospheric Science courses selected with adviser’s approval, not including courses 192 and 199**
  - **4 Engineering 6, Atmospheric Science 150, Civil and Environmental Engineering 119A or course selected with adviser’s approval**
- **15 Restricted Electives**
- **31-39 Total Units for the Degree**
- **180 Major Adviser. K. T. Paw U**

Advising Center for the major, as well as for pre-engineering students, is held in 112 Plant and Environmental Sciences Building in Land, Air, and Water Resources Teaching Center (530) 752-1669; fowleradvising@ucdavis.edu.

Minor Program Requirements:

**Minor Program.** The minor in Atmospheric Science provides a broad treatment of weather and climate, with the option to focus on such topics as climate change, meteorological instrumentation, and satellite remote sensing. Students undertaking the minor should complete major requirement coursework in calculus and physics (Mathematics 16A-16B, Physics 5A or 7A). Some upper division courses in Atmospheric Science have the Mathematics 21 and 22 series and the Physics 9 series as prerequisites.

**UNITS**
- **Atmospheric Science 20-24**
  - **8 Four courses selected with the approval of the minor program adviser from upper division Atmospheric Science courses (excluding 192 or 199) or Environmental and Resource Sciences 131**
- **12-16 Minor Adviser. K. T. Paw U**

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 Group Graduate), on page 154, and Graduate Studies, on page 97.

Related Courses. See Environmental Science and Policy 150A; Physics 104A, 104B; Environmental and Resource Sciences 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 1152 Plant & Environmental Sciences Building (530) 752-1669.

**Lower Division Courses**

5. **Global Climate (3)** Lecture—2 hours; discussion—1 hour. Scientific methods and principles used to observe and analyze the physical processes underlying the climate system. Application of principles emphasizing seasonal, regional and global climate. Analysis of global climate changes. GE credit: SciEng. —II. (W, E) Anastasio

10. **Severe and Unusual Weather (3)** Lecture—2 hours; discussion—1 hour. Pre requisite: high school physics. Introduction to physical principles of severe and unusual weather: flood, blizzards, thunderstorms, lightnings, tornadoes, and hurricanes. Emphasis on scientific perspective and human context. Not open to students who have received credit for course 100. (Former course 100.) GE credit: SciEng, Wrt.—II. (I, II, III) Grotjahn, Reck

30. **Issues in Atmospheric Science (2)** Lecture—1 hour; discussion—1 hour. Pre requisite: 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.)—II. (W, E) Faloona

60. **Atmospheric Physics and Dynamics (4)** Lecture—3 hours; discussion—1 hour. Pre requisite: Mathematics 16A and Physics 5A or 7A. Composition and thermal structure of the atmosphere. Radiation and the heat budget of the earth and its atmosphere. Cloud formation and precipitation processes. The atmosphere in motion, thunderstorms and other severe weather phenomena. —I. (I) Weare

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)

98. **Directed Group Study (1-5)** Prerequisite: consent of instructor. (P/NP grading only)

99. **Special Study for Undergraduates (1-5)** (P/NP grading only)

**Upper Division Courses**

110. **Weather Observation and Analysis (4)** Lecture—3 hours; laboratory—3 hours. Prerequisite: course 60. Acquisition, distribution and analysis of meteorological data. Verification of analysis, stability indices, probability of local severe weather, weather map analysis. Use of National Weather Service analyses and forecast products. Laboratory makes use of computer-generated analyses. —III. (III) Chen

111. **Weather Analysis and Prediction (3)** Lecture—3 hours. Prerequisite: courses 110, 121B, 111L (concurrently), knowledge of a programming language. Tools for analyzing and forecasting properties of mid-latitude weather systems. The analysis-forecast system, including various weather forecast models. General structure and properties of mid-latitude weather systems. —II. (Grotjahn)

111L **Weather Analysis and Prediction Laboratory**

Laboratory—2 hours; Online lecture—4 hours. Prerequisite: course 111 (concurrently). Subjective and objective analysis of weather data. Web-based learning of the analysis-forecast system and various weather forecasting situations. Weather map interpretation and forecast discussions. (P/NP grading only.)—II. (Grotjahn)

112. **Weather Forecasting Practice (2)** Discussion—2 hours; laboratory—1 hour. Prerequisite: course 110. Formal practice in preparing local weather forecasts. Analysis of current weather conditions and recent model performance. Verification and discussion of prior forecast. Interpretation of current forecast model guidance. Posting of forecast. May be repeated for credit up to three times. (P/NP grading only.)—II. (Grotjahn)

115. **Hydrometeorology (3)** Lecture—3 hours. Prerequisite: course 60. Examination of climate as the forcing function for the hydrologic system. Emphasis on seasonal variations in the relationship between precipitation and evapotranspiration for meso-scale areas. Watershed modeling of floods and drought for evaluating the effects of climatic fluctuations. —III. (III)

116. **Climate Change (3)** Lecture—3 hours. Prerequisite: course 60. Climate trends and patterns spanning the recent 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 climate variability. —II. (II) Reck

120. **Atmospheric Thermodynamics and Cloud Physics (4)** Lecture—4 hours, extensive problem solving. Prerequisite: Mathematics 21C, Physics 9B, course 60 (may be taken concurrently). Atmospheric composition and structure, thermodynamics of atmospheric gases, thermal properties of dry and moist air, atmospheric stability; cloud nucleation, cloud growth by condensation and collision, cloud models. —I. (I) Weare

121A. **Atmospheric Dynamics (4)** Lecture—3 hours, extensive problem solving. Prerequisite: course 120, Mathematics 21D, Physics 9B. Fundamental forces of atmospheric flow; noninertial reference frames; development of the equations of motion for rotating stratified atmospheres; isobaric and natural coordinate systems, atmospheric, thermal wind; circulation and vorticity. —II. (II) Nathan
Atmospheric Science (A Graduate Group)

121B. Atmospheric Dynamics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 121A. Derivation and solution of the equations of motion in geophysical systems; quasi-geostrophic theory; fundamentals of wave propagation in fluids; Rossby waves; gravity waves; fundamentals of hydrodynamic instability and modeling; atmospheric instabilities and cyclogenesis. —II. (III.) Nathan

124. Meteorological Instruments and Observations (3)
Lecture—2 hours; laboratory—3 hours. 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. Estimation from satellite data of such parameters as temperatures and cloudiness. —II. (III.) Reck

133. Biomeeorology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in a biological discipline and Mathematics 16B or equivalent. Spectral characterization of atmospheric radiation and the use of satellites in remote sensing. Emphasis on the modification of solar and infrared radiation by the atmosphere. Estimation from satellite data of such parameters as temperatures and cloudiness. —II. (III.) Reck

160. Introduction to Atmospheric Chemistry (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 28B. Quantitative examination of current research concerning the problems of atmospheric chemistry including photochemical smog, acid deposition, climate change, and stratospheric ozone depletion using fundamental concepts from chemistry and physics. Basic chemical modeling of atmospheric reaction systems. —II. (III.) Anastasio

190. Bioclimatic Integrations (3)
Lecture—3 hours. Prerequisite: course 230. Characterization of the bioclimatic system at the ecosystem, community, and species levels. Topics will include: climate change; the role of weather and climate in the functioning of ecosystems; the use of climate data in ecological modeling; and the role of climate in the evolution of species. —II. (III.) Weinreb

192. Atmospheric Science Internship (1-12)
Internship—3-36 hours. Prerequisite: completion of B4 units in courses of instruction. Internship off and on campus in atmospheric science. Internship supervised by a member of the faculty. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: three upper division units in Atmospheric Science. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: three upper division units in Atmospheric Science and at least an overall B average. (P/NP grading only.)

Graduate Courses

215. Advanced Hydroclimatology (3)
Lecture—3 hours. Prerequisite: course 115. Theoretical and applied aspects of energy and mass fluxes linking the earth’s surface, atmosphere, and hydrologic system. Emphasis on regional scale analysis and modeling, spatial data representation, and climate change influences on precipitation and its hydroclimatic expression. Offered in alternate years. —II. (III.) Nathan

221. Advanced Atmospheric Dynamics (3)
Lecture—3 hours. Prerequisite: course 121B. Conditions for instability in stratified atmospheres; baroclinic instability; forced topographic Rossby Waves; wave-mean flow interaction; tropical dynamics; stratospheric dynamics. Offered in alternate years. —II. (III.) Nathan

223. Advanced Boundary-Layer Meteorology (3)
Lecture—3 hours. Prerequisite: course 230. Characteristics of the atmospheric boundary layer under convective and nocturnal conditions. Heat budget at the surface and boundary layer forcing. Similarity theory and scaling of the boundary layer. Measurement and simulation techniques. Offered in alternate years. —II. (III.) Wexler

230. Atmospheric Turbulence (3)
Lecture—3 hours. Prerequisite: course 121B or 158. Dynamics and energetics of turbulence in the atmosphere including vorticity dynamics. Statistical description of turbulence; Eulerian and Lagrangian scales, spectral analysis, conditional sampling techniques. Turbulent diffusion; the closure problem, gradient-diffusion and second-order methods. Offered in alternate years. —II. Paw U

231. Advanced Air Pollution Meteorology (3)
Lecture—3 hours. Prerequisite: course 149A, 160 and one course in fluid dynamics. Processes determining transport and diffusion of primary and secondary pollutants. Models of chemical transformation, of the atmospheric boundary layer and of mesoscale wind fields, as applicable to pollutant dispersion problems. Offered in alternate years. —II.

233. Advanced Biometeorology (3)
Lecture—discussion—3 hours. Prerequisite: course 133 or consent of instructor. Current topics in biometeorology. Physical and biological basis for water vapor, other gases, and energy exchange with the atmosphere associated with plants and animals, including humans. Microclimate of plant canopies and microclimatic modification such as frost protection and windbreaks. —II. (III.) Chang

240. General Circulation of the Atmosphere (4)
Lecture—3 hours; extensive problem solving. Prerequisite: Mathematics 21D, 22B, Chemistry 28, Atmospheric Science 121A or Engineering 103. Physical and technical aspects of air pollution. Emphasis on geophysical processes and air pollution meteorology as well as physical and chemical properties of pollutants. (Same course as Civil and Environmental Engineering 149.)—I. (II.) Chan

241. Climate Dynamics (3)
Lecture—3 hours; discussion—3 hours. Prerequisite: course 121B. Large-scale, observed atmospheric properties. Radiation, momentum, and energy balances derived and examined. Lectures and interdepartmental problems of analysis and theory, then apply them to understand the large-scale circulations. Offered in alternate years. —I. (II.) Grotch

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 experience model development using the shallow water equations and the primitive equations. Operational forecast models. Offered in alternate years. —II. (III.) Chen

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-graup and particle partitioning of compounds and effects of reactions on condensed phases on the fates and transformations of tropospheric chemical species. Offered in alternate years. —II. Anastasio

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. (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.)—II, III. (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 Dynamics; (E) General Meteorology; (F) Atmospheric Chemistry. May be repeated up to a total of 4 units per semester. (S/U grading only.)—I, II, III. (II, III.)

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.)

Professional Course

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III. (II, III.)

Atmospheric Science (A Graduate Group)

Richard Snyder, Ph.D., Chairperson of the Group
(530) 752-4628

Group Office. 141 Hoagland Hall, 1152 Plant and Environmental Sciences Building, (530) 752-1669, http://atm.ucdavis.edu
Avian Medicine

See Medicine and Epidemiology (VME), on page 473.

Avian Sciences

[College of Agricultural and Environmental Sciences]

Faculty. See under Animal Science, on page 134.

The Major Program

Avian Sciences is the study of birds and the ways in which they relate to and are useful to humans. The major includes a study of avian wildlife and their environments, production and marketing of domestic birds and eggs, caged exotic bird management, and basic and applied laboratory research on birds with a broad introduction to biological science.

The Program. The flexibility of the program and the close personal interaction between students, faculty, and specialists in the field give students a large role in selecting and designing their own course work. Students may specialize in a bachelor’s program that qualifies them for a particular career or they may choose a program to meet other broader intellectual and cultural interests.

Internships and Career Alternatives. Independent study, undergraduate research, and internships are emphasized in the Avian Sciences program. Birds for laboratory or special study are housed within the main building as well as at the raptor farm and the experimental aviary. An Avian Sciences major has a variety of career options: health-oriented research, teaching biology, game bird production, domestic and foreign agricultural extension and advisory services, governmental agencies, or the domestic or exotic bird industries. A recent survey has shown that the majority of Avian Sciences graduates enter graduate school or are employed by the domestic bird industry. The remainder of the graduates were evenly distributed in the categories of professional schools, avian biology agencies, educational fields, and individual jobs indirectly associated with birds.

B.S. Major Requirements:

UNITS

English Composition Requirement ................................. 0-8 See College requirement.

Preparatory Subject Matter................................. 61-73 At least 3 units from Avian Sciences 11, 13, 14L, 15L, 16L, ................................. 3-5 Biological Sciences 1A, 1B, 1C, ................................. 15 Chemistry 2A, 2B, 2C, 8A, 8B, ................................. 8-21 Agricultural Management and Rangeland Resources 21 or Computer Science Engineering 15L ................................. 3-4 Mathematics 16A-16B-16C or 17A-17B-17C or 21A-21B-21C ................................. 9-12 Physics 1A-1B or 7A-7B-7C ................................. 6-12 One course from Statistics 13, 100, or Agricultural Management and Rangeland Resources 120 ................................. 4

Breadth Subject Matter........................................... 24 See General Education requirement.

Depth Subject Matter........................................... 26 Animal Biology 102 and 103 or Biological Sciences 102, 103 and Nutrition 123, 123L ................................. 10 Biological Sciences 101 ................................. 4 Avian Sciences 103, 150 ................................. 4 Neurobiology, Physiology, and Behavior 101 ................................. 5 Laboratory units in above listed subjects ................................. 3 (Recommended courses include Animal Genetics 101; Animal Science 136, 137; Avian Sciences 160; Molecular and Cellular Biology 120L, 150L, 160L; or Neurobiology, Physiology, and Behavior 101L)

Restricted Electives........................................... 28 Specialized courses related to avian species to supplement depth subject matter courses. Courses must be approved by an adviser.

Unrestricted Electives........................................... 21-41 Total Units for the Degree ........................................... 180

Major Adviser. F. Bradley

Advising Center for the major is located in 1202 Meyer Hall (530) 754-7915.

Minor Program Requirements:

Avian Sciences........................................... 18

Choose one from Avian Sciences 11, 13, 14L, 15L, 16L, ................................. 2-3 Choose remaining units from Avian Sciences 100, 103, 115, 121, 123, 149, 150, 160; Animal Science 143; Neurobiology, Physiology, and Behavior 117; Wildlife, Fish, and Conservation Biology 111, 120 (530) 754-7915.

Graduate Study. Further training is available through graduate or professional programs in animal physiology, genetics, nutrition, or veterinary medicine. The M.S. degree is offered in Avian Sciences. For details see under Graduate Programs (A Graduate Group), on page 156. See also Graduate Study, on page 97 in this catalog.

Related Courses. See Agricultural and Resource Economics 130; Animal Sciences 143; Food Science and Technology 120, 120L, 121; Molecular and Cellular Biology 150, 150L; Nutrition 123, 123L.

Advising for the major, minor, or the following courses is located in the Animal Science Advising Center in 1202 Meyer Hall (530) 754-7915.

Courses in Avian Sciences (AVS)

Lower Division Courses

11. Introduction to Poultry Science (3) Lecture—3 hours; one field trip required. The mosaic of events that have tied poultry science to other scientific disciplines and poultry to human life. Poultry science and technology and production methods from the time of domestication to the present. GE credit: SciEng, Wrt—I. (II.) Bradley

12. Birds, Humans and the Environment (3) Lecture—2 hours; discussion—1 hour; half-day field trip. Interrelationships of the worlds of birds and humans. Lectures, discussions, field trips and projects focus on ecology, avian evolution, physiology, reproduction, flight, folklore, identification, ecotoxicology and conservation. Current environmental issues are emphasized. GE credit: SciEng, Wrt—I. (II.)

14L. Management of Captive Birds (2) Fieldwork—3 hours; discussion—1 hour. Prerequisite: consent of instructor. One weekly discussion and field trip to study practical captive management (housing, feeding, equipment, marketing, diseases). Visit facilities rearing birds such as commercial parrots, hobbyist exotics, ostrich, raptors, waterfowl, game birds, poultry and pigeons.

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 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. — I. (II.)

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. Identifies raptors; studies 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. — III. (III.)

92. Internship in the Avian Sciences (1-12) Internship—3-36 hours. Prerequisite: sophomore standing preferred; 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.)

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 Courses

100. Avian Biology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1B. Survey of avian natural history and study of the diversity, functional morphology, behavior, ecology and evolution of birds.—I. (1) Weather

103. Avian Development and Genetics (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Biological Sciences 1A and 1B. Unique features of avian development and genetics. Development topics: gametogenesis, fertilization, pre- and post-oviposited development, morphogenesis, sex determination, specialized organ systems, incubation, hatching. Genetic topics: genome organization, inheritance, sex determination, avian models. Laboratory exercises: embryology, genetics, model systems.—I. (1) Delany

115. Raptor Biology (3)
Lecture—3 hours; two Saturday field trips. Prerequisite: Biological Sciences 1A or the equivalent. Study of birds of prey: classification, distribution, habits and habitats, migration, unique anatomical and physiological adaptations, natural and captive breeding, health and diseases, environmental concerns, conservation, legal considerations, rehabilitation, and falconry.—II. (2)

121. Avian Reproduction (2)
Lecture—2 hours. Prerequisite: Biological Sciences 1A, 1B. Breeding cycles and reproductive strategies, egg and sperm formation, incubation, sexual 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.—II. Millam

123. Management of Birds (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1B. Captive propagation of birds, including reproduction, genetic management, health, feeding, artificial incubation, artificial insemination, and related legal acts, including trade and smuggling. Emphasis on exotic species and the role of captive propagation in conservation. Offered in alternate years.—II. Millam

149. Egg Production Management (2)
Lecture—2 hours, one Saturday field trip required. Prerequisite: course 11 or the equivalent, or consent of instructor. Management of commercial table egg flocks as related to environment, nutrition, disease control, economics, hatchery, breeding equipment, egg processing and raising replacement pullets. Offered in alternate years.—III. Wakenell

150. Nutrition of Birds (1)
Lecture—1 hour. Prerequisite: Animal Biology 103 (may be taken concurrently). Principles of nutrition specific to avian species, including feedstuffs, feed additives, nutrient metabolism, energy systems, and nutritional support of egg production and growth. Use of computers for feed formulation to support production. Offered in alternate years.—III. Klaasen

160. Designing and Performing Experiments in Avian Sciences (2)
Laboratory—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.—I, II, III, I, II, III.

170. Advanced Avian Biology (4)
Lecture/discussion—3 hours; project—1 hour. Prerequisite: course in Evolution and Ecology 137 or Wildlife, Fish, and Conservation Biology 111. Ecology, behavior, functional morphology and life-history evolution 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 thought emphasized. Offered in alternate years.—III. (1) Weather

190. Seminar in Avian Sciences (1)
Seminar—1 hour. Prerequisite: departmental approval. May be repeated three times for credit. (P/NP grading only.)—I, III. (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—variable. Hours will depend on instructor with the number of units being commensurate with time in class. Prerequisite: consent of instructor. Discussion of topics of current interest in avian sciences. May be repeated three times for credit.—I, II, III, II, III

197. Tutoring in Avian Sciences (1-3)
Tutoring—1-4 hours. Prerequisite: course 100 or the equivalent, or consent of instructor. Tutoring of students in lower division avian sciences courses; weekly conference with instructors in charge of courses; evaluation 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 Courses

290. Seminar (1)
Seminar—1 hour. Reports and discussions of recent advances and selected topics of current interest in avian genetics, avian physiology, nutrition, and poultry technology.—II. (1)

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 project proposals presented and evaluated. Format will combine seminar and discussion. (S/U grading only.)—I, II, III. (II, III)

2977. Supervised Teaching in Avian Sciences (1-4)
Tutoring—1-4 hours. 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)

Mary E. Delany, Ph.D., Chairperson of the Group
Group Office. 12028 Meyer Hall
(530) 752-2382; http://www.aviansciences.ucdavis.edu

Faculty
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Wildlife, Fish, and Conservation Biology
Carol J. Cardona, D.V.M., Ph.D., ACPV, Associate
Veterinarian; Associate Extension Specialist
(Population Health and Reproduction, Veterinary Medicine)
John M. Eade, Ph.D., Associate Professor
(Wildlife, Fish, and Conservation Biology)
Peter Marler, Ph.D., Professor Emeritus
Wildlife Geneticist; Veterinary Geneticist (Veterinary Genetics Laboratory and Population Health and Reproduction, Veterinary Medicine)
John M. Eade, Ph.D., Associate Professor
(Wildlife, Fish, and Conservation Biology)
Patricia Wakenell, D.V.M., Ph.D., Professor
(Population Health and Reproduction, Veterinary Medicine)
John M. Eade, Ph.D., Associate Professor
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C. Christopher Calvert, Ph.D., Professor
(Animal Science)
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Peter Marler, Ph.D., Professor Emeritus
Wildlife Geneticist; Veterinary Geneticist (Wildlife Geneticist and Veterinary Genetics Laboratory and Population Health and Reproduction, Veterinary Medicine)

Emeriti Faculty
J. Clark Lagarias, Ph.D., Chairperson of the Group
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Biochemistry
See Molecular and Cellular Biology, on page 379; Biochemistry and Molecular Biology (A Graduate Group), on page 156; and Biophysics (A Graduate Group), on page 162.

Biochemistry and Molecular Biology
(A Graduate Group)

J. Clark Lagarias, Ph.D., Chairperson of the Group
Group Office. 310 Life Sciences Addition;
(530) 752-9091; http://www-ggc.ucdavis.edu/ggc/bmb
### Faculty

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<td>Michael S. Denison, Ph.D.</td>
<td>Professor</td>
<td>Plant Sciences</td>
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<td>Katayoon Dehesh, Ph.D.</td>
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<td>Carol Erickson, Ph.D.</td>
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<td>Andrew Fisher, Ph.D.</td>
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<td>Judy Callis, Ph.D.</td>
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<td>Paramitha Gosh, Ph.D.</td>
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<td>Cecilia Giulivi, Ph.D.</td>
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<td>Ken Kaplan, Ph.D.</td>
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<td>Professor</td>
<td>Cancer Center UCDMC</td>
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### Courses in Biochemistry and Molecular Biology (BMB)

#### Graduate Courses

**290. Seminar (1)**
- Seminar—1 hour. Prerequisite: consent of instructor. (S/U grading only.)—I, II, III. (I, II, III.)

**299. Research (1-12)** (S/U grading only.)

### Biological Chemistry

See Medicine, School of, on page 345.
Biological and Agricultural Engineering

[College of Agricultural and Environmental Sciences]

Bruce R. Hartsough, Ph.D., Chairperson of the Department

[Department Office.]

http://www.engr.ucdavis.edu/~bae

Biological Sciences

[College of Biological Sciences]

College of Biological Sciences, Dean's Office, 202 Life Sciences Additions

(530) 752-0410, http://www.biosci.ucdavis.edu

Faculty

Michael J. Delwiche, Ph.D., Professor
Fadi A. Fathallah, Ph.D., Associate Professor
D. Ken Giles, Ph.D., Professor
Mark E. Grismer, Ph.D., Professor
(a) Evolution: One from Evolution and Ecology 100, 140; Geology 107; or Plant Biology 116. Additional upper division course work in biological sciences to total of 38 or more units [see "Approved Biology Electives" list below].

Ning Pan, Ph.D., Professor [Textiles and Clothing]
Raul H. Piedrahita, Ph.D., Professor
Richard E. Plant, Ph.D., Professor
(Agronomy and Range Science)

Wesley E. Yates, M.S., Professor Emeritus

Emeriti Faculty

Norman B. Akeson, M.S., Professor Emeritus
Robert H. Burgy, M.S., Professor Emeritus
William J. Chancellor, Ph.D., Professor Emeritus
Pictor (Paul) Chen, Ph.D., Professor Emeritus
David C. Slaughter, Ph.D., Professor Emeritus
Shrinivas K. Upadhyaya, Ph.D., Professor Emeritus
Jean S. VanderGheynst, Ph.D., Associate Professor
Wesley L. Wallender, Ph.D., Professor Emeritus
(Rand, Air, and Water Resources)
Ruihong Zhang, Ph.D., Professor

Facility

Major Programs and Graduate Study.

The Biological Sciences Major and the Bodega Marine Laboratory Spring Quarter Program are offered jointly by the sections of the college. The faculty in the college are members of the Sections of Evolution and Ecology; Microbiology; Molecular and Cellular Biology; Neurobiology; Physiology; and Behavior, Plant Biology. See each section for a list of their faculty.

The Biological Sciences Major

(Social Science, Biological Systems Engineering, and Agriculture other than Biological and Agricultural Engineering)

B.S. Major Requirements:

Preparatory Subject Matter ............... 60-70
Mathematics 16A-16B-16C or 17A-17B-17C .............................................. 9-12
Chemistry 2A-2B-2C .............................................. 15
Chemistry 8A-8B or 118A-118B-118C .............................................. 6-12
Biological Sciences 1A-1B-1C .............................................. 15
Statistics 13, 32, 100, or 102 .............................................. 3-4
Physics 7A-7B-7C .............................................. 12

Field Subject Matter ............... 45

Biological Sciences 101, 102, 103, 104 .............................................. 13
Field Requirement, Area of Emphasis Requirement, and additional units (if necessary) to achieve a total of 45 units or more. Note: Although a course may be listed in more than one category, that course may satisfy only one requirement.

Field Requirement: Breadth in biology is achieved by completing one course from each field (a) through (e) below. You must take one course in each field regardless of your area of emphasis. If you plan an area of emphasis in Evolution and Ecology, Marine Biology, or Microbiology, please refer to that area of 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 requirement), 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 143 .............................................. 3-5
(b) Ecology: Anthropology 154B; Biological Sciences 122; Entomology 155; Environmental Science and Policy 100, 121; Evolution and Ecology 101; Microbiology
Marine Biology emphasis ................15-17
Although a course may be listed in more than one per week) of laboratory designated in the area of biology is achieved by completing all
Area of Emphasis Requirement: 
Evolution and Ecology emphasis ...... 13-18
course may be used only once and may satisfy only one requirement.
Evolution and Ecology emphasis .... 13-18
Field requirement: Students must take Evolution and Ecology 100 to satisfy Field requirement (a), and Evolution and Ecology 101 to satisfy Field requirement (b).
Biodiversity: Six upper division units to include at least two units (or 6 hours per week) of laboratory from the following: Entomology 100, 106, 109; Evolution and Ecology 100, 107, 109; Entomology 103, 104, 156, 156L; Environmental Science and Policy 121, 123, 150A, 150B, 150C, 151L; Evolution and Ecology 105, 107, 117, 119, 138, 140, 141, 143, 149; Geology 107, 107L, 150A, 150B, 150C, 150L; Environmental Science and Policy 100; Neurobiology, Physiology, and Behavior 110; Philosophy 108; Plant Biology 116, 117, 119; Wildlife, Fish, and Conservation Biology 136.
Marine Biology emphasis .................15-17
Field requirement: Students must take Evolution and Ecology 100 to satisfy Field requirement (a), and Evolution and Ecology 101 to satisfy Field requirement (b), and Neurobiology, Physiology, and Behavior 102 or 141 to satisfy Field requirement (d).
Marine Organismal Biology: At least 4 units from Animal Science 118, 119, 131, 132; Evolution and Ecology 112+112L; Neurobiology, Physiology, and Behavior 141+141P; Plant Biology 118; Wildlife, Fish, and Conservation Biology 120+120L, 120L, 121, 130, 141+141P.
Immersion Requirement: One field/ research course or combination of courses; requires residence at Bodega Marine Lab for spring quarter or summer session: Biological Sciences 122+122P; Neurobiology, Physiology, and Behavior 141+141P. A list of summer session offerings at the Bodega Marine Laboratory that fulfills this requirement is available in the College of Biological Sciences Dean’s Office in 202 Life Sciences addition: 8-10
Microbiology emphasis ..................14-19
Field requirement: Students must take Microbiology 102 to satisfy Field requirement (c).
Laboratory requirement: Students must take Microbiology 102L to satisfy the area of emphasis laboratory requirement.
Options: Complete one of the four options a-d below, or complete an individual option with approval from your faculty adviser.
(a) Microbial Physiology and Molecular Genetics option ................................15-18
Microbiology 102L, 140, 150 ................... 9
Select one course from Microbiology 170; Molecular and Cellular Biology 121, 160 ........................................... 3
Select one course from Microbiology 105 and 108, 108L, 160; Pathology, Microbiology, and Immunology 127 3-6
(b) Microbial Diversity and Ecology option ..................................................15-17
Microbiology 102L, 105 and 105L, 120 ............... 12
Select one course from Food Science and Technology 104, Microbiology 140, 150, 152, 152L, 152F, Microbiology and Immunology 127, 128; Plant Biology 148; Plant Pathology 148; Soil Science 111 ................................................. 3-5
(c) Biotechnology and Applied Microbiology: Microbiology option .......................16-19
Microbiology 102L ........................................ 3
Select two courses from Microbiology 140, 150, 170 3
Select one course from Food Science and Technology 102A, 104 .............. 3
Select one course from Microbiology 155L; Molecular and Cellular Biology 120L, 160L .............................................. 6-9
(d) Medical Microbiology option ..................15-20
Microbiology 102L; Pathology, Microbiology, and Immunology 126 6-9
Select one course from Medical Microbiology and Immunology 115, 116; Pathology, Microbiology, and Immunology 127 3-5
Select one course from Microbiology 105 and 105L, 162; Pathology, Microbiology, and Immunology 128 3-6
Select one course from Microbiology 140, 150, 170 3
Molecular and Cellular Biology emphasis ..................................................12-17
One course from Molecular and Cellular Biology 121, 141, or 161 3
Laboratory experience: One or more laboratory courses from Biological Sciences 120P; Molecular and Cellular Biology 120L, 140L; 160L; 10 laboratory course to total 3 units (or 9 hours per week) that emphasizes cellular or molecular biology with approval of your adviser) 3-6
Restricted electives: 3-6
Select two or more courses from Biological Sciences 120; Molecular and Cellular Biology 122, 123, 126, 142, 143, 144, 145, 150, 152, 152L, 152F; Neurobiology, Physiology, and Behavior 103; Pathology, Microbiology, and Immunology 126; Plant Biology 113, 126; or other courses with adviser’s approval.
Neurobiology, Physiology, and Behavior emphasis ....................................15
Although a course may be listed in more than one category (including the field requirement), a 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 course: Biological Sciences, Microbiology, and Immunology 101, 104L, 141P, or 160L15
(1) Neurobiology: Neurobiology, Physiology, and Behavior 100, 106, 112,
124, 125, 126, 160, 160L, 161, 162, 163, 164, 165L, 169; Psychology 121, 124, 128, 129.
(2) Physiology: Anatomy, Physiology, and Cell Biology 100; Entomology 102; Exercise Biology 102A; Neurobiology, Physiology, and Behavior 101, 101L, 103, 104L, 105, 106, 111C, 111L, 113, 114, 117, 121, 121L, 122, 123, 127, 128, 130, 131, 139, 140, 141, 141P, 152; Pathology, Microbiology, and Immunology 126; Wildlife, Fish, and Conservation Biology 121.
(3) Behavior: Anthropology 154A, 154B; Entomology 104; Neurobiology, Physiology, and Behavior 102, 150, 152, 159; Psychology 122, 123, 129.
Note: Neurobiology, Physiology, and Behavior 105, 152 or Psychology 129 may be used only once to satisfy Area of Emphasis requirements.

Plant Biology emphasis ..................13-16
Select one course from each of the following four areas and include one laboratory course from Evolution and Ecology 108, Plant Biology 105, 108, 116, 118, 148, 161A, 161B; Plant Pathology 148; or two laboratory courses from Evolution and Ecology 140; Plant Biology 153, 158, 171, 172L
(1) Anatomy and morphology: Evolution and Ecology 140; Plant Biology 105, 116, 118, 118 ......................... 4-5
(2) Physiology and development: Plant Biology 111, 112, 113; Plant Pathology 130 3-4
(3) Evolution and ecology: Evolution and Ecology 100, 117; Plant Biology 143 3-4
(4) Applied plant biology: Agriculture and Rangeland Resources 110A; Plant Biology 154, 160, 171, 172, 173, 3-4

Total Units for the Major ................................105-115
Approved Biology Electives
These courses are accepted without petition for upper division units in the Biological Science major.
Many other biologically related courses may be substituted with consent of your adviser.
Agricultural Management and Rangeland Resources 110A, 135
Anatomy, Physiology and Cell Biology 100
Anthropology 152, 153, 154A, 154B, 154E, 155, 157
Avian Sciences 100, 150
Biological Sciences—All upper division courses
Entomology—All upper division courses
Environmental Horticulture 102, 105
Environmental Science and Policy 100, 110, 121, 123, 124, 150A, 150B, 150C, 151, 151L
Evolution and Ecology—All upper division courses
Exercise Biology 101, 110, 111, 113
Food Science and Technology 102A, 104
Geology 107L, 150A, 150B, 150C
History and Philosophy of Science 130A, 130B, 131
Medical Microbiology 115, 116
Microbiology—All upper division courses
Molecular and Cellular Biology—All upper division courses
Nature and Culture 100, 120, 140
Nematology 100, 110
Neurobiology, Physiology, and Behavior—All upper division courses
Nutrition 101, 111

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses
General Education (GE) credit: ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Social-Cultural Diversity; Wrt—Writing Experience

Biological Sciences 159
Pathology, Microbiology, and Immunology 101, 102, 126, 127, 128
Philosophy 108
Plant Biology—All upper division courses, except 188, 189
Plant Pathology 120, 130
Veterinary Medicine 170
Viticulture and Enology 186
Wildlife, Fish, and Conservation Biology 110, 110L, 111, 111L, 120, 120L, 121, 122, 130, 136, 140, 151
Soil Science 111

Other Upper Division Courses
There is a limitation on variable-unit courses that may be counted toward the major. Of these courses, up to 4 units of 199 courses may be counted, and no units of 192 or 197 courses may be counted.

Minor Program Requirements:

**Biological Sciences**

Complete at least 3 units from each of the five numbered groups to total at least 18 units.

Appropriate alternative courses may be used with approval of an adviser.

1) Cell and Molecular Biology: Biological Sciences 101, 102; Microbiology 102...

2) Anatomy, Physiology and Cell Biology 100; Neurobiology, Physiology, and Behavior 123...

3) Microbiology: Microbiology 105, 162; Plant Biology, Microbiology, and Immunology 128; Plant Biology/Plant Pathology 148...

4) Plant Biology: Environmental Horticulture/Environmental and Resource Sciences/Plant Biology 144; Plant Biology 105, 111, 112, 116, 118, 126, 141, 171; Plant Biology/Plant Pathology 148...

5) Evolution and Ecology: Anthropology 151, 152, 154; Entomology 100; Evolution and Ecology 109, 115, 117, 119, 138, 140, 147; Plant Biology 102, 108, 117, 119, 142, 143, 146; Plant Pathology 150; Wildlife, Fish, and Conservation Biology 151...

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 from the Undergraduate Academic Programs in the College of Biological Sciences Dean’s Office in 202 Life Sciences Addition. Applications are due before Pass 1 registration begins for spring quarter. Additional information on the Bodega Marine Laboratory Program is available from the Undergraduate Programs office in 202 Life Sciences Addition, or directly from Bodega Marine Laboratory, P.O. Box 247, Bodega Bay, CA 94923 (707) 875-2211.

**Courses in Biological Sciences (BIS)**

**Lower Division Courses**

1A. Introductory Biology (5)

Lecture—4 hours; discussion—1 hour. Prerequisite: Chemistry 2B (may be taken concurrently). Introduction to biological molecules, bioenergetics, cell structure and function, elements of molecular biology and genetics, and viruses. Interdisciplinary course for majors in the biological sciences.—I, II, III, II, III

1B. Introductory Biology (5)

Lecture—3 hours; discussion—1 hour. Introduction to evolution and animal diversity, including transmission and population genetics, micro and macroevolution, systematics, classification, and a survey of major animal groups. Obtain forms from the Bodega Marine Laboratory Web site listed above. Applications are due before Pass 1 registration begins for spring quarter. Additional information on the Bodega Marine Laboratory Program is available from the Undergraduate Programs office in 202 Life Sciences Addition, or directly from Bodega Marine Laboratory, P.O. Box 247, Bodega Bay, CA 94923 (707) 875-2211.

15. Biology of Aging (3)

Lecture—3 hours. Biological basis of the aging process. Topics include the normal aging process, developmental influence on the rate of aging, diseases of the aged, theories of aging, and mechanisms for modifying aging. Designed for students with limited biology backgrounds.—McDonnell

20Q. Modeling in Biology (2)

Lecture—1 hour; discussion—1 hour. Prerequisite: Mathematics 16B (may be taken concurrently). Introduction to the application of quantitative methods to biological problems. Students will use a mathematical software package to tackle problems drawn from all aspects of biology.—I, II, III, II, III

92. Internship in Biological Sciences (1-12)

Internship—3-36 hours. Prerequisite: lower division standing and consent of instructor. (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 (1-5)

Prerequisite: lower division standing and consent of instructor. (P/NP grading only)

**Upper Division Courses**

101. Genes and Gene Expression (4)

Lecture—4 hours. Prerequisite: course 1A and 1B. Chemistry 8B or 118B or 128B or 118 or 128C (may be taken concurrently). Nucleic acid structure and function; gene expression and its regulation; replication; transcription and translation; transmission genetics; molecular evolution.—I, II, III, II, III, II, III

Draper, Dvorak, Engebret, Heyer, Hunter, Kliebenstein, Quiros, Rodriguez, Sandoval

101D. Genes and Gene Expression (Discussion) (1)

Discussion—1 hour. Prerequisite: course 101 concurrently. Discussion and problem solving related to fundamental principles of classical and molecular genetics as presented in course 101. (P/NP grading only.)—I, II, III, II, III

102. Structure and Function of Biomolecules (3)

Lecture—3 hours. Prerequisite: Chemistry 88 or 118B or 128B. Structure and function of macromolecules with emphasis on proteins; enzymes; kinetics; supramolecular assemblies; membranes; cytoskeleton; cell motility and cell division.—I, II, III, II, III

Cheng, Estler, Fairlough, Gkatz, Hilt, Leary, Theg

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, and nucleic acids, and of energy production and use in different types of organisms. Principles of metabolic regulation.—I, II, III, II, III, II, III

Abel, Callis, Dao, Fried, I. Segel, L. Segel

104. Regulation of Cell Function (3)

Lecture—3 hours. Prerequisite: course 101, 102. Membrane receptors and signal transduction; cell trafficking; cell cycle; cell growth and division; extracellular matrix and cell-cell interactions; cell development; immune system.—I, II, III, II, III

Edwards, Kaplan, S. Lin, Myles, Privalsky, Starr

120. Developmental Biology of Marine Invertebrates (4)

Lecture—30 hours total; laboratory—30 hours total. Prerequisite: Molecular and Cellular Biology 150, 151, 150L, Biological Sciences 102 and 103; course 123 concurrently. Phylogenetic patterns of reproduction and development among marine invertebrates. Emphasis on both modern and classical approaches to understanding gametogenesis, gamete interaction and fertilization, cleavage, cell differentiation, morphogenesis, and larval development and metamorphosis. Course offered at Bodega Marine Laboratory. (See above description for Bodega Marine Laboratory Program.)—I, II, III

Bodega Marine Laboratory Program

http://www-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 areas of biological 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 1.5 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 Web site listed above. Applications are due before Pass 1 registration begins for spring quarter. Additional information on the Bodega Marine Laboratory Program is available from the Undergraduate Programs office in 202 Life Sciences Addition, or directly from Bodega Marine Laboratory, P.O. Box 247, Bodega Bay, CA 94923 (707) 875-2211.
120P. Developmental Biology of Marine Invertebrates/Advanced Laboratory Topics (4) Laboratory—150 hours total; discussion—10 hours total. Prerequisite: course 120 concurrently. Students pick a research topic for intense study. Research will be conducted in course 120 and will be presented at the Bodega Marine Laboratory. Prerequisite: course 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 once for credit with consent of instructor. (P/NP grading only.)

197T. Tutoring in Biological Sciences (1-5) Seminar—1 hour. Prerequisite: enrollment at the Bodega Marine Laboratory. Weekly seminars by recognized authorities in various disciplines of marine science from within and outside the UC system. Includes informal discussion with speaker. Course will be held at Bodega Marine Laboratory. (P/NP grading only.) [See above description for Bodega Marine Laboratory Program.—III. (III.) Morgan]

123. Undergraduate Colloquium in Marine Science (1) Seminar—1 hour. Prerequisite: enrollment at the Bodega Marine Laboratory. Series of weekly seminars by recognized authorities in various disciplines of marine science from within and outside the UC system. Includes informal discussion with speaker. Course will be held at Bodega Marine Laboratory. (P/NP grading only.) [See above description for Bodega Marine Laboratory Program.—III. (III.) Morgan]

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 (3-5 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, original research culminating in the writing of a senior thesis with the guidance of faculty advisers. (P/NP grading only.)

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—3-15 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 once for credit with consent of instructor. (P/NP grading only.)

195. 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.)

Graduate Courses

198. Group Study (1-5) Prerequisite: consent of instructor. College of Biological Sciences staff members may offer group study courses under this number.

Biomedical Engineering (A Graduate Group)

Tonya L. Kuhl, Ph.D., Chairperson of the Group (530) 754-5911

Group Office, 2303 Genome and Biomedical Sciences Facility, (530) 752-2611. http://www.bme.ucdavis.edu

Faculty

Crawford, K., Abbey, Ph.D., Adjunct Assistant Professor (Biomedical Engineering)

Ralph C. Aldredge, III, Ph.D., Professor (Mechanical and Aeronautical Engineering)

Ramey D. Barlow, Ph.D., Physicist (Radiology)

Zhiquan Bai, Ph.D., Professor (Computer Science)

Abdul I. Barakat, Ph.D., Associate Professor (Mechanical and Aeronautical Engineering)

Craig Benham, Ph.D., Professor (Biomedical Engineering, Mathematics)

John M. Boone, Ph.D., Professor (Radiology, Biomedical Engineering)

Michael H. Buonocore, Ph.D., M.D., Professor (Radiology)

Simon R. Cherry, Ph.D., Professor (Biomedical Engineering)

Anthony T. Cheung, Ph.D., Professor (Pathology)

FitzRoy E. Curry, Ph.D., Professor (Human Physiology, Biomedical Engineering)

Paul Dayton, Ph.D., Assistant Research Engineer (Biomedical Engineering)

Roland Faller, Ph.D., Assistant Professor (Chemical Engineering & Materials Science)

Fadi A. Fathallah, Ph.D., Associate Professor (Biological and Agricultural Engineering)

Katherine W. Ferrara, Ph.D., Professor (Biomedical Engineering)

David Fyhrie, Ph.D., Professor (Orthopaedic Surgery, Medicine)

Jeffery C. Gibling, Ph.D., Professor (Chemical Engineering and Materials Science)

Brend Hamann, Ph.D., Professor (Computer Science)

David A. Hawkins, Ph.D., Professor (Exercice Science)

Scott J. Hazelwood, Ph.D., Assistant Professor (Orthopaedic Research Labs)

Volkan Heinrich, Ph.D., Assistant Professor (Biomedical Engineering)

Mont Hubbard, Ph.D., Professor (Mechanical and Aeronautical Engineering)

Maury L. Hull, Ph.D., Professor (Mechanical and Aeronautical Engineering)

Thomas Huser, Ph.D., Associate Professor (Internal Medicine)

Dustin Kruse, Ph.D., Research Scientist (Biomedical Engineering)

Michael F. Insana, Ph.D., Adjunct Professor (Biomedical Engineering)

Thomas Jue, Ph.D., Professor (Biological Chemistry)

Ian M. Kennedy, Ph.D., Professor (Mechanical and Aeronautical Engineering)

Gerald Joseph Kost, Ph.D., M.D., Professor (Pathology)

Tatiana Kubil, Ph.D., Associate Professor (Biomedical Engineering and Materials Science, Biomedical Engineering)

Kit S. Lam, M.D., Ph.D., Professor (Internal Medicine)

Kent Leach, Ph.D., Assistant Professor (Biomedical Engineering)

Marjorie L. Largo, Ph.D., Associate Professor (Chemical Engineering and Materials Science)

Angelique Louie, Ph.D., Assistant Professor (Biomedical Engineering)

Laura Marcu, Ph.D., Associate Professor (Biomedical Engineering)

R. Bruce Martin, Ph.D., Professor (Orthopaedic Research Labs)

Dennis L. Matthews, Ph.D., Adjunct Professor (Applied Sciences)

Claude F. Meares, Ph.D., Professor (Chemistry)

Alexander Mogilner, Ph.D., Professor (Mathematics)

Atul Parikh, Ph.D., Professor (Applied Science)

Tony Passeri, Ph.D., Assistant Professor (Biomedical Engineering)

Robert L. Powell, Ph.D., Professor (Chemical Engineering and Materials Science)

Jiying Qi, Ph.D., Assistant Professor (Biomedical Engineering)

Melvin R. Ramey, Ph.D., Professor (Civil and Environmental Engineering)

Bahram Ravani, Ph.D., Ph.D., Professor (Mechanical and Aeronautical Engineering)

Subhadip Raychaudhuri, Ph.D., Assistant Professor (Biomedical Engineering)

A. Hari Reddi, Ph.D., Ph.D., Professor (Orthopaedic Research Labs)

Alexander Revzin, Ph.D., Assistant Professor (Biomedical Engineering)

Nesrin Sarigul-Klijn, Ph.D., Professor (Mechanical and Aeronautical Engineering)

Michael A. Savageau, Ph.D., Professor (Biomedical Engineering)

J. Anthony Selbert, Ph.D., Professor (Radiology)

James F. Shackelford, Ph.D., Professor (Chemical Engineering and Materials Science)

Scott L. Simon, Ph.D., Professor (Biomedical Engineering)

Hennig Stahlberg, Ph.D., Assistant Professor (Department of Cellular and Molecular Biology)

Doug Stephens, Ph.D., Assistant Research Engineer (Biomedical Engineering)

Susan M. Stover, D.V.M., Ph.D., Professor (Anatomy, Physiology and Cell Biology)

Pieter Strove, Sc.D., Professor (Chemical Engineering and Materials Science)

Julie Sutcliffe-Goulden, Ph.D., Assistant Professor (Biomedical Engineering)

Yoshikazu Takada, M.D., Professor (Dermatology)

Alice Tarantil, Ph.D., Professor (CA National Primate Research Center)

Jeffrey Walton, Ph.D., Associate Research Physicist (NIH Facility)

John [Jack] Werner, Ph.D., Professor (Ophthalmology)

Anthony S. Wexler, Ph.D., Professor (Mechanical and Aeronautical Engineering, Civil and Environmental Engineering, Land, Air, and Water Resources)

Keith R. Williams, Ph.D., Associate Professor (Exercise Science)

Jacob Willig-Onwuachi, Ph.D., Assistant Professor (Radiology, Biomedical Engineering)

Erik Wisner, D.V.M., Professor (Surgical and Radiological Sciences)

Yin Yeh, Ph.D., Professor (Applied Science)

Yohei Yokobayashi, Ph.D., Assistant Professor (Biomedical Engineering)
Emeriti Faculty
V. Ralph Algazi, Ph.D., Professor Emeritus
(Chemical Engineering)

Roland Faller, Ph.D., Assistant Professor

Robert H. Fairclough, Ph.D., Associate Professor

Stephen P. Cramer, Ph.D., Professor

Volkmar Heinrich, Ph.D., Assistant Professor

Niels G. Jensen, Ph.D., Professor

Ching-Yao Fong, Ph.D., Professor

Thomas Jue, Ph.D., Professor

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 218, for courses.

Biophysics (A Graduate Group)

Marjorie Longo, Ph.D., Chairperson of the Group

Faculty
Toby Allen, Ph.D., Assistant Professor (Chemistry)

Enoch P. Baldwin, Ph.D., Assistant Professor (Molecular and Cellular Biology)

Abdul I. Barakat, Ph.D., Associate Professor (Mechanical and Aeronautical Engineering)

Ronald J. Baskan, Ph.D., Professor (Molecular and Cellular Biology)

Craig J. Benham, Ph.D., Professor (Mathematics, Biomedical Engineering)

E. Morton Bradbury, Ph.D., Professor (Biological Chemistry)

R. David Britt, Ph.D., Professor (Chemistry)

Tsung-Yu Chen, Ph.D., Assistant Professor (Neurobiology, Physiology, and Behavior)

R. Holland Cheng, Ph.D., Professor (Molecular and Cellular Biology)

Daniel L. Cox, Ph.D., Professor (Physics)

Stephen P. Cramer, Ph.D., Professor (Biomedical Engineering)

Thorsten Dieckmann, Ph.D., Assistant Professor (Chemistry)

Yang Duan, Ph.D., Professor (Applied Science)

Robert H. Fairclough, Ph.D., Associate Professor (Neurobiology, Physiology, and Behavior)

Roland Faller, Ph.D., Assistant Professor (Chemical Engineering and Materials Science)

Andrew J. Fisher, Ph.D., Associate Professor (Molecular and Cellular Biology)

Alla F. Fomin, Ph.D., Assistant Professor (Chemistry, Molecular and Cellular Biology)

Ching-Yao Fong, Ph.D., Professor (Chemistry)

Jerry L. Hedrick, Ph.D., Research Professor (Animal Science)

Volkmar Heinrich, Ph.D., Assistant Professor (Biomedical Engineering)

Niels G. Jensen, Ph.D., Professor (Applied Science)

Thomas Jue, Ph.D., Professor (Biological Chemistry)

Stephen C. Kowalczykowski, Ph.D., Professor (Microbiology)

Denise Krol, Ph.D., Professor (Applied Science)

Tanya L. Kuhl, Ph.D., Associate Professor (Chemical Engineering and Materials Science)

Gerd N. LaMar, Ph.D., Professor (Chemistry)

Janine M. LaSalle, Ph.D., Associate Professor (Microbiology and Immunology)

Carlos R. Lebrilla, Ph.D., Professor (Chemistry)

Gangyu Liu, Ph.D., Associate Professor (Chemistry)

Marjorie I. Longo, Ph.D., Associate Professor (Chemical Engineering and Materials Science)

Pamela A. Papadopoulos, Ph.D., Associate Professor (Biomedical Engineering)

Carl W. Schmid, Ph.D., Professor (Biological Chemistry)

Scott I. Simon, Ph.D., Professor (Biomedical Engineering)

Rajiv R. Singh, Ph.D., Professor (Physics)

Henning Stahlberg, Ph.D., Assistant Professor (Biochemistry and Molecular Biology)

Alexei Stuchiukhov, Ph.D., Professor (Chemistry)

Steven M. Theg, Ph.D., Professor (Plant Biology)

Michael D. Toney, Ph.D., Associate Professor (Chemistry)

Frederic A. Troy, Ph.D., Professor (Biological Chemistry)

John C. Voss, Ph.D., Associate Professor (Biological Chemistry)

David K. Wilson, Ph.D., Associate Professor (Molecular and Cellular Biology)

Heike Wulff, Ph.D., Assistant Professor (Pharmacology, Toxicology, and Therapeutics)

Yin Yeh, Ph.D., Professor (Applied Science)

Emeriti Faculty
William H. Fink, Ph.D., Professor Emeritus

John H. Crowe, Ph.D., Professor Emeritus

Graduate Study. The Graduate Group in Biophysics offers programs of student leading to the Ph.D. degree. Biophysics is a broad interdepartmental program that is ideal for students who are interested in molecular biophysics. The curriculum consists of certain core courses in biology, chemistry, and physics, followed by specialization in research interests. Specific program requirements are decided in consultation with a research supervisor and the graduate adviser.

Graduate Adviser. J. H. Crowe (Molecular and Cellular Biology), W. H. Fink (Chemistry), L. Lango (Chemical Engineering and Materials Science), M. Theg (Plant Biology), C. Lebrilla (Chemistry)

Courses in Biophysics (BPH)

Graduate Courses

200. Current Techniques in Biophysics (2)

Graduate Study—2 hours. Prerequisite: graduate standing; Biological Sciences 102 or 104 or the equivalent. Current techniques in biophysics research including diffraction, magnetic resonance spectroscopy, calorimetry, optical spectroscopy, and electrophysiology. (Same course as Molecular and Cellular Biology 200C.) (S/U grading only)—II, III, IV

200LA. Biophysics Laboratory (3)

Lecture—2 hours. Prerequisite: course 200. Laboratory—3 hours. Prerequisite: course 200. May be taken concurrently. Three-week laboratory assignments in the research laboratory of a Biophysics Graduate Group faculty member. Individual research problems with emphasis on methodological/procedural experience and experimental design. May be repeated for credit twice. (S/U grading only)—I, II, III

200LB. Biophysics Laboratory (6)

Lecture—1 hour. Prerequisites: course 298. Laboratory—2 hours. Prerequisite: course 200. May be taken concurrently. Three-week laboratory assignments in the research laboratory of a Biophysics Graduate Group faculty member. Individual research problems with emphasis on methodological/procedural experience and experimental design. May be repeated for credit twice. (S/U grading only)—I, II, III

231. Biological Nuclear Magnetic Resonance (3)

Lecture—3 hours. Prerequisite: Molecular and Cellular Biology 221A or the 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 Biological Chemistry 231.) Offered in alternate years.—II, I

241. Membrane Biology (3)

Lecture—3 hours. Prerequisite: Biological Sciences 102 or 104 or consent of instructor. Advanced topics in membrane biochemistry and biophysics. Relationship of the unique properties of biomembranes to their roles in cell biology and physiology. (Same course as Molecular and Cellular Biology 241.)—III, III, II

271. Optical Methods in Biophysics (4)

Lecture—3 hours, discussion/laboratory—1 hour. Prerequisite: Biological Sciences 102 or the equivalent, Applied Science Engineering 108B or the equivalent, and Chemistry 110A or the equivalent. Principal optical techniques used to study biological structures and their related functions. Specific optical techniques useful in the studies of protein-nucleic acid, protein-protein interactions, and the biophysical basis for magnetic resonance in biomedicine. (Same course as Applied Science Engineering 271.)—III, III, III

290. Biophysics Seminar (1)

Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Presentation of current research by experts in biophysics. May be repeated for credit. (S/U grading only)—I, II, III, IV

290C. Research Conference in Biophysics (1)

Discussion—1 hour. Prerequisite: graduate standing in Biophysics and/or consent of instructor; course 299 concurrently. Presentation and discussion of faculty and graduate-student research in biophysics. May be repeated for credit. (S/U grading only)—I, II, III, IV

298. Group Study (1-5)

(1-5)

299. Research (1-12)

(1-12)

Biostatistics

(Hans-Georg Mueller, M.D., Ph.D., Chairperson of the Group)

Group Office. 4118 Mathematical Sciences Building, (530) 752-3302, http://biostat.ucdavis.edu/

Faculty
Rahman Azari, Ph.D., Lecturer (Statistics)

Laurel Beckert, Ph.D., Professor (Public Health Sciences)

Rudolph Beran, Ph.D., Professor (Statistics)

Prabir Burman, Ph.D., Professor (Statistics)

Andrew J. Clifford, Ph.D., Professor (Nutrition)

Nello Cristianini, Ph.D., Associate Professor (Statistics)

Christiana Drake, Ph.D., Associate Professor (Statistics)

Thomas R. Famlu, Ph.D., Professor (Population Health and Reproduction)

Thomas B. Farver, Ph.D., Professor (Animal Science)

Ian Gardner, Ph.D., Professor (Medicine and Epidemiology)

Jingming Jiang, Ph.D., Professor (Statistics)

Danielle Harvey, Ph.D., Assistant Adjunct Professor (Public Health Sciences)

Fushing Hsieh, Ph.D., Professor (Statistics)

Philip H. Kass, Ph.D., Professor (Population Health and Reproduction)


Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer, 2007-2008 offering in parentheses
Biotechnology

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Yue-Fok (Ed) Mack, Ph.D., Professor (Statistics)
Hans-Georg Mueller, Ph.D., Professor (Statistics)
Ile Feng, Ph.D., Professor (Statistics)
David M. Rocke, Ph.D., Professor
(Applied Science Engineering)
Geoff G. Roussos, Ph.D., Professor (Statistics)
Francisco J. Samaniego, Ph.D., Professor (Statistics)
Robert H. Shumway, Ph.D., Professor (Statistics)
Chih-Ling Tsai, Ph.D., Professor (Graduate School of Management)
Alex Tsokolov, Ph.D., Associate Professor (Public Health Sciences)
Jessica M. Ulls, Ph.D., Professor (Statistics)
Jane-Ling Wang, Ph.D., Professor (Statistics)

Graduate Studies: 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 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 biostatistical data analysis; third, substantial exposure to the biological and epidemiological sciences; and fourth, with a strong background in theoretical modeling, statistical techniques and 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 biostatistical data analysis, environmental toxicology and stochastic modeling in biology and medicine to clinical trials, drug development, epidemiological and medical statistical. 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 Advisor. Jane-Ling Wang (Statistics)

Courses in Biostatistics (BST)

Graduate Courses

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.)—I.

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; case-control studies; dose-response and bioassay; Poisson regression; Gamma regression; quasi-likelihood 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 for analysis of repeated measurements and longitudinal data in biostatistical and statistical settings. (Same course as Statistics 224.)—III. (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 randomized 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 genomic data. (Same course as Statistics 226.) Offered in alternate years.—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: genomics, 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 222.) 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 faculty and 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).—I, II, III, IV.

299D. Dissertation Research (1-12)
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)

Breadth/General Education

1. English Composition

2. Oral Communication

3. Scientific Inquiry

4. Quantitative Reasoning

5. Critical Analysis

6. Global Context

7. Interdisciplinary Knowledge

8. Communication: Written

B.S. Major Requirements:

Preparatory Subject Matter

English Composition Requirement

See College requirement.

Preparatory Subject Matter

Biology Sciences 1A, 1B, 1C .................. 15
Chemistry 2A, 2B, 2C ....................... 15
Chemistry 8A 8B, 8B, 8A .................. 8
Mathematics 1A, 1B, 1C .................. 6-12
Physics 7A, 7B ................................ 6
Plant Sciences 120, 120A .................. 4
Plant Sciences 21 or Engineering: Computer Science 10 or 15 .................. 3-4

Depth Subject Matter

Biology Sciences 101 .................................... 4
Microbiology 102 ................................. 4
Animal Biology 102 or Biological Sciences 102 .................................. 3-5
Animal Biology 103 or Biological Sciences 103 .................................. 3-5
Biological Sciences 104 .......................... 3
Molecular and Cellular Biology 161 .............. 3
Biotechnology 171 ............................... 3
Biotechnology 192 or Biotechnology 199 .................. 3
Undergraduate research proposal: Biotechnology 188 (optional) .................. 3
Honors undergraduate theses .................. 3

Areas of Specialization (choose one)

Fermentation/Microbiology Biotechnology Option

Engineering: Chemical 160, Microbiology 140 and 150, or Plant Pathology 130 and Microbiology 170; Microbiology 102 or Food Science and Technology 104L, Molecular and Cellular Biology 160 or Plant Biology 161A .................. 16-17
Restricted Electives .................. 15
Select from:

Plant Biotechnology Option

Microbial and Cellular Biology 126, Plant Biology 152, 160, 161A, 161B .................. 18
Restricted Electives .................. 12
Select at least one course from each of the following areas:

(a) Pests, Pathogens and Production: Plant Sciences 118, Entomology 110, Molecular and Cellular Biology 120L, 164, Entomology 100 or 110, Plant Pathology 120, 130, 140, Plant Biology 143, 146, 153, 154, 172
(b) Growth and Development: Molecular and Cellular Biology 120L, Plant Biology 105, 111, 112, 137, 158, Plant Pathology 140

Animal Biotechnology Option

Animal Genetics 111, Neurobiology, Physiology, and Behavior 101, Molecular and Cellular Biology 150, 151, 155, Veterinary Medicine 170 .................. 21
Restricted Electives .................. 12
Select at least one course from each of the following areas:

(a) Animal cell biology/microbiology/immunology: Animal Genetics 101,
in biotechnology, performance of proposed experiments. May be repeated for credit up to 12 units. (P/NP grading only.)—I, II, III, IV. (II, III, IV.)

192. Internship in Biotechnology (1-12) Internship—3-36 hours. Prerequisite: consent of instructor. Work experience on or off campus in subject area pertaining to biotechnology or in a business, industry or agency associated with biotechnology. Internship supervised by faculty member in the animal or plant sciences. (P/NP grading only.)

194H. Honors Thesis in Biotechnology (1-5) Independent Study—3-15 hours. Prerequisite: senior standing in Biotechnology with 3.250 GPA or higher and completion of courses 188 and 189L. Independent study of selected topics under the direction of a member or members of the staff. Completion will involve the writing of a senior thesis. (Deferred grading only, pending completion of sequence. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only.)

Botany

See Plant Biology, on page 413; and Plant Biology (A Graduate Group), on page 416.

Business Management

See Managerial Economics, on page 338, for undergraduate study; and Management, Graduate School of, on page 335.

Cantonese

See Asian American Studies, on page 131.

Cell Biology

See Molecular and Cellular Biology, on page 379.

Cell and Developmental Biology (A Graduate Group)

Richard Tucker, Ph.D., Chairperson of the Group (530) 752-0238

Group Office. 310 Life Sciences Addition (530) 752-9091; http://www.ggc.ucdavis.edu/ggc/cdb

Faculty
Gary B. Anderson, Ph.D., Professor (Animal Science)
Peter Anstrung, Ph.D., Professor (Molecular and Cellular Biology)
Kenneth A. Beck, Ph.D., Associate Professor (Cell Biology and Human Anatomy)

Patricia Berger, Ph.D., Professor (Animal Science)
E. Morton Bradbury, Ph.D., Professor (Biological Chemistry)
Pete M. Cala, Ph.D., Professor (Human Physiology)
Frederic Chedin, Ph.D., Assistant Professor (Molecular and Cellular Biology)
Hwai-Jong Cheng, Ph.D., Assistant Professor (Neurobiology, Physiology, and Behavior)
James S. Clegg, Ph.D., Professor (Molecular and Cellular Biology)
John H. Crowe, Ph.D., Professor (Molecular and Cellular Biology)
Elva Diaz, Ph.D., Assistant Professor (Medical Pharmacology and Toxicology)
Jason P. Eiserich, Ph.D., Assistant Professor (Nephrology)
JoAnne Engbrecht, Ph.D., Associate Professor (Molecular and Cellular Biology)
Carol Erickson, Ph.D., Professor (Molecular and Cellular Biology)
Marilynn E. Etzler, Ph.D., Professor (Molecular and Cellular Biology)
Peggy J. Farnham, Ph.D., Professor (Medical Pharmacology and Toxicology)
Michael Fers, Ph.D., Associate Professor (Physiology and Membrane Biology)
Paul G. FitzGerald, Ph.D., Professor (Cell Biology and Human Anatomy)
J. David Furlow, Ph.D., Assistant Professor (Neurobiology, Physiology, and Behavior)
Angela Gelli, Ph.D., Associate Professor (Medical Pharmacology and Toxicology)
Gizhi Gong, Ph.D., Assistant Professor (Cell Biology and Human Anatomy)
Nobuko Hagiwara, Ph.D., Assistant Professor (Internal Medicine)
John Harada, Ph.D., Professor (Plant Biology)
Jerry L. Hedrick, Ph.D., Professor (Animal Science)
Wolf-Dietrich Heyer, Ph.D., Professor (Microbiology)
Leonard M. Hjelmeland, Ph.D., Professor (Biological Chemistry)
Neil Hunter, Ph.D., Assistant Professor (Microbiology)
Rikah Isseroff, Ph.D., Professor (Dermatology)
Ken Kaplan, Ph.D., Assistant Professor (Molecular and Cellular Biology)
Anne Knowlton, Ph.D., Associate Professor (Cardiovascular Medicine)
Artym Kopp, Ph.D., Assistant Professor (Center of Genetics and Development)
Su-Ju Lin, Ph.D., Assistant Professor (Microbiology)
Noelle L'Etal, Ph.D., Assistant Professor (Psychiatry)
Bo Liu, Ph.D., Assistant Professor (Plant Biology)
Soo Hoo Lo, Ph.D., Assistant Professor (Ortha Research Labs, UCDMC)
Francis J. McNally, Ph.D., Associate Professor (Molecular and Cellular Biology)
Diana Myles, Ph.D., Professor (Molecular and Cellular Biology)
Jeanette E. Natzie, Ph.D., Associate Professor (Molecular and Cellular Biology)
Jodi M. Nunnani, Ph.D., Associate Professor (Molecular and Cellular Biology)
Martha E. O'Donnell, Ph.D., Professor (Human Physiology)
Charles G. Foapper, Ph.D., Professor (Anatomy, Physiology and Cell Biology)
Paul Primakoff, Ph.D., Professor (Cell Biology and Human Anatomy)
A. Hari Reddy, Ph.D., Professor (Ortha Research Labs, UCDMC)
Robert H. Rice, Ph.D., Professor (Environmental Toxicology)
Leslee Rose, Ph.D., Assistant Professor (Molecular and Cellular Biology)
Jonathan M. Scholey, Ph.D., Professor (Molecular and Cellular Biology)
Don Star, Ph.D., Assistant Professor (Molecular and Cellular Biology)
Fern Tablin, V.M.D., Ph.D., Professor (Anatomy, Physiology and Cell Biology)
Alice Tarantal, Ph.D., Professor (Cell Biology and Human Anatomy)
James S. Trimmer, Ph.D., Professor (Medical Pharmacology and Toxicology)

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007/2008 offering in parentheses

General Education (GE) credit: ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div=Social-Cultural Diversity; Wrt=Writing Experience
Cell Biology and Human Anatomy

See Medicine, School of, on page 345.

Chemistry

(Deceased)

(College of Letters and Science)

R. David Britt, Ph.D., Chairperson of the Department
Neil E. Schore, Ph.D., Vice-Chairperson of the Department
Dino S. Tinti, Ph.D., Vice-Chairperson of the Department
Philip P. Power, Ph.D., Chairperson of the Department

Department Office, 108 Chemistry Building (530) 754-9252; 752-0953;
Fax (530) 752-8995;
http://www.chem.ucdavis.edu

Faculty

Toby Allen, Ph.D., Assistant Professor
Matthew P. Augustine, Ph.D., Associate Professor
Alan L. Baich, Ph.D., Professor
Enoch Baldwin, Ph.D., Associate Professor
R. David Britt, Ph.D., Professor
William Casey, Ph.D., Professor
Xi Chen, Ph.D., Assistant Professor
W. Ronald Fawcett, Ph.D., Professor
Andrew J. Fisher, Ph.D., Associate Professor
Giulia Galli, Ph.D., Professor
Jacquelyn Gervay Hague, Ph.D., Professor
Ting Guo, Ph.D., Associate Professor
William M. Jackson, Ph.D., Professor
Susan M. Kauzlarich, Ph.D., Professor
Peter B. Kelly, Ph.D., Professor
Mark J. Kurth, Ph.D., Professor
Donald P. Land, Ph.D., Associate Professor
Delmar Larsen, Ph.D., Assistant Professor
Julie A. Leary, Ph.D., Professor
Carlitto B. Lebrilla, Ph.D., Professor
Gang-Yu Liu, Ph.D., Associate Professor
C. William McCurdy, Ph.D., Professor
Mark Mascal, Ph.D., Assistant Professor
Claude F. Meoires, Ph.D., Professor
Krishnan P. Nambiar, Ph.D., Associate Professor
Alexandra Nuvrotsky, Ph.D., Professor
Cheuk-Yiu Ng, Ph.D., Professor
Marilynn Olmstead, Ph.D., Professor
Frank Osterloh, Ph.D., Assistant Professor
Timothy E. Patton, Ph.D., Assistant Professor
Philip P. Power, Ph.D., Professor
Carl W. Schmid, Ph.D., Professor
Neil E. Schore, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Alexei P. Stychubskiy, Ph.D., Professor
Dean Tantillo, Ph.D., Assistant Professor
Dino S. Tinti, Ph.D., Professor
Michael Toney, Ph.D., Associate Professor
Nancy S. True, Ph.D., Professor

Preparatory Subject Matter..............36-39
Chemistry 2A-2B-2C or 2A-H2B-H2C........15
Physics 7A-7B-7C.........................12
Mathematics 21A-21B-21C or 110-110A-110C........9-12

Depth Subject Matter.....................43
Chemistry 110A, 110B, 110C, 105, 124A,
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....................................11

Total Units for the Major..............79-82

B.S. Major Requirements:

Preparatory Subject Matter..............53
Chemistry 2A-2B-2C or 2A-H2B-H2C........15
Physics 9A, 9B, 9C or 11A-11B-11C........6
Mathematics 21A, 21B, 21C, 21D, 22A,
22B...........................................22
Chemistry 110A, 110B, 110C (10, 10, 10)
At least one additional course from Chemistry 118B, 124B and 124C

Note: The minor program has prerequisites of Chemistry 2A, 2B, 2C, and Mathematics 1A, 1B, 16C, and Physics 7A, 7B, 7C or their equivalents. Students wishing to earn a Chemistry minor should consult with a Chemistry major adviser.

Honors and Honors Program. The student must take courses 194HA, 194HB, and 194HC.

Graduate Study. The Department of Chemistry offers graduate research leading to the M.S. and Ph.D. degrees in Chemistry. Detailed information regarding graduate study may be obtained by writing to the Graduate Adviser, Department of Chemistry. See also Graduate Studies, on page 97 in this catalog.

Courses in Chemistry (CHE)

Diagnostic Examinations. To enroll in Chemistry 2A or 2AH, a student must either successfully complete an Advanced Placement examination in chemistry or mathematics or pass the Chemistry Diagnostic Test and the Precalculus Diagnostic Examination with satisfactory scores. Both exams are administered during Summer Advising and Orientation and during the orientation week of any quarter in which Chemistry 2A or 2AH is offered. Students who have not passed both exams will be administratively dropped from Chemistry 2A and 2AH.

If you do not achieve a satisfactory score on the Chemistry Diagnostic Test, you have two options. First, you may retake the test. The Learning Skills Center will provide you with the results of your test and details regarding self-directed study materials you may use to prepare to retake the test. The second option is to enroll in Sacramento City College's Chemistry 110C (listed in the Class Schedule and Registration Guide as WLD 041C before the Chemistry courses). This course is given at UC Davis during fall quarter specifically for UC Davis students who require extra preparation for Chemistry 2A. WLD 041C provides 3 units of credit toward minimum progress and verification of full-time status, but provides no units toward graduation or grade point average. You may not enroll in WLD 041C if you have passed the Chemistry Diagnostic Test or if you have not yet taken the Chemistry Diagnostic Test.

Lower Division Courses

2A. General Chemistry (5)
Lecture—3 hours; laboratory/discussion—4 hours. Prerequisite: High school chemistry and physics; satisfactory score on diagnostic examinations; Mathematics 21A (may be taken concurrently) or consent of instructor. Limited enrollment course with a more rigorous treatment of material covered in course 2A. Students completing course 2AH can continue with course 2B or 2C.—I. (I, II)

2B. General Chemistry (5)
Lecture—3 hours; laboratory/discussion—4 hours. Prerequisite: course 2A with consent of instructor or course 2AH with a grade of C or better; and Mathematics 21B (maybe taken concurrently) or consent of instructor. Limited enrollment course with a more rigorous treatment of material covered in course 2A. Students completing course 2B can continue with course 2C or 2B.—I. (I, II)

2G. Honors General Chemistry (5)
Lecture—3 hours; laboratory/discussion—4 hours. Prerequisite: course 2A with consent of instructor or course 2AH with a grade of C or better; and Mathematics 21B (maybe taken concurrently) or consent of instructor. Limited enrollment course with a more rigorous treatment of material covered in course 2A. Students completing course 2B can continue with course 2C or 2B.—I. (I, II)

2C. General Chemistry (5)
Lecture—3 hours; laboratory/discussion—4 hours. Prerequisite: course 2B or 2BH. Continuation of course 2B. Kinetics, electrochemistry, spectrophotometry, structure and bonding in transition metal compounds, application of principles to chemical reactions. Laboratory experiments in selected analytical methods and syntheses. GE credit: SciEng.—I, II, III. (I, II, III)

2CH. Honors General Chemistry (5)
Lecture—3 hours; laboratory—6 hours. Prerequisite: course 2B with consent of instructor or course 2BH with a grade of C or better; and Mathematics 21C (maybe taken concurrently) or consent of instructor. Limited enrollment course with a more rigorous treatment of material covered in course 2C.—I, II. (I, II)

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 reaction mechanisms of organic compounds. Intended for students majoring in areas other than organic chemistry.—I, III. (I, III)

8B. Organic Chemistry: Brief Course (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 8A or 118A. Continuation of course 8A. Laboratory work primarily with organic laboratory techniques and the chemistry of the common classes of organic compounds.—I, II. (I, II)

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 students who have had Chemistry 2A; but students with credit for course 10 may take Chemistry 2A for full credit. GE credit: SciEng, Wrt.—I. (I, II)

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 Courses

105. Analytical and Physical Chemical Methods (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 110A (may be taken concurrently) or consent of instructor. Fundamental principles and laboratory techniques in analytical and physical chemistry. Errors and data analysis methods. Basic electrical circuits in instruments. Advanced solution equilibria. Potentiometric analysis. Chromatographic separations. UV/Visible spectroscopy. Lasers.—I, II. (I, II)

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 sciences. Introductory development of classical and statistical thermodynamics including equilibrium processes and solutions of both non-electrolytes and electrolytes. The classical 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, enzyme 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. Physical Chemistry of Macromolecules (3)
Lecture—3 hours. Prerequisite: course 1078 or 110C. Physical properties and characterization of macromolecules with emphasis upon those of biological interest. Structural thermodynamics, optical and transport properties of polymers in bulk and in solution. Physical characterization methods. Special topics on the properties of polyelectrolyte systems.—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.—I, II. (I, II)

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. Intermolecular forces and the gas, liquid and solid states. Distributions, ensembles and partition functions. Transport 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 to applications of statistical thermodynamics. Chemical kinetics, rate laws for chemical reactions and reaction mechanisms.—I, II, III. (I, II, III)

1. Instrumental Analysis (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 105 and 110B (may be taken concurrently). 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 chromatography. GE credit: Wrt.—I, II. (I, II)

118A. Organic Chemistry for Health and Life Sciences (4)
Lecture—3 hours; laboratory/discussion—1.5 hours. Prerequisite: course 2C 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 non-natural hydrocarbons, haloalkanes, alcohols and ethers.—I, II. (I, II)

Quarter Offered: I–Fall, II–Winter, III–Spring, IV–Summer, 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum, Arts and Humanities; SciEng, Science and Engineering; SocSci, Social Sciences; Div, Social-Cultural Diversity; Wrt, Writing Experience
118C. 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, and steroids. Designed primarily for majors in chemistry.—I, II, III.

121. Introduction to Molecular Structure and Stereochemistry (3)
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, I, II, III.

124A. Inorganic Chemistry: Fundamentals (3)
Lecture—3 hours. Prerequisite: course 1C or 4C. 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, II.

124B. Inorganic Chemistry: Main Group Elements (3)
Lecture—3 hours. Prerequisite: course 124A. Synthesis, structure and reactivity of inorganic and heteroorganic molecules containing the main group elements.—III, I, II.

124C. Inorganic Chemistry: d and f Block Elements (3)
Lecture—3 hours. Prerequisite: course 124A. Synthesis, structure and reactivity of transition metal complexes and bioinorganic chemistry: fire, lanthanides and actinides.—III, I, II.

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, II.

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. Wrt.—II, III.

128A. Organic Chemistry (3)
Lecture—3 hours. Prerequisite: course 2C with a grade of C or higher; chemistry majors should enroll in course 129A concurrently. Introduction to the basic concepts of organic chemistry with emphasis on stereochemistry and the chemistry of hydrocarbons. Designed primarily for majors in chemistry.—I, II, III.

128B. Organic Chemistry (3)
Lecture—3 hours. Prerequisite: course 128A or consent of instructor. course 129A strongly recommended; chemistry majors should enroll in course 129B 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.

128C. Organic Chemistry (3)
Lecture—3 hours. 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, alcohols, and sugars; selected biologically important compounds.—I, II, III.

129A. Organic Chemistry Laboratory (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 2C with a grade of C or higher; course 128A (may be taken concurrently). Introduction to laboratory techniques of organic chemistry. Emphasis on methods used for separation and purification of organic compounds.—II, 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: courses 128C (may be taken concurrently) and 129B. Continuation of course 128B.—I, II, III.

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 multifunctionality.—II, III.

135. Advanced Organic Chemistry Laboratory (3)
Lecture—1 hour; laboratory—6 hours. Prerequisite: courses 115 and 129C. Separation, purification and identification of organic compounds using modern methods of synthesis and instrumentation.—III.

140. Synthetic Methods (4)
Lecture—3 hours. Prerequisite: courses 124A, 128C, 129C. Integrated inorganic-organic course in the preparation, purification and characterization of multifunctional organic, organometallic, and transition metal compounds using a wide range of methods. Offered in alternate years.—III.

150. Chemistry of Natural Products (3)
Lecture—3 hours. Prerequisite: course 128C. Chemistry of terpenes, steroids, and aminoids: isolation, structure determination, biosynthesis, chemical transformations, and total synthesis. GE credit: SciEng, Wrt.—I, 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 program. Original research under the guidance of a faculty adviser, culminating in the writing of an extensive report. (Deferred 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 in-depth appreciation of career opportunities for graduates in chemistry. Professional chemists (and allied professionals) describe research and provide career insights. (P/NP grading only)—I.

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.)

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 Courses

201. Chemical Uses of Symmetry and Group Theory (3)
Lecture—3 hours. Prerequisite: course 212A and 110B, or consent of instructor. Symmetry elements and operations, point groups, representations of groups. Applications to molecular orbital theory, ligand field theory, molecular vibrations, and angular momentum. Crystallographic symmetry.—I, II.

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 photochemistry; magnetism; electron spin and nuclear quadrupole resonance spectroscopy; nuclear magnetic resonance spectroscopy; other spectroscopic methods.—II.

209. Special Topics in Physical Chemistry (3)
Lecture—3 hours. Prerequisite: courses 210A and 211A; graduate standing in Chemistry. Advanced topics in physical chemistry, biophysical 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: consent of instructor. GE credit: SciEng, Wrt.—I, II, III.

210B. Quantum Chemistry: Time-Dependent Systems (3)
Lecture—3 hours. Prerequisite: course 210A. Matrix mechanics and time-dependent quantum chemistry; matrix formulation of quantum mechanics, Heisenberg representation, time-dependent perturbation theory; selection rules, density matrices, and miscellaneous molecular properties.—II, III.

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 photochemistry.—I, II.

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, II.

211B. Statistical Mechanics (3)
Lecture—3 hours. Prerequisite: course 211A. Statistical mechanics of nonequilibrium systems, including the rigorous kinetic theory of gases, continuum
212. Chemical Dynamics (3)
Lecture—3 hours. Prerequisite: consent of instructor. Introduction to modern concepts in chemical reaction dynamics for graduate students in chemistry. 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, computational 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. Offered in alternate years. —(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 multiplet structures, relaxation, theory of g-tensor in organic and transition ions, spin Hamiltonians, nuclear quadrupolar resonance, spin relaxation processes. Offered in alternate years. —(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, numerical calculation of 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. —I.

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. —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 in general will emphasize the research interests of the staff member giving the course. —I. (II)

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. —I. (II) Balch

228A. Bio-inorganic Chemistry (3)
Lecture—3 hours. Prerequisite: course 226 or consent of instructor. Basic principles of inorganic chemistry in the functioning of biological systems by identifying the functions of metal ions and main group compounds in biological systems and discussing the chemistry of metal and main group compounds. Offered every third year.

228B. Main Group Chemistry (3)
Lecture—3 hours. Prerequisite: course 226 or consent of instructor. Synthesis, physical properties, reactivity and bonding in the main group compounds. Discussions of concepts of electron deficiency, hyper-valency, and non-classical bonding. Chemistry of the main group elements will be treated systematically. Offered every third year. —III.
The Major Program

The Chicana/Chicano Studies Program offers an interdisciplinary curriculum focusing on the Chicana/Chicano experience through an analysis of class, race, ethnicity, gender and sexuality, and cultural expression. The program offers a major leading to the Bachelor of Arts degree and a minor that can satisfy breadth requirements at the College of Letters and Science. Both the major and minor frame an analysis within the historical and contemporary experiences of Chicanas/os in the Americas. The major gives students the opportunity to specialize in one of two emphases: Cultural Studies or Social/Policy Studies. Students in the major are expected to read, write, and speak Spanish at a level suitable for future study and work in Chicana/o and Latino/a settings. There are no language requirements for the minor, and all Chicana/Chicano Studies courses are open to students in any major.

The Program. At the lower division level, the major curriculum provides an interdisciplinary overview of various topics. Students are advised to take courses that serve as prerequisites for certain upper division courses. At the upper division level, majors pursue advanced coursework in both the humanities/arts and the social sciences. At this level, students will find courses in Chicana/Chicano history, theory, and several courses taught from a variety of disciplines. Majors may specialize in one of two emphases for the A.B. degree. The Cultural Studies emphasis integrates literature, culture, and artistic expression. Social/Policy Studies emphasizes social theory, research methods, area studies in community/political economy, family, societal, and health issues.

Career Alternatives. The Cultural Studies emphasis prepares students for professional work in cross-cultural education, cultural/art center, arts, artistic expression and communications. The Social/Policy Studies emphasis orients students towards professional work in human service delivery, community development, legal services assistance, health services, social welfare and education. Both emphases in the major prepare students for advanced graduate and/or professional studies in related fields.

A.B. Major Requirements: UNITS

Cultural Studies Emphasis: Preparatory Subject Matter: 16-31 units

Chicana/o Studies 10, 20, 30, 40 ............... 8
Chicana/o Studies 21 or 40 ..................... 8
One of Chicana/o Studies 60, 65, 70, or 73 .................................................................. 4
Spanish 1, 2, 3, or 28, 31, 32 and the equivalent .................................................. 0-15

Depth Subject Matter: 40 units

One course from Chicana/o Studies 150, 151, 156, 165, 169A, 169B, 169C, 169D .......... 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 Chicana/o Studies, Asian American Studies, Native American Studies, or Women’s Studies ..................................................................................... 8
Two courses from Chicana/o Studies 110, 112, 120, 121, 122, 123, 124, 129 ........ 12
Three courses from Chicana/o Studies 154, 155, 156, 160, 165, 171, 172 ..................... 12

Total Units for the Major: 56-71 units

Social/Policy Studies Emphasis: Preparatory Subject Matter: 20-35 units

Chicana/o Studies 10, 20, 30, 40 ............... 8
Chicana/o Studies 21 or 40 ..................... 8
One of Chicana/o Studies 60, 65, 70, or 73 .................................................................. 4
One from Chicana/o Studies 200, 231, 233, 140A
Sociology 46A or Psychology 41 ................................. 4
Spanish 1, 2, 3, or 28, 31, 32 and the equivalent .................................................. 0-15

Depth Subject Matter: 40 units

Two courses from Chicana/o Studies 154, 155, 156, 160, 165, 171, or 172 .............. 8

Minor Advisers. A. Martínez, A. de la Torre

Minor Program Requirements: This minor provides a broad overview of the historical, social, political, economic, ideological and cultural forces that shape the Chicana/o and Latina/o experience. The minor is open to all students with or without course work in Spanish. Students should contact the master adviser for a plan approval and verification of the minor.

Chicana/o Studies (CHI) Lower Division Courses

Introduction to Chicana/o Studies (4) Lecture—3 hours; discussion—1 hour. Analysis of the situation of the Chicana/o (Mexican-American) people, emphasizing their history, literature, political movements, education, and related areas. GE credit: Div, Wrt.—I, II, III. (I, II, III.) Chávez-García

Chicana/o and Latina/o Health Care Issues (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 10. Overview of health issues of Chicana/os and Latinas/os in the State of California; role of poverty/lack of educational access and limited access to health care. GE credit: Div.—I, II, III. (I, II, III.) Flores, García

Qualitative Research Methods (4) Lecture/discussion—3 hours; discussion—1 hour. Dominant models of qualitative inquiry in educational social and scientific research as well as mestizo approaches to research with latinos. Emphasis given to choosing and designing culturally appropriate strategies to investigate Latino health, education, social context, and policy issues. GE Credit: Soci.—I, II, III. Flores

United States Political Institutions and Chicanas/os (4) Lecture/discussion—3 hours; term paper. Overview of the major political institutions and ideologies of the United States and the Chicana/o people’s historical and contemporary role in, effects from, and responses to them. Theory, method and critical analysis. GE credit: Div.—I, II, III.

Comparative Health: Leading Causes of Death (4) Lecture—3 hours; discussion—1 hour. Introduction to the epidemiology of the leading causes of death for ethnic and racial minority populations at the disproportionate rate at which ethnic and racial minorities suffer and die prematurely from injuries and chronic and infectious diseases. GE credit: Div, Wrt.—II, III. (I, II, III.) Garcia

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007/2008 offering in parentheses
General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Social-Cultural Diversity; Wrt=Writing Experience
50. Chicana and Chicano Culture (4) M/W/F—10 a.m.-11 a.m. Interdisciplinary survey of Chicana/o cultural representation in the 20th century. Examines Chicana/o culture within a national and transnational context. Explores how Chicana/o cultural forms and practices intersect with social/material forces, historical formations, and cultural discourses. Former course 20. GE credit: Div.—II, III, (II, III) Chabram-Dernersesian, de la Mora

60. Chicana and Chicano Representation in Cinema (4) Lecture—3 hours; discussion—1 hour; film viewing—2 hours. Introductory-level study of Chicana and Chicano representation in cinema. Depiction of Chicana and Chicano experience by Chicana/o filmmakers, as well as by non-Chicanos, including independent filmmakers and the commercial industry. GE credit: ArtHum, Div.—I. (I) De la Mora

65. New Latin American Cinema (4) Lecture—2 hours; discussion—1 hour; film viewing—3 hours. Historical, critical, and theoretical survey of the cinemas of Latin America and their relationship to the emergence of U.S. Latino cinema. Emphasis on social formations and identities, including gender, sexuality, class, race, and ethnicity. GE credit: ArtHum, Div.—II, III. 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.—I. (I) 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. Integrated approach to Chicana/o philosophy of art.—I. (I) Montoya

92. Internship (1-12) Internship—3 to 36 hours. Prerequisite: course 10 or consent of instructor. Academic guidance combined with internship in community agencies serving Mexican/Latino/Chicana/Chicano 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 Courses

100. Chicana/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 analysis of practices of self-representation, and socio-cultural developments in the Chicana/o community.—II. (II)

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 perspective. Emphasis on history of integration of Chicana/o labor into American class structure, education inequality, ethnicity, the family and Chicana/o politics. Former course Sociology 110. GE credit: SociSci, Div, Wrt.—I. (I)

111. Chicanas/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 and status, and their contribution to society and their community. (Former course 102.) GE credit: ArtHum. —III. (III) Chabram-Dernersesian, de la Torre

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: SociSci, Div, Wrt.—I. (I, II, III) Flores, de la Torre. 120. Chicana/o Psychology (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 21; introductory psychology course recommended. Introduction to the field of Chicana/o psychology. Analysis of socio-cultural context of Chicana/o and Latina/o life experiences. Special attention to issues of ethnic identity development, biculturalism, and development of self esteem. Impact of minority experience, migration, acculturation are examined. GE credit: SociSci, Div, Wrt.—II. (II) Flores

121. Chicana/o Community Mental Health (4) Lecture—3 hours; term paper. Prerequisite: course 10 or 20. Mental health needs, problems, and service utilization patterns of Chicanas/os and Latinas/os will be analyzed. An analysis of social service policy, and the economic context of mental health programs. GE credit: SociSci, Div, Wrt.—II. (II) Flores

122. Psychology Perspectives Chicana/o and Latina/o Family (4) Lecture—4 hours. Prerequisite: course 10; introductory psychology course 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 familism, family resiliency and coping strategies. —I. (I) 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/Latina children and adolescents, with particular attention to the formation of ethnic, gender, class, race, and sexual identities. GE credit: Div, SociSci, Wrt.—III. (II) Flores

130. United States-Mexican Border Relations (4) Lecture—3 hours; term paper. Prerequisite: upper division standing. Theories of U.S.-Mexican border relations, with an overview of the political, economic, and social relationships and an in-depth analysis of immigration issues, border industrialization, women’s organizations, economic crises, and legal issues. GE credit: Div.—I. (I, III) Chávez-García, 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 Chicanas/Latinas involvement and activities in the general political system, women’s movement, Chicano movement and Chicano movement. Course also examines the public policy process and the relationship of Chicanas/Latinas to public policy formation. Offered in alternate years. GE credit: SociSci, Div.—II. (II) Chávez-García, de la Torre

132. Political Economy of Chicana/o Communities (4) Lecture—3 hours; term paper. Prerequisite: upper division standing; lower division Chicana/o Studies course recommended. Historical and contemporary study of political and economic forces which define and intervene the development of Chicana/o communities. Includes critiques of traditional and Marxist theories and concepts applicable to Chicana/o communities, case studies of Chicana/o communities, especially in California and Texas. —III. (III) de la Torre

1455. Bi-National Health (5) Lecture—5 hours. Prerequisite: Biological Sciences 1A-1B-1C, Spanish 21 or consent of instructor; upper division standing only. Examination of health status and intervention strategies presented in public health care settings, private clinics and by indigenous healers in Mexico. Analysis of impact of high risk disease. Offered in a Spanish speaking country under supervision of UC Davis faculty/lnterceptor.—I. (I) de la Torre

150. The Chicana and Chicano Movement (4) Lecture—3 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.—III. (II, III) Chávez-García, de la Torre

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 Chicana/o novelists. Bilingual readings, lectures, discussions, and writing in Spanish. (Former course Spanish 126A.) GE credit: ArtHum, Div.—III. (II, III) Chabram-Dernersesian

155. Chicana/o Theatre (4) Lecture—4 hours. Prerequisite: intermediate Spanish or consent of instructor. Examination of the formal and thematic dimensions of Chicana/o theatre in the contemporary period with special emphasis on El Teatro Campesino and Chicana Feminist Theatre. Bilingual readings, lectures, discussions, and writing in Spanish. (Former course Spanish 126B.) GE credit: ArtHum, Div.—III. (II, III) Chabram-Dernersesian

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. (Former course Spanish 126C.—(I, III) Chabram-Dernersesian

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 sexualized narratives. GE credit: ArtHum, Div.—II. (II) de la Mora

165. Chicanas, Latinas and Mexicans 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 Mexicans in commercial media. The relation between the representation of Chicanas, Latinas, and Mexican women in commercial television and cinema and the role of women in Mexican and U.S. societies. Offered in alternate years.—III. (III) de la Mora

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer. 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering, SociSci=Social Sciences, Div=Social-Cultural Diversity, Wrt=Writing Experience
171. Mexican and Chicano Mural Workshop (4) Lecture—8 hours; independent study—1 hour. Prerequisite: course 70 or written consent of instructor. The Mural: a collective art process that empowers students and people through design and execution of mural paintings in the tradition of the Mexican Mural Movement; introduces materials and techniques. May be repeated once for credit. (Same course as Art Studio 171.—II. III. Montoya)

172. Chicana/o Voice/Poster Silk Screen Workshop (4) Studio—8 hours; independent study—1 hour. Prerequisite: course 70 and/or 73 and/or written consent of instructor. The poster as a voice art form used by Chicana/os and other people of color to point to the defects of social and political existence and the possibility for change, from the Chicana/o artists’ perspective. May be repeated once for credit.—II. III.

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, Puerto Ricans, and Cubans in the U.S. and their countries of origin. GE credit: ArtHum, Div, Wrt.—II. Chavez-Garcia

192. Internship in the Chicana/o/Chicano/Latina/Latino Community (1-12) Internship—3-36 hours. Prerequisite: course 10, 21, or 50; Spanish 3 or equivalent. Academic guid- ance combined with internship in community agen- cies serving Mexican/Latina/Latino/Chicana/ Chicano clients. Use of bilingual skills and knowl- edge of history, culture, economics, politics and social issues. Internship project required. May be repeated for credit up to 12 units. (P/NP grading only.)

192S. Directed Group Study (1-5) Undergraduates (1-5) Prerequisite: upper division standing and consent of Program Chairperson. (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. Students are required to read, research, and write Honors Thesis on Chicana/o Studies topics. (Deferred grading only, pending completion of sequence.)

198. Directed Group Study (1-5) Prerequisite: upper division standing and consent of Program Chairperson. (P/NP grading only.)

198S. 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.)

199S. Special Study for Advanced Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only.)

Graduate Courses

230. Chicano/Latino Hispanic Politics (4) Seminar—3 hours, term paper. Prerequisite: two undergraduate courses in Chicano/a Studies or consent of instructor. Examination of Chicana/o/Latino political experiences. Evaluate theories, ideology, and practice of Chicano politics. Brief history of Chi- cano/Latino political activism, comparison among political modes, gendered politics, and understanding relationships among Chicano, Mexican, American, and world politics.—II. de la Torre

291. 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 Course

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)

Child Development (A Graduate Group)

Lawrence V. Harper, Ph.D., Chairperson of the Group

Group Office. 1303 Hart Hall (530) 752-4109; http://childdevelopment.ucdavis.edu

Faculty

Thomas F. Anders, M.D., Professor (Psychiatry)
Zhe Chen, Ph.D., Professor (Human and Community Development)
Katherine J. Conger, Ph.D., Assistant Professor (Human and Community Development)
Rand Conger, Ph.D., Professor (Human and Community Development)
Emilio Ferrer, Ph.D., Assistant Professor (Psychology)
Patricia C. Gandara, Ph.D., Associate Professor (Education)
Xiaojia Ge, Ph.D., Professor (Human and Community Development)
Beth Goodlin-Jones, Ph.D., Assistant Adjunct Professor (Psychiatry)
Robin L. Hansen, M.D., Associate Professor (Pediciatrics)
Randi Hagerman, M.D., Director (M.I.N.D. Institute)
David Hesli, Ph.D., Assistant Professor (Psychiatry)
Lawrence V. Harper, Ph.D., Professor (Human and Community Development)
Rosemarie H. Kraft, Ph.D., Lecturer SOE (Human and Community Development)
Penelope Knapp, M.D., Professor (Psychiatry)
Thomas L. Morrison, Ph.D., Professor (Psychiatry)
Katherine Masyn, Ph.D., Assistant Professor (Human and Community Development)
Lisa Miller, Ph.D., Assistant Professor (Human and Community Development)
Adrienne Nishina, Ph.D., Assistant Professor (Human and Community Development)
Marianne Neblo, Ph.D., Assistant Professor (Human and Community Development)
Ernesto Politt, Ph.D., Professor (Pediciatrics)
Jonathan H. Sandoval, Ph.D., Professor (Education)

Affiliated Faculty

Kristin Alexander, Ph.D.
Joanne Decampoto, Ph.D., Academician Administrator (Human and Community Development)
Anne Driscoll, Ph.D., Researcher (School of Education)
Ann Mastergeorge, Ph.D., Assistant Adjunct Professor (Human Development and Community Development)
Lenna Otsi-Ogiek, Ph.D., Assistant Extension Specialist, (Human and Community Development)
Richard Ponzi, Ph.D., 4-H Extension Specialist (Human and Community Development)

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 postgraduate study in the field of child development with departmental and interdisciplinary emphases. 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 degree gain solid knowledge and understanding of in- flections 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 consideration for admissions and fellowships must submit all materials by January 1.

Graduate Adviser. Contact Group office.

Chinese

See Asian American Studies, on page 191; East Asian Languages and Cultures, on page 192; and East Asian Studies, on page 193.

Classics

(No. of College of Letters and Science)

David A. Traill, Ph.D., Program Director

Department Office. Spanish and Classics, 616 Sproul Hall, (530) 752-0835; http://classics.ucdavis.edu

Faculty

Emily Albo, Ph.D., Associate Professor
Lynn Bollman, Ph.D., Professor (Art History)
Seth L. Schein, Ph.D., Professor (Comparative Literature)
David A. Traill, Ph.D., Professor

Emeriti Faculty

Wesley E. Thompson, Ph.D., Professor Emeritus

Affiliated Faculty

Patricia Bulman, Ph.D., Lecturer
John Rundlin, 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, reli- gions, myths, art 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 Civilization track allows students to choose their electives from a broadly balanced program in history, art and archaeology, literature, philosophy and rhetoric. The Classical Languages and Literatures track focuses more intensively on language and literature, requir- ing 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 Civ-ilization 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 School and practi- cally 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:

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<thead>
<tr>
<th>UNITS</th>
<th>Classical and Mediterranean Civilizations track</th>
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<tbody>
<tr>
<td></td>
<td>Preparatory Subject Matter ........................ 26-27</td>
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<tr>
<td></td>
<td>Latin 1-2-3, or Greek 1-2-3, or Hebrew 1-2-3 ............ 15</td>
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<td></td>
<td>Two courses from Classics 1, 2, 3, or 31 .......... 8</td>
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<td></td>
<td>One additional course from: Art History 1A; Classics courses 1 through 50 (except 30 and 31); Comparative Literature 1; Philosophy 21; Religious Studies 21, 40 ................... 3-4</td>
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</table>

| DEPT | Subject Matter ................................................. 40 |
|      | Upper division courses in Latin, Greek or Hebrew ........... 12 |
|      | Classics 190 .......................................... 4 |
|      | Six additional courses selected from at least three of the following groups .......... 24 |
|      | Of these 24 units, at least 12 must be in Latin, Greek, Hebrew, or Classics, and one course must be selected from group (c). |
|      | (a) Literature and Rhetoric: Additional upper division courses in Latin, Greek and Hebrew: Classics 102, 110, 140, 141, 142, 143 |
|      | (b) History: History 102A, 111A, 111B, 111C; Religious Studies 102, 125 |
|      | (c) Art and Archaeology: Classics 171, 172A, 172B, 173, 174, 175 |
|      | (d) Philosophy and Religion: Classics 150; Philosophy 143, 160, 161, 162; Political Science 118A; Religious Studies 141A, 141B |

| Total Units for the Major ......................... 66-67 |

Classical Languages and Literatures track

<table>
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<tr>
<th>Preparatory Subject Matter ........................ 34</th>
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<tr>
<td>Two of the following sequences: Latin 1-2-3; Greek 1-2-3; Hebrew 1-2-3 .... 30</td>
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<tr>
<td>Classics 1, 2, or 3 ................................ 4</td>
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<tr>
<th>Depth Subject Matter ....................................... 36</th>
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<tr>
<td>Six upper division courses in the two chosen languages.................... 24</td>
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<tr>
<td>Classics 190 .......................................... 4</td>
</tr>
<tr>
<td>Two additional courses selected from any of the following groups .......... 8</td>
</tr>
<tr>
<td>(a) Literature and Rhetoric: Additional upper division courses in Latin, Greek and Hebrew: Classics 102, 110, 140, 141, 142, 143</td>
</tr>
<tr>
<td>(b) History: History 102A, 111A, 111B, 111C; Religious Studies 102, 125</td>
</tr>
<tr>
<td>(c) Art and Archaeology: Classics 171, 172A, 172B, 173, 174, 175</td>
</tr>
<tr>
<td>(d) Philosophy and Religion: Classics 150; Philosophy 143, 160, 161, 162; Political Science 118A; Religious Studies 141A, 141B, 141C</td>
</tr>
</tbody>
</table>

| Full Units for the Major.............................. 66-67 |

Minor Program Requirements:

The Department offers minors in Classical Civilization, Greek and Latin for those wishing to follow a shorter but formally recognized program of study in Classics.

<table>
<thead>
<tr>
<th>UNITS</th>
<th>Classical Civilization .................................. 20</th>
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<tbody>
<tr>
<td></td>
<td>Classics 1, 2, or 3 .................................. 4</td>
</tr>
<tr>
<td></td>
<td>One upper division course in Latin, Greek or Hebrew .... 4</td>
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<tr>
<td></td>
<td>Two additional upper division courses in Classics, Latin, Greek or Hebrew .... 8</td>
</tr>
</tbody>
</table>

One additional upper division course selected from any of the groups (a) through (d) in the Classical Civilization major.

### Greek

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<tr>
<th>UNITS</th>
<th>Greek ................................................. 20</th>
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<tbody>
<tr>
<td></td>
<td>Classics 1 or 2 ...................................... 4</td>
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<tr>
<td></td>
<td>Three upper division courses in Greek ............... 12</td>
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<tr>
<td></td>
<td>One additional upper division course in Classics, Latin, Greek or Hebrew .......... 4</td>
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<tr>
<th>LATIN</th>
<th>Latin ................................................. 20</th>
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<td>Classics 3 ............................................ 4</td>
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<tr>
<td></td>
<td>Three upper division courses in Latin ................ 12</td>
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<td></td>
<td>One additional upper division course in Classics, Latin, Greek or Hebrew .......... 4</td>
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</tbody>
</table>

Honors Program

Candidates for honor 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 194A and 194B, normally during the first two quarters of the senior year. Enrollment is limited to upper division students with a minimum of 135 units, and a 3.5 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 a prerequisite of a course already successfully completed. Exceptions can be made by the Program Director only.

Courses in Classics (CLA)

### Lower Division Courses

   - Lecture—3 hours; term paper. Introduction to the literature, art, and social institutions of ancient Mesopotamia, Egypt, Palestine, and early Greece from 3000 to 500 B.C.E. GE credit: ArtHrm, Wrt.—(II.) Bulman

2. Ancient Greece and the Near East: 500 B.C.E. 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 Judeans. GE credit: ArtHrm, Wrt.—II.—(II.) Traill

3. Rome and the Mediterranean: 1000 B.C.E. to 500 C.E. (4)
   - Lecture—3 hours; term paper. Introduction to the history, literature and art and the political and social institutions and values of Roman civilization, with emphasis on Rome's interactions with its Mediterranean neighbors—Etruscans, Carthaginians, Greeks, Egyptians, and Persians—and on the rise of Christianity. GE credit: ArtHrm, Wrt.—III.—(II.) Carson

4. Greek, Roman, and Near Eastern Mythology (3)
   - Lecture—3 hours; term paper. Lives and roles of women in ancient Greece and Rome. Readings from history, philosophy, medical and legal documents, literature and myth. GE credit: ArtHrm, Div.—Wrt.—(III.) Allan

5. Pompeii AD 79 (4)
   - Lecture—3 hours; term paper. Roman life in an urban community at the time of the eruption of Vesuvius. Slide presentation of the archeological evidence will be supplemented by readings from Petronius' Satyricon and other ancient authors. Offered in alternate years. GE credit: ArtHrm, Wrt.—(II.) Traill

6. 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. —III. (III.) Bulman

7. Greek and Latin Elements in Technical Vocabulary (3)
   - Lecture—3 hours. Knowledge of Greek and Latin not required. Elements of Greek and Latin vocabulary for increased understanding of technical information in medical, scientific and technical terminology and improve ability to understand and retain unfamiliar terms.

8. 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: ArtHrm, Wrt.

### Upper Division Courses

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 dramas set in the Ancient Mediterranean world, and films imbued with classical themes and allusions. Supplementary readings in ancient literature and mythology. GE credit: ArtHrm, Wrt.—(II.) Albu

111. 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 Quintillian. 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. [Former course Rhetoric and Communication 110.] GE credit: ArtHrm, Wrt.—(III.)

140. Homer and Ancient Epic (4)
   - Lecture—3 hours; term paper. Prerequisite: course 4A or 10 or Comparative Literature 1. Reading of Iliad, Odyssey, and Aeneid in English. Discussion of Homer's and Vergil's techniques of composition, the beliefs and values of their respective societies and the influence of Homer on Vergil. Offered in alternate years. GE credit: ArtHrm, Wrt.—(II.)

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: ArtHrm, Wrt.

142. Greek and Roman Novel (4)
   - Lecture—3 hours; term paper. Examination of the ancient Greek romances and their development into the protofictional realism of Petronius' Satyricon, and the religious mysticism of Apuleius' The Golden Ass. GE credit: ArtHrm, Wrt.—Schein

143. Greek Tragedy (4)
   - Lecture—3 hours; term paper. Prerequisite: course 4A or 10. Reading in English of selected plays of Aeschylus, Sophocles and Euripides. Lectures on the development and influence of Athenian tragedy. Offered in alternate years. GE credit: ArtHrm, Wrt.—(II.)

150. Socrates and Classical Athens (4)
   - Lecture/discussion—3 hours; term paper. Prerequisite: course 4A. Study of the major sources of our knowledge of Socrates to assess his role in the
171. Mediterranean Bronze Age Archaeology (4)
Lecture—3 hours; extensive writing. Prerequisite: one of courses 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 existence and collapse of Bronze Age societies. Offered in alternate years. GE credit: Arthum, Wrt.—Roller

172A. Early Greek Art and Architecture (4)
Lecture—3 hours; term paper. Examination of the origins 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. GE credit: Arthum, Wrt.—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.—Roller

173. Roman Art and Architecture (4)
Lecture—3 hours; term paper. The art and architecture of Rome and the Roman Empire, from the founding of Rome through the fourth century C.E. Not open for credit to students who have completed Art History 155. (Same course as Art History 173.) Offered in alternate years. GE credit: Arthum, Wrt.—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. Culls, festivals, and rituals of Greek religious practice and their relationship to Greek social and political institutions, and to Greek private life. Includes discussion of major sanctuaries at Olympia, Delphi, Athens, and others. Offered in alternate years. GE credit: Arthum, Wrt.—Roller

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 impetus of urbanism. (Same course as Art History 175.) Offered in alternate years. GE credit: Arthum, Wrt.—Roller

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.—I. (II.)

194HA-194HB. Special Study for Honors Students (1-3)
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 preparation of a senior honors thesis under the direction of faculty adviser. (Deferred grading only, pending completion of sequence. P/NP grading only.)—I-II.

197TC. 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)
Seminar—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 Courses

200A. Approaches to the Classical Past (4)
Seminar—3 hours; term paper. Prerequisite: graduate student status. First half of two quarter seminar. Survey of major areas of classical scholarship, with special emphasis on the continuing impact of Mediterranean antiquity on later literature, history, art, and culture. (Deferred grading only pending completion of sequence.) Offered in alternate years. —(II.) Albu

200B. Approaches to the Classical Past (4)
Independent study—4 hours. Prerequisite: course 200A and graduate student status. Second half of two quarter seminar. 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. Offered in alternate years. —(III.) Albu

201. Introduction to Classical Philology (4)
Seminar—3 hours; term paper. Survey of many temporary areas of classical scholarship with special attention devoted to current problems in literary and textual criticism. —Traill

202. Homer (4)
Seminar—3 hours; term paper. Readings in the Iliad and Odyssey: the origins and transmission of the poems. —Albu

203. Vergil (4)
Seminar—3 hours; term paper. Reading of selected books of the Aeneid, 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 in Aristophanes or New Comedy. May be repeated for credit.—Traill

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.—Traill

206. Greek Historiography (4)
Seminar—3 hours; term paper. Development of historical writing in Greece. May be repeated for credit.—Albu

207. Greek Drama (4)
Seminar—3 hours; term paper. Literary and philosophical analysis of plays of Euripides, Sophocles, or Aeschylus. May be repeated for credit.—Albu

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only)

Courses in Greek (GRK)

Lower Division Courses

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.)—I. (II.)

2. Elementary Greek (5)
Lecture—5 hours. Prerequisite: course 1. Continuation of course 1. —II. (III.)

2NT. Elementary New Testament Greek (1)
Lecture—1 hour. Prerequisite: course 2 (concurrent). Supplementary study of New Testament Greek. —II. (III.)

3. Intermediate Greek (5)
Lecture—5 hours. Prerequisite: course 2. Selected readings from Greek authors. —III. (III.)

3NT. Elementary New Testament Greek (1)
Lecture—1 hour. Prerequisite: course 2 (concurrent). Supplementary study of New Testament Greek. —III. (III.)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Upper Division Courses

100N. Readings in Greek Prose (4)
Lecture—3 hours; recitation—1 hour. Prerequisite: course 3. Selected readings from pagan and Christian sources. May be repeated for credit with consent of instructor. GE credit: Arthum, Wrt.—I. (II.)

101. Plato (4)
Lecture—3 hours; term paper. Prerequisite: course 3. GE credit: Arthum, Wrt.—I. (II.)

102. Euripides (4)
Lecture—3 hours; term paper. Prerequisite: course 101. GE credit: Arthum, Wrt.—I. (II.)

103A. Homer: Iliad (4)
Recitation—3 hours; term paper. Prerequisite: course 3. GE credit: Arthum, Wrt.—I. (II.)

103B. Homer: Odyssey (4)
Recitation—3 hours; term paper. Prerequisite: course 103. GE credit: Arthum, Wrt.—II. (III.)

104. Menander (4)
Lecture—3 hours; term paper. Prerequisite: course 3. GE credit: Arthum, Wrt.

105N. Attic Orators (4)
Lecture—3 hours; term paper. Prerequisite: course 3. Selected readings from the orators of 4th and 5th century Athens. May be repeated for credit with consent of instructor. Offered in alternate years. GE credit: Arthum, Wrt.

111. Sophocles (4)
Lecture—3 hours; term paper. Prerequisite: course 103. GE credit: Arthum, Wrt.—I. (II.)

112. Aristophanes (4)
Lecture—3 hours; term paper. Prerequisite: course 103. GE credit: Arthum, Wrt.

113. Thucydides (4)
Lecture—3 hours; term paper. Prerequisite: course 103. Offered in alternate years. GE credit: Arthum, Wrt.—Roller

114. Lyric Poetry (4)
Lecture—3 hours; term paper. Prerequisite: course 103. Offered in alternate years. GE credit: Arthum, Wrt.—Roller

115. Aeschylus (4)
Lecture—3 hours; term paper. Prerequisite: course 103. Offered in alternate years. GE credit: Arthum, Wrt.—Schein

116. Herodotus (4)
Lecture—3 hours; term paper. Prerequisite: course 103. Offered in alternate years. GE credit: Arthum, Wrt.—Traill

198. Directed Group Study (1-5)
(P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only)
Courses in Latin (LAT)

Lower Division Courses

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.]—I. (I.) Bulman, Rundin

2. Elementary Latin (5)
   Lecture—5 hours. Prerequisite: course 1. Continuation of course 1. [II. (II.) Rundin]

3. Intermediate Latin (5)
   Lecture—5 hours. Prerequisite: course 2. Continuation of course 2. Selected readings from Latin authors.—III. (III.) Rundin

98. Directed Group Study (1-5)
   Prerequisite: consent of instructor. [P/NP grading only.]

Upper Division Courses

100N. Readings in Latin Prose (4)
   Lecture/discussion—3 hours; term paper. Prerequisite: course 3. Review of basic forms, grammar, and vocabulary. Readings in prose authors, including Julius Caesar. Not open for credit to students who have completed course 110. GE credit: ArtHum, Wrt.—I. (I.)

101. Livy (4)
   Lecture—3 hours; term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt.—I. (I.)

102. Roman Comedy (5)
   Lecture—4 hours; term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt.—III. (III.)

103. Vergil: Aeneid (4)
   Lecture—3 hours; term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt.—II. Traill

104. Sallust (4)
   Lecture—3 hours; term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt.—III. Rundin

105. Catullus (4)
   Lecture—3 hours; term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt.—III. Rundin

106. Horace: Odes and Epodes (4)
   Lecture—3 hours; term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt.—III. Albu

108. Horace: Satires and Epistles (4)
   Lecture—3 hours; term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt.

109. Roman Elegy (4)
   Lecture—3 hours; term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt.

110N. Ovid (4)
   Lecture/discussion—3 hours; term paper. Prerequisite: course 3. Translation and discussion of selected readings from the works of Ovid. May be repeated once for credit when topic differs and with consent of instructor. Offered in alternate years. GE credit: ArtHum, Wrt.—II. Albu

111. Silver Age Latin (4)
   Lecture—3 hours; term paper. Prerequisite: course 3. Selections from Tacitus, Pliny, Petronius, Juvenal, Martial, and other writers of the Silver Age. Offered in alternate years. GE credit: ArtHum, Wrt.—Albu

112. Cicero: Political Writings (4)
   Recitation—3 hours; term paper. Prerequisite: course 3. GE credit: ArtHum, Wrt.—III. (III.)

114. Cicero: Philosophical Works (4)
   Lecture—3 hours; term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt.

115. Lucretius (4)
   Lecture—3 hours; term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt.—II.

116. Vergil: Eclogues and Georgics (4)
   Lecture—3 hours; term paper. Prerequisite: course 3. Offered in alternate years. GE credit: ArtHum, Wrt.

121. Prose Composition (5)
   Lecture—4 hours; term paper.—Traill

125. Medieval Latin (4)
   Lecture—3 hours; term paper. Prerequisite: course 2 and two upper division courses in Latin. Selections from the Vulgate and several medieval authors provide an introduction to the developments in the Latin language and literature from the fourth to the fifteenth centuries. GE credit: ArtHum, Wrt.—II. (II.) Albu, Traill

198. Directed Group Study (1-5)
   [P/NP grading only.]

199. Special Study for Advanced Undergraduates (1-5)
   [P/NP grading only.]

Clinical Nutrition

[College of Agricultural and Environmental Sciences]

Faculty

See the Department of Nutrition, on page 398.

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 dietetics internship or the equivalent, which must be completed before qualifying for registration as a dietitian.

The Program. The Clinical Nutrition major includes the basic core of nutrition classes as the Nutrition Science major, but includes additional courses such as food service management, education, sociology, and communication skills to prepare for work with the public. Clinical Nutrition students spend the first two years completing preparatory course work 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 demonstrate mathematics competency adequate to pass the Pre-calculus Diagnostic Examination with a minimum score of 27, or have taken calculus at a community college or other four-year institution.

Career Alternatives. The Clinical Nutrition major qualifies students to apply for the American Dietetics Association “accredited internship,” enabling them to become a Registered Dietitian, the professional credential necessary to work in a clinical setting. Once dietitians are registered, they generally seek employment in administrative, therapeutic, teaching, research, or public health/public service positions in clinics, hospitals, schools, or other similar institutions. There is a growing role for dietitians working in settings outside of the traditional hospital (for example, in state and federal nutrition programs, nutrition education, Peace Corps, and Cooperative Extension work). Students who complete the undergraduate preparation in clinical nutrition are also qualified to enter graduate programs in dietetics, nutrition science, public health nutrition, and food service management.

B.S. Major Requirements:

Written/oral expression.......................... 8
English 3 or University Writing Program 1 ........ 4
Communication 1 .................................. 4

Above courses simultaneously satisfy College requirement.

Preparatory Subject Matter......................... 47-48
Biological Sciences 1A, 1B .......................... 10
Chemistry 2A, 2B, 2C, 8A, 8B .................... 21
Economics 1A or 1B ................................. 4
Psychology 1 ....................................... 4
Sociology 1 or 3 or Anthropology 2 .............. 4
Statistics 13 ....................................... 4

Breadth/General Education......................... 6-24
Satisfaction of General Education requirements.

Depth Subject Matter................................ 84
Agricultural and Resource Economics 112 .......... 4
Animal Biology 102 and 103 ........................ 10
Biological Sciences 101 .............................. 4
Food Science and Technology 100A, 100B, 101A, 101B, 108 ........................................... 15
Food Service Management 120, 120L, 122 ........ 8
Food Science and Technology 104-104L ......... 7
Neurobiology, Physiology, and Behavior 101, 101L .................................................. 8
Additional upper division Nutrition electives ... 4

Unrestricted Electives .............................. 16-35
Total Units for the Major ......................... 180
Major Adviser. A.J. Clifford (Nutrition)
Advising Center for the major is located in 3211 Meyer Hall [530] 752-2512.

Graduate Study. See Graduate Studies, on page 97 in this catalog.

Clinical Nutrition and Metabolism

See Internal Medicine (IMD), on page 339.

Clinical Psychology

See Medicine, School of, on page 345.

Clinical Research

(A Graduate Group)

Frederick J. Meyers, M.D., Chairperson of the Group

Group Office. CRISP, 1472, 2921 Stockton Blvd., Sacramento, CA 95817, (916) 703-9181

Faculty

Timothy Albertson, M.D., Ph.D. (Internal Medicine: Pulmonary and Critical Care Medicine)
Laurel Beckert, Ph.D. (Public Health Sciences)
Lars Berglund, M.D., Ph.D. (Internal Medicine: Endocrinology, Clinical Nutrition, and Vascular Medicine)
Richard Bold, M.D. (Surgery: Oncology)
Faculty
Robert A. Bell, Ph.D., Professor
Charles R. Berger, Ph.D., Professor
Eun-Ju Lee, Ph.D., Assistant Professor
Mikayla Hughes, Ph.D., Assistant Professor
Michael T. Matley, Ph.D., Professor
Nicholas A. Palomares, Ph.D., Assistant Professor
Laramie Taylor, Ph.D., Assistant Professor
Emeriti Faculty
Kina Alcalay, Ph.D., Professor Emerita
James J. Murphy, Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award
Ralph S. Pomeroy, Ph.D., Professor Emeritus
John L. Vohs, M.A., Senior Lecturer Emeritus
Affiliated Faculty
Virginia O. Creveling, Ph.D., Lecturer
Alisa Shubb, 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. Classes addressing such topics as communication and cognition, message systems, interpersonal communication, nonverbal communication, communication and persuasion, organizational communication, mass media effects and public communication campaigns explore communication at these levels of analysis. Related social science courses are also part of the major.

Preparatory Requirements. Before declaring a major in communication, students must complete the following courses with a combined grade point average of at least 2.500 at the University of California (at least 3.000 GPA may be required for similar courses taken at community college). All courses must be taken for a letter grade.

Anthropology 4 or Linguistics 1 .......................... 4 units
Psychology 1 ........................................ 4 units
Sociology 1 ........................................ 5 units
Statistics 13 .......................................... 4 units
Career Alternatives. Communication graduates have found careers in such fields as broadcast and print journalism, administration, sales, management, politics and government, public relations, and education. A communication degree is also excellent preparation for law school or other graduate programs.

A.B. Major Requirements: UNITS

Preparatory Subject Matter......................................... 21
Anthropology 4 or Linguistics 1 .......................... 4 units
Psychology 1 ........................................ 4 units
Sociology 1 ........................................ 5 units
Statistics 13 .......................................... 4 units

Depth Subject Matter............................................ 44
Communication 101 .......................... 4 units
Communication 102, 134, 141 .......................... 12 units
Select one of Communication 103 or 105 .......................... 4 units
Select one of Communication 140 or 142 .......................... 4 units
Select one of Communication 143 or 146 or 152 or 165 or 170 or 172 or 180 or 189A, 189B, 189C, 189D, Anthropology 117, 120, Linguistics 160, 163, 171, 172, Political Science 164, 165, Psychology 132, Sociology 126, 128, 135, 148

Total Units for the Major .............................................. 65

Grading recommendation. Although not required, it is recommended that all courses offered in satisfaction of the major, except variable-unit courses, be taken for a letter grade.

Major Advisers. Faculty (Contact department.)

Advising Office. 109 Sproul Hall

Minor Program Requirements:

Communication.................................................. 24

One course from Communication 1, 3, 4 .......................... 4
At least five upper division courses in communication .......................... 20

Graduate Study. The Department of Communication offers programs of study and research leading to the M.A. degree in Communication. Detailed information may be obtained from the Graduate Adviser, Department of Communication.

Graduate Adviser. C. Berger

Courses in Communication (CMN)

Students must have satisfied the Subject A requirement before taking any course in Communication.

Lower Division Courses

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 strategies of informing and persuading audiences. GE credit: Wrt (cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously)—I, II, III, (I, II, III) Shubb

3. Interpersonal Communication Competence (4)
Lecture—2 hours; discussion—2 hours. Communication in interpersonal contexts. Sender, receiver, and message variables, and their interaction with communication competence. Participation in simulations and experiential exercises.—I, II, III, (I, II, III) Duax

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Upper Division Courses

101. Communication Theories (4)
Lecture/discussion—4 hours. Examination of the forms, functions, development, and testing of theory in human communication. Topics include theories of truth, social and symbolic levels of analysis, and the cultural construction of reality. GE credit: SocSci—II, III, Creveling

102. Empirical Methods in Communication (4)
Lecture—4 hours. Prerequisite: course 101 or 114, Sociology 13 or the equivalent. Survey of social scientific research methods commonly employed in the communication discipline. Includes basic topics in research design, measurement, sampling, questionnaire construction, survey research, experimental research, content analysis, and interaction analysis. Not open for credit to students who have completed course 114. GE credit: SocSci—II, III, Creveling

103. Gender Differences in Communication (4)
Lecture—4 hours. Prerequisite: upper division standing in Communication discipline. Topics include communicative differences between men and women as sources of male/female stereotypes, misunderstandings, dilemmas, and difficulties (real and imagined). Treatment of genders as cultures. Topics include male/female differences in discursive practices and patterns, language attitudes, and relationship dynamics. GE credit: SocSci—II, Palomares
105. Semantic and Pragmatic Functions of Language (4)
Lecture—4 hours. Prerequisite: course 115. The role of language in shaping attitudes and perceptions of self and others. The use and abuse of verbal symbols of language in shaping attitudes and perceptions of communication.

134. Interpersonal Communication (4)
Lecture—4 hours. Prerequisite: course 1 or 3, or the equivalent. Communication between two 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, self-disclosure, reciprocity, games, and conflict. GE credit: SocSci.—I, II, III. Berkeley

135. Nonverbal Communication (4)
Lecture—4 hours. Examination of the interaction between nonverbal communication and verbal communication channels in influencing outcomes in interpersonal and mass-mediated communication contexts. Underlying functions served by nonverbal communication will also be considered. GE credit: SocSci, Div.—I, II, III. Berkeley

136. Organizational Communication (4)
Lecture—4 hours. Examination of the communication in various organizational situations. Focuses on the use of effective communication strategies for achieving organizational and individual goals. Emphasis is placed on examining and designing strategies for improving ineffective communication within organizations. GE credit: SocSci.—I, II, Bereling

138. Communication and Cognition (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing with major in Communication Science and Technology. Topics include the historical evolution of the print and broadcast media; emerging technologies, including the Internet and interactive media; the globalization of the industry; patterns of media ownership. GE credit: SocSci.—I, II, III. Berkeley

140. The Media Industry (4)
Lecture/discussion—4 hours. Examines the economic, social, and political forces that shape media content. Topics include the historical evolution of the media and the impact of new technologies. GE credit: SocSci.—I, II, III. Taylor

141. Media Effects: Theory and Research (4)
Lecture/discussion—4 hours. Prerequisite: course 115 or the equivalent; course 140 recommended. Social scientific approaches to 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.—I, II, III. Theobald

Lecture—4 hours. Exploration of processes and constraints in the gathering, editing, and reporting of news. Examination of studies on the effects of news, contemporary challenges to news reporting presented by new technologies, and the relationship of news to other social institutions. GE credit: SocSci.—I, II, III. Theobald

143. Analysis of Media Messages (4)
Lecture—1 hour; discussion—2 hours; term paper. Prerequisite: courses 140 and 141 recommended. Examination of approaches to the analysis, interpretation, and evaluation of media messages, including those disseminated through broadcasting, print, and new technologies. Both content analytic and interpretive approaches covered. GE credit: SocSci, Writ—I, II, III. Theobald

144. Media Entertainment (4)
Lecture/discussion—4 hours. Prerequisite: course 102; course 141 recommended. Effects and appeal of mass media affecting emotional reactions. Topics include key concepts of entertainment research such as mood management, and the respective features and emotional/social-psychological effects of genres such as comedy, mystery, thriller, sports, music, horror, and erotica. GE credit: SocSci.—III. Berkeley

146. Communication Campaigns (4)
Lecture/discussion—3 hours; term paper. Strategic uses of media and interpersonal communication channels in health, environmental, advertising, and political campaigns. Emphasis on general principles relevant to most campaign types, including public information, social marketing, and media advocacy campaigns. Not open for credit to students who have completed course 160. GE credit: SocSci.—I, II, III.

152. Theories of Persuasion (4)
Lecture—4 hours. Prerequisite: course 115. Survey of communication and social psychological theories of persuasion. Examination of influence tactics and message design. Contexts of application include product advertising, propaganda campaigns, and health promotion. GE credit: SocSci.—I, II, III. Bell

165. Media and Health (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 115 or the equivalent. Content and effects of messages in news, entertainment, and advertising. Topics include health news reporting, portrayal of health issues, health care providers, social and health-related behaviors; representations of health professionals; promotion of drugs and other health products; tobacco and alcohol advertising. GE credit: SocSci.—I, II, III. Berkeley

170. Communication, Technology, and Society (4)
Lecture/discussion—4 hours. Prerequisite: course 114, 115, and upper division standing. Survey of how communication technologies transform our lives at the individual and society levels. Topics include human-computer interaction; the effects of communication technologies in education, health and business; and social and political implications of technological development. GE credit: SocSci.—I, II. Lee

172. Computer-Mediated Communication (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 101 and 102. Uses and impacts of computer-mediated communication. Theories and research findings pertaining to how computer-media affects various aspects of human interaction including impression formation, development of personal relationships, group decision making, collaborative work, and community building.—II, III. Lee

180. Current Topics in Communication (4) Seminar—4 hours. Prerequisite: upper division standing with a major in Communication and consent of instructor. Group study of a special topic in communication. May be repeated once for credit. Enrollment limited.

189A. Proseminar in Social Interaction (4)
Seminar—3 hours; term paper. Prerequisite: course 114 and 115. Reading, discussion, research, and writing on a selected topic in the specialty of social interaction. Potential topics include initiation, maintenance, and deterioration; communication failure; nonverbal communication; conversational management; semantics and pragmatic assumptions of language and verbal communication. May be repeated for credit when topic differs. Offered in alternate years. GE credit: SocSci, Writ—III.

189B. Proseminar in Mass Communication (4)
Seminar—3 hours; term paper. Prerequisite: course 114 and 115. Reading, discussion, research, and writing on a selected topic in the specialty of mass communication. Potential topics include, agenda-setting, the cultivation of beliefs, television violence, media portrayals of underprivileged groups, mediated political discourse, interactive technologies, and international/global communications. May be repeated for credit when topic differs. Offered in alternate years. GE credit: SocSci, Writ—I, III.

189C. Proseminar in Health Communication (4)
Seminar—3 hours; term paper. Prerequisite: course 114 and 115. Reading, discussion, research, and writing on a selected topic in health communication. Potential topics include health communication design and evaluation, media advocacy, health and illness, mass-mediated 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: SocSci, Writ

189D. Proseminar in Organizational Communication (4)
Seminar—3 hours; term paper. Prerequisite: course 114 and 115. Reading, discussion, research, and writing on a selected topic in the specialty of organizational communication. Potential topics include power and influence, organizational conflict and its resolution, mediation, bargaining and negotiation, superior-subordinate interaction, leadership styles, and inter-organizational communication. May be repeated for credit when topic differs. Offered in alternate years. GE credit: SocSci, Writ

192. Internship in Communication (1-6)
Internship—3-18 hours. Prerequisite: communication major who has completed 20 units of upper division communication courses. 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 resources, health promotion, political campaigns, journalism, and broadcasting. May be repeated up to 6 units of credit. (P/NP grading only.)

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 direction of faculty advisor.

197T. Tutoring in Communication (2-4)
Seminar—4 hours. Prerequisite: upper division standing with major in Communication 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 Courses

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 realization of intentions in message plans and discourse.—II. Berger

202. Communication Theory Construction (4)
Seminar—4 hours. Prerequisite: consent of instructor; graduate standing. Alternative meta-theoretical perspectives for theory generation in communication inquiry. Processes of constructing communication, rationalization and theory construction. Emphasis on the critique of extant communication theories and the development of theory construction skills. Not offered every year.—III. Berger

210. Evaluation of Communication Effects (4)
Lecture—4 hours. Prerequisite: graduate standing; one course in Inferential Statistics; consent of instructor. Research methods for evaluating communication effects, including the outcomes of communication interventions. Issues to be examined
include measurement, experimental and quasi-experimental design, and evaluation research. — I. (II.) Motley

211. Audience Assessment and Analysis (4)
Seminar—4 hours. Prerequisite: graduate standing; one course in Inferential Statistics; consent of instructor. Interdisciplinary perspectives on the “audience concept.” Methods and methodologies to assess audience segmentation based on demographics and geodemographics, psychographics, audience needs and assessments, and values/lifestyles. Formative and summative research methods for assessing audience attitudes, values, beliefs and behaviors. — I. (II.) Taylor

220. Persuasion Theories and Message Design (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Major social scientific theories and perspectives on attitude change and persuasion. Application of persuasion theories and principles to persuasive message design in applied contexts. — II. (III.) Hughes

221. Communication and Cognition (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Theories of cognitive structures and processes that enable the production, comprehension and interpretation of messages in face-to-face and mediated communication contexts. Explores the communication outcomes associated with these processes. Offered in alternate years. — II. Berger

222. Risk Communication (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Theories and models of individual risk perception and risk assessment. Media depictions of threats and risk-related information and their potential effects on audiences. Implications for the design and implementation of messages concerning threat and risk. Not offered every year. Berger

230. Social Interaction Theory and Research (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Survey of theories and research on social interaction processes and interpersonal communication. Covers communication codes, individual differences in communication, communication and relationship development, family communication, conflict, cognitive and emotional processes underlying social interaction, social influence, intercultural communication, and nonverbal behavior. — II. (II.) Berger, Hughes, Matley, Palomares

231. Theories of Interpersonal Influence (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Achievement of interpersonal influence. Topics include social and social psychological influences on the communication process. May be repeated for credit when topic differs. Not offered every year. Bell

244. Organizational Communication (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Theory and research on communication processes in organizations. May be repeated for credit when topic differs. Not offered every year. Bell

250. Mediated Communication Theory and Research (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Survey of major theories on the effects of mediated communication on the ways in which people express themselves, form impressions about strangers, develop and maintain relationships, collaborate on group work, and expand social networks, especially in comparison to face-to-face communication. Offered in alternate years. — III. (II.) Lee

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 present themselves, form impressions about strangers, develop and maintain relationships, collaborate on group work, and expand social networks, especially in comparison to face-to-face communication. Offered in alternate years. — II. Taylor

253. Negotiation (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Theory and research on negotiating. — II. Taylor

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 interventions in a variety of applied contexts. Offered in alternate years. Not offered every year. — Berger, Matley, Hughes, Palomares, Lee

260. Communication Applications (2-4)
Discussion—1 hour; supervised field work—3-9 hours. Prerequisite: course 220. Fieldwork in communication. Organization and implementation of a research project or a communication campaign. May be repeated once for credit. (S/U grading only.)

261. Special Topics in Social Interaction (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Reading, discussion, research, and writing on a selected topic in the specialty of social interaction. May be repeated for credit when topic differs. Not offered every year. — Berger, Matley, Hughes, Palomares, Lee

262. Special Topics in Media Communication (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Reading, discussion, research, and writing on a selected topic in the specialty of mediated communication. May be repeated for credit when topic differs. Not offered every year. Bell

263. Special Topics in Health Communication (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Reading, discussion, research, and writing on a focused topic in health or medical communication. May be repeated for credit when topic differs. Not offered every year. Bell

264. Special Topics in Organizational Communication (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Reading, discussion, research, and writing on a selected topic in the specialty of organizational communication. May be repeated for credit when topic differs. Not offered every year. Bell

269. Group Study (1-5)
Lecture—3 hours. (S/U grading only)

269R. Thesis Research (1-12)
Prerequisite: consent of instructor. Reading, discussion, research, and writing on a topic in the student’s specialty. May be repeated for credit. (S/U grading only)

270. Research (4)
Seminar—4 hours. Prerequisite: graduate standing; consent of instructor. Major social scientific theories and perspectives on attitude change and persuasion. Application of persuasion theories and principles to persuasive message design in applied contexts. — III. (II.) Hughes

271. Community and Regional Development
Quarter Offered: =Fall, =Winter, =Spring, =Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering; SocSci=Social Sciences; Div=Social-Cultural Diversity; Wrt=Writing Experience

Community and Regional Development (College of Agricultural and Environmental Sciences)
Faculty. See the Department of Human and Community Development, on page 302.

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 for 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, and it considers 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 designed 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 non-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: UNITS

English Composition Requirement ………….4-12
One course from English 3, University Writing Program 1, 3, 18, 19, 101, 104A, 104B, 104C, 104D, or 104E …………………….4
Additional course from above or Comparative Literature 1, 2, 3, 4, Native American Studies 3 or Communication 1, University Writing Program 102 ……………………4
Additional course from University Writing Program 101, 102 104A, 104B, 104C, or 104D …………………….4

Preparatory Subject Matter ……………………..22-25

B.S. Major Requirements ……………………..24

Satisfaction of General Education requirement.

Depth Subject Matter ……………………..40
Two courses from Community and Regional Development 151, 151L, 160, 161, or 168 …………………….8
Two courses from Community and Regional Development 140, 142, 152, 153A or 153B, or International Agricultural Development 104 …………………….8
Two courses from Community and Regional Development 154, 157, 158, or 17 …………………….4
Two courses from Community and Regional Development 164, 172, 173, 174, or 176 …………………….8
Two courses from Community and Regional Development 118, 141, 156, 162, or an International Agricultural Development 103, 108, 113, 116, 125, 127, 128, 130, 132. 

Internship: Community and Regional Development 192. 

Areas of Specialization 

Take 20 units from each of two options or 40 units from one option. The Areas of Specialization must include two Community and Regional Development courses. Up to 4 units of variable-unit course work may be counted toward this requirement (e.g., Community and Regional Development 192).

Community Groups Option 

Students must consult with a faculty adviser to identify an emphasis within the option and to select suitable courses. 

General (Community and Regional Development 151, 152, 153, 154, 157, 160, 161, 172, 176, American Studies 156, Human Development 103) 

African Americans (African American and African Studies 100, 123, 130, 145A, Sociology 128, 129, 130, 134) 

Asian Americans (Asian American Studies 100, 110, 111, 112, 155, 156) 

Chicanas/os (Chicana/o Studies 100, 110, 111, 120, 121, 131, 132, 140, Political Science 168) 

Native Americans (Native American Studies 115, 116, 117, 118, 122, 130A, 130B, 134, 156, 157) 

Youth (American Studies 152, Human Development 100A, 100B, 101, 102, 103, 130, 131, 140, 140L, 141, 142, 151, Psychology 112, Sociology 122, 152) 

Aging (Community and International Health 180, Human Development 100C, 143, 160, 161, 162, 191, Sociology 154) 

Gender (American Studies 154, Anthropology 130, Political Science 166, Psychology 114, Sociology 132, 133, 1458, Women’s Studies 103, 130, 140, 187) 

Specially Challenged Individuals (Education 115, Human Development 130, 131) 

Class (Sociology 140, 185) 

Organization and Management Option 

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, 168, Agricultural Economics 100A, 171A, Computer Science Engineering 167, Economics 104, 105, 115A, Political Science 100, 105, 142, 155, 181, 182, 183) 

Communication (Communication 114, 130, 161, 172, 176, College and Regional Development 173, 175, Education 120, 163) 

Human Resources (Community and Regional Development 151, 160, 61, 172, 176, Economics 1518, Food Service Management 123, Psychology 143, 144, 145, 183, Sociology 120, 128, 129) 

Management (Community and Regional Development 118, 140, 151, 154, 161, 162, 164, 168, Agricultural Economics 112, 113, History 174A, Political Science 188, Sociology 138, 139, 158, 159, 180A, 180B) 

Policy and Planning Option 

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, 160, 161, 162, 168, Environmental Science and Policy 165, Political Science 100, 103, 105, 108, 109, 142, 173, 182) 

Environmental Policy (Political Science 107, 175, Environmental Science and Policy 110, 160, 161, 164, 166, 168A, 168B, 171, 172, 173, 179, Environmental and Resource Science 121) 

Law and Policy (Sociology 120, 152, 155, Political Science 103, 105, 154, 155, 181, 182) 

Urban and Regional Planning (Community and Regional Development 140, 141, 152, 157, 158, 159, 171, Economics 115A, Environmental Planning and Management 110, 134, Environmental Science and Policy 171, 173, Geography 155, Political Science 100, 101, 102) 

Social Services Option 

Students must consult with a faculty adviser to identify an emphasis within the option and to select suitable courses. 

Community Health (Community and Regional Development 164, Community Health 101, Environmental Science and Policy 126, Psychology 160, Sociology 154) 

Aging (Community Health 180, Human Development 100C, 143, 160, 162) 

Counseling (Counseling 134, 135, Education 160, 163, Human Development 121, 130, Psychology 143, 145, 168) 

Youth (American Studies 152, Human Development 100A, 100B, 101, 102, 103, 130, 131, 140, 140L, 141, 142, 151, Psychology 112, Sociology 122, 152) 

The Family (Human Development 110, Sociology 131, 134, 135) 

Education (Community and Regional Development 173, 175, Agricultural Education 100, 106, 160, Education 100, 110, 114, 120, Psychology 136, Sociology 124) 

Bilingual Education (Education 151, 152, 153, Psychology 132) 

Unrestricted Electives 

Total Units for the Degree = 180 

Major Adviser. M. Wells 

Advising Center for the major is located in 1303 Hart Hall (530) 752-2244. 

Minor Program Requirements: 

The Community and Regional Development faculty offers the following minor program: 

UNITS 

Community Development 

Upper Division Courses 

118. Technology and Society (4) Lecture—3 hours, discussion—1 hour. Prerequisite: course 18 or consent of instructor. Impact of technological change on labor relations, employment, industrial development and international relations. The international relations of technology development and deployment. GE credit: SocSci, Wrt.—II (II) Kenney 

140. Dynamics of Regional Development (4) Lecture—4 hours. Prerequisite: one undergraduate social science course or consent of instructor. Political economy of domestic regional development. Technology, labor relations and interfirm linkages. California and other regions as case studies. GE credit: SocSci, Wrt.—II (II) Kenney 

141. Organization of Economic Space (4) Lecture—3 hours, discussion—1 hour. Prerequisite: course 1. The globalization of economic activity focusing on new spatial patterns of production and circulation and their implications for particular countries and regions. 

142. Rural Change in the Industrialized World (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Geography of rural environment with special emphasis on rural restructuring. The regional focus is on the developed world and comparisons are drawn between Europe (Eastern and Western) and North America. (II) 

151. Community Field Research: Theory and Analysis (3) Lecture—3 hours. Prerequisite: course 151L must be taken concurrently, course 1 and any upper division Community and Regional Development course are
recommended. Design and analysis of research at the community level with a focus on the relationship between theory and practice. Focus will be on conducting community research using structural analysis, elite interviewing, ethnographic research, and other qualitative research methods. GE credit: SocSci, Div, Wrt.—II. Tarollo

151L. Laboratory in Community Research and Analysis: Field Experience (1-3)
Fieldwork—39 hours. Prerequisite: course 151L concurrently. Field research focused on community or organizational issues and their resolution. Includes assignment with local agencies or community-based organizations. The focus will be conducting community research using such methods as structural analysis, elite interviewing, ethnographic research, and comparative community studies. GE credit: SocSci, Div, Wrt.—III. Tarollo

152. Community Development (4)
Lecture—4 hours. Prerequisite: course 1 or 151L, Sociology 2, Anthropology 2, Asian American Studies 100, Chicana/o Studies 132, Geography 5, or African American and African Studies 101 or consent of instructor. Examination of non-profit organizations, citizen participation, approaches to reducing poverty, community needs assessment, and regional development strategies. GE credit: SocSci, Div.—Wrt.—II. Bradshaw

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 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.—Fujimoto

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 Freiburg, Germany, and includes field trips to France and Switzerland. GE credit: SocSci, Div.—Hitz

154. Social Theory and Community Change (4)
Lecture—4 hours. Prerequisite: course 1, Sociology 1, or Anthropology 2. A comparative overview of the dominant social science paradigms for the study of community, poverty, and development. Among the paradigms discussed are functionalism, conflict theory/ Marxism, structuralism, and methodological individualism. GE credit: SocSci, Div, Wrt.—II. (II.) Hirtz

156. Community Economic Development (4)
Lecture—4 hours. Prerequisite: course 152 or consent of instructor. How government and community organizations help firms grow and create jobs through local economic development corporations, small business centers, revolving loan funds, incubators, and many other programs. Techniques to analyze community economic potential and identify appropriate intervention tools. Group project.—II. Bradshaw

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 political organization. Course covers actual community development in comparative historical perspective. GE credit: SocSci, Div, Wrt.—II. Smith

158. Small Community Governance (4)
Lecture/discussion—3 hours; fieldwork—3 hours. Prerequisite: course 151L or 160 or Political Science 100. Governing institutions and political processes in rural and small urban places. Local government organization, community autonomy, leadership, political change and policy issues including public finance. Field research on political processes or policy issues in select communities. Offered in alternate years.—III. Campbell

160. Research Design and Method in Comparative Community and Regional Development (4)
Lecture—4 hours. Prerequisite: course 1; Statistics 13 or the equivalent. Application of behavioral science research methodology to multidisciplinary problems confronting communities and community organizations. Focuses on design, sampling, measurement and analysis. Offered in alternate years. —II. (II.)

161. Ethnographic Research in America (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: completion of 8 units of course work in Anthropology, Sociology, or Community and Regional Development. Methodologies, ethics and goals of ethnographic research. Emphasis on analyzing and conducting ethnographic research in American communities; problem formulation, analytical modes, data correction and interpretation. Offered in alternate years. —II. (II.)

162. People, Work and Technology (4)
Lecture—4 hours. Prerequisite: upper division standing; eight units of sociology, anthropology, or community and regional development. Relationship between work, technology, and people’s lives. Such topics as industrialization, bureaucratization, automation, the structure of work-linked communities, education and the labor market, work and the economic system and the future of work.—III. (III.) Wells

164. Theories of Organizations and Their Roles in Community Change (4)
Lecture—4 hours. Prerequisite: course 1 or 2. Planned change within and through community organizations. Private voluntary organizations, local community associations, and local government. Relationships between community organizations and social capital.—III. Hirtz

168. Program Evaluation and the Management of Organizations (4)
Lecture—4 hours. Prerequisite: courses 160, 161. Role of program evaluation in organizational and program management. Impact of internal evaluation in program planning, improvement, and accountability.—II. (II.)

171. Housing and Social Policy (4)
Lecture—4 hours. Social impact, economics, and politics of housing in the United States. Special attention given to alternative policy strategies at the national and local levels.—I. (II.) Leiber

172. Social Inequality: Issues and Innovations (4)
Lecture—4 hours. Prerequisite: upper division standing; 8 units of sociology or anthropology or combi- nation. Study of the phenomenon of inequality in the U.S. Various approaches to inequality examined, including structural and historical explanations, prejudice and discrimination, the “culture of poverty,” and arguments concerning race, sex, and genetic potential.—I. (II.) Wells

173. The Continuing Learner (4)
Lecture—4 hours. Prerequisite: upper division standing. Theories of adult learning and teaching emphasizing the role of adult education in the community. Designing of adult education programs.—II. (II.) Lippin

174. Communication for Community Change (4)
Lecture—4 hours. Prerequisite: course 1. Communication as a mechanism and method for creating change in communities. Theories and practices; impact of message on attitudes and behavior; ethics of change induced through communication. Not offered every year.

176. Comparative Ethnicity (4)
Lecture—4 hours. Prerequisite: upper division standing; 8 units of sociology or anthropology or combination. Exploration of the role of ethnicity in shaping social systems and interaction. Examination of ana- lytical approaches to and issues arising from the study of ethnicity, through utilization of data from a range of different societies. GE credit: SocSci, Div, Wrt.—II. Guarnizo

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: completion of 54 units and consent of supervisor. Internship—off and on campus, in community and institutional settings. (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 Courses

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 development techniques to theory, evaluating development policy, and examining case studies of community development organizations and projects.—I. (II.) Bradshaw

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, 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 organizations and philanthropic foundations.—III. (III.) Hirtz

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 organizations, social production of urban form, role of the state in uneven development; dynamics of urban growth and decline; regional development in California.—III. (III.) Smith

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 conven- tional theories will precede contemporary comparative perspectives on class, race, ethnicity, citizenship, and the ethnic economy.—II. (II.) Guarnizo

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.—II. (III.) Wells

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/nor- mative, organizational, and administrative aspects. Analysis of specific social issues within the U.S./Cal- ifornia context. Not open for credit to students hav- ing completed course 248A and 248B. Offered in alternate years.—II. (II.) Hirtz
Community Development (A Graduate Group)

Ted Bradshaw, Ph.D., Chairperson of the Group
Group Office, 1303 Hart Hall (Human and Community Development)
(530) 752-1926; http://hcd.ucdavis.edu

Faculty
Rita Alcalay, Ph.D., Associate Professor (Communication)
Ted K. Bradshaw, Ph.D., Professor (Human and Community Development)
Stephen B. Brush, Ph.D., Professor (Human and Community Development)
Dennis Dingemans, Ph.D., Professor (Geography)
Deborah Elliott-Fisk, Ph.D., Professor (Landscape Architecture)
Patsy Eubanks-Owens, M.L.A., Associate Professor (Landscape Architecture)
Yvette Flores-Ortiz, Ph.D., Associate Professor (Chicana/o Studies)
Mark Francis, M.L.A., Professor (Landscape Architecture)
Isao Fujimoto, M.A., Senior Lecturer Emeritus (Human and Community Development)
Barbara G. Goldman, Ph.D., Professor (Landscape Architecture)
James I. Grieshop, Ph.D., Lecturer (Human and Community Development)
Luis Guzmán, Ph.D., Associate Professor (Human and Community Development)
Pat Harrison, M.Arch., Professor (Design)
Frank W. Hirsz, Ph.D., Associate Professor (Human and Community Development)
Carl C. Jorgensen, Ph.D., Associate Professor (Sociology)
Susan B. Kaiser, Ph.D., Professor (Textiles and Clothing)
E. Dean MacCannell, Ph.D., Professor (Environmental Design)
Philip E. Martin, Ph.D., Professor (Agricultural and Resource Economics)
Jay Meckling, Ph.D., Professor (American Studies)
Janet D. Momsen, Ph.D., Professor (Human and Community Development)
Donald A. Palmer, Ph.D., Professor (Graduate School of Management)
Beatrix M. Pesquera, Ph.D., Associate Professor (Chicana/o Studies)
Heath Schenker, M.A., Professor (Landscape Architecture)
Michael F. Smith, Ph.D., Professor (Human and Community Development)
Jessica M. Utt, Ph.D., Professor (Statistics)
Stefano Varese, Ph.D., Professor (Native American Studies)
Miriam J. Wells, Ph.D., Professor (Human and Community Development)
Emeritus Faculty
Isao Fujimoto, M.A., Lecturer SOE Emeritus
Robert A. Johnston, Ph.D., Emeritus Professor (Environmental Science and Policy)
Helge Olsen, Senior Lecturer SOE Emeritus (Design)
Seymour I. Schwartz, Ph.D., Emeritus Professor (Environmental Science and Policy)
Alvin D. Sokolow, Ph.D., Extension Specialist Emeritus (Human and Community Development)
Geoffrey A. Wandesforde-Smith, Ph.D., Associate Professor Emeritus (Political Science, Environmental Science and Policy)
Robert L. Thayer, Jr., M.A., Professor Emeritus (Landscape Architecture)
O. E. Thompson, Ph.D., Professor Emeritus
Ronald E. Voss, Ph.D., Extension Specialist Emeritus (Vegetable Crops Extension)
Joan Wright, Ph.D., Extension Specialist Emeritus
Affiliated Faculty
David Campbell, Ph.D., Associate Extension Specialist (Human and Community Development)
James I. Grieshop, Ph.D., Extension Specialist and Lecturer (Human and Community Development)
Bernadette Tarallo, Ph.D., Lecturer (Human and Community Development)
Graduate Study. The Graduate Program in Community Development is a multidisciplinary program of study which leads to the M.S. degree. The program prepares students for professional roles as administrators, designers, planners, or researchers, with emphasis upon urban and rural communities and human service organizations. Graduate study in community development also prepares individuals to work within government or non-profit organizations in the realm of social and economic change. Students have the opportunity to specialize in (1) urban and rural development, (2) community economic and political development, (3) community design and planning, (4) racial and ethnic relations, (5) international migration and development, (6) gender and community development, and (7) social policy analysis.
Preparation. Applicants to this program can prepare themselves by enrolling for upper division coursework in the social or behavioral sciences, e.g., anthropology, economics, sociology, psychology, cultural geography, or political science, and courses in community studies.
Graduate Advisers. Contact the Group office.

Community Health
See Epidemiology and Preventive Medicine (EPP), on page 355; and Family and Community Medicine (FAP), on page 356.

Community Nutrition
See Nutrition Science, on page 402.

Comparative Literature
[College of Letters and Sciences]
Program Director
Program Office, 522 Sproul Hall; (530) 752-1219; http://complit.ucdavis.edu
Committee in Charge
Marc E. Blanchard, Agrégé de Lettres (Comparative Literature, French)
Gail Finney, Ph.D., (Comparative Literature, German)
Neil Larsen, Ph.D. (Comparative Literature, Critical Theory)
Kari Lekke, Ph.D. (Comparative Literature)
Sheldon Lu, Ph.D. (Comparative Literature)
Seth L. Schein, Ph.D. (Comparative Literature)
Juliana Schiesari, Ph.D. (Comparative Literature)
Brenda Schildgen, Ph.D. (Comparative Literature)
Jocelyn Sharlet, Ph.D. (Comparative Literature)
Faculty
Marc Eli Blanchard, Agrégé de Lettres, Professor (Comparative Literature, French)
Gail Finney, Ph.D., Professor (Comparative Literature, German)
Neil Larsen, Ph.D., Professor (Comparative Literature, Critical Theory)
Kari Lekke, Ph.D., Professor (Comparative Literature)
Sheldon Lu, Ph.D., Professor (Comparative Literature)
Seth L. Schein, Ph.D. (Comparative Literature)
Juliana Schiesari, Ph.D. (Comparative Literature)
Brenda Schildgen, Ph.D., Professor (Comparative Literature)
Jocelyn Sharlet, Ph.D., Assistant Professor
Emeriti Faculty
Ruby Cohn, Ph.D., Professor Emerita (Comparative Literature, Italian)
Manfred Kusch, Ph.D., Senior Lecturer Emeritus (Comparative Literature, Italian)
Robert M. Torrance, Ph.D., Professor Emeritus
Affiliated Faculty
Scott McLean, Ph.D., Lecturer
The Major Program
Comparative literature encourages students to read, think about, and compare books from different national languages and from different parts of the world. Comparative literature enlarges students’ horizons by bridging the divisions between national cultures instead of concentrating on a single tradition.
The Program. Both the major programs and the minor program in comparative literature allow students to combine courses in one or more national literature departments with courses in comparative literature. The introductory course sequence, “Great Books of Western Culture” and “Major Books of the Contemporary World,” provides both an overview of European literary culture from ancient times to the present and intensive practice in analytical thought and English composition. All readings in undergraduate comparative literature courses are in English,

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Social-Cultural Diversity; Wrt=Writing Experience
but majors take upper division courses in at least one foreign literature in the original language.

**Career Alternatives.** Careers directly related to comparative literature include teaching, journalism, publishing, and translating. Because many professional schools consider a literature major an excellent background for their graduate disciplines, comparative literature is a valuable preparation (supplemented with courses outside the major) for careers in business, government, medicine, or law.

**A.B. Major Requirements:**

**European Emphasis**

Preparatory Subject Matter: 15-46
Comparative Literature 1, 2, 3, 4: 12
One other lower division course in Comparative Literature: 3-4
Foreign language: sufficient preparation to ensure satisfactory performance at the upper division level: 0-30

**Deutsch Subject Matter:** 40
Five upper division Comparative Literature courses including at least one course in a major period (such as 164A-164B-164C-164D), movement (such as 168A-168B-168C) or genre (such as 161A-161B; 161A-161B, 163, 166A-166B) and including Comparative Literature 141. Three upper division literature courses in a language other than English: 12
Two additional upper division literature courses in Comparative Literature or in any other program including English or literature in translation: 8

**Total Units for the Major (European Emphasis):** 55-86

**Recommended**

Anthropology 2; Classics 10; English 171A, 171B, French 114; History 4A-4B-4C, 101; Linguistics 1, 4, 163; Philosophy 24, 123; Religious Studies 2.

**Major Adviser.**

Asian Emphasis

Preparatory Subject Matter: 14-44
Comparative Literature 53 series: 6
Foreign language: sufficient preparation to ensure satisfactory performance at the upper division level: 0-30

**Deutsch Subject Matter:** 40
Comparative Literature 141 and 151: 8
Four other upper division Comparative Literature courses such as Comparative Literature 152 or 166, or any other Comparative Literature courses with an Asian emphasis: 16

Note: Courses in the East Asian Languages and Cultures Department can be substituted for these courses with the approval of an adviser. Three upper division literature courses in an Asian language: 12
One additional upper division course selected from Film Studies, Asian American Studies, History or Religious Studies: 4

**Total Units for the Major (Asian Emphasis):** 54-84

**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 literatures in translation. There is no foreign language requirement for the minor.

**UNITS**

Comparative Literature: 24
Comparative Literature 1, 2, 3, 4: 4

At least five upper division literature courses, at least four of which are in Comparative Literature (Comparative Literature 141 recommended). 20 Courses should be chosen in consultation with, and with the approval of, the adviser.

**Minor Adviser.** Same as Major Adviser.

**Advising.** All Comparative Literature majors and minors must consult with their adviser, individually, at least once at the beginning and once at the end of each academic year.

**Honors Program.** Candidates for high or highest honors in Comparative Literature must write a senior thesis under the direction of a faculty member approved by the Program Director. For this purpose, in addition to fulfilling all other major requirements, honors candidates must enroll in 6 units of Comparative Literature 194H during the first two quarters of the senior year. Only students who have attained a cumulative GPA of 3.500 in all courses satisfying the major (except elementary foreign language courses) at the end of the junior year will be eligible for the honors program.

**Teaching Credential Subject Representative.** The Staff; see the Teaching Credential/M.A. Program on page 102.

**Graduate Study.** See Comparative Literature (A Graduate Group), on page 154. See also Graduate Studies, on page 97 in this catalog.

**Courses in Comparative Literature (COM)**

**Lower Division Courses**

**Great Books of Western Culture: The Ancient World (4)**
Lecture/discussion—4 hours. Prerequisite: completion of Subject A requirement. An introduction, through class discussion and frequent written assignments, to some of the great books of western civilization from The Epic of Gilgamesh to St. Augustine’s Confessions. GE credit: ArtHum, Writ (cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously).—II, III; I, II, III

**2. Great Books of Western Culture: From the Middle Ages to the Enlightenment (4)**
Lecture/discussion—4 hours. Prerequisite: completion of Subject A requirement. An introduction, through class discussion and frequent written assignments, to some of the great books of western civilization from Dante’s Inferno to Swift’s Gulliver’s Travels. GE credit: ArtHum, Writ (cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously).—II, III; I, II, III

**3. Great Books of Western Culture: The Modern Crisis (4)**
Lecture/discussion—4 hours. Prerequisite: completion of Subject A requirement. An introduction, through class discussion and frequent written assignments, to some of the great books of western civilization from Goethe’s Faust to Beckett’s Waiting for Godot. GE credit: ArtHum, Writ (cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously).—II, III; I, II, III

**4. Great Books of the Contemporary World (4)**
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 on these works. GE credit: ArtHum, Div, Writ (cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously).—II, III; I, II, III

**5. Fairy Tales, Fables, and Parables (4)**
Lecture—3 hours; discussion—1 hour. An introduction to fairy tales, fables, and parables 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 African American folklore. GE credit: ArtHum, Div, Writ.—I, II, III; I, II, III; I, II, III

**6. Myths and Legends (4)**
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, P’u Sung-Ling, Kafka, Kawabata, Fuentes, and Morris. GE credit: ArtHum, Div, Writ.—I, II, III; I, II, III

**7. Literature of Fantasy and the Supernatural (4)**
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, P’u Sung-Ling, Kafka, Kawabata, Fuentes, and Morris. GE credit: ArtHum, Div, Writ.—I, II, III; I, II, III

**8. Utopias and their Transformations (4)**
Lecture/discussion—3 hours, term paper. Prerequisite: satisfactory performance in the Subject A requirement. A consideration, in literary works from different ages, of visionary and rational perception 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, Writ.—II, III

**9. The Short Story and Novella (4)**
Lecture/discussion—3 hours, term paper. An introduction to shorter forms of prose fiction by major authors of different countries, with special emphasis on the modern period. GE credit: ArtHum, Div, Writ.—II, III

**10A-N. Master Authors in World Literature (2)**
Lecture/discussion—1 hour—2 hour session. Designed primarily to acquaint the non-lit 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, Tammuz, Beowulf; (B) Metamorphoses, Decameron, Arabian Nights, Canterbury Tales; (C) Chanson de Roland, El Cinder, Igors Campaigns, Mario D’Arthur; (D) Sakuntala, Tristan and Isolde, Aucassin and Nicolette, Gawain and the Green Knight; (E) Swift, Rabelais, La Celestina, Simplicissimus; (F) Cervantes, Saikaku, Fielding, Voltaire; (G) Machiavelli, Shakespeare, Lope de Vega/Calderon, Molieres/Racine; (H) Goethe, Byron, Stendhal, Pushkin, Lermontov; (I) Hoffmann, Gogol, Poe, Hawthorne, Maupassant, Chekhov, Melville, (J) Flaubert, Twain, Turgeniev, Galdos, Ibsen; (K) Balzac, Dostoevsky/Tolstoy, Hardy, Shaw, Strindberg; (L) Unamuno, Svevo, Conrad, Gide, Kafka, Faulkner; (M) Rilke/Yeats, Joyce/ Woolf, Mann/Celine, Bulgakov/Tanzuki, O’Neill/Brecht, Lorca/Pirandello; (N) Camus/Sartre, Garcia Marquez/Grazz, Borges/Sarrate, Bellow, Nabokov, Beckert/Pinter, Genet/ Durrenmatt. May be repeated for credit in different subject area. Limited enrollment, (F/Y/F grading only).—II, III; I, II, III, III

**12. Introduction to Women Writers (4)**
Lecture—3 hours; discussion—1 hour. Prerequisite: completion of Subject A requirement. Survey of fiction, drama, and poetry by women writers from all continents. Concerns of women compared in light of their varied social and cultural traditions. Literary analysis of voice, imagery, narrative strategies and diction. GE credit: ArtHum, Div, Writ.—III, III

**13. Dramatic Literature (3)**
Lecture—3 hours. Prerequisite: completion of Subject A requirement or the equivalent. Introduction, through careful reading of selected plays, to some of the major forms of Western drama, from the earliest tragedies of ancient Greece to the contemporary American theater. Offered in alternate years. GE credit: ArtHum, Writ.—II, Finney
182 Comparative Literature

14. Introduction to Poetry (3)
Lecture/discussion—3 hours. Prerequisite: completion of Subject A requirement. Comparative study of poetry in a variety of lyric and other poetic forms from different historical periods and different linguistic, national, and cultural traditions. Offered in alternate years. GE credit: ArtHum, Wrt.—I. (II.) McLean

20. Man and the Natural World (4)
Lecture/discussion—3 hours; term paper. Examination of the changing relationship between the individual human being and his "natural" environment, whether the latter is reflected in literary works from ancient times to the present by such authors as Hesiod, Virgil, Rousseau, Wordsworth, and Thoreau. GE credit: ArtHum, Wrt.—I. (II.) McLean

25. Ethnic Minority Writers in World Literature (4)
Lecture—3 hours; term paper. Consideration of a broad range of writers who speak from an ethnic perspective different from the nominally or politically dominant culture of their respective countries and who explore the challenges faced by characters significantly affected by their ethnic minority status. GE credit: ArtHum, Wrt.

53A. Literature of China and Japan (3)
Lecture—2 hours; discussion—1 hour. Introduction to representative masterpieces of East Asia with readings from such works as The Story of the Stone, The Peach Blossom Spring, Tanka poetry, classical Japanese poetry, drama, and travel diaries, and The Tale of Genji. GE credit: ArtHum, Div, Wrt.

53B. Literature of India and Southeast Asia (3)
Lecture—2 hours; discussion—1 hour. Introduction to representative masterpieces of South Asia with readings from such works as the Mahabharata and Ramayana, The Cloud Messenger, Shakuntala, The Little Clay Cart, and the stories and poems of both ancient and modern India and Southeast Asia. GE credit: ArtHum, Div, Wrt.—II. (III.) Schildgen

53C. Literatures of the Islamic World (3)
Lecture—2 hours; discussion—1 hour. Introduction to classical Islamic culture through translations of literature primarily from Arabic and Persian, as well as other languages. Topics include the concept of the self, society and power, spirituality, the natural world, the cosmos, and the supernatural. GE credit: ArtHum, Div, Wrt.—I. (II.) Sharlet

90X. Lower Division Seminar (1-2)
Seminar—1.4 hours. Prerequisite: consent of instructor. Examination of a special topic in a small group setting.

89. Directed Group Study (1-5)
Directed Group Study—1-5 hours. Restricted to lower division students. (P/NP grading only)

99. Special Study for Undergraduates (1-5)
Special Study—1-5 hours. Prerequisite: course 1, 2, 3, or 4, or consent of instructor. Offered in alternate years and in summer quarter. GE credit: ArtHum, Wrt.—I. (II.) Schiesari

135. Women Writers (4)
Lecture/discussion—3 hours; term paper. An exploration of women’s differing views of self and society as revealed in major works by female authors of various times and places. GE credit: ArtHum, Wrt.—II. (III.) McLean

138. Gender and Interpretation (4)
Lecture/discussion—3 hours; term paper. Prerequisite: completion of Subject A requirement and at least one course in literature. Study of the representations of gender roles and gender hierarchy in literary texts from various periods, societies, and cultures. GE credit: ArtHum, Div, Wrt.—II. Scheisari

139. Shakespeare and the Classical World (4)
Lecture/discussion—3 hours; term paper. Prerequisite: at least one course in literature. Shakespeare’s representations of the classical world in the light of selected ancient texts and Renaissance conceptions of Antiquity, with special attention to the depiction of politics and history. Offered in alternate years.—(II.) Schein

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 of formal and structural elements. May be repeated for credit when subject of course varies. GE credit: ArtHum, Wrt.—II.

141. Introduction to Critical Theoretical Approaches to Literature and Culture (4)
Lecture/discussion—3 hours; term paper. Prerequisite: completion of Subject A requirement and at least one course in literature. Study of the "grotesque" in selected texts from the Renaissance to the 20th century, with attention to the "grotesque" as a means of social, cultural, and political commentary, as well as of aesthetic innovation. Offered in alternate years. GE credit: ArtHum, Wrt.—II.

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 "grotesque" in selected texts from the Renaissance to the 20th century, with attention to the "grotesque" as a means of social, cultural, and political commentary, as well as of aesthetic innovation. Offered in alternate years. GE credit: ArtHum, Wrt.—II.

145. Representations 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. Portrayals of urban experience in literature. Topics include public and private space, memory, and gender. Offered in alternate years. GE credit: ArtHum, Div, Wrt.—I. 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, Wrt.—II.

147. Modern Jewish Writers (4)
Lecture/discussion—3 hours; term paper. Prerequisite: completion of Subject A requirement and at least one course in literature. Study of the Jewish experience from the perspective of the writer’s construction of the self in relation to the future and to the non-Jew. Drawns upon Russian, German, Yiddish, and American traditions. GE credit: ArtHum, Div, Wrt.—II. (III.) Schein

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, discussing and writing on narratives which articulate diverse points of view. GE credit: ArtHum, Div, Wrt.—II. (III.) Blanchard, Larsen

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 stylistic, historical, social and cultural factors that contributed to a hemispheric vision of American literature, encompassing works by Canadian, United States, Caribbean, Brazilian, and Spanish-American writers. Offered in alternate years. GE credit: ArtHum, Div, Wrt.—I. (II.) Blanchard

153. The Forms of Asian Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: upper division standing. Introduction to distinctively Asian literary forms, such as haiku, noh, the Chinese novel and tale, through reading of major works. Comparison with Western genres and study of native and Western critical traditions. GE credit: ArtHum, Div, Wrt.

154. African Literature (4)
Lecture—3 hours; term paper. Prerequisite: completion of Subject A requirement and at least one course in literature. Pre- and post-colonial sub-Saharan African literature and the African oral traditions from which it emerged. Genres and themes of African literature in the 19th and 20th centuries. GE credit: ArtHum, Div, Wrt.

155. War and Peace in Literature (4)
Lecture/discussion—3 hours; term papers. Prerequisite: course 1, 2, 3, or 3, or consent of instructor. Through study of a few major works from Western and non-Western literature the course seeks to illuminate the way in which literature from antiquity to the present has dealt with the antinomy peace-war through the ages. GE credit: ArtHum, Wrt.

158. The Detective Story as Literature (4)
Lecture—3 hours; term paper. Study of the origins, literary and social background, development and implications of the literature of detection in a comparative context. GE credit: ArtHum, Div, Wrt.—II. Cannon

159. Women in Literature (4)
Lecture—3 hours; term paper. Prerequisite: course 1, 2, 3, or 4, or the equivalent recommended. Portrayals of women in literature, comparing selected heroines who represent a particular theme, period, or genre. Topics range around the globe and from ancient to modern works, such as Lystistrata, Emma, Hedda Gabler, The Malaisa Sisters, and Top Girls. GE credit: ArtHum, Div, Wrt.

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 Joyce, Proust, and Mann. GE credit: ArtHum, Wrt.—II. (III.) Schildgen

160B. The Modern Drama (4)
Lecture/discussion—3 hours; term paper. Portrayals in representative authors such as Ibsen, Strindberg, Chekov, Pirandello and Brecht. GE credit: ArtHum, Wrt.—II. (III.) 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.

161B. Comedy (4)
Lecture/discussion—3 hours; term paper. Comic attitudes toward life in literary works of different ages and cultures. GE credit: ArtHum, Wrt.

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.—II.

164A. The Middle Ages (4)
Lecture/discussion—3 hours; term paper. Readings in heroic epics, chivalric romances, and such major authors as Dante and Chaucer, with emphasis on shared assumptions concerning man’s place in the world. GE credit: ArtHum, Wrt. —II.
164B. The Renaissance (4)
Lecture/discussion—3 hours; term paper. Readings in major authors such as Petrarch, Machiavelli, Erasmus, Montaigne, Rabelais, Cervantes, and Shakespeare, with particular emphasis on changing conceptions of the possibilities and limitations of man. GE credit: ArtHum, Wrt.—(II.) Schiesari

164C. Baroque and Neoclassicism (4)
Lecture/discussion—3 hours; term paper. Readings in major authors such as Calderón, Corneille, Pascal, Racine, Milton, and Grimmelshausen, with consideration of the tension between the expansive energies of the "baroque" and the restraints of dogma and reason. GE credit: ArtHum, Wrt.

164D. The Enlightenment (4)
Lecture/discussion—3 hours; term paper. Readings in major authors such as Swift, Voltaire, Rousseau, Sterne, and Kant, with emphasis on philosophical ideas and literary forms. GE credit: ArtHum, Wrt.—III. (III.)

165. Caribbean Literatures (4)
Lecture/discussion—4 hours. Prerequisite: upper division standing. Comparative approach to the multi-lingual, multi-cultural 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.—II. (III.) Blanchard

166. Literatures of the Modern Middle East (4)
Lecture/discussion—4 hours. Study of major translated works in modern Middle East literature, including Turkish, Arabic, Palestinian-Arab, Israeli, and Persian contemporary writings. Discussion of social and historical formation, and special attention given to dissident and minority writers. GE credit: ArtHum, Div, Wrt.—I. (I.) Sharlet

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.—II. (II.) Schein

166B. The Novel (4)
Lecture/discussion—3 hours; term paper. Readings in various forms of the novel such as the picaresque, the developmental, and the confessional, with emphasis on the evolution of the genre. May be repeated for credit in different subject area. GE credit: ArtHum, Wrt.—III. (III.)

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, Cervantes, Goethe, Tolstoy, Proust, and Joyce. GE credit: ArtHum, Wrt.

168A. Romanticism (4)
Discussion—3 hours; term paper. Prerequisite: any introductory course in literature. Introduction to the Romantic movement with emphasis upon Romantic concepts of the self, irony, love, the imagination and artistic form and relationships, the individual to nature and society. GE credit: ArtHum, Wrt.—I. McLean, Lokke

168B. Realism and Naturalism (4)
Discussion—3 hours; term paper. Prerequisite: consent of instructor. Novels and plays by Dickens, Zola, Flaubert, Dreiser, Ibsen, and Strindberg investi- gate 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.—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.

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.

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 once for credit when the topic differs. GE credit: ArtHum, Wrt.

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 approved by the Program Director, leading to a thesis on a comparative topic. May be repeated for credit. (P/NP grading only)

195. Seminar in Comparative Literature (4)
Seminar—3 hours; term paper. Prerequisite: junior standing and major in Comparative Literature, or consent of instructor. Advanced comparative study of selected topics and texts, with explicit emphasis on the theoretical and interpretive approaches that define Comparative Literature as a discipline and distinguish it from other literary disciplines. May be repeated once for credit when topic differs. Offered in alternate years. —(III.)

197. Tutoring in Comparative Literature (1-5)
Discussion—2-4 hours. Prerequisite: upper division standing with declared major in Comparative Literature. Tutoring in undergraduate courses including leadership in small voluntary discussion groups affiliated with current courses offered by Comparative Literature. May be repeated for credit for a total of 6 units. (P/NP grading only)

198. Research Group Study for Advanced Undergraduates (1-5)
(P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only)

Graduate Courses

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.) Finney

214. Approaches to Lyric Poetry (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.) Schiesari

215. Forms of the Spiritual Quest (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor; knowledge of at least one foreign language. An exploration, culminating in a research paper, of changing forms of the quest for transcendence in different cultures, mainly in major works of Western literature, but also in other traditions and from the perspectives of other disciplines.

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 literature of major works in a particular genre from various linguistic, national, and cultural traditions, with particular attention to historical developments within the genre and to genre theory. May be repeated for credit when topic differs. —(I.) Schein

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 in gender in anthropology, literature, psychology, and women's studies.

250A. Research in Comparative Literature (4)
Individual instruction—1 hour. Individually guided research, under the supervision of a faculty member, in a comparative topic culminating in a term paper. Required of M.A. and Ph.D. candidates. —I, III. (I, III.)

250B. Research in Comparative Study of Author, Period, or Genre (4)
Individual instruction—1 hour. Individually guided research, under the supervision of a faculty member, in the specialized study of an individual author, historical period, or literary genre culminating in a term paper. Required of Ph.D. candidates. —I, II, III. (I, II, III.)

250C. Basic Research for the Dissertation (4)
Individual instruction—1 hour. Individually guided research, under the supervision of a faculty member, in preparation for the dissertation in Comparative Literature. Required of Ph.D. candidates. —I, 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)—(II.)

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 Courses

300. Teaching Comparative Literature in College (3)
Lecture—1 hour; discussion—2 hours. Methods of teaching Comparative Literature with specific application to the introductory courses 1, 2, and 3, in

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007/2008 offering in parentheses

General Education (GE) credit: ArtHum—Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Social-Cultural Diversity; Wrt=Writing Experience
Comparative Literature (A Graduate Group)

Juliana Schiesari, Ph.D., Chairperson of the Group
Group Office. 522 Sproul Hall (530) 752-5799

Faculty
Marc Blanchard, Ph.D., Professor (Comparative Literature, French)
Seth Schein, Ph.D., Professor (Comparative Literature, German)
Neil Larsen, Ph.D., Professor (Comparative Literature, Critical Theory)
Seth Schein, Ph.D., Professor (Comparative Literature)
Juliana Schiesari, Ph.D., Professor (Italian, Comparative Literature)
Brenda Schildgen, Ph.D., Professor (Comparative Literature)
Jocelyn Sharlet, Ph.D., Assistant Professor (Comparative Literature, German)
Michelle Yeh, Ph.D., Professor (East Asian Languages and Cultures)

Graduate Study. The Comparative Literature Program offers the Ph.D. degree with a strong emphasis on individual research under the supervision of a faculty member. Candidates for the Ph.D. in addition to research of a comparative nature, study three literatures (one of which may be English and/or American in women and gender studies), acquiring an extensive knowledge of the overall development of one. Students may choose to focus on a special topic instead of on a third literary tradition. Within this framework, each student’s program will be tailored to individual interests, and may center on a major historical period, such as the Renaissance or the modern age; a genre, such as lyric poetry, epic, drama, or the novel; or any special emphasis approved by the Graduate Adviser.

Preparation. For admission to the Ph.D. Program candidates should have an undergraduate major in literature and reading ability in two foreign languages. The Group requires three letters of recommendation and a sample of recent written work, and it is recommended that students submit their GRE scores.

Graduate Adviser. Juliana Schiesari (Italian, Comparative Literature)

Comparative Pathology (A Graduate Group)

Reen Wu, Ph.D., Chairperson of the Group

Faculty
Barry A. Ball, D.V.M., Ph.D., Professor (Population Health and Reproduction)
Donika Bannosch, D.V.M., Ph.D., Assistant Professor (Population Health and Reproduction)
Peter A. Barry, Ph.D., Associate Professor (Pathology and Oncology)
Stephen W. Barbould, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Nicole Baumgarten, D.V.M., Ph.D., Associate Professor (Pathology, Microbiology, and Immunology)
Richard J. Bold, M.D., Assistant Professor (Surgery)
Robert H. BonDurant, D.V.M., Professor (Population Health and Reproduction)
Christopher Bowles, M.D., Ph.D., Assistant Professor (Internal Medicine)
Walter M. Boyce, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Hilary A. Bromley, Ph.D., Professor (Otorhinolaryngology)
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, Microbiology, and Immunology)
Carol J. Cardona, D.V.M., Ph.D., Assistant Professor (Population Health and Reproduction)
Anthony T.W. Cheung, Ph.D., Professor (Pathology, Microbiology, and Immunology)
Bruno B. Chomel, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Mary J. Church, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Alan J. Conley, D.V.M., Ph.D., Professor (Population Health and Reproduction)
Patricia A. Conrad, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
James S. Cullor, D.V.M., Ph.D., Professor (Population Health and Reproduction)
Sahya Danekar, Ph.D., Professor (Microbiology and Immunology)
William G. Ellis, M.D., Professor (Pathology and Oncology)
Kent L. Erickson, Ph.D., Professor (Human Anatomy)
Thomas B. Farver, Ph.D., Professor (Population Health and Reproduction)
Janet Foley, M.S., D.V.M., Ph.D., Assistant Professor (Medicine and Epidemiology)
Laurel J. Gershwin, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
M. Eric Gershwin, M.D., Professor (Rheumatology)
Sergio A. Granda, M.D., Ph.D., Professor (Dermatology)
Clare R. Gregory, D.V.M., Professor (Surgical and Radiological Sciences)
Steve Haskins, D.V.M., M.S., Professor (Surgical and Radiological Science)
Ronald P. Hedrick, Ph.D., Professor (Medicine and Epidemiology)
Robert J. Higgins, B.V.Sc., M.Sc., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Dallas M. Hyde, Ph.D., Professor (Anatomy, Physiology and Cell Biology)
Lynelle J. Jochelson, B.V.Sc., M.Sc., Ph.D., Assistant Professor (Medicine and Epidemiology)
James H. Jones, D.V.M., Ph.D., Professor (Surgical and Radiological Sciences)
Mark D. Kittleman, D.V.M., M.S., Ph.D., Professor (Medicine and Epidemiology)
Gerald J. Kost, M.D., Professor (Pathology and Oncology)
Andrew E. Kyles, B.V.M.S., Ph.D., Associate Professor (Surgical and Radiological Sciences)
Kenneth M. Lam, Ph.D., Professor (Population Health and Reproduction)
Bill Lasley, Ph.D., Professor (Population Health and Reproduction)
Richard A. LeCouteur, B.V.Sc., Ph.D., Professor (Surgical and Radiological Sciences)
Rance B. LeFevbre, Ph.D., Professor (Pathology, Microbiology, and Immunology)
Irwin K. Liu, D.V.M., Ph.D., Professor (Population Health and Reproduction)
Linda J. Lowenstein, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Paul A. Lucic, Ph.D., Professor (Pathology and Oncology)
Leslie A. Lyons, Ph.D., Assistant Professor (Population Health and Reproduction)
Melinda H. MacDonald, D.V.M., Ph.D., Assistant Professor (Surgical and Radiological Sciences)
John E. Madigan, M.S., D.V.M., Professor (Medicine and Epidemiology)
Gary Magdesian, D.V.M., Assistant Professor (Medicine and Epidemiology)
Jonna A. Mazet, D.V.M., M.P.V.M., Ph.D., Associate Professor of Clinical Wildlife Health (Medicine and Epidemiology)
Stuart Meyers, D.V.M., Ph.D., Assistant Professor (Anatomy, Physiology and Cell Biology)
Chris J. Miller, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
F. Charles Mohr, D.V.M., Ph.D., Associate Professor (Pathology, Microbiology, and Immunology)
Peter F. Moore, B.V.S.C., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Linda Munson, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Thomas W. North, Ph.D., Professor (Molecular Biosciences)
Bennie L. Oubrier, D.V.M., Ph.D., Professor and Dean (Pathology, Microbiology, and Immunology)
Niels C. Pedersen, D.V.M., Ph.D., Professor (Medicine and Epidemiology)
Dean E. Pippert, Ph.D., Professor (Anatomy, Physiology and Cell Biology)
Charles G. Plopper, Ph.D., Professor (Anatomy, Physiology and Cell Biology)
Jerry S. Powell, M.D., Professor (Anatomy, Physiology and Cell Biology)
Thomas P. Prindiville, M.D., Professor (Internal Medicine)
Dick L. Robbins, M.D., Professor (Internal Medicine)
Jose Eduardo Santos, D.V.M., Ph.D., Associate Professor (Population Health and Reproduction)
Edward Schleigel, Ph.D., Assistant Professor (Pathology, Physiology and Cell Biology)
Earl T. Sawai, Ph.D., Assistant Adjunct Professor (Pathology)
Kurt S. Schulz, D.V.M., M.S., Professor (Surgical and Radiological Sciences)
Bernard Seguin, D.V.M., MS, Assistant Professor (Surgical and Radiological Sciences)
William M. Sisco, D.V.M., Ph.D., Associate Professor (Population Health and Reproduction)
Jack R. Snyder, D.V.M., Ph.D., Professor (Surgical and Radiological Sciences)
Jay V. Solnick, M.D. Associate Professor (Surgical and Radiological Sciences)
Edward Schleigel, Ph.D., Assistant Professor (Pathology, Physiology and Cell Biology)
Eugene P. Steffey, V.M.D., Ph.D., Professor (Surgical and Radiological Sciences)
Jeffrey L. Stott, Ph.D., Professor (Pathology, Microbiology, and Immunology)
Suzan M. Stover, D.V.M., Ph.D., Professor (Anatomy, Physiology and Cell Biology)
Ronald T. Tablin, V.M.D., Ph.D., Professor (Anatomy, Physiology and Cell Biology)
Alice F. Tarantal, Ph.D., Professor (Pediatrics)
M. E. Thean, D.M.V., Ph.D., Professor (Surgical and Radiological Sciences)
Jose V. Torres, Ph.D., Professor (Microbiology)
Francisco Uzal, D.V.M., Ph.D., Associate Professor of Clinical Diagnostic Pathology (Pathology, Microbiology, and Immunology)

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities, SocSci=Science and Engineering, SciSoc=Social Sciences, Div=Social-Cultural Diversity; Wrt=Writing Experience
Mathematics electives ........................................ 12
Mathematics 102 and one course from Mathematics 115A, 115B, 115C, 127A, 127B, 127C, 131 or (Statistics 131A, 141, 145, 147, 149A, 149B, 150A, 150B, 150C); and one upper division Mathematics course numbered below 188 except 111

Total Units for the Major .................. 104-109


Minor Program Requirements:

Computer Science ................................. 24
Computer Science Engineering 30 ............ 4
Computer Science Engineering 110 .......... 4
Upper division Computer Science Engineering courses ................................. 16

Graduate Study. See Graduate Studies, on page 97 in this catalog.

Computer Science (A Graduate Group)

Prafulla Mahapatra, Ph.D., Chairperson of the Graduate Group

Graduate Office, 2063 Engineering II (Department of Computer Science)

J.G. Zinkl, D.V.M., Ph.D., Chairperson of the Graduate Group

Group Office. 2063 Engineering II (Department of Computer Science)


Minor Program Requirements:

Computer Science ..................................24
Computer Science Engineering 30 ............ 4
Computer Science Engineering 110 .......... 4
Upper division Computer Science Engineering courses ................................. 16

Graduate Study. See Graduate Studies, on page 97 in this catalog.

Computer Science (A Graduate Group)

Prafulla Mahapatra, Ph.D., Chairperson of the Graduate Group

Graduate Office, 2063 Engineering II (Department of Computer Science)

J.G. Zinkl, D.V.M., Ph.D., Chairperson of the Graduate Group

Group Office. 2063 Engineering II (Department of Computer Science)


Minor Program Requirements:

Computer Science ..................................24
Computer Science Engineering 30 ............ 4
Computer Science Engineering 110 .......... 4
Upper division Computer Science Engineering courses ................................. 16

Graduate Study. See Graduate Studies, on page 97 in this catalog.

Computer Science (A Graduate Group)

Prafulla Mahapatra, Ph.D., Chairperson of the Graduate Group

Graduate Office, 2063 Engineering II (Department of Computer Science)

J.G. Zinkl, D.V.M., Ph.D., Chairperson of the Graduate Group

Group Office. 2063 Engineering II (Department of Computer Science)
Conservation Biology

Matthew Franklin, Ph.D., Professor (Computer Science)
Michael Gertz, Ph.D., Associate Professor (Computer Science)
Dipak Ghosal, Ph.D., Professor (Computer Science)
Daniel Gusfield, Ph.D., Professor (Computer Science)
Bernd Hamann, Ph.D., Professor (Computer Science)
Michael Hogarth, Ph.D., Assistant Professor (School of Medicine)
Mant Hubbard, Ph.D., Professor (Mechanical and Aeronautical Engineering)
Sanjay Joshi, Ph.D., Assistant Professor (Mechanical and Aeronautical Engineering)
Kenneth Joy, Ph.D., Professor (Computer Science)
Patrice Koehl, Ph.D., Associate Professor (Computer Science)
Karl Levitt, Ph.D., Professor (Computer Science)
Xin Liu, Ph.D., Assistant Professor (Computer Science)
Kwan-Liu Ma, Ph.D., Professor (Computer Science)
Bertram Ludaescher, Ph.D., Associate Professor (Computer Science)
Charles Martel, Ph.D., Professor (Computer Science)
Norman Mailhot, Ph.D., Professor (Computer Science)
Nelson Max, Ph.D., Professor (Applied Science)
E.O. Milton, Ph.D., Professor (Mathematics)
Dob Nijeme, Ph.D., Professor (Civil and Environmental Engineering)
Prasant Mohapatra, Ph.D., Associate Professor (Computer Science)
Biswanath Mukherjee, Ph.D., Professor (Computer Science)
Voijn Q. Oklabdzija, Ph.D., Professor (Electrical and Computer Engineering)
Ronald Olson, Ph.D., Professor (Computer Science)
John Owens, Ph.D., Assistant Professor (Electrical and Computer Engineering)
Raju Pandey, Ph.D., Associate Professor (Computer Science)
Robert Redinbo, Ph.D., Professor (Electrical and Computer Engineering)
David Rocke, Ph.D., Professor (Applied Science)
Garry Rodrigue, Ph.D., Professor (Applied Science)
Phillip Rogaway, Ph.D., Professor (Computer Science)
Kenneth Shackel, Ph.D., Professor (Plant Sciences)
David Slaughter, Ph.D., Professor (Biological and Agricultural Engineering)
Oliver Staadt, Ph.D., Assistant Professor (Computer Science)
Henning Stahlberg, Ph.D., Assistant Professor (Molecular and Cellular Biology)
Susan Ustin, Ph.D., Professor (Land, Air, and Water Resources)
S. Felix Wu, Ph.D., Associate Professor (Computer Science)
Rao Vemuri, Ph.D., Professor (Applied Science)
Shih-Ho Wang, Ph.D., Professor (Electrical and Computer Engineering)
Kent Wilken, Ph.D., Associate Professor (Electrical and Computer Engineering)
David Woodruff, Ph.D., Professor (Graduate School of Management)
Felix Wu, Ph.D., Associate Professor (Computer Science)
Catherine Yang, Ph.D., Assistant Professor (Graduate School of Management)
Peter Yellowlees, Ph.D., Professor (School of Medicine)
Ben Yoo, Ph.D., Professor (Electrical and Computer Engineering)
Richard Wallers, Ph.D., Professor Emeritus
Affiliated Faculty
Owen Carmichael, Ph.D., Visiting Assistant Professor (Med Neurology)
Farid Dowlah, Ph.D., Adjunct Associate Professor (Applied Science)
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 verification, programming languages and compilers, parallel and distributed systems, scientific computation, and software engineering. Interdisciplinary research in computer science is encouraged.
Preparation. Normal preparation for the program is a bachelor’s degree in either computer science or in a closely related field (such as electrical engineering or mathematics, with substantial coursework in computer science). Applications are also considered from students with outstanding records in other disciplines. M.S. students may either complete a thesis or pass a comprehensive examination. Ph.D. students must pass a qualifying oral examination and complete a dissertation demonstrating original research in an area approved by the Graduate Group.

Conservation Biology

See Ecology (A Graduate Group), on page 196; Environmental Biology and Management, on page 257; and Wildlife, Fish, and Conservation Biology, on page 483.

Consumer Science

[College of Agricultural and Environmental Sciences]

Contemporary Leadership

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 plan approval.

UNITs

Contemporary Leadership ............... 24
Science and Society 130 .................. 4
Science and Society 192 concurrent with an approved internship ......................... 2
Science and Society 190X .................. 2
One upper division course from each of the following four areas:
Ethics and Values
Communication, Interpersonal Relationships and Human Dynamics
Anthropology 139AN, Communication 130, Community and Regional Development 172, 174, Linguistics 163, Military Science 131, Psychology 145, Sociology 126, University Writing Program 104
Organization Structure and Cultures
American Studies 15, Anthropology 123BN, Community and Regional Development 152, 164, 173, Psychology 156, Sociology 30A, 156, 183, Women’s Studies 140 .......... 4
Multiculturalism
American Studies 156, Community and Regional Development 176, English 179, History 173, 178, Political Science 166, 176, Sociology 130, 134, Textiles and Clothing 174 ............ 4
Minor Advisers. Consult Science and Society Program office in 3574 Hutchison Hall.
Critical Theory

Elizabeth Constable, Ph.D., Program Director
Program Office, 611 Sproul Hall
(530) 752-5799, http://crittheory.ucdavis.edu

Committee in Charge
Joshua Clover, Ph.D. (English)
Elizabeth Constable, Ph.D. (French and Italian)
Lynette Hunter, Ph.D. (Theatre and Dance)
Robert Irwin, Ph.D. (Spanish)
Karen Kaplan, Ph.D. (Cultural Studies)
Sheldon Lu, Ph.D. (Comparative Literature)
Leslie Rabine, Ph.D. (Women and Gender Studies)
Scott Shershow, Ph.D. (English)
David Simpson, Ph.D. (English)
George Wilson, Ph.D. (Philosophy)

Graduate Study. The program in Critical Theory offers study and research leading to the Ph.D. with a designated emphasis in Critical Theory. The program provides theoretical emphasis and interdisciplin- ary perspective to students already preparing for the Ph.D. in one of 13 participating departments (Anthropology, Comparative Literature, Culture Studies, Education, English, French, German, History, Music, Nature American Studies, Sociology, Spanish, and Theatre and Dance). Students complete all requirements for the Ph.D., including the dissertation, in one of the participating departments. Minimum coursework for the Critical Theory Designated Emphasis consists of four courses. The first three of these, Critical Theory 200A, 200B, and 200C form a core sequence for the graduate program. For the fourth course, students have the option of taking Critical Theory 201 or an approved course from their own department.

Graduate Adviser. Consult Critical Theory Program office.

Courses in Critical Theory (CRI)

Upper Division Courses

101. Introduction to Critical Theoretical Approaches to Literature and Culture (4)
Lecture/discussion—3 hours; paper. Prerequisite: course 23. This course provides theoretical emphasis for students already preparing for the Ph.D. in one of 13 participating departments. Introduction to critical theory and its use for interpreting literary texts, film, and media forms in our present global culture. (Same course as Comparative Literature 141.) GE credit: ArtHum, Wrt.

Graduate Courses

200A. Approaches to Critical Theory (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing in a participating department. The purpose of the seminar is to introduce students to various theoretical approaches to literary criticism (e.g., semiotics, hermeneutics, and postmodern theory). The course is designed for graduate students already preparing for the Ph.D. in one of the participating departments. Prerequisite: course 23. GE credit: ArtHum, Wrt.

200B. Problems in Critical Theory (4)
Seminar—3 hours; term paper. Prerequisite: Graduate standing in a participating department. The course is designed for graduate students already preparing for the Ph.D. in one of the participating departments. Prerequisite: course 23. GE credit: ArtHum, Wrt.

200C. History of Critical Theory (4)
Seminar—3 hours; term paper. Prerequisite: Graduate standing in a participating department. The course is designed for graduate students already preparing for the Ph.D. in one of the participating departments. Prerequisite: course 23. GE credit: ArtHum, Wrt.

201. Critical Theory Special Topics (4)
Seminar—3 hours; term paper. Prerequisite: course 200A. Application of theoretical principles to one specific research topic. May be repeated for credit with consent of instructor when topic differs. I, II, III.

202. Visual Culture (4)
Lecture/discussion—4 hours. Prerequisite: course 200A strongly recommended. Analysis of image production in the contemporary world (photography, film, television, advertising, etc.) and their effects on individual subjectivities and collective social identities. II, III.

298. Directed Group Study (1-5)
299. Individual Study (1-12)
(S/U grading only.)

Crop Science and Management

(College of Agricultural and Environmental Sciences) Faculty. See under Plant Sciences, on page 419.

Related Major Programs. The major relies on courses taught in conjunction with numerous other major programs, particularly Plant Biology, Plant Sciences, and Agricultural and Resource Economics.

The Major Program

The Crop Science and Management major trains students in biological and natural sciences and economics as they apply to the production, protection, and maintenance of crop plants, and their quality following harvest.

The Program. Students majoring in crop science and management spend the first two years of study developing the scientific and general background necessary for upper division work. In the upper division, students take courses in areas supportive of crop science and farm management, such as entomology, weed science, water and soil science, plant pathology, nematology, plant physiology and agricultural economics. Students may specialize by electing courses pertinent to specific crop types (vegetables, fruits and nuts, small grains, or nursery crops).

Internships and Career Alternatives. This program prepares graduates for careers in farm management and various other technical and management positions in agricultural business and associated enterprises, such as banking and equipment and supply companies, as well as private, state and federal service in consulting and research. Graduates are also qualified to pursue graduate studies in sciences such as plant biology, horticulture, agronomy, agroecology, pest management, economics or business management. Internships are available in local companies involved in farm production and in extension work with farm advisers.

B.S. Major Requirements:

English Composition Requirement 8

See College requirement.

Preparatory Subject Matter 60-62

B.S. Major Requirements:

Biological Sciences 1A, 1B, 1C 15
Chemistry 2A, 2B, 8A, 8B 16
Mathematics 1A, 1B 6
Physics 1A-1B or 7A-7B 6-8
Plant Sciences 101, 105, 107, 112, 118 16
Economics 1A, 1B 8
Plant Sciences 120, Statistics 13 or 102 4
Applied Biological Systems Technology 49 2

Breadth/General Education 24

See General Education requirement and consult your adviser.

Depth Subject Matter 57-60

Crop and Soil Science Component 22-24

Lecture/discussion—3 hours; term paper. Prerequisite: course 23. Application of theoretical principles to one specific research topic. May be repeated for credit with consent of instructor when topic differs. I, II, III.

202. Visual Culture (4)
Lecture/discussion—4 hours. Prerequisite: course 200A strongly recommended. Analysis of image production in the contemporary world (photography, film, television, advertising, etc.) and their effects on individual subjectivities and collective social identities. II, III.

In consultation with adviser select a minimum of 8 additional units from Plant Sciences 110, 110B, 110C, 110L, Environmental Horticulture 125, Plant Biology 173, 174, Viticulture and Enology 115

Past Management Component 16

Entomology 110, Nematology 100, Plant Biology 176, Plant Pathology 120

Economics and Business Management Component 19-20

Agricultural and Resource Economics 100A, 130, 112 or 140 12-13

In consultation with adviser select a minimum of 7 additional units from Agricultural and Resource Economics 100B, 112, 113, 120, 136, 145, 147M, 150 or 157, International Agricultural Development 110, 111

Restrictive Electives 14-19

(Internship and Spanish Recommended)

Total Units for the Major 180

Major Adviser. T. DeJong (Plant Sciences)

Advising Center for the major is located in 1220A Plant and Environmental Sciences (530) 752-1717.

Related Courses. See Agricultural and Resource Economics, Environmental Horticulture, Plant Biology, Plant Pathology, Plant Sciences, and Viticulture and Enology.

Cultural Studies (A Graduate Group)

Caren Kaplan, Ph.D., Director of the Group
Group Office. 3337 Hart Hall
(530) 754-7683; http://culturalstudies.ucdavis.edu

Committee in Charge
Carolyn de la Peña, Ph.D
(American Studies, Technocultural Studies)
Laura Grindstaff, Ph.D. (Sociology)
Robert Irwin, Ph.D. (Spanish and Classics)
Susan Kaiser, Ph.D. (Textiles and Clothing, Women and Gender Studies)

Caren Kaplan, Ph.D. (Women and Gender Studies)
Anna Kuhn, Ph.D. (Women and Gender Studies)
Catherine Kudlick, Ph.D. (History)
Anna K. Kuhn, Ph.D. (Women and Gender Studies)
Betina Ng'weno, Ph.D.
(African American and African Studies)
Juana Maria Rodriguez, Ph.D.
(Women and Gender Studies)
Evan Watkins, Ph.D. (English)

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences; Div=Social/Cultural Diversity; Wrt=Writing Experience
Affiliated Faculty
Moradewun Adejunmobi, Ph.D., Associate Professor (African American and African Studies)
David Blate, Ph.D., Professor (History, Jewish Studies)
Patrick Carroll, Ph.D., Assistant Professor (Sociology, Science and Technology Studies)
Angie ChangrRevisioni, Ph.D., Professor (Chicana/o Studies)
Elizabeth Constable, Ph.D., Assistant Professor (French and Italian, Critical Theory)
Allison Costello, Ph.D., Associate Professor (Religious Studies)
Mairosal de la Cadera, Ph.D., Associate Professor (Anthropology)
Sergio de la Mata, Ph.D., Assistant Professor (Chicana/o Studies)
Carolyn de la Peña, Ph.D., Associate Professor (American Studies, Technocultural Studies)
Gregory Dobbins, Ph.D., Assistant Professor (English)
Donald Danham, Ph.D., Professor (Anthropology)
Joseph Dumit, Ph.D., Associate Professor (Science and Technology Studies)
Frances Dyson, Ph.D., Associate Professor (Technocultural Studies)
Omnia El Shakry, Ph.D., Assistant Professor (History)
Gail Finney, Ph.D., Professor (Comparative Literature, German and Russian)
Jaimey Fisher, Ph.D., Assistant Professor (German and Russian)
Yvette Flores-Ortiz, Ph.D., Professor (Chicana/o Studies)
Elizabeth Freeman, Ph.D., Associate Professor (English)
Gayatri Gopinath, Ph.D., Assistant Professor (American Studies)
Ryken Grettatt, Ph.D., Associate Professor (Sociology)
Laura Grindstaff, Ph.D., Associate Professor (Sociology)
John R. Holaday, Ph.D., Professor (Sociology)
Bruce Haynes, Ph.D., Associate Professor (Sociology)
Wendy Ho, Ph.D., Associate Professor (Asian American Studies, Women and Gender Studies)
Lynette Hunter, Ph.D., Professor (Theatre and Dance)
Robert Irwin, Ph.D., Associate Professor (Spanish and Classics)
Kevin Johnson, J.D., Professor (School of Law)
Alessa Johns, Ph.D., Associate Professor (English)
Suad Joseph, Ph.D., Professor (Anthropology, Women and Gender Studies)
Douglas Kahn, Ph.D., Professor (Technocultural Studies, Art History)
Susan Kaiser, Ph.D., Professor (Textiles and Clothing, Women and Gender Studies)
Caren Kaplan, Ph.D., Associate Professor (Women and Gender Studies)
Richard Kim, Ph.D., Assistant Professor (Asian American Studies)
Elisabeth Krimmer, Ph.D., Assistant Professor (German and Russian)
Catherine Kudlick, Ph.D., Professor (History)
Anna K. Kuhn, Ph.D., Professor (Women and Gender Studies)
Benjamin Lawrance, Ph.D., Associate Professor (History)
Michael Lazzara, Ph.D., Assistant Professor (Spanish and Classics)
Sheldon Lu, Ph.D., Professor (Comparative Literature)
Dean MacCannel, Ph.D., Professor (Environmental Science and Policy)
Dianne MacLeod, Ph.D., Professor (Art Studio, Art History)
Sunaina Maira, Ph.D., Associate Professor (Anthropology)
Desiree Martin, Ph.D., Assistant Professor (English)
Jay Meichling, Ph.D., Professor (American Studies)
Luz Mena, Ph.D., Assistant Professor (Women and Gender Studies)
Colin Milburn, Ph.D., Assistant Professor (English)
Susette Min, Ph.D., Assistant Professor (American Studies)
Patricia Moran, Ph.D., Associate Professor (English)
Kimberly Netles, Ph.D., Assistant Professor (Women and Gender Studies)
Dermatology

See Medicine, School of, on page 345.

Design

(College of Letters and Science)

Patricia Harrison, M. Arch., Program Director

Program Office, 142 Walker Hall
(530) 752-6223; http://design.ucdavis.edu

Faculty

Susan Avila, M.F.A., Associate Professor
Glenda Drew, M.A., Assistant Professor
Patricia Harrison, M. Arch., Professor
Danh Nguyen, M.Arch., Assistant Professor
Kostas Papamichael, Ph.D., Professor
Victoria Z. Rivers, M.A.C.T., S.C.T., Professor
Ann Savageau, M.F.A., Associate Professor
Michael Sjominovitch, Ph.D., Professor
Kathryn Sylva, M.F.A., Associate Professor

Emeriti Faculty

Richard Bertaux, B.Arch., M.S., Professor Emeritus
Frances Butler, M.A., Professor Emeritus
Dolph Gotelli, M.A., Professor Emeritus

Gyorgy Laky, M.A., Research Professor Emerita
Helge B. Olsen, M.F.A., Professor Emeritus
Katherine W. Rossbach, M.A., Professor Emerita
Barbara Shawcroft, M.F.A., Professor Emerita
JoAnn C. Stabb, M.A., Senior Lecturer Emerita

Dolph Gotelli, M.A., Professor Emeritus
Emeriti Faculty
Kostas Papamichael, Ph.D., Professor
Danh Nguyen, M.Arch., Assistant Professor
Patricia Harrison, M.Arch., Professor
Faculty
(1) Lecture—1 hour. Prerequisite: graduate standing or consent of instructor. Designed to provide coherent identity and faculty student exchange. Opportunity to present papers, hear guest lecturers, and see faculty presentations, gather for organizational and administrative news, exchange information, and make announcements. May be repeated up to 12 units of credit. (S/U grading only)—I, II, III, (I, II, III)

199. Special Topics (4)

Lecture/discussion—4 hours. Prerequisite: graduate standing or consent of instructor. Special topics courses offered according to faculty and student interests and demands. May be repeated for credit with consent of adviser.—I, II, III, (I, II, III)

298. Group Research (1-5)

(S/U grading only)—I, II, III, (I, II, III)

299. Directed Research (1-5)

(S/U grading only)—I, II, III, (I, II, III)

299D. Dissertation Research (1-12)

Independent study—3-36 hours. Prerequisite: standing or consent of instructor. Special topics courses offered according to faculty and student interests and demands. May be repeated for credit with consent of adviser.—I, II, III, (I, II, III)

Professional Course

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)

Dermatology

See Medicine, School of, on page 345.

Design

A.B. Major Requirements:

UNITS

Interior Architecture emphasis:

Preparatory Subject Matter:.............. 26

Design 1, 14, 15, 16............. 14

Design 21................................. 4

Design 40A, 40B......................... 8

Depth Subject Matter:............. 44


Two courses from Design 121, 135A, 135B, 150A, 150B, 181A, 181B... 8

Design 144......................... 4

Two courses from AHI 168, 184, 188A, 188B... 8

Total Units for the Major:.............. 70

Textile and Clothing Design emphasis:

Preparatory Subject Matter:.............. 34

Design 1, 14, 15, 16............. 14

Three courses from 18, 23, 24, 77A, 77B... 12

Design 40A, 40B......................... 8

Depth Subject Matter:............. 40


Design 142A, 142B, 143.................. 12

Total Units for the Major:.............. 74

Visual Communication and Presentation emphasis:

(Select courses from one option)

Preparatory Subject Matter:.............. 24

Option 1-Graphic Design............. 26

Design 1, 14, 15, 16............. 14

Design 13................................. 4

Design 40A, 40B......................... 8

Option 2-Presentation Design............. 30

Design 1, 14, 15, 16............. 14

Design 18, 21......................... 8

Design 40A, 40B......................... 8

Depth Subject Matter:............. 44

Option 1-Graphic Design............. 26

Design 113, 115......................... 8

Design 152, 154, 153............. 12

One course from Design 156, 157, 158... 4

Two courses from one of the following sequences... 8

Design 156, 157, 158, 159
Design 134A, 134B, 134C
Design 150A, 150B
Design 160A, 160B
Select three courses from Design 142A, 142B, 143, 144, 145, 188A, 188B, 188C, 188D... 12

Total Units for the Major:.............. 70-74

Developmental Design emphasis:

Preparatory Subject Matter:.............. 24

Design 1, 14, 15, 16............. 14

Three courses from 13, 18, 21, 23, 24, 77A, 77B... 12

Design 40A, 40B............. 8

Depth Subject Matter:............. 40

Select seven upper division Design courses with advisor approval... 28

Select three courses from Design 142A, 142B, 143, 144, 145, AHI 110, 168, 184, 188A, 188B, 188C, 188D... 12

Total Units for the Major:.............. 74

Major Adviser. Information on the current Aca-
demic Advisers can be obtained by contacting the Undergraduate Staff Advisor at (530) 752-1165.

Graduate Study. The graduate program in Textile Arts and Costume Design leading to the Master of Fine Arts degree offers students opportunities for independent, creative, innovative interdisciplinary study combining design with anthropology, critical theory, consumer issues, art, engineering, the sci-
ences and industry. Faculty work closely with students to build individual programs based upon a student’s specialized goals and interests in textile and costume design. Study in new technologies and experimental approaches are encouraged. Areas of emphasis include constructed textiles (off loom and woven), surface design, computer-integrated textile design, and functional, ethnographic, and aesthetic costumes. The Textile and Costume Study Collection, which houses over 8,500 artifacts, is a valuable resource in enriching studies emphasizing multi-cul-
tural expression. For information about specific requirements, please contact the Advising Center at (530) 752-1165.

Graduate Adviser. Please contact Program at (530) 752-1165.

Courses in Design (DES)

Questions pertaining to the following courses should be directed to the instructor or to the Design Advis-
ing office in 152 Walker Hall (530) 752-1165. Scheduling of classes is subject to change; please

General Education (GE) credit: Arhum—Arts and Humanities, SciEng—Science and Engineering; SocSci—Social Sciences; Div—Social-Cultural Diversity; Wrt—Writing Experience
1. Design and Visual Culture (4)
Lecture—4 hours. Introduces design awareness; role of designer in contemporary culture; emphasis on visual literacy and perception, creative problem solving, and design vocabulary. GE credit: ArtHum. Wrt.—II, IV. (II, IV.) Olsen

2. History of Modern Design (4)
Lecture—4 hours. Prerequisite: course 1, course 24A or an equivalent through the 19th century, or consent of instructor. Priority given to Design majors. Social and stylistic history of design (crafts and industrial products, costume, architecture, landscape, visual communication) from the mid-nineteenth century to the present. Emphasis on design reform and the growth of modernism in Europe and America. Field trip required. GE credit: ArtHum. Wrt.—II, IV. (II, IV.) Olsen

3. Soft Product Development (4)
Studio—8 hours. Prerequisite: courses 14, 15 recommended. Basic theories and principles of soft product development from two-dimensional shapes to three-dimensional forms. Approaches include flat pattern, computer-aided design (CAD) of joining and building. Structural development of clothing in relation to bodies is emphasized.—II, IV. (II, IV.) Olsen

4. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

9. Upper Division Courses
100. Design, Creativity, and Fantasy (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 and upper division standing or consent of instructor. To explore and develop personal creativity and imagination utilizing fantasy as a methodology for design. Examples of fantasy as found in the designed environment. Use of fantasy as problem solving tool in design. GE credit: ArtHum. Wrt.—III, Gotelli

111. Visual Communication: Digital Imaging (4)
Studio—6 hours; studio—2 hours. Prerequisite: course 1, 13, 15, 16, and consent of instructor. Fundamentals of digital imaging for the field of design, combining theoretical perspectives with practical applications. Expansion of the use and meaning of the single photographic image. Focus on the use of collage techniques, image sequencing and the addition of text to alter the meaning of original photographs.—Syla

115. Letterforms and Typography (4)
Studio—6 hours; lecture—2 hours. Prerequisite: course 1, 14, 15, 16. Fundamentals of letterforms and typography. Characteristics of typefaces; metatting and composition of type. Principles of legibility, visual hierarchy, rules and blocks, grids, and images as they relate to typography will be discussed. Not available for credit to students having completed course 22.—II, III, IV. (II, III, IV.) Nguyen

121. Design Delineation (4)
Studio—8 hours. Prerequisite: consent of instructor: courses 14, 15, and 21. Exploration of the process of delineation, including principles of perspective drawing, rapid visualization techniques (the quick sketch), rendering, and graphic presentation methods.—III. (III.) Olsen

220. Textile Structures: Two- and Three-Dimensional Constructions (4)
Studio—8 hours. Prerequisite: course 1, 23 or 24, or consent of instructor. Priority given to students interested in advanced study related to fabric design and art practice. Students work with focus on small complex projects and focus on residential spaces. Basic methods of design conceptualization, development, and presentation. For Design majors only.—I, IV. Harrison

3. Photography for Designers (4)
Studio—6 hours; lecture—2 hours. Prerequisite: course 1, 14, 15. Photography for designers with emphasis on 35mm camera photography, black and white processes, and darkroom techniques. Brief introduction to digital photography. Role of photography within society. Critical analysis of photograph. Priority given to Design majors.—IV. (IV.) Syla

4. Design Drawing (2)
Studio—4 hours. Priority enrollment to Design majors. Students with a background in drawing or Advanced Placement Art Studio units are encouraged to submit for review to waive this course. Develop freehand drawing skills to graphically communicate ideas and form. Basic skills in objective observation and representation. Range of media used.—IV. (IV.) Syla

15. Design Media (4)
Lecture—2 hours; studio—4 hours. Priority given to Design majors. Understand color, composition and form as ways of communicating design concepts and content. Media and typography as tools for all design students: color theory and mixing, variety of materials and media, introduction to the camera.—I, IV. (IV.) Syla

16. Graphic Design and Computer Technology (4)
Studio—6 hours; lecture—1 hour. Prerequisite: course 1, 14, 15. Introduction to computers in design with emphasis on development of a general understanding of design, including theory, practice, and technology. Includes principles of color, visual organization, visual hierarchy, typogra- phy, image enhancement. Projects created on Macintosh computer system. Priority given to sophomores and junior Design students.—I, II, III, IV. (II, III, IV.) Syla

18. Three-Dimensional Design (4)
Studio—8 hours. Principles of three-dimensional design through creative experimentation in a variety of media. Exploration of structural, perceptual, and spatial properties of form.

21. Drafting and Perspective (4)
Studio—8 hours. Prerequisite: course in drawing recommended. Creation of three-dimensional designs on two-dimension paper. GE credit: SciEng. Wrt.—I, IV. (I, IV.) Olsen

23. Personal Adornment (4)
Studio—8 hours; field trip. Exploration of the human image altered through ornament and its relation to the human structure.—I.

24. Hand Constructed Textiles (4)
Studio—8 hours; two field trips. Prerequisite: courses 14, 15. Contemporary approach to textile techniques of construction such as netting, plaiting, knotting and basketry.—II. (I.) Laky

40A. History of Design: Ancient through Industrial Revolution (4)
Lecture—4 hours. Prerequisite: course 1. Priority to Design majors. A social and stylistic history of design (crafts and industrial products, costume, architecture, landscape, visual communication) up to the 19th century. Emphasis on changing methods of design and production in the 19th century. Field trip required. Not open for credit to students who have completed course 24A prior to fall 2002.—II. (II.) Laky

124. Textile Structures: Architectural Concepts (4)
Studio—8 hours. Prerequisite: course 1, 18, 23, 24, 100 or 126A or Art 5 or consent of instructor. Priority to Design majors. The art and science of hand building textile structures using flexible and semi-rigid materials related to traditional geometric forms and principles. Textile wall structures, textile architecture, construction and structure and three-dimensional form. Field trip required.—II. Laky

125. Structures in the Landscape (4)
Studio—8 hours. Prerequisite: course 18 or consent of instructor. Pass 1 restricted to Design and Landscape Architecture majors. Concepts and methods of built environments in symbiotic relationships with the scale of the landscape. Landscape design structures, using basic principles of design, are created by students. Use of recycled materials explored in detail.—II. (III.) Shawcroft

127. Critical Issues in Design and Art: Environmental Consciousness (4)
Lecture—2 hours; studio—4 hours. Prerequisite: course 1, Art 5 or Landscape Architecture 1 or consent of instructor. Analysis of responsible and sustainable design and art practice. Projects in visual and environmental arts addressing issues in renewable resources; working with nature, reusing/recycling, post-consumer products, reclamation, endangered sources, and new/alternative uses of products and materials. Required field trip.—II. (III.) Laky

131. Ethnographic Inspired Costume Design (4)
Studio—8 hours. Prerequisite: course 77A or consent of instructor; course 23 or 24 recommended. Priority given to Design and Textile and Clothing majors. Exploration of surface embellishments and structural techniques derived from historic and contemporary world cultures. Emphasis on unique qualities of handmade textiles/costumes and individual expression. Topics include mola and appliqué, piecing and quilting, beadwork, embroidery, and dimensional quilting. Offered in alternate years.—III. (III.) Rivers

132A. Loom-Constructed Textile Design (4)
Studio—8 hours. Foundation course in handwoven textile structure and design, emphasizing yarn identification, basic drafting, basic weaves and their derivatives explored in context of original color effects and yard combinations.—I. (I.) Shawcroft

132B. Loom-Constructed Textile Design (4)
Studio—8 hours. Prerequisite: course 132A. Intermediate level study of complex fabric structure with emphasis on pattern in relation to surface, dimension, and material.

132C. Computer-Aided Textile Design (4)
Studio—8 hours. Prerequisite: course 132B. Microcomputer applications to the structure, design, and weaving of fabrics, emphasizing advanced compositions, drafting, and plotting of multi-dimensional, ornamental weave designs.—I, IV. (I, IV.) Harrison

134A. Introduction to Interior Design—Residential (4)
Lecture/discussion—2 hours; studio—5 hours. Prerequisite: course 1, 14, 15, 16, and 21. Introduction to the theory and practice of interior design with focus on residential spaces. Basic methods of design conceptualization, development, and presentation. For Design majors only.—I, IV. Harrison

134B. Introduction to Interior Design—Commercial and Technical Spaces (4)
Studio—5 hours; lecture/discussion—2 hours. Prerequisite: course 1, 14, 15, 16, 21. 134A. Introduction to the theory and practice of interior design with focus on small commercial and technical spaces. Archetypal spaces, non-residential building systems, ADA accessibility, design programming and research methods. Priority to Design majors.—II, IV. (II, IV.) Harrison

135A. Furniture Design (4)
Studio—8 hours. Prerequisite: course 21; course 134A recommended. Development of designs for contemporary furniture. Consideration of behav-
ioral and physical requirements, cultural and historic expression, and structural and aesthetic qualities. Process includes research, drawing, and construction of scale models. Required field trip.—II. (II.) Olsen

135B. Furniture Design (4)
Study of furniture. Prerequisite: course 125A or consent of instructor. History and construction of full size prototype furniture based on preliminary work completed in course 135A. Material technology, construction methods, and finishes discussed. Process includes development of shop drawings and furniture construction. Required field trip.—III. (III.)

138. Materials and Methods in Interior Design (4)
Lecture, discussion.—2 hours; project—1 hour. Prerequisite: course 1, 14, 15, and 21. Introduction to the finish materials used for interior design with special emphasis on sustainable and recyclable products. Performance factors, relative costs and energy impacts, installation conditions and construction details, and design potential for a full range of interior materials. Two field trips required. Offered in alternate years.—I. (II.) Harrison

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 methodology in eastern hemisphere textiles. Emphasis on Japan, China, Indonesia, Oceania, Southern and Central Asia, Africa. GE credit: ArtHum, Div. Rivers

142B. World Textiles: Western Hemisphere (4)
Lecture—4 hours. Prerequisite: course 1, Art History 1A, 1B, or 1C recommended. Social context, aesthetics, stylistic developments and methods significant in western hemisphere textiles. Emphasis on the Middle East, Europe, and the Americas up to contemporary times. Two required field trips. GE credit: ArtHum, Div. Rivers

143. History of Costume Design (4)
Lecture—4 hours. Prerequisite: Art History 1A or the equivalent; background in art or design history recommended. History of costume design from the earliest times to the present with emphasis on both aesthetic and functional aspects. Required field trip. GE credit: ArtHum, Wrt.—II. (II.)

144. History of Interior Design (4)
Lecture—4 hours. Prerequisite: course 40A or 40B; Art History 1C recommended. Priority to Design majors. History of interior design in Europe and America from the classical period to modern times. Emphasis on the dwelling in its cultural setting and exploration of sections. Letter grading by contract. Field trips required.—Rivers

145. History of Visual Communication (4)
Lecture—4 hours. Prerequisite: Art History 1A, 1B, or 1C; course 1; course 40 recommended. Priority to Design majors. Historical developments of visual communication, concentrating on the technological and aesthetic development of graphic design; origins and manifestations of current issues in visual communication. One all-day field trip required. GE credit: ArtHum, Wrt.—III. (III.)

150A. Computer-Assisted Drawing for Designers (4)
Lecture—2 hours; studio—4 hours. Prerequisite: course 21 or consent of instructor. Priority to Design majors. Computer assisted drawing and modeling using a mid-level, multi-use CAD program. Basic architectural drafting and modeling techniques in both two-dimensional and three-dimensional CAD environments. Not open for credit to students who have completed course 150.—I, II, IV. (I, II, IV.) Xiques

150B. Computer-Assisted Presentations for Interior Architecture (4)
Lecture—2 hours; studio—4 hours. Prerequisite: course 16 and 150A or consent of instructor. Priority to Design majors. Computer-assisted architectural presentation including the development of complex 3D models, textural rendering, and computer simulation of movement through architectural and interior space.—III. (III.) Xiques

152. Visual Communication: Graphic Design Production (4)
Studio—6 hours. Prerequisite: course 22 or consent of instructor. Priority given to Design majors. Symbolism and representation as essential to the development of effective logos and identity systems. The need to incorporate these design strategies within the context of computer-generated prepress limitations. Not open for credit to students who have completed course 152A.—I. (I.) Xiques

153. Visual Communication: Internet and Interiors (we Design (4)
Studio.—8 hours. Prerequisite: course 22 or consent of instructor; course 152B highly recommended. Priority given to Design majors. Introduction to computer-based interactive World Wide Web, Intranet systems, CD-ROM, or kiosks. Emphasis in development of strategies for content development; visual cohesiveness between content and interface design; and graphic and non-photorealistic techniques using Macintosh platform.—II, IV. (II, IV.)

154. Visual Communication: Message Campaign Design (4)
Studio.—6 hours; lecture—2 hours. Prerequisite: courses 113, 115, 117. Priority given to Design majors. Principles and application of visual design strategies for advertising. Emphasis on promotion of design for social change. Creation of public visual-media campaign. Not open for credit to students who have completed course 152B.—II, III, IV. (II, III, IV.) Xiques

156A. Visual Presentation: Exhibition Design (4)
Studio.—8 hours. Prerequisite: course 14, 15, or consent of instructor. Priority to Design majors. Design and placement of objects in spatial relationships that enhance non-verbal communication. Three-dimensional design in the museum and gallery environment. Not open for credit to students who have completed course 126A. Field trips required.—II. (II.) Gotelli

156B. Visual Presentation: Visual Merchandising (4)
Studio.—8 hours. Prerequisite: course 14 and 15 or consent of instructor. Priority to Design majors. Design and placement of objects in spatial relationships that enhance communication. Three-dimensional design as visual merchandising. Not open for credit to students who have completed course 126A. Field trips required.—IV. (IV.) Gotelli

156C. Visual Presentation: Installation and Design (4)
Studio.—8 hours. Prerequisite: course 156A and 156B or consent of instructor. Advanced principles and practice of visual communication of ideas through non-verbal presentation. The study of three-dimensional objects in a spatial context with an emphasis on self-expression and alternative exhibition spaces. Not open for credit to students who have completed course 126C. Field trips required.—II. (II.) Xiques

160A. Textile Design: Patterns and Resists (4)
Studio.—8 hours. Prerequisite: courses 1, 14, 15, and 77A. Exploration of traditional and contemporary processes to create images and patterns on fabric using disperse, fiber-reactive, vat, acid dyes, and textile pigments. Emphasis on individual exploration and interpretation of processes and techniques.—Rivers

160B. Textile Design: Screen Printing and Advanced Techniques (4)
Studio—8 hours. Prerequisite: course 160A. Study of printing on fabrics, textile design and soft-product development, and integration of hand-produced and digitally generated imagery on cloth. Field trip required.—Rivers

170A. Fashion Design: Unique Expression (4)
Studio—8 hours. Prerequisite: course 1, 14, 15, and 77B or consent of instructor. Exploration of fashion design as an expression of contemporary and projected individual image. Emphasis on developing two-dimensional conceptualizations of ideas and translating them into one-of-a-kind garments utilizing new fabric technologies and architectural forms. Field trip required.

170B. Apparel Design (4)
Studio—8 hours. Prerequisite: courses 77B, 170A. Exploration of apparel design processes for industry within the social and physical context. Emphasis on two-dimensional conceptualization of ideas utilizing commercial textiles for ready-to-wear. Field trips required.—II. (II.)

177. Computer-Assisted Apparel Design (4)
Studio—8 hours. Prerequisite: courses 16, 77A, 77B, 160A, 170A, 170B. Advanced exploration of apparel design processes for industry with emphasis on computer-assisted design applications. Field trip required.

180A. Advanced Interior Architecture (4)
Studio—8 hours. Prerequisite: course 134C and senior standing. Advanced problems in interior architectural design emphasizing re-use of existing buildings. Focus is on commercial and retail environments, code requirements, color and lighting. Field trips required.—II. (II.)

190. Proseminar (1)
Seminar.—1 hour. Prerequisite: design major or consent of instructor. Philosophies of design explored through discussion and presentation of research results. May be repeated three times for credit. (P/NP grading only.)

191A-D. Workshops in Design (4-12)
Seminar—1 hour; studio or field experience—3 hours per unit (units determined by student and instructor). Field trip. Prerequisite: course 14, 15; upper division standing and consent of instructor. Faculty initiated workshops featuring advanced studies and applications of original work in Design: (A) Costume; (B) Environment; (C) Graphics; (D) Textiles. Credit limited to 12 units in one section or a combination of sections. Letter grading by contract. Field trips included.

192. Internship (1-6)
Internship—3-18 hours. Prerequisite: completion of 84 units and consent of instructor. Supervised internship, off and on campus, in areas of design including environmental, costume, textile, museum, display and interior design. Enrollment limited to 3 units per quarter or 6 units per iv session. (P/NP grading only.)

197T. Tutoring in Design (1-5)
Discussion.—3-15 hours. Prerequisite: upper division standing and consent of instructor. Leading of small discussion groups or studio meetings affiliated with one of the department’s regular courses. (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 of Advanced Undergraduates (1-5)
(P/NP grading only.)
Graduate Courses

221. Experimental Approaches to Textile and Costume Design Media and Methods (4)
Lecture/discussion—2 hours; seminar—1 hour; term paper. Prerequisite: graduate standing in Textile Arts and Costume Design or consent of instructor. Covers perspectives on theoretical and aesthetic issues such as methodology in historical, contemporary and ethnographic fiber/fabric media. Students apply theories to their creative explorations for presentation and discussion.

222. Seminar in Costume and Textile Design Criticism (4)
Seminar—3 hours, independent study. Prerequisite: course 221, graduate standing in Textile Arts and Costume Design or consent of instructor. Criticism and communication in relation to creative work in textile arts and costume design through seminar, readings, field trips and discussion. May be repeated twice for credit. —I.

224. Seminar in Textile and Costume Design Research (4)
Lecture—4 hours; discussion—1 hour. Prerequisite: course 222, to be taken concurrently with course 142A (fall), 142B (spring) or 143 (winter) with separate discussion section; graduate standing in Textile Arts and Costume Design or consent of instructor. Required of first-year students. Students utilize existing historical and ethnographic materials as points of departure for creative work through research and examination of textile/costume specimens with oral and written presentation of findings. May be repeated for credit. —III. [I] Rivers

290. Seminar in Design (4)
Seminar—4 hours. Prerequisite: graduate standing or consent of instructor. Selected topics in design methodology, research, communication, and education. May be repeated for credit. —II. [II.]

292. Practicum in Textile Arts/Costume Design (1-12)
Prerequisite: graduate standing in Textile Arts and Costume 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. (S/U grading only.)

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. May be repeated for credit. (S/U grading only.)—II. [III.]

Professional Course

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.]

Dietetics

See Clinical Nutrition, on page 174.
Honors Program. Candidates for high or highest honors in Chinese or Japanese must enroll in CHN 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 135 units with a minimum GPA of 3.500 in courses counted toward the major. Interested students should consult with faculty in their field of interest in their junior year and undertake their project during the first two quarters of their senior year. Other arrangements must be authorized in advance by the department chair.

Students with 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, see the department's undergraduate adviser and the Education Abroad Program 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. All students must follow departmental 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 the level of those expected in its prerequisite courses. Accordingly, students who have completed a language course cannot go back and take a lower level course. If the prerequisite courses are required for the major, students may substitute other 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 language 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 Courses

1. Elementary Chinese (5)
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 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. (Former course 7.)—II. (II.)

1A. Accelerated Intensive Elementary Chinese (15)
Lecture/discussion—15 hours. Prerequisite: placement exam. Special 12 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. Not open for credit to students who have completed course 1, 2, or 3.—I-II

1BL. Accelerated Written Chinese I (5)
Lecture—5 hours. Prerequisite: ability to speak and understand oral Chinese. Mandarin or dialect. Designed to accelerate the progress of students who already know spoken Mandarin or a dialect but cannot read or write Chinese characters. Not open for credit to students who have completed course 8. (Former course 8.)—II. (II.)

1CN. Mandarin for Cantonese Speakers I (5)
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 courses 10.)—II. (II.)

2. Elementary Chinese (5)
Lecture/discussion—5 hours. Prerequisite: course 1. Continuation of course 1 in the areas of grammar and basic language skills. —II. (II.)

2BL. Accelerated Written Chinese II (5)
Lecture—5 hours. Prerequisite: course 1BL. Continuation of course 1BL. Designed to accelerate the progress of students who already know spoken Mandarin or a dialect but cannot read or write Chinese characters. Not open for credit to students who have completed course 18. (Former course 18.)—II. (II.)

2CN. Mandarin for Cantonese Speakers II (5)
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 (5)
Lecture/discussion—5 hours. Prerequisite: course 2. Continuation of course 2. Introduction to reading and written grammar style and continuing practice of all language skills. —III. (III.)

3BL. Accelerated Written Chinese III (5)
Lecture—5 hours. Prerequisite: course 2BL. Advanced written styles and syntax in Chinese. Students completing this course proceed to course 111, which starts the third-year Chinese, to or some other appropriate upper-division course. Not open for credit to students who have completed course 28. (Former course 28.)—III. (III.)

3CN. Mandarin for Cantonese Speakers III (5)
Lecture—5 hours. Prerequisite: course 2CN. Continuation of course 2CN. Preparations for students entering upper division courses in Chinese. Not open for credit to 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. —I. (I.)

5. Intermediate Chinese (5)
Lecture/discussion—5 hours. Prerequisite: course 4 or the equivalent. Intermediate-level training in spoken and written Chinese in cultural contexts, based on language skills developed in course 4. —II. (II.)

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. —III. (III.)

10. Modern Chinese Literature (in English) (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing; course in Chinese history recommended. English language survey of Chinese film, from its inception to the end of the twentieth century. Chinese films as important texts for understanding national, transnational, racial, gender, and class politics of modern China. GE credit: ArtHum, Div, Wrt.—II. (II.) Yeh

98. Directed Group Study (1-5)
(P/NP grading only)

99. Special Study for Undergraduates (1-5)
(P/NP grading only)

Upper Division Courses

101. Chinese Film (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: History 9A or any course on traditional Chinese, upper division standing. English language survey of Chinese film. Designed to convey a feeling for what China has experienced in the twentieth century. GE credit: ArtHum, Div, Wrt.—II. (II.) Chen

11. Great Books of China (in English) (4)
Lecture—3 hours; discussion—1 hour. Selected readings in English translation are supplemented with basic information on periods, authors and the interrelationships of culture, literature and social change. Methods of analysis are introduced and applied in class discussions. GE credit: ArtHum, Div, Wrt.—II. (II.) Halperin

50. Introduction to the Literature of China and Japan (3)
Lecture—3 hours. Methods of literary analysis and their application to major works from the various genres of Chinese and Japanese literature (in translation), including film. East Asian cultural traditions will also be introduced. (Same course as Japanese 50.) GE credit: ArtHum, Div, Wrt.—II. (II.) Yeh

81. Directed Group Study (1-5)
(P/NP grading only)


Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer, 2007-2008 offering in parentheses
107. Traditional Chinese Fiction (in English) (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 10 or a course in Chinese history. English-language course studying the dawn of Chinese fiction and its development down to modern times. Combines study of the two traditions, plus survey of the languages of Chinese literature such as The Story of the Stone and famous Ming-Qing short stories. GE credit: ArtHum, Div, Wrt.—II. (II.) Halperin

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, including a close study of selected works from the two traditions, with study of poetic forms, techniques, and distinct treatments of universal themes: love, nature, war, etc. Offered in alternate years. (Same course as Japanese 108) GE credit: ArtHum, Div, Wrt.—II. (II.) Yeh

109A-L. 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 literature may include: (A) crime and punishment; (B) love in poetry; (C) women writers; (D) the knight-errant; (E) the city in fiction; (F) the recluses; (G) the literature of twentieth-century Taiwan; (H) popular literature; (I) the scholar and the courtsman. Offered in alternate years. GE credit: ArtHum, Div, Wrt.—II. (II.) Chen, Halperin, Yeh

110. 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 methods 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, Wrt.—I. (I.) Chen, Halperin, Yeh

111. Modern Chinese: Reading and Discussion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 6 or the equivalent. Readings in modern Chinese newspaper articles, essays, and short stories, based on language skills developed in courses 1 through 6. —I. (I.)

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 language skills developed in course 111. —I. (I.)

113. Modern Chinese: Reading and Discussion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 112. Readings in modern Chinese newspaper articles, essays, and short stories, based on language skills developed in course 112. —II. (II.)

114. Introduction to Classical Chinese: Confucius (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 111. Readings from the Confucian canon are read with the assistance of prepared word glossaries so that while learning to read classical Chinese, the students also experience the most influential books in the history of China in their original texts. —I. (I.) Halperin

115. Introduction to Classical Chinese: Mencius (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 114. Continuation of course 114 by reading selections from the text of the Mencius. —II. (II.) Halperin

116. Introduction to Classical Chinese: Narrative Styles (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 115. Chinese course 115 by reading selections from the Records of the Grand Historian and other early, influential works. —III. (III.) Halperin

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, aural comprehension, and translation. May be repeated once for credit. —I. (I.)

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 once for credit when content varies. —II. (II.)

131. Readings in Traditional Chinese Poetry (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 6 or consent of instructor. Traditional Chinese poetry from its beginnings to the golden ages of Tang and Song, surveying forms and poets that best reveal the Chinese poetic sensibility and the genius of the language of Chinese poetry. —I. (I.) Yeh

132. Readings in Modern Chinese Poetry (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 6 or consent of instructor. Contemporary Chinese poetry from the Revolutionary modernization of 1917 to the present, surveying works that embody exciting innovations and reflect the modernity of twentieth-century Chinese society and culture. —I. (I.)

140. Readings in Classical Chinese (4)
Lecture/discussion—3 hours; term paper. Prerequisite: consent of instructor. Study and philosophical analysis of selected texts from the first millennium of Imperial China. May be repeated twice for credit. —I. (I.), II. (II.), III. (III.)

160. The 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 grammar of modern standard Chinese, dialectal variation, and sociolinguistic factors. —III. (III.) Chu

192. Chinese Internship (1-12)
Internship—3.36-36 hours to be arranged. Prerequisite: upper division standing and consent of instructor. Work experience in the Chinese language, with analytical term paper on a topic approved by instructor. (P/NP grading only.)

197T. Tutoring in Chinese (1-5)
Tutoring/discussion—20 hours. Prerequisite: consent to Chinese 1 or the equivalent. Intermediate-level training in spoken and written Chinese, as well as cultural experience in Japanese society; principles of language use in Japanese society. Speech levels and honorific language in Japanese society. Not open for credit to students who have taken course 1, 2, 3, or 6. —III. (III.)

192. Chinese Internship (1-12)
Internship—3.36-36 hours to be arranged. Prerequisite: upper division standing and consent of instructor. Work experience in the Chinese language, with analytical term paper on a topic approved by instructor. (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.)

299. Research (1-12)
(S/U grading only.)

Courses in Japanese (JPN)

1. Elementary Japanese (5)
Lecture/discussion—5 hours. Introduction to spoken and written Japanese in cultural contexts, with emphasis on communication. (Students who have successfully completed courses 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.)—I. (I.)

1A. Accelerated Intensive Elementary Japanese (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 Japanese grammar and development of all language skills in a cultural context with emphasis on communication. Not open for credit to students who have completed course 1, 2, or 3.

1AS. Intensive Elementary Japanese (15)
Lecture/discussion—15 hours. Intensive course taught combining the work of courses 1, 2, and 3. Introduction to Japanese grammar and development of all language skills in a cultural context with emphasis on communication. Offered in Japan. Not open for credit to students who have taken course 1, 2, 3, or IV. (IV.)

2. Elementary Japanese (5)
Lecture/discussion—5 hours. Prerequisite: course 1 or the equivalent. Combination of training in basic spoken and written skills.—II. (II.)

3. Elementary Japanese (5)
Lecture/discussion—5 hours. Prerequisite: course 2 or the equivalent. Combination of training in basic spoken and written skills.—III. (III.)

4. Intermediate Japanese (5)
Lecture/discussion—5 hours. Prerequisite: course 3 or the equivalent. Intermediate-level training in spoken and written Japanese in cultural context, based on language skills developed in course 3.—I. (I.)

5. Intermediate Japanese (5)
Lecture/discussion—5 hours. Prerequisite: course 4 or the equivalent. Intermediate-level training in spoken and written Japanese in cultural context, based on language skills developed in course 4.—II. (II.)

6. Intermediate Japanese (5)
Lecture/discussion—5 hours. Prerequisite: successful completion (C– or better) 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.—III. (III.)

75. Intensive Intermediate Japanese (20)
Lecture/discussion—20 hours. Prerequisite: course 2. 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 Japan. Not open for students who have taken course 3, 4, 5, or 6.—III. (III.)

10. Masterworks of Japanese Literature (in English) (4)
Lecture—3 hours; discussion—1 hour. An introduction to Japanese literature: readings and discussion in English of important works from earliest times to the present. GE credit: ArtHum, SciEng, Wrt.—III. (III.)

155. Introduction to Japanese Culture (2)
Lecture/discussion—1.5 hours; term paper. Aspects of Japanese culture: literature, history, religion, art, language, and society. Conducted in English; taught in Japan.

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. Conducted in alternate years.—I. (I.) Smith

50. Introduction to the Literature of China and Japan (3)
Lecture—3 hours. Methods of literary analysis and their application to major works from the various genres of Chinese and Japanese literature (in translation), including film. East Asian cultural traditions will also be introduced. (Some course as Chinese 50.) GE credit: ArtHum, Div, Wrt.—II. (II.) Borgen

98. Directed Group Study (1-5)
(P/NP grading only.)

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum—Arts and Humanities; SciEng—Science and Engineering; SociSci—Social Sciences; Div—Social-Cultural Diversity; Wrt=Writing Experience
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 or more of either Chinese or Japanese language study, the student chooses additional courses focusing on a special field of interest, such as anthropology or history. Since six quarters of language work are required, students normally should apply to the East Asian Studies program no later than their sophomore year.

Programs, Internships, and Career Alternatives. One program of interest to East Asian Studies majors is the education abroad program, which gives students the opportunity to live and experience the culture of their focus country. At UC Davis, the International and Cultural Study Center helps students obtain legislative, legal, and business internships. Additionally, the UC Davis Washington Center arranges legislative, legal, and business internships. East Asian Studies graduates are prepared for employment in government agencies (such as Foreign Service), state agencies, international or non-governmental (such as United Nations), foundations, journalism, teaching, counseling, and companies having an interest in international business, trade, finance. The stringent language requirement of the major program enhances career prospects in jobs that demand knowledge of language and culture of the focus country.

A.B. Major Requirements:

UNITS

Preparatory Subject Matter .................. 41-42
History 9A and 9B ................................ 8
One course from ArtHum 1D, Chinese 10, 11, Comparative Literature 53A, Japanese 10, 25, Religious Studies 70, 75 .......... 3-4
Two years (or the equivalent) of Chinese or Japanese language (Chinese 1-2-3-4-5-6; Japanese 1-2-3-4-5-6) ....................... 30

Depth Subject Matter ....................... 36
Must include at least 8 units of core courses from each of the following three categories.


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, 132; 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, 160, 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 (or other appropriate courses, including individual and group study courses 190-199, as approved by the Committee in charge).

Total Units for the Major ................... 77-78

Recommended

Students are strongly urged to take a substantial number of courses in Euro-American civilization as a basis for comparison for a deeper understanding of America’s relations with East Asia.

Minor Adviser. B. Bossler (History)

Minor Program Requirements:

Courses taken for the minor are expected to reflect a predominant interest in either China or Japan, but also to provide some exposure to the other of the two countries. All courses counting towards the East Asian Studies major, including individual and group study courses (198, 199), may be used to fulfill the requirements for the minor program, as long as they deal predominantly with China, Japan, or both.

East Asian Studies .................. 22

History 98 and 198 upper division units, of which at least 12 must be in courses focusing on China; OR History 99A and 198 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
149B. 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
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
1958. 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 Courses

88. Korean Society: Late 19th Century to the Present

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: ArtHum, Div, Wrt. — II. Kim

Upper Division Courses

113. Cinema and Society in China (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: one course from History 190C, 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: ArtHum, Div, Wrt. — III. (I.)

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. Not offered every year.

192. East Asian Studies Internship (1-12)

Internship—3-36 hours, term paper. Prerequisite: upper division standing or 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.

194A. 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 (4-4)

Seminar—2 hours; conference—2 hours. Prerequisite: GPA of 3.500 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.

Ecology (A Graduate Group)

M.W. Schwartz, Ph.D., Chairperson of the Group

Group Office. 2148 Wickson Hall
Meadows Hall (530) 752-6752; http://ecology.ucdavis.edu

Faculty

Daniel W. Anderson, Ph.D., Professor (Wildlife, Fish, and Conservation Biology)
Michael G. Barbou, Ph.D., Professor (Plant Sciences)
Alison Berry, Ph.D., Professor (Plant Sciences)
Robert L. Bettinger, Ph.D., Professor (Anthropology)
The Graduate Group in Ecology offers the M.S. and Ph.D. degrees in several areas of specialization within the spectrum of ecology. The Ecology program is one of the most diverse on the Davis campus. In order to accommodate varied student interests, the Group depends on close consultation between students and faculty for program development. Several curricular plans are now available in the following areas of emphasis: agricultural ecology, conservation ecology, ecosystems and landscape ecology, ecological policy analysis, human ecology, integrative ecology, marine ecology, physiological ecology, and restoration ecology. For further details, contact the Group office.

Preparation. Appropriate preparation is under-graduate work in any of the biological, social or behavioral, and physical sciences, mathematics or engineering. Applicants will normally be expected to have completed two courses each in introductory biology and general chemistry and physical science; one course each in calculus, an upper division ecology course and introductory statistics, are also required. Applicants in the human ecology area may substitute quantitative social science courses for at least two courses of chemistry. Each of the three broad areas requires certain advanced preparation appropriate to the option. Details can be found in the Group web page.

Graduate Advisers. M.W. Schwartz, C. Toft

Wesley W. Weathers, Ph.D., Professor
Avian Sciences
Susan L. Williams, Ph.D., Professor
(Evolution and Ecology
Bruce Winterhalder, Ph.D. Professor (Anthropology)
Rosemarie B. (Nematology)
J. Heinrich Lienhard, Ph.D., Professor
(Environmental Toxicology
Mark Van Kessel, Ph.D., Professor (Plant Sciences)
Dirk Van Vuren, Ph.D., Professor (Wildlife, Fish, and Conservation Biology)
Peter C. Wainwright, Ph.D., Professor
(Genetics; Plant Sciences)
Courses in Ecology (ECL)

Graduate Courses

200A. Principles and Application of Ecological Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: first course in ecology; Statistics 102; Mathematics 16A, 16B. Critical evaluation of ecological literature and applications to ecological management. Historical development of ecological theory is emphasized. Critical evaluation of ecological principles pertaining to the structure and dynamics of ecosystems, their organization and evolution. —I. [II] Holyoak

200B. Principles and Application of Ecological Theory
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200A. Continuation of course 200A. Critical evaluation of theory and application in the areas of ecological adaptation and system plasticity, spatial and temporal scales, ecosystem energetics, and system dynamics. Synthesis of ecological theory into testable principles. —II. [II] Strong

201. Ecosystems and Landscape Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200A. Emphasis on integration of landscape and ecosystem principles (structure, energy, nutrient flow, species diversity, landscape heterogeneity, change and stability), building on ecological principles and theory. Introduction to analysis tools (remote sensing, geographic information systems, modeling) applied to landscape systems. Offered in alternate years. —III. Wainwright, Cech

202. 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 invertebrate taxa focusing on fundamental physiological mechanisms that shape the ecology of each animal group. Offered in alternate years. —III. Wainwright, Cech

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 226 recommended. Review of major concepts of population ecology and community ecology, with emphasis on the rationale of theory and use of theory in the management of natural and managed systems. Offered in alternate years.

205. Community Ecology (4)
Lecture—2 hours; discussion—2 hours. Prerequisite: Environmental Studies 100, Evolution and Ecology 101, or Plant Biology 117. Introduction to current literature and contemporary research into processes structuring ecological communities. —II. 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; measurements and analysis of vegetation; association analysis, ordination, processes and mechanisms of succession, and classification. Most techniques are demonstrated or conducted during field trips and laboratories. —I. [I] Rejmanek, Barbour

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, Entomology 104 or Plant Biology 117), and advanced undergraduate course in genetics and/or evolution (e.g., Biological Sciences 101 or Evolution and Ecology 100) to 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 Population Biology 207.) Offered in alternate years. —III. Rice

208. Issues in Conservation Biology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one of Environmental Studies 100, Zoology 125, Botany 117, or Entomology 106. Graduate-level introduction to current research in conservation biology. Course will emphasize reading and discussing primary literature. Specific topics will reflect the research interests of UCD conservation biology faculty. —III. [III] Holyoak

210. Advanced Topics in Human Ecology (4)
Lecture—2 hours; discussion—2 hours. Prerequisite: graduate standing. Course stresses the commonalities that human ecologists have as social scientists who specialize in population and environmental variables. General epistemological issues and theoretical models are reviewed. Similarities and differences of human and biological ecology are examined. Offered in alternate years. —II. [II] Rice

211. Advanced Topics in Cultural Ecology (4)
Lecture/discussion—3 hours; term paper. Prerequisite: Environmental Science and Policy 133/Anthropology 133 and graduate standing in Ecology or Anthropology. Topics of current analytical and methodological importance in cultural ecology. Examination of general literature through study of human response to and influences on climate. (Same course as Anthropology 211.) Offered in alternate years. —II. Rice

212A. Environmental Policy Process (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course in public 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 106); 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. Development of 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 Environmental Science and Policy 212A.) —III. Sabatier

212B. Environmental Policy Evaluation (4)
Lecture—1 hour; discussion—1 hour; seminar—2 hours. Prerequisites: Environmental Economics (e.g., Economics 100); Statistics 108 or Agricultural and Resource Economics 106; policy analysis (e.g., Environmental Studies 168A or equivalent); (c) Anthropology 126, 131, Geography 142; (b) Environmental Studies 101, 133, Environmental Science and Policy 212A.)—III. Sabatier

213. Population, Environment, and Social Structure (4)
Seminar—3 hours; term paper. Prerequisite: at least one course in population or human ecology, or in environment and resources. Relationships among population dynamics, resource scarcity and environmental problems, and social structure, focus on demographic contexts. —III. Mathews, Veldhuis.

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, population or genetics, or consent of instructor; survey course in marine ecology recommended. Critical review and analysis of concepts and practices in modern marine ecology at the interface between biology, geology, oceanography, evolution, behavior, and physiology. Emphasis on critical thinking, problem solving, and hands-on study. Three field trips required. Offered in alternate years. —III. Rice

216. Ecology and Agriculture (3)
Lecture/discussion—3 hours. Prerequisite: Plant Biology 142 or consent of instructor. Ecological principles and relationships as applied to agriculture. Integration of ecological theories into agricultural development to develop environmentally sound management practices. Topics include crop autoecology, biotic interactions among crops and pests, and crop systems ecology. (Same course as Plant Sciences 216.) —I. [I] Jackson

217. Conservation and Sustainable Development in Third World Nations (4)
Lecture/discussion—3 hours; fieldwork—2 hours. Prerequisite: at least one course in 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 lands, extractive zones (fisheries, forests) and wilderness, with emphasis on conservation and sustainability. Comparison of industrial democracies and poorer nations. (Same course as International Agricultural Development 217.) Offered in alternate years. —II. Delcourt

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. Multidisciplinary 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. —III. Delcourt

220. Spatio-Temporal Ecology (2)
Lecture/discussion—2 hours. Prerequisite: Population Biology 200 or course 204 or Evolution Ecology 104 or Environmental Science and Policy 121 or consent of instructor. Spatio-temporal ecological theory focusing on population persistence and stability, predator-prey and host-parasitoid interactions, species coexistence and diversity maintenance, including effects of spatial variation, spatial and temporal scale, life-history traits and non-linear dynamics. Topics vary. (Same course as Population Biology 220.) May be repeated once for credit. [SU grading only]

222. Human Ecology of Agriculture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division course work in environmental sciences, cultural anthropology, economics, international agricultural development or sociology, or consent of instructor. Social and cultural factors relating to agricultural adaptation and evolution. Ethnobiological knowledge systems, rules and customs of resource allocation, impact of population growth, technological change, state and markets. Social and cultural contexts of biological diversity and agricultural resource conservation. —II. Karban

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 weeks 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 225/Population Biology 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 difference and ordinary differential equation models are studied, using stability analysis and qualitative meth-
Economics

Economics majors complete an introductory course sequence in economics, in addition to several courses in quantitative methods. Intermediate theory and economic history are taken on the upper division level and then students are free to concentrate the remainder of their units in various areas of interest, including more courses in economic theory or history, international economics, labor, industry, alternative economic systems, economic development, public finance, econometrics, or mathematical economics.

Internships and Career Alternatives. Internships for economics majors have been arranged at banks, brokerages, other business enterprises, and governmental units. The interns must complement the student's course work. A degree in economics is excellent preparation for students who want 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:

Preparatory Subject Matter............. 17-20
Economics 1A-1B......................... 8
Statistics 13, 32, or 102................ 3-4
Mathematics 22A or 22B................ 5-6

Depth Subject Matter.................. 44
Economics 100, 101........................ 8
Economics 102........................... 8
One course from Economics 110A, 110B, 111A, 111B................ 4
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 Mathematical Economics 21A-21B and 22A. The Economics Department suggests that Economics 100 and 101 be taken as soon as possible after the introductory courses.

Major Advisers. Contact Department office. Minor Program Requirements:

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, not more than three economics courses may be taken in any one 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 3.50 grade point average in those courses, and complete at least eight out of the nine upper division courses as a result of the submission of an Honors project. Consult the College 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 wish to complement their economics degree 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 EAP 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 Undergraduate requirements.

Courses in Economics (ECN)

Lower Division Courses

1A. Principles of Microeconomics (4)

Lecture—3 hours; discussion—1 hour. Course 1A and 1B may be taken in either order. Not open to students with credit for the foreign courses they wish to complete.

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 bank-
Economics

Prerequisite: consent of instructor. (P/NP grading 1-5)

99. Individual Study for Undergraduates
Prerequisite: consent of instructor. For primarily for lower division students. (P/NP grading only)

100. Intermediate Micro Theory
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A, 1B, Mathematics 16A-16B or 21A-21B, with grade of C- or better in each. The theory of supply and demand; price and distribution theory under conditions of perfect and imperfect competition. The behavior of the market, the demand and supply of goods and services, and the welfare economic analysis. GE credit: SocSci.

101. Intermediate Macro Theory
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A, 1B, Mathematics 16A-16B or 21A-21B, with grade of C- or better in each. The theory of income, employment and prices under static and dynamic conditions, and long-term growth. Only 2 units of credit allowed to students who have completed course 100 or consent of instructor. The theory of income, employment and prices under static and dynamic conditions, and long-term growth. Only 2 units of credit allowed to students who have completed course 100 or consent of instructor.

102. Analysis of Economic Data
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 100 or consent of instructor. The 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 100 or consent of instructor.

103. Economics of Uncertainty and Information
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or 104, Mathematics 16A and 16B, or 21A and 21B. Opportunities and uncertainty, expected utility theory, economics of insurance, information, signaling in the job market, incentives and Principal-Agent theory, optimal search strategies and the reservation price principle. GE credit: SocSci.

104. Intermediate Microeconomics
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A, 1B, Mathematics 16A or 16B. Price and distribution theory under conditions of perfect and imperfect competition. Not open for credit to students who have completed course 100 or 104. Economics of insurance, information, signaling in the job market, incentives and Principal-Agent theory, optimal search strategies and the reservation price principle. GE credit: SocSci.

105. Intermediate Macroeconomics
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or 104, Mathematics 16A or 16B. The study of interest rates, employment and prices, with policy implications. Not open for credit to students who have completed course 101. GE credit: SocSci.

106.—I, II, III. Cameron, Cascio, Miller

110A. World Economic History Before the Industrial Revolution
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A and 1B. Development and application of analytical models 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: SocSci.

110B. World Economic History Since the Industrial Revolution
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A, 1B, and 110A. Development and application of analytical models to explain the nature and functioning of economies since the Industrial Revolution. Examples will be drawn from a variety of societies, including England, China, Germany, and India. GE credit: SocSci.

111A. Economic History
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 present. GE credit: SocSci.

111B. Economic History
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 present. GE credit: SocSci.

115A. Economic Development
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A and 1B. Major issues encountered in emerging from international poverty, including problems of growth and structural change, human welfare, population growth and health, labor markets and international migration. Important issues of policy concerning international trade and industrialization. GE credit: SocSci.

115B. Economic Development
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A and 1B. Major issues encountered in emerging from international poverty, including problems of growth and structural change, human welfare, population growth and health, labor markets and international migration. Important issues of policy concerning international trade and industrialization. GE credit: SocSci.

116. Comparative Economic Systems
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or 104, Mathematics 16A and 16B, or 21A and 21B. Economic analysis of the relative virtues of capitalism and socialism, including welfare economics. Maxian exploitation theory, the socialist calculation debate (Hayek and Lange), alternative socialist systems (Japan, Germany, U.S.) and contemporary models of market socialism. GE credit: SocSci.

121A. Industrial Organization
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A, 1B, 100, or 104, 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.

121B. Industrial Organization
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1A, 1B, 100, or 104, or consent of instructor. The study of antitrust and economic regulation. Emphasis on applying theoretical models to U.S. industries and industries of the world, including telecommunication, electricity, and electricity markets. Topics include monopoly, oligopoly, and actual and potential competition, mergers, predatory pricing, and monopolization. GE credit: SocSci.

122. Theory of Games and Strategic Behavior
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or 104, or consent of instructor. Strategic analysis of games theory and applications. GE credit: SocSci.

130. Public Microeconomics
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or 104, or consent of instructor. Public expenditure theory and applications. Efficiency and equity of competitive markets; externalities, public goods, and market failure; positive and normative aspects of public policy for expenditure, including benefit-cost analysis. Topics include consumer protection, pollution, education, poverty and crime.

131. Public Finance
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or 104. Assisting the economic burden of taxation; equity and efficiency considerations in tax design; structure and economic effects of the U.S. tax system (including personal income tax, corporation income tax, and property taxes); government budgetary and tax holes; recent developments, tax reform proposals.

132. Health Economics
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.

133. Money, Banks and Financial Institutions
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A, 1B, and 100 or 104, Mathematics 16A, Statistics 13. General background and rationale of corporate finance; 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 117A may not receive credit for this course.

135. Money, Banks and Financial Institutions
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or 104. Monetary institutions, the banking system, money creation, the Federal Reserve System, and the tools of monetary policy.

136. Topics in Macroeconomic Theory
Lecture—3 hours; discussion—1 hour. Prerequisite: course 101 or 105. Advanced topics in macroeconomic theory. Possible topics include money demand, financial intermediation, rational expectations, growth theory. GE credit: SocSci.

137. Macroeconomic Policy
Lecture—3 hours; discussion—1 hour. Prerequisite: course 101 or 105. Theory and practice of macroeconomic policy, both monetary and fiscal.

140. Econometrics
Lecture—2 hours; discussion—2 hours. Prerequisite: course 100 or 104 and courses 1A or 105, Mathematics 16A or 16B or 21A and 21B, Statistics 13, course 102 or any upper division statistics course. Introduction of problems of observation, estimation and hypothesis testing in econometrics. Through the study of the theory and application of linear regression models, critical evaluation of selected examples of empirical research and exercises in applied econometrics. Not open for credit to students who have completed Agricultural and Resource Economics 101 or 104, Economics 122, or 122A, or 122B.
145. Transportation Economics (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, Mathematics 10A, 16B, Statistics 13 or consent of instructor. Intended for advanced economics undergraduates. Examination of fundamental problems of planning and financing transportation infrastructure (airports, ports).

151A. Economics of the Labor Market (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 100 or 104. Theory of labor supply and demand; determination of wages and employment in the labor market. Economic theories of labor unions. Policy for labor force participation by married women; minimum wages and youth unemployment; effect on unions on wages. —I, II, III, IV. Miller

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 wage differentials, including theories of discrimination; income distribution; poverty. Policy issues; negative income tax; manpower training programs; incomes policy. —I, II, III, IV. Page, Casio

160A. International Microeconomics (4) Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A, 1B, 104, and consent of instructor. International trade theory: impact of trade on the domestic and world economies; public policy toward international trade; only 2 units of credit allowed to students who have completed course 162. —I, II, III, IV. Swenson, Russ

160B. International Macroeconomics (4) Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A, 1B, 104, and courses 101 or 105, or consent of instructor. Macroeconomic theory of an open economy. Balance of payments adjustment mechanism, international monetary economics, international financial institutions and policies. Only 2 units of credit allowed to students who have completed course 162. —I, II, III, IV. Bergin, Woo

162. International Economic Relations (4) Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A, 1B, 104, and 105, or consent of instructor. International trade and monetary relations, trade policy, exchange rate policy, policies toward international capital flows, international investment. Emphasis on current policy issues. Course intended especially for non-majors. Not open for credit to students who have completed course 160A or 160B. GE credit: SocSci—II, III, IV. Taylor

171. Economy of East Asia (4) Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1A or 1B or consent of instructor. Intensive reading, discussion and research on selected topics from the economies of the countries of East Asia. Consult department for course scheduling. —I, II, III, IV. Russ

190. Topics in Economics (4) Lecture/discussion—Seminar —4 hours. Selected topics in economic theory and public policy. Variable content. May be repeated for credit. —I, II, III, IV. (II.)

190X. Upper Division Seminar (1-4) Seminar—1-4 hours. Prerequisite: courses 100 or 104, and 101 or 105; and consent of instructor. In-depth examination at an upper division level of a special topic in Economics. Emphasis on focused analytical work. May not be repeated for credit. Limited enrollment.

192W. Internship in the Davis-in-Washington Program (6-8) Internship—18-24 hours. Prerequisite: junior or senior standing in Economics; completion of 84 units of coursework with a grade point average of 3.00; admission to the Davis-in-Washington Program. Internship in Washington, DC with associated research project. Students must arrange for a faculty sponsor before embarking on the internship. Maximum of 3 units will count toward satisfying Economics major requirements. (P/NP grading only)

194HA-194HB. Special Study for Honors Students (4-5) Independent study—3 hours; seminar—1 hour. Prerequisite: major in Economics with senior standing; consent of instructor; 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 Courses

200A. Microeconomic Theory (5) Lecture—4 hours; discussion—1 hour. Prerequisite: graduate standing. Linear and non-linear optimization theory applied to develop the theory of the profit-maximizing firm and the utility-maximizing consumer. (Same course as Agricultural and Resource Economics 200A.) —I, II. Silvestre

200B. Microeconomic Theory (5) Lecture—4 hours; discussion—1 hour. Prerequisite: course 200A. Characteristics of market equilibrium under perfect competition, 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, III. Quinzii

200C. Microeconomic Theory (5) Lecture—4 hours; discussion—1 hour. Prerequisite: course 200A. Uncertainty and information economics. Individual decision making under uncertainty. Introduction to microeconomics, 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.) —I, II. Schipper

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. —II, III. Cogley

200E. Macroeconomic Theory (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 200B (may be taken concurrently) and 200D. Macrodynamics theory of income, employment, and prices. —III. Salerno

201A. History of Economic Thought (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—4 hours; discussion—2 hours. Prerequisite: course 200A, 200B. Advanced microeconomic theory on general equilibrium theory and welfare economics: existence, determinateness and efficiency; intertemporal economies; uncertainty. —II, III. Quinzii

203B. Advanced Economic Theory: Game Theory (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 200A, 200B, 200C. Covers the most recent developments in game theory, with the focus changing from year to year. Main topics are: refinements of Nash equilibrium, repeated games, evolution, social situations, bounded rationality, and bargaining theory. —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. —II, III. Nehring

207. Contemporary Economics Seminar (1-5) Seminar—1 hour. Prerequisite: graduate standing in Economics. Seminar series on topics of current interest. May be repeated for credit. (S/U grading only) —I, II, III, IV.

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, III, IV. Clark

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. —I, II, III, IV. Olmstead

210C. Economic History (4) Seminar—4 hours. Prerequisite: a graduate course in economic history. Selected topics and issues, emphasis on current research. (Quarter offered to be flexible.) —I, II, III, IV. Taylor

214. Development Economics (4) Lecture—4 hours. Prerequisite: Agricultural and Resource Economics 100B, 100C, 101, Agricultural and Resource Economics/Economics 204, and course 160A or 160B recommended. Review of the principal theoretical and empirical issues whose analysis has formed development economics. Analysis of economic development policies and development strategies and their application to specific policy issues in developing country contexts. (Same course as Agricultural and Resource Economics 214.) —II, III. Boucher

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 labor, land, credit and insurance markets, institutions, and contracts. (Same course as Agricultural and Resource Economics 215A.) —I, II, III, IV. Taylor

215B. Microdevelopment Theory and Methods II (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 debt are discussed in the microeconomic framework of an open developing country. The basic analytical focus is real exchange rate and its impact on sectoral allocation of resources. (Same course as Agricultural and Resource Economics 215B.) —I, II, III, IV. Boucher

215C. Microdevelopment Theory and Methods III (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Agricultural and Resource Economics/Economics 200A or 204, 200D or 205, and 214 or 215A. Extends to international trade and monetary issues. Factor mobility, terms of trade, and the balance of payments are discussed.
development processes. Analysis of issues emerging at the interface of environmental and development economics. (Same course as Agricultural and Resource Economics 2125J.)—III. (II.) Farzin

221A. The Theory of Industrial Organization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200A, 200B, 200C. Game theory is used to analyze strategic interactions of firms in industries. Topics include models of competition, product differentiation, entry-deterring strategies, contractual arrangements, vertical control and antitrust issues.—I. (II.) Knittel

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. (II.) Knittel

221C. Industrial Organization and Regulation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 221A and 240B. Optimal regulation of natural monopolies. 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.—III. (III.) Illin

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 taxation, corporate taxation, and social insurance; the evaluation of effective tax rates.—III. (III.) Helms

230B. Public Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 230A. Estimation and inference for nonseparable 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.) Havener

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 models and cointegration; time series models for higher order moments and transition data; state-space modeling and simulation. (Same course as Agricultural and Resource Economics 240C.)—I. (I.)

240D. Cross Section Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 240B. Estimation and inference for nonseparable 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.)

240E. Topics in Applied Econometrics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 240A and 240B. Examination of modern econometric techniques used in applied fields of economic research, such as demand analysis, environmental economics, macroeconomics/finance, etc. Emphasis on selection of appropriate tools for individual fields. Course focus will expand topics covered in Economics 240A and 240B. (Same course as Agricultural and Resource Economics 240E.)—III. (III.) Smith

250A. Labor Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 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; human capital theory; labor market and employment; and the relationship between labor market changes and economic growth models. Emphasis on the analysis of human capital and growth, technological innovation, its diffusion and empirical evidence on growth.—I. (I.) Peri

250B. Labor Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200D and 200E. Advanced topics in labor economics. Selection of appropriate tools for individual fields. Course focus will expand topics covered in Economics 240A and 240B. (Same course as Agricultural and Resource Economics 240B.)—III. (III.) Smith

260A. International Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 200D and 200E. Balance of payments; adjustment mechanisms; foreign exchange markets; theories of balance of payments policy and international monetary mechanisms.—II. (II.) Woo

260B. International Economics (4)
Lecture—3 hours; discussion—1 hour. 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 trade policies.—III. (III.) Swenson

260D. Topics in International Macroeconomics (4)
Seminar—4 hours. Prerequisite: course 260B or consent of instructor. Survey of current literature in international macroeconomic theories.—III. (III.)

260E. Topics in International Trade (4)
Seminar—4 hours. Prerequisite: course 260A, 260B. Current literature in international trade theory.—II. (II.) Russo

270A. Economics of Growth (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200D and 200E. Modern theories and empirics of economic growth beginning with the neoclassical theories up to modern exogenous growth models. Emphasis on the analysis of human capital and growth, technological innovation, its diffusion and empirical evidence on growth.—I. (I.) Peri

270B. Economics of Growth (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200D and 200E. Modern theories 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 mishaps; the comparison of growth performance in East Asia and Latin America since WW2; the experience of centrallyplanned economies and transitions to market-based growth; and the transformation from an industrial economy to a knowledge economy.—II. (II.) Woo

270C. Economy of Growth (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 200D and 200E. Institutional bases; politics; contracts and commitment; money and finance; multilateral dynamic; modern economic growth; transition of industrialization; dual economies, core and periphery; sources of convergence and divergence; openness and growth; resources, demography, and geography, institutions, imperialism, and colonial conflicts.—III. (III.) Tsouphen

280. Orientation to Economic Research (2)
Seminar—4 hours. Prerequisite: consent of instructor. Selected topics in economic analysis and public policy, focusing on current research. May be repeated for credit.

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.

298. Group Study (1-5)
Seminar—1-5 hours. Prerequisite: graduate standing and consent of instructor. Independent study credits granted. (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 Course

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.) Stevens

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer, 2007-2008 offering in parentheses.
Education, School of

Harold G. Levine, Ph.D., Dean, School of Education
Sharon Dugdale, Ph.D., Associate Dean
Graduate Group in Education (Ph.D.)
Graduate Group Chair
UCD/CSU Fresno Joint Doctoral Program in Educational Leadership, Fresno (JDPEL)
J. Phillip Young, Ph.D., UC Davis Co-Director
Sharon Brown-Welty, Ph.D., CSU Fresno Co-Director
Capital Area North Doctorate in Educational Leadership (CANDEL)
Paul Heckman, Ph.D., UC Davis Co-Director
Paul Porter, Ph.D., Sanoma State University Co-Director
Rosemary Papa, Ph.D., CSU Sacramento Co-Director

Master of Arts in Education
Sharon Dugdale, Ph.D., Program Chair

Teacher Education
Barbara J. Merino, Ph.D., Director
Barbara G. Goldman, Ph.D., Associate Director
UCD/CSU Sacramento Collaborative Elementary Credential Program
Barbara Goldman, Ph.D., UC Davis Co-Director
Nadeen Ruiz, Ph.D., CSU Sacramento Co-Director
Cooperative Research and Extension Services for Schools (CRESS)
Paul Heckman, Ph.D., UC Davis Co-Director
Sharon Dugdale, Ph.D., Program Chair

Teacher Research
Joanne Boosmeyer, Ph.D., Evaluation & Policy Analyst
Kindra Montgomery, B.A., Research & Policy Analyst

Graduate Programs. See the School of Education, on page 101, in this catalog.

Graduate Group in Education (Ph.D.)
Faculty Advisors. Jon Wagner, Cynthia Passmore
Program Administrator. Robin Latin

Program Office. 2060 Academic Surge, (530) 752-0757, eduadvising@ucdavis.edu

UCD/CSU Fresno Joint Doctoral Program in Educational Leadership, Fresno (JDPEL)
Faculty Advisors. J. Phillip Young, Sharon Brown-Welty
Program Administrator. Robin Latin

Program Office. 2060 Academic Surge, (530) 752-0757, eduadvising@ucdavis.edu

Teacher Education-Credential Faculty Advisors-Elementary Credential.
Joanne Galli-Banducci, Anna Kato, Michele Leonard-Fortes, Al Mendle

Faculty Advisor-Bilingual Emphasis
Barbara J. Merino, Michele Leonard-Fortes

Faculty Advisors-Secondary Credential.
Allan Selman, Pauline Holmes, J.Richard Pomery, Lynn Martindale, Rebecca Rosa

Program Administrator. MaryAnn Mellor

CREDENTIAL ANALYST. Judy MacDonald

Program Office. 2060 Academic Surge, (530) 752-0757, eduadvising@ucdavis.edu

Minor Program Requirements:
The Minor in Education is considered a foundation for undergraduates who wish to obtain a teaching credential, obtain a master’s degree in education or a related field, pursue a doctoral degree in education, enter a profession that focuses on working with people, or develop a better understanding of issues confronting education today.

At least 12 of the 20 unit minimum required for the minor must be taken in Education. The remaining elective courses may be courses in Education or approved courses outside of Education.

Education:
Education 115, 122, 130, 151, 152, 153, 163, 192*, 199 (with approval)*

Approved courses outside of Education:
African American and African Studies 130, American Studies 152, Asian American Studies 101, Biological Sciences 195A or B, University Writing Program 197TC, Human Development 100A, 100B, 101, Linguistics 173, Mathematics 197TC, Psychology 130, 132, Sociology 124, Spanish 116, 117, University Writing Program 104D

* Internship (192, 195TC, 197TC) and Independent Study (199) for a combination of both, may not exceed a total of 4 units. Elective course may include only one internship.

Minor Advisors. A designated faculty member in the School of Education may advise students and give final approval on the minor. For additional information contact the School Services Office in 2060 Academic Surge.

Courses in Education (EDU)

Lower Division Course
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 Courses
100. Introduction to School (4)
Lecture—4 hours, field work—3 hours. Prerequisite: upper division standing. Study of occupational concerns of teachers; skills for observing classroom
ers. Students will continue to meet with instructor as a group throughout the quarter to discuss specific projects. —I. (I.) Athanases, Murphy, Uchikoshi

206A. Inquiry into Classroom Practice: Traditions and Approaches (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing or consent of instructor. Examination 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. —III. Uchikoshi

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; production processes; socio-cultural and national perspectives; implications for education. Offered in alternate years. —II. (III.) Murphy

244. Topical Seminar in Language, Literacy and Culture (4)
Seminar—3 hours; project—1 hour. Prerequisite: graduate standing. Critical study of selected issues in language, literacy, and culture as they relate to education. May be repeated twice for credit when topic differs. —II. (III.) Athanases, Murphy, Uchikoshi

249. Discourse Analysis in Educational Settings (4)
Seminar—4 hours; term paper. Prerequisite: graduate standing and at least one previous course in linguistics. Examinations of models, processes, and case studies of school change and educational reform with respect to variable characteristics of schools and schooling, planned and unplanned change, the moral evaluation of school change, and the role of educational research. —II. (III.) Heckman

251. Research in Bilingual and Second Language Education (3)
Seminar—2 hours. Prerequisite: course 151; knowledge of a foreign language. Discussion and analysis of recent research in bilingual and second language education. Topics include: second language teaching methods, language use models in bilingual education, interaction analysis in English language classrooms. —II. (III.) Watson-Gegeo

253. Language and Literacy in Linguistic Minorities (5)
Seminar—2 hours; field work—3 hours. Prerequisite: familiarity with another language and culture; graduate standing. Analysis and application of research on oral language development and literacy in language minority students, through the development, implementation, and evaluation of research-based language arts curriculum. —II. (III.) Merino

255. Curriculum Development and Evaluation in Mathematics (4)
Seminar—4 hours. Prerequisite: graduate standing in Education with upper division course work in mathematics 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. —III. Uchikoshi

261. School-Based Prevention Programs (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Promotion of health and mental health in schools. Topics include the theoretical base, prevention models, specific examples of techniques and programs designed to prevent learning and adjustment problems, and evaluation issues. Offered in alternate years. —I. (I.)

218. Testing Minority Children (4)
Lecture—3 hours; fieldwork—3 hours. Prerequisite: admission to school psychology program or to M.A. bilingual education program. Assessment of ethnic minority children. Emphasizing tests and techniques that are appropriate for use with Hispanic students. The use of multicultural pluralistic assessment. Review studies and guidelines on use of tests with minority children. Offered in alternate years.

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 policy-makers, and school members and their implications for educational research, policy, and practice. —II. (III.) Athanases, Murphy, Uchikoshi

222. School Change and Educational Reform (4)
Lecture/discussion—2 hours; seminar—2 hours. Prerequisite: graduate standing in Education and consent of instructor. Seminar on understanding the social and political context of education in the U.S. and California and how education policy is formed in the broader public arena. Develops skills in educational policy analysis. (Former course 237.) —III. (III.) Gandara

226. Culture and Social Organization of Higher Education (4)
Seminar—3 hours; field work—1 hour. Prerequisite: graduate standing or consent of instructor. Seminar on understanding the social and political context of education in the U.S. and California and how education policy is formed in the broader public arena. Develops skills in educational policy analysis. (Former course 237.) —III. (III.) Gandara

231. Culture and Learning (4)
Seminar—4 hours. Prerequisite: Graduate standing in Education with course 120 or the equivalent, or consent of instructor. Analysis of major theories of relationships between culture and the sociocultural context in which learning takes place, issues related to the academic achievement of different language groups, and implications for research and pedagogical practice.

233. Anthropology of Education (4)
Seminar—3 hours; term paper. Prerequisite: one of the following courses: Anthropology 117, 127, 129, or 222, or course 231, 201A, or 201B, or consent of instructor. Anthropology of education in such settings as family, community, and formal institutions of schooling. Course goal is to raise questions about educational issues often taken for granted and provide a perspective from which problems may be analyzed. (P/NP grading only.)

235. Critical Pedagogy (4)
Seminar—4 hours. Prerequisite: Critical Theory 200A and graduate/cultural critique, from an interdisciplinary perspective, of educational reform and change. The critique will include an analysis of the influence of text content on the perpetuation of social power differences. —III. (III.) Johnson
research process in mathematics education; review of critical productive problems identified by researchers; evaluation of theories and hypotheses in various areas of mathematics education research. Course emphasizes foundations. Offered in alternate years.—II. Ambrose, White

256B. Research in Mathematics Education (4)
Seminar—4 hours. Prerequisite: graduate standing in Education with upper division coursework in mathematics, or consent of instructor. Current research issues in 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.—II. Ambrose, White

257. Computer Technology in Mathematics Education (4)
Seminar—4 hours. Prerequisite: graduate standing in Education with mathematics coursework, or consent of instructor. The roles of calculators, computers, and graphing calculators in mathematics education will be addressed, with emphasis on the impact of these technologies on curriculum reform. Selected efforts to integrate technology into mathematics instruction will be examined. Offered in alternate years.—II. 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.—II. Passmore, Stellf

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. Research process and product in science education; review of critical science education issues; evolution of trends, theories and hypotheses in various areas of science education research. Survey of current major research in science education. Passmore, Stellf

262B. Research Topics in Science Education II (4)
Seminar—4 hours. Prerequisite: course 262A and graduate standing in Education with upper division coursework in science. Current research issues and activities in science education: status, trends, theories and hypotheses. Formulation of research questions, design of critical, in-depth review of literature related to the student’s research interests.—II. Passmore, Stellf

264. Scientific Literacy and Science Education Reform (4)
Seminar—4 hours. Prerequisite: graduate standing in Education with upper division coursework in science, or consent of instructor. Current trends in science education reform locally, regionally, and nationally focusing on scientific literacy. Equity, access and “science for all.” Offered in alternate years.—III. Tixler

270. Research on Teacher Education and Development (3)
Seminar—3 hours, project. Prerequisite: graduate standing. Experience with formal or informal teaching recommended. Research on teacher preparation in university credential programs and on professional development of in-service teachers, with special attention to teacher preparation for work with culturally and linguistically diverse youth.—III. Afcharanes

275. Effective Teaching (4)
Seminar—4 hours. Review of research on the relationship of effective teacher behavior and student learning. Use of research on teacher effectiveness to develop teaching strategies. Ways to decide on the most appropriate instructional strategies in specific teaching situations.—II, III

290C. Research Conference in Education (1)
Discussion—1 hour. Prerequisite: graduate standing. Presentations and critical discussions of research in education by graduate students with their major professor. May be repeated twice for credit. (S/U grading only.)

291. Proseminar in Education (3)
Seminar—3 hours. Prerequisite: admission to the Ph.D. graduate program in Education. Seminar for first-year education Ph.D. students. Study of the study of multi-disciplinary research approaches to educational issues. Reports and discussions of recent advances in education. Speakers from the graduate group faculty in Education. May be taken twice for credit.—I, II, III

292. Special Topics in Education (2-4)
Variable—2 to 4 hours. Prerequisite: completion of doctoral core courses in Education or consent of instructor. Selected topics in education. 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.—I, II, III

298. Graduate 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 grading only.)

299D. Research (1-12)
Independent study—3-36 hours. Research for individual graduate students. (S/U grading only.)

Professional Courses

300. Reading in the Elementary School (4)
Lecture—3 hours; fieldwork—3 hours. Prerequisite: graduate standing. Principles, procedures, and curriculum materials for teaching of reading. Includes decoding skills work on phonics, comprehension skills, study skills, and reading in the content areas.—I, II. Galli-Banducci

301. Reading in the Secondary School (4)
Discussion—4 hours. Prerequisite: graduate standing, enrollment in the secondary credential program, or consent of instructor. Principles, procedures, and materials to help secondary school teachers improve the reading competence of students. Strategies for enhancing learning through reading and writing in all disciplines, with special attention to linguistically diverse populations.—I, II. Galli-Banducci

302. Language Arts in the Elementary School (2)
Lecture—2 hours. Prerequisite: graduate standing. Principles, procedures, and materials for the teaching of oral and written expression, listening skills, drama, and children’s literature in elementary schools.—II. Galli-Banducci, Leonard Fortes

303. Art Education (3)
Lecture/discussion—2 hours; laboratory—2 hours. Prerequisite: admission to multiple subject credential program. Understanding the principles of education and the arts through participation. Development of concepts, introduction to media, and techniques suitable for the elementary school with emphasis on cross-discipline exploration.—II. Galli-Banducci

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. Galli-Banducci

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 elementary school curriculum, emphasis on contributions from the social, biological, and physical sciences. Emphasis on effective teaching methods.—II. Galli-Banducci

304C. 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. Evaluation of teaching materials including instructional technology. Current elementary school curriculum with emphasis on contributions from fine arts and humanities.—III. Galli-Banducci

305A. Teaching in the Middle Grades (5-8)
Lecture—2 hours; seminar—2 hours; student teaching—15-30 hours. Prerequisite: acceptance into a teacher education program. Supervised teaching in regular or special education classrooms in middle grades. Current conceptions of the middle-grade curriculum with emphasis on social, biological, and physical sciences. Effective teaching methods.—I. Galli-Banducci

Lecture/discussion—2 hours; fieldwork—9-48 hours. Prerequisite: acceptance into a teacher education program. Supervised teaching in regular secondary classrooms. Techniques for classroom communications; constructing goals and objectives; assessment of learning; special problems of adolescents; instructional technology.—I, II, III. Passmore

307. Methods in Elementary Science (2)
Lecture/discussion—2 hours. Prerequisite: acceptance into teacher education program. Principles, procedures, and materials for teaching the biological and physical sciences in elementary schools.—I. Passmore

308. Methods in Elementary Social Studies (2)
Lecture/discussion—2 hours. Prerequisite: acceptance into a teacher education program. Principles, procedures, and materials for teaching history and the social sciences in elementary schools.—III. Rosa

309. The Teaching of Mathematics, K–9 (3)
Lecture/discussion—3 hours. Prerequisite: acceptance into a teacher education program. Mathematics curriculum and teaching methods for K-9 reflecting the needs of California’s diverse student populations.—II. Mendle

322A. Pedagogical Preparation for Secondary Social Science I (3)
Lecture/discussion—2 hours; discussion—1 hour. Prerequisite: acceptance into a teacher education program. Introduction to 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. Rosa

322B. Pedagogical Preparation for Secondary Social Science II (3)
Lecture/discussion—1 hour; discussion—2 hours. Prerequisite: course 322A. Intermediate teaching methods and curriculum approaches for secondary social science teaching. Interdisciplinary approaches to teaching major themes across social science content areas; teaching potentially controversial social science topics; teaching democratic civic values, student assessment and evaluation.—II. Rosa
Education (A Graduate Group)

Graduate Advisers. Jon Wagner, Cynthia Passmore
Graduate Coordinator. Robin Lattin
Courses. See School of for courses.

Education Abroad Program

The Education Abroad Program (EAP) is one of the premier study-abroad programs in the nation. EAP 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 Davis while studying abroad and receive full academic credit for their work. EAP students maintain their financial aid and scholarship eligibility while abroad. EAP has study abroad opportunities for undergraduates at all class levels as well as to qualified graduate students who have completed at least one full year of graduate work and have support of their graduate program and graduate dean.

Academic Programs. EAP offers year, semester, quarter, and summer programs for all majors. Over 50% of the programs are offered in English, not only in English-speaking countries such as the United Kingdom, Australia, New Zealand, and South Africa, but in Hong Kong, Hungary, the Netherlands, and Japan, among many others. Several programs make it possible for students to learn a language while experiencing the culture first hand (e.g., in Mexico, Spain, Italy, France, Germany, China, and Japan). Most programs include the possibility of internships. There are field research programs in Australia, Mexico, South Africa, and Canada as well as biology programs in Costa Rica and Australia. Global studies programs are offered in Sweden, China, and Japan. In most situations, students from the University of California live as the students of the host country do, and in most cases students attend the same courses, taught by the faculty of the host country.

Because new programs are added every year, it is important to consult the Education Abroad Center Web site at http://eac.ucdavis.edu. Additionally, country and some discipline specific brochures are available at the Education Abroad Center. UC faculty members serve as directors at most Study Centers, providing academic advising to students while abroad. Full UC credit is granted for courses satisfactorily completed, and courses and grades are recorded on official UC transcripts. With careful planning, most EAP 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.

Finances. Participants pay UC registration and education fees while abroad. Estimated budgets include room and board, books, round-trip transportation, on-site orientation, intensive language programs (where applicable), and miscellaneous expenses. The cost of studying abroad is often comparable to that of studying at UC Davis, although living costs vary from country to country. In some cases, studying abroad is less expensive than studying at UC Davis.

Those students already receiving UC financial aid maintain their eligibility for grants, loans and scholarships while studying on EAP. Financial aid is

Education Abroad Center. Campus Director
Education Abroad Center
207 Third Street, Suite 130 (530) 297-4635; Fax (530) 758-8472; http://eac.ucdavis.edu

Programs of Study

Courses.

Education in the Social Sciences (4)
Laboratory/discussion—2 hours; discussion/laboratory—1 hour. Prerequisite: acceptance into a teacher education program. Activity-based overview of concepts and processes in secondary school physical sciences. Emphasis upon philosophy, appropriate teaching methods, materials, assessment and evaluation of learning. I. (I) Passmore

Life Sciences in the Secondary School (3)
Laboratory/discussion—2 hours; discussion/laboratory—1 hour. Prerequisite: acceptance into a teacher education program. Activity-based overview of concepts and processes in secondary school biology and life science. Emphasis upon philosophy, appropriate teaching methods, materials, assessment and evaluation of learning, and issues. I. (II) Passmore

Methods and Technology in Secondary Mathematics I (4)
Lecture/discussion—4 hours. Prerequisite: admission to a teacher education program or consent of instructor. Introduction to methods and curriculum for teaching mathematics at the secondary level. Introduction to applications of computer technology as instructional, intellectual, and communication tools for mathematics teachers. I. (I) Bellman

Methods and Technology in Secondary Mathematics II (4)
Lecture/discussion—4 hours. Prerequisite: admission to a teacher education program or consent of instructor. Expansion of methods and curriculum for teaching mathematics at the secondary level. Inter-middle application of computer technology as instructional, intellectual, and communication tools in mathematics teaching. I. (II) Bellman

Research and Methods in Secondary English Language Arts (4)
Discussion—4 hours. Prerequisite: admission to graduate standing or credential program in Education or consent of instructor. Research on teaching and learning in the language arts. Principles, procedures and materials for improving the writing, reading and oral language of secondary students, with special attention to students from culturally and linguistically diverse populations. I. (I) Holmes

Teaching Language Minority Students in Secondary Schools: Methods and Research (4)
Seminar—3 hours; field work—3 hours. Prerequisite: graduate standing in Education or consent of instructor. Research on principles, procedures and curricula for teaching discipline-specific concepts to language minority students in secondary schools. Second-language acquisition principles and instructional strategies.

Group Study (1-5)
(S/U grading only.)

Individual Study (1-5)
(S/U grading only.)

Education (A Graduate Group)

Elizabeth Cascio, Ph.D., Assistant Professor (Economics)
Pamela Castanir, Ph.D., Science Education Specialist (Center for Biophotonics)
Cecelia Colombi, Ph.D., Professor (Spanish)
Adela de la Torre, Ph.D., Professor (Chicano Studies)
Sharon S. Dugdale, Ph.D., Professor (Education)
Richard A. Figueroa, Ph.D., Professor (Education)
Patricia Gandara, Ph.D., Professor (Education)
Barbara Goldstein, Ph.D., Associate Director of Teacher Education
Cristina Gonzalez, Professor (Spanish and Education)
Eric Grady, Ph.D., Assistant Professor (Sociology)
Joyce Gutstein, Acting Director, Public Service Research Program
Paul Heckman, Ph.D., Professor (Education)
Odys Johnson, Ph.D., Assistant Professor (Education)
Saad Joseph, Ph.D., Professor (Anthropology)
Michal Kurlaender, Ph.D., Assistant Professor (Education)
Harold Levine, Ph.D., Professor (Education)
Ann Mastergeorge, Ph.D., Assistant Developmental Psychology and Education Researcher (M.I.N.D.)
Institute Investigator (Human Development and Family Science)
Julia Menard-Warwick, Ph.D., Assistant Professor (Linguistics)
Barbara J. Merino, Ph.D., Professor (Education)
Marco Malinali, Ph.D., Assistant Education Officer (Center for Biophotonics Science and Technology)
Jay Mechling, Ph.D., Professor (American Studies)
Sandra M. Murphy, Ph.D., Professor (Education)
Cynthia Passmore, Ph.D., Assistant Professor (Education)
J. Richard Pomeroy, Ph.D., Lecturer, Supervisor of Teacher Education (Education)
Wendell Potter, Ph.D., Senior Lecturer (Physics)
Gloria Rodriguez, Ph.D., Assistant Professor (Education)
Thomas Rost, Ph.D., Professor (Plant Biology)
Tom Sallee, Ph.D., Professor (Psychology)
Jonathan Sandoval, Ph.D., Professor (Education)
Barbara Sellers-Young, Ph.D., Professor (Theatre and Dance)
Mike Steff, Ph.D., Assistant Professor (Education)
Thomas Timar, Ph.D., Associate Professor (Education)
Gary Trelux, Ph.D., Assistant Professor (Agricultural Education)
Yuuko Uchikoshi, Ph.D., Assistant Professor (Education)
Julia Utts, Ph.D., Professor (Statistics)
Stefano Varzi, Ph.D., Professor (Native American Studies)
Kenneth Verosub, Ph.D., Professor (Geology)
Jon Wagner, Ph.D., Professor (Education)
Richard West, Professor Emeritus (Computer Science)
Karen Watson-Gegge, Ph.D., Professor (Education)
Tobin White, Ph.D., Assistant Professor (Education)
P. Phillips Young, Ph.D., Professor (Education)

Graduate Study. The Graduate Group in Education offers programs of study and research leading to the Ph.D. degree. Students may concentrate in educational psychology; language, literacy and culture; mathematics education; school organization and educational policy; and science and agriculture education. Students may also combine these fields of study with designated emphasis areas such as critical theory, second-language acquisition, and women’s studies. Detailed information regarding graduate study may be obtained by writing the Graduate Coordinator or at http://education.ucdavis.edu/gradgroup.

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; students applying to the educational psychology program should have a B.A. or M.A. in psychology or educational psychology.

Education Abroad Center

Group Office, 2060 Academic Surge, (530) 754-6503; Fax: (530) 754-6672; nlattin@ucdavis.edu

Faculty
Jamal Abedi, Ph.D., Professor (Education)
Rebecca C. Ambrose, Ph.D., Assistant Professor (Education)
Steven Althanses, Ph.D., Assistant Professor (Education)
Brenda Bryant, Ph.D., Professor (Human Development)

Chairperson of the Group

The Graduate Group in Education (A Graduate Group)

Quarter Offered: Fall, Winter, Spring, Summer; 2007-2008 offering in parentheses


Spring 2007 GE credit:

SciEng—Science and Engineering

ArtsHum—Arts and Humanities

SocSci—Social Sciences

Div—Social-Cultural Diversity

Wrt—Writing Experience
Courses in Education Abroad Program (EAP)

Lower Division Course

90X. International Education Seminar (1) Seminar—1 hour. Prerequisite: open to upper division applicants for EAP or 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, III, (I, III).

Upper Division Courses

190X. International Education Seminar (1) Seminar—1 hour. Prerequisite: open to upper division applicants for EAP or 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, III, (I, III).

192. Internship in Education Abroad (1-4) Internship—3–12 hours. Prerequisite: participation in a study abroad program. Internship related to education abroad. May take place at or away from the university. May be repeated up to 12 units of credit. (P/NP grading only)—I, II, III, IV. (II, III, IV).

Endocrinology (A Graduate Group)

Judith Turgeon, Ph.D., Chairperson of the Group

Group Office. 4136 Tupper Hall; Human Physiology. (530) 752-3230

Faculty

Thomas Adams, Ph.D., Professor (Animal Science)
Marylynn Barkley, Ph.D., Associate Professor (Neurobiology, Physiology, and Behavior)
Chris Calvert, Ph.D., Professor (Animal Science)
Erdinc S. Chang, Ph.D., Professor (Bodega Marine Laboratory)
Bruce Hammock, Ph.D., Professor (Entomology)
Robert Hansen, Ph.D., Professor (Molecular Biosciences)
Larry Hjelmeland, Ph.D., Professor (Ophthalmology)
Bill L. Lasley, Ph.D., Professor (Public Health and Reproduction)
Harry Matthews, Ph.D., Professor (Biological Chemistry)
Stanley Meisel, Ph.D., Professor (Cell Biology and Human Anatomy)
James R. Miller, Ph.D., Associate Professor (Animal Science)
Marty Privalsky, Ph.D., Professor (Microbiology)
Jan F. Roser, Ph.D., Professor (Animal Science)
Judith Stern, Sc.D., Professor (Nutrition)
Dennis M. Syne, M.D., Professor (Pediatrics)
Judith L. Turgeon, Ph.D., Professor (Human Physiology)
Donal A. Walsh, Ph.D., Professor (Biological Chemistry)
Dorothy E. Woolley, Ph.D., Professor (Neurobiology, Physiology, and Behavior)

Courses in Endocrinology (EDO)

Graduate Courses

218. Mammalian Endocrinology and Homeostasis (4) Lecture—4 hours. Prerequisite: Biological Sciences 102 and 103, Neurobiology, Physiology, and Behavior 101, and consent of instructor. Biochemical, physiological, and regulatory properties of the mammalian endocrine system, at the molecular, cellular and systemic level. Signal transduction mechanisms and hormonal actions. Principles that regulate homeostasis, especially in organ–organ interrelationships, metabolism and minerals, fluids and electrolytes. Reproductive endocrinology. III. (III) Turgeon

220. Endocrinology Literature Critique (1) Discussion—1 hour. Prerequisite: consent of instructor. Critical reading and evaluation of current original publications in endocrinology. Selected papers will be presented and discussed in detail by faculty and students. May be repeated for credit. (S/U grading only)—I, II, (I, II) Turgeon

240. Biochemical Endocrinology (3) Lecture—3 hours. Prerequisite: graduate standing or consent of instructor. Examination of recent advances in biochemical endocrinology and molecular and cellular biology of endocrine systems with emphasis on processes of hormone and receptor synthesis, second messenger phenomena, and hormonal control of gene expression. III. (III) Adams

298. Group Study (1-5) Prerequisite: consent of instructor.

299. Research (1-12) (S/U grading only)

Endocrinology and Metabolism

See Internal Medicine (IMD), on page 359.

Engineering

[College of Engineering]

Enrique J. Lavernia, Ph.D., Dean
Bruce R. White, Ph.D., Associate Dean—Academic Personnel and Planning
Karen A. McDonald, Ph.D., Associate Dean—Research and Graduate Studies
Gary E. Ford, Ph.D., Associate Dean—Undergraduate Studies
Billy Sanders, Ph.D., Assistant Dean—Academic Affairs

College Office, 1050 Kemper Hall (530) 752-1979; http://engineering.ucdavis.edu

Undergraduate Study

The college has eight departments: Applied Science Engineering, Biological and Agricultural Engineering, Biomedical Engineering, Chemical Engineering and Materials Science, Civil and Environmental Engineering, Computer Science Engineering, Electrical and Computer Engineering, Mechanical and Aeronautical Engineering.

Graduate Study

Graduate degrees (M.S., MEng., Ph.D., DEng.) are offered in the following engineering disciplines:

Applied Science

Biological Systems Engineering

Biomedical Engineering

Chemical Engineering

Civil and Environmental Engineering

Computer Science

Electrical and Computer Engineering

Materials Science and Engineering

Mechanical and Aeronautical Engineering

Mechanical Engineering

Transportation Technology and Policy

For additional information, refer to http://engineering.ucdavis.edu or the Graduate
17. Circuits (1-4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 3C or 3D (may be taken concurrently); Physics 9C. Basic electric circuit analysis techniques, including electrical quantities and elements, resistive circuits, transient and steady-state responses of RLC circuits, sinusoids, complex impedances, and complex frequencies and network functions.—I, III. (I, III.)

35. Statics (3)  
Lecture—2 hours; laboratory—3 hours. Prerequisite: Physics 9A, Mathematics 21D (may be taken concurrently); Civil and Environmental Engineering 19 or Engineering 6 recommended. Force systems and equilibrium conditions with emphasis on engineering problems.—I, III. (I, III, III.)

45. Properties of Materials (4)  
Lecture—3 hours; laboratory—3 hours. Prerequisites: Mathematics 16C or 21C and Chemistry 2A. Introductory course on the properties of engineering materials and their relation to the internal structure of materials. GE credit: Wrt.—I, III, (II, III, III.)

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 Courses

100. Electronic Circuits and Systems (3)  
Laboratory—3 hours; lecture—1 hour. Prerequisite: course 17. Introduction to analog and digital circuit design and system design through hands-on laboratory design projects. Students who have completed Electrical and Computer Engineering 100 may receive only 1.5 units of credit.—I, III. (II, III.)

102. Dynamics (4)  
Lecture—4 hours. Prerequisite: course 35, Mathematics 22B; open to College of Engineering students only. Kinematics and kinetics of particles, of systems of particles, and of rigid bodies applied to engineering problems. Only 2 units of credit allowed to students who have previously taken Engineering 36.—I, II, III. (II, III.) Hessel, Schaaf, Velinsky

103. Fluid Mechanics (4)  
Lecture—4 hours. Prerequisite: course 102 (may be taken concurrently). Open to majors in hydrology or the College of Engineering. Fluid properties, fluid statics, 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.—I, II, III. (II, III.)

104. Mechanics of Materials (4)  

104L. Mechanics of Materials Laboratory (1)  
Laboratory—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 in the laboratory.—II, III, (II, III.)

105. Thermodynamics (4)  
Lecture—4 hours. Prerequisite: Mathematics 22B and Physics 9B. Open to Engineering majors 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 scales. Applications of thermodynamics to engineering systems.—I, II, III. (II, III.)

106. Engineering 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, origination and cost of capital, economic life, and risk and uncertainty are applied to methods of selecting most economic alternatives.—II. (II) Hartsough, Slaughter

111. Electric Power Equipment (3)  
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 17. Principles of AC and DC electric motors and generators, their control systems and power sources. Selection of electrical power equipment components based on their construction features and performance characteristics.—I, II. Delvalle, Hartsough

122. Introduction to Mechanical Vibrations (4)  
Lecture—4 hours. Prerequisite: course 102. Free and forced vibrations in lumped-parameter systems with and without damping; vibrations in coupled systems, electromechanical analogs; use of energy conservation principles.—I, II. Frank

160. Environmental Physics and Society (3)  
Lecture—3 hours. Prerequisite: Physics 9D, 5C, or 10-1B and Mathematics 16B or the equivalent. Impact of mankind on the environment will be discussed from the point of view 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.—I, II. Jungerman, Craig

180. Engineering Analysis (4)  
Lecture—3 hours; discussion—1 hour. Prerequisite: course 21D, 22B, and course 6 or Mechanical Engineering 5. 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.—I, II. Halez

190. Professional Responsibilities of Engineers (3)  
Lecture—3 hours; laboratory—1 hour. Prerequisite: upper division standing. Organization of the engineering profession; introduction to contracts, specifications, business law, patents, and liability; discussion of professional and ethical issues; oral presentations on the interactions between engineering and society.—II, III. (II, III.)

191. Effective Communication Strategies in Engineering (1)  
Lecture—1.5 hours. Prerequisite: upper division standing in an engineering major. Interpersonal communication strategies in various organizational situations. Topics include leadership theory, conflict resolution, ethics, and negotiating strategies. (P/NP grading only.)—II. (II)

198. Directed Group Study (1-5)  
May be repeated for credit up to 3 times. (P/NP grading only.)

Graduate Course

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 product life cycle. Research and development activity. Project planning and organization. Manufacturing issues. Case studies.—I, III.

Engineering: Applied Science

[College of Engineering]

A. Orel. Ph.D., Chairperson of the Department
Hector A. Baldis, Ph.D., Vice Chairperson of the Department
Faculty
Hector A. Baldus, Ph.D., Professor
Stephen P. Cronin, Ph.D., Professor
Yong Duan, Ph.D., Associate Professor
Francois Gangi, Ph.D., Professor
David Q. Hwang, Ph.D., Professor
Nialls G. Jensen, Ph.D., Professor
Brian H. Kolner, Ph.D., Professor (Applied Science, Electrical and Computer Engineering)
Denise M. Krol, Ph.D., Professor (Applied Science, Electrical and Computer Engineering)
Nelson Max, Ph.D., Professor (Applied Science, Computer Science)
William McCurdy, Ph.D., Professor (Applied Science, Chemistry)
Greg Miller, Ph.D., Professor (Applied Science, Computer Science)
Ann E. Orel, Ph.D., Professor (Applied Science, Computer Science)
Ahlu N. Pandhi, Ph.D., Associate Professor (Applied Science, Computer Science)
David M. Rocke, Ph.D., Professor (Applied Science, Computer Science)
Garry Rodrigue, Ph.D., Professor (Applied Science, Computer Science)
Rao Vemuri, Ph.D., Professor (Applied Science, Computer Science)
Yin Yeh, Ph.D., Professor (Applied Science, Computer Science)

Emeriti Faculty
Benn J. Alder, Ph.D., Professor Emeritus
Meera M. Blattner, Ph.D., Professor Emeritus
Stuart D. Bloom, Ph.D., Professor Emeritus
Richard B. Christensen, Ph.D., Professor Emeritus
Paul C. Craig, Ph.D., Professor Emeritus
Richard R. Freeman, Ph.D., Professor Emeritus
John S. De Groat, Ph.D., Professor Emeritus
Jonathan P. Heritage, Ph.D., Professor (Applied Science, Electrical and Computer Engineering)
William G. Hoover, Ph.D., Professor Emeritus
Kileen H. Kortum, Ph.D., Professor Emeritus
Richard F. Poust, Ph.D., Professor Emeritus
Wilson K. Talley, Ph.D., Professor Emeritus

Affiliated Faculty
Rod Balhorn, Ph.D., Adjunct Professor
Andrew Canning, Ph.D., Adjunct Professor
James S. Felton, Ph.D., Adjunct Professor

The Major Program
The Department of Applied Science administers two programs: Optical Science and Engineering and Computational Applied Science.

Mission Statement
The mission of the Department of Applied Science is to foster the use of fundamental mathematical and scientific knowledge to improve the quality of life. We provide the profession and academia with outstanding Computational Applied Science and Optical Science and Engineering graduates who advance both engineering practice and fundamental knowledge.

We challenge students to develop attributes that lead to professional growth throughout their careers: a sense of community, ethical responsibility, an expectation for lifelong learning and continuing education, the ability to think independently and perform creatively and effectively in teams, and the ability to communicate effectively both orally and in written media.

Upon graduation, we challenge our students to understand the fundamentals and the application of mathematics and sciences, to have an ability to design, conduct, and understand experiments, as well as to analyze and interpret data; to have a proficiency in the design of components and systems to meet desired performance specifications; an ability to function effectively in multi-disciplinary teams; a proficiency in the use of techniques, skills, and modern engineering tools to identify, formulate, and solve scientific and engineering problems; an understanding of professional and ethical responsibility; a proficiency in written communication; the broad educational necessary to understand the impact of engineering solutions in a global and societal context; an ability to engage in graduate education and life-long learning; and a knowledge of contemporary issues that have an impact on society and the profession.

Computational Applied Science

Major Program
Computational Applied Science (CAS) encompasses the interplay between the mathematics of models, arising from physical science and engineering, and the numerical techniques for their computational implementation and subsequent solution. With a comprehensive background in mathematics and physical sciences, the major has, as its specific objective, to enable students in the major to construct numerical solutions to problems in science and engineering. A strong component of the program is the development, analysis, and integration of numerical algorithms and an appreciation for the interaction between numerical simulation, theoretical models, and experiment. Students who complete the Computational Applied Science program will receive a Bachelor of Science degree in Computational Applied Science.

Objectives
The objective of the Computational Applied Science program is to provide a basic education in the fundamental principles of computational applied science combined with key courses in mathematics, engineering, and the sciences. This will enable an integrated understanding of all components leading to practical and efficient computational solutions to problems. The major prepares students for careers in computational applied science professions as well as for graduate study in related fields.

Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Science Engineering 2</td>
<td></td>
</tr>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 22A-22AL-22B</td>
<td>7</td>
</tr>
<tr>
<td>Physics 9A-9B-9C-9D</td>
<td>19</td>
</tr>
<tr>
<td>Engineering 17</td>
<td></td>
</tr>
<tr>
<td>Computer Science Engineering 30 and 40</td>
<td>8</td>
</tr>
<tr>
<td>Computer Science Engineering 20 or 50</td>
<td></td>
</tr>
<tr>
<td>Electrical Engineering 70</td>
<td></td>
</tr>
<tr>
<td>English 3 or University Writing Program 1 or</td>
<td></td>
</tr>
<tr>
<td>Comparative Literature 1, 2, 3, or 4, or</td>
<td></td>
</tr>
<tr>
<td>Native American Studies 5</td>
<td>4</td>
</tr>
<tr>
<td>Communication 1</td>
<td>4</td>
</tr>
<tr>
<td>Civil Engineering 19</td>
<td>4</td>
</tr>
<tr>
<td>General Education electives</td>
<td>12</td>
</tr>
</tbody>
</table>

Minimum Lower Division Units: 91

Upper Division Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Science Engineering 115, 116,</td>
<td></td>
</tr>
<tr>
<td>117A, 117B, 117C, 117D</td>
<td>31</td>
</tr>
<tr>
<td>Statistics 131A or Civil Engineering 114 or</td>
<td></td>
</tr>
<tr>
<td>Mathematics 131</td>
<td>4</td>
</tr>
<tr>
<td>Physics 104A</td>
<td>4</td>
</tr>
<tr>
<td>Civil Engineering 119</td>
<td>4</td>
</tr>
<tr>
<td>Computational Applied Science electives*</td>
<td>28</td>
</tr>
<tr>
<td>Engineering 190</td>
<td>3</td>
</tr>
<tr>
<td>General Education electives</td>
<td>3</td>
</tr>
<tr>
<td>Unrestricted electives</td>
<td>3</td>
</tr>
</tbody>
</table>

Minimum Upper Division Units: 89

Minimum Units Required for Major: 180

* Computational Applied Science Electives must be chosen in consultation with a faculty adviser. You may choose up to a maximum of 4 units, for any combination of engineering courses numbered 190C, 192, 198, and 199. With the exception of the following courses, all upper-division courses in chemistry, engineering, mathematics, physics, and statistics may be taken as CAS electives. The courses that may not count as CAS electives are: Chemistry 194A, 194B, 194HC, 197, 198, 199; Electrical and Computer Engineering 101; Engineering 160 (restricted to one unit of CAS elective); Mathematics 192, 194, 197TC, 198, 199; Physics 160 (restricted to one unit of CAS elective); Physics 9A-9B, 9C-9D, and Computer Science and Engineering 30.

Optical Science and Engineering

Optical Science and Engineering encompasses the physical phenomena and technologies associated with the generation, transmission, manipulation, detection, and applications of light. The Optical Science and Engineering curriculum prepares students to design, analyze, and fabricate effective optical systems. Much of the nation’s high-technology infrastructure is based upon optical science and its applications, the most prominent being optical digital information transmission. Optical systems play a central role in nearly all aspects of modern life including health care and the life sciences, remote optical sensing, lighting, cameras, space, and national defense.

Students who complete the Optical Science and Engineering curriculum will receive a Bachelor of Science degree in Optical Science and Engineering.

Objectives
Our fundamental program objective is to educate students in the basics required for optical science and engineering: mathematics, sciences, and engineering. We educate students in the fundamentals of the science, analysis, and design of optical systems.

The Optical Science and Engineering Major Program

Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Science Engineering 1</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 22A-22B</td>
<td>6</td>
</tr>
<tr>
<td>Physics 9A-9B-9C-9D</td>
<td>19</td>
</tr>
<tr>
<td>Engineering 17</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science Engineering 30</td>
<td>8</td>
</tr>
<tr>
<td>Computer Science Engineering 20 or 50</td>
<td>4</td>
</tr>
<tr>
<td>Electrical Engineering 70</td>
<td></td>
</tr>
<tr>
<td>English 3 or University Writing Program 1 or</td>
<td></td>
</tr>
<tr>
<td>Comparative Literature 1, 2, 3, or 4, or</td>
<td></td>
</tr>
<tr>
<td>Native American Studies 5</td>
<td>4</td>
</tr>
<tr>
<td>Communication 1</td>
<td>4</td>
</tr>
<tr>
<td>General Education electives</td>
<td>16</td>
</tr>
</tbody>
</table>

Minimum Lower Division Units: 86

Upper Division Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>115, 116, 165, 166, and 167</td>
<td></td>
</tr>
<tr>
<td>Electrical and Computer Engineering 130A.</td>
<td></td>
</tr>
<tr>
<td>130B, and 135</td>
<td>11</td>
</tr>
<tr>
<td>Physics 104A</td>
<td>4</td>
</tr>
<tr>
<td>Physics 112 or Chemistry 110C</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry 110A</td>
<td>4</td>
</tr>
<tr>
<td>Applied Science Engineering 137 or</td>
<td>3</td>
</tr>
<tr>
<td>Engineering 190</td>
<td></td>
</tr>
<tr>
<td>Optics electives</td>
<td>20</td>
</tr>
<tr>
<td>Technical electives</td>
<td>12</td>
</tr>
</tbody>
</table>

Minimum Upper Division Units: 94

Minimum Units Required for Major: 180
Optics electives and technical electives should be chosen in consultation with a staff or faculty adviser.

**Courses in Engineering:**

**Applied Science—Davis (EAD)**

### Lower Division Courses

1. **Optical Science and Engineering (4)**
   - Lecture—3 hours; discussion—1 hour. Discussion and demonstrations of optical science and engineering principles and applications. Discussion of the opportunities and professional practice in the field including ethics and responsibilities. —I. (I.) Baldis, Cramer, Orel, Rodrigue

2. **Introduction to Applied Computational Science and Engineering (4)**
   - Lecture—3 hours; laboratory—3 hours. Prerequisite: Mathematics 21C (may be taken concurrently), Physics 9A (may be taken concurrently), Computer Science Engineering 30. Role of mathematics in modeling physical, biological, and engineering phenomena. Pitfalls in computation. Limitations of models, numerical implementations, and quality assessment of computational data. Interactions among mathematics, algorithms, computer hardware and software, and selected scientific and engineering applications.—III. (III.)

### 90C. Research Group Conference for Lower Division Students (1)

Discussion—1 hour. Prerequisite: lower division standing; consent of instructor. May be repeated for credit. (P/NP grading only)—I, II, III, (I, II, III.)

### 98. Directed Group Study (1-5)

Prerequisite: consent of instructor and lower division standing. (P/NP grading only)

### 99. Special Study for Lower Division Students (1-5)

Prerequisite: consent of instructor. (P/NP grading only)

### Upper Division Courses

#### 108A. Optics I (4)

#### 108B. Optics II (4)
- Lecture—3 hours; laboratory—3 hours. Prerequisite: course 108A. Introduction to wave theory of optics, including Maxwell's equations and boundary conditions, reflection and transmission coefficients, interference, diffraction, polarization, thin film and ultra thin film optics, and radiation from extended distributions of oscillating electric dipoles. Applications of wave optics. Not open for credit to students who have completed Physics 108 and 108L.—II. (II.) Baldis, Kolner

#### 115. Numerical Solution of Engineering and Scientific Problems (4)

#### 116. Computer Solution of Physical Problems (4)

#### 117A. Simulation and Modeling of Real Time Systems (5)
- Lecture—3 hours; laboratory—3 hours; extensive problem solving. Prerequisite: course 2, 116, Physics 9D, Engineering 180 or Physics 104A or the equivalent. Application of numerical techniques for simulation and modeling of nonlinear deterministic systems. Examples taken from fluid, continuum, and molecular mechanics, and from low dimensional nonlinear systems. Emphasis given to error and stability control of computer methods, and evaluation of relationships between the physical system, the model equations, and the numerical implementations.—I, II.

#### 117B. Simulation and Modeling of Statistical Systems (5)
- Lecture—3 hours; laboratory—3 hours; extensive problem solving. Prerequisite: Statistics 131A or Civil and Environmental Engineering 114 or Mathematics 131 or Optics 117A. Similar ideas of stochastic systems, Monte Carlo techniques, Brownian motion, Langevin, and molecular dynamics. Simulation of meaningful statistical sampling in stochastic and disorder systems.—II. (II.) Miller, Orel, Laub, McCurdy, Rodriguez

#### 117C. Topics in Simulation and Modeling (5)
- Lecture—3 hours; laboratory—3 hours; extensive problem solving. Prerequisite: course 117B. Topics may include statistical mechanics, magnetism, materials, biology, and economics. Fast multipole and resummation techniques, algorithms for integral transforms, mesh generation, combinatorics, encryption; data mining, handling, and compression of large data sets; optimization.—III. (III.) Miller, Orel, Laub, McCurdy, Rodrigue

#### 118. High Performance Computing (4)
- Lecture—3 hours; laboratory—3 hours. Prerequisite: course 117B or by permission of instructor. Algorithms for efficient scientific computing on modern high-performance computers; influence on algorithms of distributed computing, memory management, and data transfer; managing relationships among computer architecture, software, and algorithms. —II. (II.) Miller, Orel, Laub, McCurdy, Rodrigue

#### 119. Applied Computational Linear Algebra (4)
- Lecture—3 hours; discussion—1 hour. Prerequisite: course 115 and Physics 104A. Introduction to computational linear algebra with emphasis on applications in engineering systems. Matrix factorizations; mathematical software for fundamental algorithms. —I, II. Jensen, Laub

#### 161. Optical Design (4)
- Lecture—3 hours; laboratory—3 hours. Prerequisite: course 108B. Design and analysis of optical systems. Computer assisted optical design of optical systems including construction and final system characterization. Knowledge and skills acquired in earlier coursework are used for designs that include engineering standards and realistic constraints. —II. (II.) Baldis

#### 165. Statistical and Quantum Optics (4)
- Lecture—3 hours; laboratory—3 hours. Prerequisite: Chemistry 110A, Electrical and Computer Engineering 130B, Physics 112 (may be taken concurrently). Waves and photons; photon number and fluctuations; field and number fluctuations; properties of single-mode, coherent and statistical mixture states of the radiation field; photon bunching and anti-bunching; photoelectric counting distributions for chaotic and coherent light; the squeezed state. Not open for credit to students who have completed course 165A.—II. (II.) Yeh, Krol, Jensen

#### 166. Lasers and Nonlinear Optics (4)
- Lecture—3 hours; lab—3 hours. Prerequisite: course 165. Theory of simple optical processes, population inversion, stimulated emission, laser threshold conditions, line broadening mechanisms, saturation, coherence, laser resonator optics, Q-switching, mode locking, harmonic and sum-frequency generation, parametric conversion, stimulated scattering processes, four-wave mixing, phase conjugation, frequency chirping, ultrashort pulse generation.—II. (II.) Yeh, Krol, Orel

#### 167. Fourier Optics (4)
- Lecture—3 hours; discussion—1 hour. Prerequisite: Physics 104A and Electrical and Computer Engineering 130B. Linear systems analysis of two-dimensional optical systems, 2D Fourier transforms, scalar diffraction theory, Fresnel and Fraunhofer diffraction, coherent and incoherent optical systems, spatial frequency analysis, analog optical information processing, spatial light modulators, film, holography, character recognition, and image restoration.—II. (II.) Kolner, Orel, Jensen

#### 169. Optical Properties of Materials (4)
- Lecture—3 hours; discussion—1 hour. Prerequisite: course 108B, Engineering 45, and Chemistry 110A. Relation between structure, composition, and optical properties of laser materials, nonlinear optical materials, photorefractives, fiber optics, semiconductors, liquid crystals, and thin films.—III. (III.) Krol, Parikh

#### 170. Optical Spectroscopy: Concepts and instrumentation (4)
- Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 110A and course 166. Fundamentals of absorption and emission, spectrometers, interferometers, light sources and detectors, UV, Visible, and IR spectroscopy, fluorescence, Raman and Brillouin high-resolution, high-resolution laser spectroscopy.—III. (III.) Kolner, Yeh, Parikh

#### 172. Optical Methods for Biological Research (4)
- Lecture—3 hours; discussion—1 hour. Prerequisite: Course 108B, Biological Sciences 1A, and Chemistry 110A. Optical techniques for resolving significant research problems in biology. Examples include the sequence, structure, and movement of DNA; nuclear organization and DNA replication; channel transport; membrane receptor sites and cell fusion; protein-protein interactions and supramolecular organization.—III. (III.)

### Research Group Conference for Advanced Undergraduates (1)

Discussion—1 hour. Prerequisite: advanced standing; consent of instructor. Weekly conference on research problems, progress and techniques in applied science. May be repeated for credit. (P/NP grading only)—I, II, III, (I, II, III.)

### 198. 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 Courses

#### 205A. Mathematical Methods (4)
- Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 229 or equivalent. Complex variables, theory of convergence, evaluation of definite integrals, factorial function (gamma function), solution of second-order ODEs, Fourier analysis.—I. (I.) Jensen, Miller, Orel, Rodrigue

#### 205B. Mathematical Methods (4)
- Lecture—3 hours; discussion—1 hour. Prerequisite: course 205A. Laplace transforms, Fourier transforms, Sturm-Liouville theory, solution of ODEs and PDEs, Green’s functions.—I. (I.) Jensen, Miller, Orel, Rodrigue

#### 205C. Mathematical Methods (3)
- Lecture—3 hours. Prerequisite: course 205B. Spherical harmonics, Bessel functions, conformal mapping, hypergeometric functions, elliptic functions.—I, II, III. Jensen, Orel, Rodrigue

#### 209. Linear Modeling Techniques (4)
- Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 167 or the equivalent strongly recommended. Matrix theory and linear algebra with emphasis on applications in engineered systems.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>210A</td>
<td>Numerical Methods in Applied Science (4)</td>
<td>Lecture—3 hours; prerequisite: facility with a programming language, C or C++ strongly recommended. Numerical methods developed from an applied mathematics perspective: Analysis and control of numerical error, interpolation, iterative methods for linear systems, numerical solutions for ODE initial and boundary value problems, numerical PDEs, eigenvalues and eigenvectors.</td>
<td>4</td>
</tr>
<tr>
<td>210B</td>
<td>Numerical Methods in Applied Science (4)</td>
<td>Lecture—3 hours; prerequisite: facility with a programming language, C or C++ strongly recommended. Numerical methods developed from an applied mathematics perspective: Iterative methods for linear systems, numerical solutions for ODE initial and boundary value problems, numerical PDEs, eigenvalues and eigenvectors.</td>
<td>4</td>
</tr>
<tr>
<td>210C</td>
<td>Numerical Methods in Applied Science (3)</td>
<td>Lecture—3 hours. Prerequisite: course 210B. Computational methods in various fields including: fluid mechanics, kinetic theory, solid mechanics, quantum mechanics.</td>
<td>3</td>
</tr>
<tr>
<td>211A</td>
<td>Numerical Solution of Partial Differential Equations I (3)</td>
<td>Lecture—3 hours. Prerequisite: course 210A, 210B. Fundamentals of parallel computers, grid generation, domain decomposition, Laplace’s equation, elliptic PDEs, Galerkin methods, numerical linear algebra, iterative acceleration.</td>
<td>3</td>
</tr>
<tr>
<td>211B</td>
<td>Numerical Solution of Partial Differential Equations II (3)</td>
<td>Lecture—3 hours. Prerequisite: course 211A. Parabolic PDEs, stability, preconditioned time differencing, hyperbolic PDEs, modified differential equation, advective-diffusion equations, wave equation, Burger’s equation, reaction-diffusion equations.</td>
<td>3</td>
</tr>
<tr>
<td>211C</td>
<td>Numerical Solution of Partial Differential Equations III (3)</td>
<td>Lecture—3 hours. Prerequisite: course 211B. Conservation laws, fluid equations, turbulence, elasticity equations, electromagnetic equations, transport equations.</td>
<td>3</td>
</tr>
<tr>
<td>213A</td>
<td>Computer Graphics (3)</td>
<td>Lecture—3 hours. Prerequisite: course 213A or Computer Science Engineering 175. Algorithms to produce color raster renderings of three-dimensional models.</td>
<td>3</td>
</tr>
<tr>
<td>213B</td>
<td>Computational Visualization (3)</td>
<td>Lecture—3 hours. Prerequisite: Computer Science Engineering 175 or consent of instructor. Visualization of 3D data, including scalar fields, vector fields, and molecular structures. Primary emphasis on volume visualization.</td>
<td>3</td>
</tr>
<tr>
<td>215A</td>
<td>Computer Animation (4)</td>
<td>Lecture—3 hours; laboratory—3 hours. Prerequisite: Computer Science Engineering 175 or 177 or 178. Control of camera and object motion necessary to produce computer animation, modeling of articulated objects made from jointed segments, and of deformable objects. Students will complete a final animation project.</td>
<td>4</td>
</tr>
<tr>
<td>216A</td>
<td>Special Topics in Computer Science (1-5)</td>
<td>Lecture, laboratory, or combination. Prerequisite: consent of instructor. Special topics in the following areas: Architecture; Software Systems; Language Translation; Language Design; Operating Systems; Foundations of Computing; Computational Mathematics. May be repeated for credit for a total of 5 units per segment if topic differs.</td>
<td>1-5</td>
</tr>
<tr>
<td>217A</td>
<td>Applied Computational Science (3)</td>
<td>Lecture—2 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 applied to computational science problems, which are exemplified through projects. Emphasis on the practical use and implementation of theory taught in course 210A.</td>
<td>3</td>
</tr>
<tr>
<td>217B</td>
<td>Applied Computational Science (3)</td>
<td>Lecture—3 hours. Prerequisite: course 210B or the equivalent (may be taken concurrently). Applied modular programming in low level language (C or Fortran). Direct implementation of theory taught in course 210B and integrated applications of algorithms for computational science problems, exemplified through projects including partial differential equations; initial/boundary value problems.</td>
<td>3</td>
</tr>
<tr>
<td>218</td>
<td>Signal Processing (3)</td>
<td>Lecture—3 hours. Prerequisite: Electrical and Computer Engineering 150A, Mathematics 167. Fourier transforms and digital filters; sampling theorem and analog-to-digital conversion; multiple signal processing; wavelet transforms and filter banks; fast algorithms; FFT, DWT, and pyramid; data compression with wavelets; spectral factorization; designing application-specific wavelets. Offered in alternate years.</td>
<td>3</td>
</tr>
<tr>
<td>219</td>
<td>Waves and Their Applications (3)</td>
<td>Lecture—3 hours. Prerequisite: Electrical and Computer Engineering 150A, Mathematics 167. Fourier transforms and digital filters; sampling theorem and analog-to-digital conversion; multiple signal processing; wavelet transforms and filter banks; fast algorithms; FFT, DWT, and pyramid; data compression with wavelets; spectral factorization; designing application-specific wavelets. Offered in alternate years.</td>
<td>3</td>
</tr>
<tr>
<td>221</td>
<td>Genetic Algorithms and Optimization (3)</td>
<td>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 theory; operators; application to function optimization, scheduling, VLSI circuit layout. Implementation on parallel computers; genetic programming; evolutionary algorithms.</td>
<td>3</td>
</tr>
<tr>
<td>225</td>
<td>Computational Structures for Signal and Image Processing and Graphics (3)</td>
<td>Lecture—3 hours. Prerequisite: Computer Science Engineering 40; course 210A. Tools for research in digital media. Relevant computer architectures, algorithms and languages for signal processing, image processing and graphics. Hardware and software issues in parallelism. Programming in SISAL. Parallel algorithms using SISAL on parallel computers. Offered in alternate years.</td>
<td>3</td>
</tr>
<tr>
<td>228A</td>
<td>Properties of Matter (3-3-3)</td>
<td>Lecture—3 hours. Prerequisite: Mathematics 228 and Physics 112B. Microscopic and macroscopic descriptions of matter; thermodynamics and kinetics; constitutive, electrical, mechanical and thermal properties.</td>
<td>3-3-3</td>
</tr>
<tr>
<td>229</td>
<td>Computational Molecular Modeling (4)</td>
<td>Lecture—3 hours; project. Prerequisite: course 210A and 228A or consent of instructor. Theory and hands-on implementation of algorithm in computational statistical mechanics. Thermal integrators, molecular dynamics, force fields, constrained dynamics, Monte Carlo techniques, fluctuation-dissipation theorem, and parallel vs. serial computing.</td>
<td>4</td>
</tr>
<tr>
<td>230</td>
<td>Topics in Computational Fluid Dynamics (3)</td>
<td>Lecture—3 hours. Prerequisite: course 210A, 210B or consent of instructor. A hands-on approach to numerical methods for compressible fluid flow. Readings and discussions of solution strategies complemented with programming exercises and projects to give first hand experience with performance and accuracy of several computational methods; from upward differentiating to Godunov methods.</td>
<td>3</td>
</tr>
<tr>
<td>231A</td>
<td>Applied Quantum Mechanics (3)</td>
<td>Lecture—3 hours. Prerequisite: course 205A-205B-205C (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 time evolution in 1-D, well, and hydrogen atom. Matrix theory: Schroedinger, Heisenberg, and interaction pictures.</td>
<td>3</td>
</tr>
<tr>
<td>231B</td>
<td>Applied Quantum Mechanics (3)</td>
<td>Lecture—3 hours. Prerequisite: course 231A. Perturbation theory of atoms, molecules, and solids; quantum theory of cooperative effects.</td>
<td>3</td>
</tr>
<tr>
<td>233A</td>
<td>Theory and Applications of Solid-State Physics (3-3-3)</td>
<td>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.</td>
<td>3-3-3</td>
</tr>
<tr>
<td>234A</td>
<td>Applied Electromagnetics I (3)</td>
<td>Lecture—3 hours. Prerequisite: Electrical and Computer Engineering 132B or the equivalent. Electromagnetics; Gauss’s law, potentials, fields, boundary value problems, multiple pole expansions, dielectrics, polarization, capacitance, energy, torque, forces, eigenfunction expansions.</td>
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<td>234B</td>
<td>Applied Electromagnetics II (3)</td>
<td>Lecture—3 hours. Prerequisite: course 234A. Maxwell’s Equations, wave equations for fields and potentials. Poynting’s Theorem and power flow. Momentum and angular momentum in the electro-</td>
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234C. Applied Electromagnetics III (3) Lecture—3 hours. Prerequisite: course 234B. Dynam-ics of relativistic particles; collisions between charged particles; energy loss, and scattering; radia-tion by moving particles; bremsstrahlung, method of virtual quanta, beta-radiation processes; multipole fields; radiation damping, self fields of a particle, scattering and absorption of radiation. —I. (I.) Kolner, Hwang

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: course 262B. Classi-cal and quantum mechanical collision theory of electron and heavy particle scattering. Offered in alternate years. —(III.) Orel


265B. Laser Physics II (3) Lecture—3 hours. Prerequisite: course 265A. Beam propagation, scattering, and laser dynamics. Threshold dynamics and cavity modes. Ray optics and matrices, wave optics and Gaussian beams. Resona-tor stability. Linear pulse propagation, dispersion and pulse compression, standing waves, relaxation, Q-switching, injection locking and modlocking. —II. (II.) Kolner


271. Optical Methods in Biophysics (4) Lecture—3 hours. Prerequisite: Physics 102 or the equivalent. Biological Sciences 102 or the equiva-lent, course 108B or the equivalent, and Chemistry 110A or the equivalent. Principal optical techniques used to study biological structures and their related functions. Specific optical techniques useful in the studies of protein-nuclear acid, protein-membrane and protein-protein interactions. Biomedical applica-tions of optical techniques. (Same course as Biophys-ics 271.) —III. (III.) Yeh, Parikh, Balhorn, Matthews

273. X-Ray Spectroscopy and Synchrotron Radiation (4) Lecture—3 hours; discussion/ laboratory—1 hour. Fundamentals of x-ray absorption, emission, and inelastic scatter-ing; x-ray imaging and microscopy; synchrotron radia-tion from bend magnets, wigglers, undulators, and free electron lasers; x-ray optics and storage ring design; visits to the synchrotron radiation facilities. SSRL and ALS; optional experiments. Offered in alternate years. —III. Cramer

280A-280B-280C. Plasma Physics and Controlled Fusion (3-3-3) Lecture—3 hours; discussion—1 hour; course 234B or con-sent of instructor. Equilibrium plasma properties; sin-gle particle motion; fluid equations; waves and instabilities in a fluid plasma; plasma kinetic theory and transport differential equations; linear and nonlinear You-soy theory; fluctuations, correlations and radiation; inertial and magnetic confinement systems in con-trolled fusion. —I, II, III, (I, II, III.) Luhmann, Hwang

285A. Physics and Technology of Microwave Vacuum Electron Beam Devices I (4) Lecture—4 hours. Prerequisite: B.S. degree in phys-ics or electrical engineering or the equivalent back-ground. Physics and technology of electron beam emissions, flow and transport, electron gun design, space charge waves and klystrons. Offered in alter-nate years. —III. (III.) Luhmann

285B. Physics and Technology of Microwave Vacuum Electron Beam Devices II (4) Lecture—4 hours. Prerequisite: 285A. Theory and experimental design of traveling wave tubes, back-ward wave oscillators, and extended interaction oscil-lators. Offered in alternate years. —(I.) Luhmann

285C. Physics and Technology of Microwave Vacuum Electron Beam Devices III (4) Lecture—4 hours. Prerequisite: 285B. Physics and technology of gyrotrons, gyro-amplifiers, free elec-tron lasers, magnetrons, crossfield amplifiers and rel-ativistic devices. Offered in alternate years. —(II.) Luhmann

285D. Physics and Technology of Microwave Vacuum Electron Beam Devices IV (4) Lecture—4 hours. Prerequisite: 285C. Compu-tational models of vacuum electron beam devices. Offered in alternate years. —(III.) Luhmann

285X. Special Topics in Applied Science (1-5) Lecture, laboratory, or combination. Prerequisite: consent of instructor. Special topics in the following areas: (A) Atomic and Molecular Physics; (B) Chemi-cal Physics; (C) Computational Physics; (D) Digital Media; (E) Materials Science; (F) Imaging Science and Photonics; (G) Nuclear Physics; (H) Plasma Physics; (I) Quantum Electronics; (J) Solid State; (K) Microwave and Millimeter Wave Technology. May be repeated for credit up to a total of 5 units per seg-ment when topic differs. —I, II, III, (I, II, III.)

290. Seminar (1-2) Lecture—1 hour. Prerequisite: consent of instruc-tor. May be repeated for credit. (S/U grading only)

290C. Graduate Research Group Conference (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, (I, II, III.)

Course in Biophotonics (BPT) Graduate Course

290B. 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

Faculty

Michael J. Delwiche, Ph.D., Professor Fadi A. Fathallah, Ph.D., Associate Professor D. Ken Giles, Ph.D., Professor Mark E. Grismer, Ph.D., Professor (Land, Air, and Water Resources)

Bruce R. Hartsough, Ph.D., Chairperson of the Department

D. Ken Giles, Ph.D., Professor

Bryan M. Jenkins, Ph.D., Professor

Michael J. McCarthy, Ph.D., Professor (Food Science and Technology)

Kathryn McCarthy, Ph.D., Professor (Food Science and Technology)

Miguel A. Martíno, Ph.D., Professor (Food Science and Technology)

Michael J. McCarthy, Ph.D., Professor (Food Science and Technology)

Ning Pan, Ph.D., Professor (Textiles and Clothing)

Raul H. Piedrahita, Ph.D., Professor

Richard E. Plant, Ph.D., Professor (Agronomy and Range Science)

Uriel Rosa, Ph.D., Assistant Professor

R. Paul Singh, Ph.D., Professor (Agronomy and Range Science)

David C. Slaughter, Ph.D., Professor (Agronomy and Range Science)

Shrinivas K. Upadhye, Ph.D., Professor

Jean S. VanderGheynst, Ph.D., Associate Professor

Wesley W. Wallender, Ph.D., Professor (Land, Air, and Water Resources)
Ruifang Zhang, Ph.D., Associate Professor

Emeriti Faculty
Norman B. Akesson, M.S., Professor Emeritus
Robert H. Burgly, M.S., Professor Emeritus
William J. Cherron, Ph.D., Professor Emeritus
Pichai (Paul) Chen, Ph.D., Professor Emeritus
Robert B. Fridley, Ph.D., Professor Emeritus
Roger E. Garrett, Ph.D., Professor Emeritus
John R. Gross, Ph.D., Professor Emeritus
S. Milton Henderson, M.S., Sc.D., Professor Emeritus
R. Larry Merson, Ph.D., Professor Emeritus
John A. Miles, Ph.D., Professor Emeritus
Stanton R. Morrison, Ph.D., Professor Emeritus
James W. Rumsey, M.S., Senior Lecturer Emeritus
Thomas A. Rumsey, Ph.D., Professor Emeritus
Verne H. Scott, Ph.D., Professor Emeritus
Henry E. Studer, M.S., Professor Emeritus
Wesley E. Yates, M.S., Professor Emeritus

Affiliated Faculty
Daniel Downey, Ph.D., Assistant Research Engineer
Dennis R. Heldman, Ph.D., Adjunct Professor
James M. Meyers, Ph.D., Extension Specialist
Zhangli Pan, Ph.D., Adjunct Assistant Professor
Herbert B. Scher, Ph.D., Research Engineer
James F. Thompson, M.S., Extension Specialist

Mission. The Department of Biological and Agricultural Engineering is dedicated to the advancement of engineering for biological systems. Specifically, our goals are to: (1) integrate biology with the principles and applications of engineering; (2) integrate the knowledge of biology needed to efficiently produce, distribute, and process biological products, such as food, feed, 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. We also provide a University Writing Program, 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 engagement in life-long 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.

The Biological Systems Engineering Major Program

Biological Systems Engineering is the branch of engineering that builds strongly on biology as a scientific base. The combination of biology and biotechnology, engineering, and management will be needed to work side by side with life scientists to bring laboratory developments into commercial production. Industries in plant and animal production, tissue culture, bioprocessing, bio-technology, food processing, aquaculture, agriculture, and forest production will all need engineers to work side by side with large and small agricultural producers, equipment manufacturers, food processors, consulting engineering firms, and government agencies.

Biological Systems Engineering Program

The Biological Systems Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc.
Ecological Systems Engineering. Specialists in ecological systems engineering are concerned with the design, development, and management of ecosystems. Typical applications include the rehabilitation of disturbed ecosystems, the design of mitigation areas, the incorporation of ecologically sustainable features into land developments, and the design and management of public and private landscapes. An understanding of ecology and the interaction of ecological communities, coupled with knowledge of engineering design and economics, are stressed in this specialization. Employment opportunities include environmental consulting firms, government regulatory agencies, and agencies involved in wildland resource management.

Recommended biological science electives:

- Entomology 100
- Environmental Science and Policy 100
- Soil Science 100
- Select one course from Atmospheric Science 133, Plant Biology 119, Environmental Toxicology 101 or 112A

Recommended engineering electives:

- Applied Biological Systems Technology 180
- Biological Systems Engineering 115, 135, 141, 145
- Civil and Environmental Engineering 141 or 149
- Environmental and Resource Sciences 100

Recommended course:

Landscape Architecture 1 (no technical elective credit will be guaranteed for this course in any engineering major)


Food Engineering. The food industry is the largest industrial sector of the U.S. economy. Food engineers conceive, develop, and operate food processes, equipment, and plants for efficient food production with minimal impact on the environment. Students specializing in food engineering learn to apply engineering principles and concepts to handling, storing, processing, packaging, and distributing food and related products. In addition to engineering principles, the food engineering specialization is intended to provide an understanding of the chemical, biochemical, microbiological, and physical characteristics of foods. In the junior and senior years, students take courses that focus on the integration of biological and food science with engineering. Concepts of food refrigeration, freezing, thermal processing, drying, and other food operations are studied.

Recommended biological science electives:

- Biological Sciences 101, 103
- Environmental Science and Policy 110
- Environmental Toxicology 101, 131, Food Science and Technology 104A, 119, 120, 128; Plant Biology 152, 172.

Recommended engineering electives:

- Biological Systems Engineering 175; Chemical Engineering 157, 159.


Forest Engineering. Forest engineers apply engineering principles to solve problems in managing forest lands. Forestry has evolved from an emphasis on wood production toward multiple use, ecosystem management, and protection and rehabilitation of non-forested areas. Forest engineers help to develop the techniques for reforestation, harvesting, forest residue management, and development of roads and recreation facilities.

Following the sophomore year, students are encouraged to attend an eight-week field course, followed by a semester at UC Berkeley taking forestry courses, and forest ecology, planning, and operations. Students enter their engineering programs at UC Davis, taking courses in planning methods, equipment development, and road design. Forest engineers are employed by the US Forest Service and other public agencies, the forest industry, consulting firms, and equipment manufacturers.

Recommended biological science electives:

- ESPM 120* (Soil Characteristics, 4.5 units) or Soil Science 100
- ESPM 182* (Forest Operations Management, 6 units)
- ESPM 185* (Silviculture, 6 units)

Recommended engineering electives:

- Applied Biological Systems Technology 180
- Biological Systems Engineering 114, 115, 116
- Civil and Environmental Engineering 141, 141L, 145

Recommended Courses:

- ESPM 101* (Forestry Summer Program, 15 units)
- ESPM 172* (Photogrammetry and Remote Sensing, 4.5 units)
- Environmental and Resource Sciences 185
- Plant Biology 120
- *ESPM courses are offered at UC Berkeley campus.

Suggested Adviser: B. Hartsough, J. Miles

Upper Division Required Courses

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<th>Course</th>
<th>Units</th>
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<td>Chemistry 88 or 1188 (recommended for Aquacultural, Biotechnical, Food, and Biomechanical/Preventive Veterinary Medicine Engineering specializations) or Civil and Environmental Engineering 10 (recommended for Ecological, and Forest Engineering specializations)</td>
<td>4 or 3</td>
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<tr>
<td>Biological Sciences 18 and 1C or Food Science and Technology 100A, 104, 131</td>
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<tr>
<td>Biological Systems Engineering 102, 103, 105, 106, 110, 114 Engineering 104 (recommended for Agricultural, Biomechanics/Preventive Medicine/Preventive Veterinary Medicine, Ecological and Forest Engineering, and Chemical Engineering 161A (recommended for Aquacultural and Biotechnical Engineering specializations)</td>
<td>4 or 3</td>
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<tr>
<td>Biological Systems Engineering 103, 125, 130, 165, 170A, 170B, 170BL, 170C, 170CL</td>
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Biological Systems Engineering electives—Select one course from all upper-division Biological Systems Engineering courses not otherwise required, with the exception of Biological Systems Engineering courses 189-199.

Statistics 100........................................ 4

Engineering electives—Select a minimum of 3 units. All upper division courses offered by the College of Engineering may be taken as engineering electives with the exception of the following: Computer Science Engineering 188, Engineering 160, all courses numbered 190-197 and 199 (excluding Computer Science Engineering 190, which may be taken for 2 units of engineering elective credit). The following courses may also be taken as engineering electives:

- Applied Biological Systems Technology 163, 175, 180, 181, Environmental and Resource Sciences 100, 100L

3 Biological science electives—Select a minimum of 5 or 9 units (for a combined lower and upper division total of 24 units of biological sciences). Of the 24 units, at least nine must be upper division.

For the 24 units, all upper-division courses in the College of Biological Sciences (with the exception of Exercise Biology 102, 112, 115, 118 through 149 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
- Agricultural Management and Rangeland Resources 110A; Atmospheric Science 133; Avian Sciences 100; Cell Biology and Human Anatomy 101, 101L
- Entomology 100; Environmental Horticulture 102; ESPM 120, 182, 185 (offered at UC Berkeley); Environmental Science and Policy 100, 110, 155; 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.

General Education electives..........................12

Minimum Upper Division Units..........................86

* Only 3 units of credit for Civil and Environmental Engineering 10 for students who completed Biological Systems Engineering 1.

Master Undergraduate Adviser: R. Piedrahita

Courses in Engineering: Biological Systems (EBS)

Lower Division Courses

1. Foundations of Biological Systems Engineering (5)
   Lecture—2 hours; laboratory—6 hours; project. Open only to students in Biological Systems Engineering. Introduction to engineering and the engineering design process with examples drawn from fields of biological, agricultural and food engineering. Relationship of engineering principles to biological systems. Small group design projects with presentations, use of engineering software, and fabrication of designs. — I. (J.) Hartsough, Piedrahita

75. Properties of Materials in Biological Systems (4)
   Lecture—3 hours; laboratory—3 hours. Prerequisite: Biological Sciences 1A; Physics 9C (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; interactions of biological materials with typical engineering materials. GE credit: SciEng. — II. (L.) Rosa or Singh, Slaughter

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).—I, II, III, IV, V, VI, VII, VIII, IX

92. Internship in Biological Systems Engineering (1-5)
   Internship. Prerequisite: lower division standing; project approval prior to internship. Supervised work experience in biological systems engineering. May be repeated for credit. (P/NP grading only).

98. Directed Group Study (1-12)
   Prerequisite: consent of instructor. Group study of selected topics; restricted to lower division students. (P/NP grading only)
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.—(III.) Rosa
115. Forest Engineering (3)
Lecture—3 hours. Prerequisite: Engineering 104, Biological Sciences 1C. Applications of engineering principles to forestry including those in forest regeneration, harvesting, residue utilization, and transportation.—(III.) Hartsough
120. Power Systems Design (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 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 machinery for matching and optimum performance.—(I.) Rosa
125. Heat and Mass Transfer in Biological Systems (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course or Engineering 105. Heat and mass transfer and physical processes with principal applications to biological, food, and environmental processes. Steady and transient heat and mass transfer. Analysis of heat conduction, convection and radiation, and material diffusion and convection. Analysis of heat and mass transfer with non-Newtonian fluid flow.—(III.) Jenkins, VanderGheyst
128. Biomechanics and Ergonomics (4)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Statistics 100, Engineering 102. Anatomical, physiological, and biomechanical bases of physical ergonomics. Human motor capabilities, body mechanics, kinematics and dynamics. Use of bioinstrumentation, industrial surveillance techniques and the NIOSH lifting guide. Cumulative trauma disorders. Static and dynamic biomechanical modeling. Emphasis on spine, shoulder, elbow, and hand/wrist biomechanics.—(II.-III.) Fathallah
130. Modeling of Dynamic Processes in Biological Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course or Engineering 6 or Computer Science Engineering 30, Mathematics 228. Techniques for modeling processes through mass and energy balance, rate equations, and equations of state. Computer problem solving. Examples include package design, evaporation, respiration heating, thermal processing of foods, and plant growth.—(II.) K. McCarthy, Upadhyaya
132. Unit Operations in Biological and Food Engineering (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 130, course 125 and Engineering 103 (may be taken concurrently). Mechanical unit operations which include separation and purification, mixing, sizing, and mixing. Thermal operations related to drying, sterilization, freezing, and refrigeration. Mass transfer operations applied to membrane separations, adsorption, and absorption processes.—(III.) VanderGheyst, Singh
135. Bioenvironmental Engineering (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 125, 130. 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, and environmental pollution control technologies.—(I.) Jenkins, Zhang
144. Groundwater Hydrology (4)
145. Irrigation and Drainage Systems (4)
Lecture—4 hours. Prerequisite: Engineering 103 or Hydrologic Science 103. Engineering and scientific principles applied to the design of surface, sprinkler and micro irrigation systems, data source systems within economic, biological, and environmental constraints. Interaction between irrigation and drainage. (Same course as Hydrologic Science 115.)—(II.) Walder, Greens
147. Runoff, Erosion and Water Quality Management in the Tahoe Basin (3)
Lecture/laboratory—30 hours; fieldwork—15 hours; discussion—10 hours; term paper. Prerequisite: Physics 7B or 9B, CE 21C, Civil and Environmental Engineering 142 or Hydrologic Science 141 or Environmental and Resource Sciences 100. Five days of instruction in Tahoe City. Practical hydrology and runoff water quality management from Tahoe Basin slopes. Development of hillside and riparian restoration concepts, modeling and applications from physical science perspectives including precipitation-runoff relationships, sediment transport, and detention ponds. (Same course as Hydrologic Science 147.)—Grismer
160. Biotechnical Systems Engineering (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 75, Biological Sciences 101 or Microbiology 102. Microbial and enzyme kinetics. Biomass conversion. Production and recovery of biochemicals from plants and animals. Delivery and detection of microorganisms for bioremediation and biological control.—(II.) VanderGheyst
165. Bioinstrumentation and Control (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 100. Instrumentation and control for biological production systems. Measurement system concepts, instrument selection and transducers for sensing physical and biological parameters, data acquisition and control.—(I.) Delwiche, 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 engineering sources, specifications, human factors, biological materials, safety systems, and professionalism. Detailed design proposals will be developed for courses 170B and 170L.—(I.) Giles, Zhang
170B. Engineering Projects: Design (2)
Discussion—2 hours. Prerequisite: course 170A; course 170BL required concurrently. Individual or group projects involving the design of devices, structures, or systems to solve specific engineering problems in biological systems. Project for study is jointly selected by student and instructor.—(II.-III.) 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.—(II.) Giles, Zhang
170C. Engineering Projects: Design Evaluation (1)
Discussion—1 hour. Prerequisite: course 170B; required to enroll in course 170CL concurrently. Individually 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 in course 170B.—(II.) Miles, Zhang
170CL. Engineering Projects: Design Evaluation (2)
Laboratory—6 hours. Prerequisite: 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.—(III.)
stress; deformation gradient; velocity gradient; stretch and spin tensors. (Same course as Hydrologic Science 205.)—III. (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 equipment. Determination of relevant physical properties of soil; analyses of stress and strains in soil due to machine-applied loads; experimental and analytical methods for synthesizing characteristics of operating equipment. Offered in alternate years.—(I.) Upadhyaya

216. Energy Systems (3)
Lecture—3 hours. Prerequisite: Engineering 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. Jenkins

218. Solar Thermal Engineering (3)

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.—(II.) Piedrahita

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. (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 affecting storage and processing of biological foods and controlling release of biologically active compounds. Offered in alternate years.—II. Krachta

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 dryers. Steady-state and dynamic models to predict performance evapora tors: multiple effects, mechanical and thermal recompression, control systems. Offered in alternate years.—II. (II.) Kuo

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 models and mass transfer models for operations involving phase change such as freezing and frying. 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 materials in containers or in bulk. Offered in alternate years.—III. Singh

239. Magnetic Resonance Imaging in Biomedical 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 multi-phase flow in soils and their application to infiltration and immiscible displacement problems. Gas phase transport and entrainment during infiltration, and oil-water gas displacement will be considered. Offered in alternate years.—(II.) Grismer

241. Sprinkle and Trick Irrigation Systems (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 145/Hydrologic Science 115. Computerized design of sprinkle and trickle irrigation systems. Consideration of emitter mechanics, distribution functions and water yield functions. Offered in alternate years.—(III.) Hills

242. Hydraulics of Surface Irrigation (3)
Lecture—3 hours. Prerequisite: course 145, Hydrologic Science 115. Mathematical models of surface irrigation systems. Consideration of design, operation and ultimate disposal 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, capacity expansion, and reservoir operation. Conjunctive use of surface water and groundwater. Water quality management. Irrigation planning and operation models. (Same course as Hydrologic Science 243.) Offered in alternate years.—II. (II.) Manfo

245. Waste Management for Biological Production Systems (3)
Lecture—3 hours. Prerequisite: graduate standing or consent of instructor. Characterization of solid and liquid wastes. Energy recovery and control systems in agricultural and bioprocessing systems. Study of methods and system design for handling, treatment, and disposal/utilization of these materials.—II. (II.) Zhang

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, filter and noise transducers: motion, force, pressure, flow, temperature, and photoelectric cells. Offered in alternate years.—II. (II.) Delwiche

262. Computer Interfacing and Control (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 100, course 165. Computer and object-oriented programming in C++, analog and digital signal conversion, data acquisition and computer control. Offered in alternate years.—II. 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 effects, sample size, multiple comparisons, randomized block, repeated measures, and Latin square designs, factorial experiments, nested design and sub-sampling, split plot design, statistical software packages.—II. (II.) 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 processes. Offered in alternate years.—I. VanderCheynt

270. Modeling 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

275. Physical Properties of Biological Materials (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: consent of instructor. Selected topics on physical properties, such as mechanical, optical, rheological, and aerodynamic properties, as related to the design of harvesting, handling, sorting, and processing equipment. Techniques for measuring and recording physical properties of biological materials. Offered in alternate years.—I. Slaughter, Rosa

289A-K. Selected Topics in Biological Systems Engineering (1-5)
Variable—1-5 hours. Prerequisite: consent of instructor. Special topics in: (A) Animal Systems Engineering; (B) Aquacultural Engineering; (C) Biological Engineering; (D) Energy Systems; (E) Environmental Quality; (F) Food Engineering; (G) Forest Engineering; (H) Irrigation and Drainage; (I) Plant Production and Harvest; (J) Postharvest Engineering; (K) Sensors and Actuators. May be repeated for credit when topic differs.—I, II, III, (I, II, III)

290. Seminar (1)
Seminar—1 hour. Prerequisite: graduate standing. Weekly seminars on recent advances and selected topics in biological systems engineering. Course theme will change from quarter to quarter. May be repeated for credit. (S/U grading only.)

290C. Graduate Research Conference (1)
Discussion—1 hour. Prerequisite: consent of instructor. Research problems, progress and techniques in biological systems engineering. May be repeated for credit. (S/U grading only)—II, III, (I, II, III)

298. Group Study (1-5)
(S/U grading only.)

Professional Course

390. Supervised Teaching in Biological and Agricultural Systems (3)
Laboratory—3 hours; tutorial—3-9 hours. Prerequisite: graduate standing; consent of instructor. Tutoring and teaching students in undergraduate courses offered in the Department of Biological and Agricultural Engineering. Weekly conferences with instructor; evaluation of teaching. Preparing for and conducting demonstrations, laboratories and discussions. Preparing and grading exams. May be repeated for a total of 6 units. (S/U grading only)—II, III, (II, III)

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer, 2007/2008 offering in parentheses

General Education (GE) credit: ArtHum—Arts and Humanities, SciEng—Science and Engineering, SocSci—Social Sciences, Div=Social-Cultural Diversity; Wrt=Writing Experience
Engineering: Biomedical

Biomolecular Specialization

Biomolecules such as DNA, RNA, and proteins comprise the fundamental building blocks of life. Recent technological advances have produced abundant biomolecular data such as genome sequences and gene expression measurements. However, these data introduce the new challenges of understanding how numerous biological entities behave in a living system and how such interactions result in various physiological and pathological events. Additionally, engineering biomolecules such as proteins and RNAs can result in effective control of cellular behavior, tissue formation, or gene expression, and can lead to effective therapeutic or diagnostic tools. Students who wish to tailor the interface between engineering and biology must gain a balanced background in the biological sciences, mathematics, physics, chemistry, engineering, and bioinstrumentation. Suggested Advisors: S. Raychauduri, Y. Yokobayashi

Imaging Specialization

Specialists in imaging apply engineering principles to visualize systems in the biological sciences and medicine. The study of imaging may have an electrical, mechanical, or chemical emphasis and can take place on scales ranging from subcellular to whole body. Students specializing in imaging have the flexibility to select electives (in consultation with their faculty advisors) in their junior and senior years to tailor to their particular interests. Employment opportunities include the design and building of imaging instruments for research or clinical applications; development of diagnostic agents; and image processing and analysis. Suggested Advisors: K. Ferrara, A. Louie

Pre-Medical Specialization

The pre-medical specialization is designed for students planning to attend medical school after graduation, or for students interested in working in the biomedical industries. Course work in biology, chemistry, and organic chemistry satisfies the typical entrance requirements for medical school. There is flexibility in the selection of technical electives to gear towards particular interests (for example, in neurobiology versus systems physiology; or in electrical versus mechanical engineering) or towards particular medical school entrance requirements. The elective requirements differ slightly for the Pre-Medical Specialization to allow room to satisfy all of the medical school entrance requirements.

Suggested Advisors: K. Leach, A. Passerini

Upper Division Required Courses

Engineering 100 or Electrical and Computer Engineering 105.............. 3


Life Sciences electives.... 9

Computer sciences 120, 120B, 121, 129A, 129B, 130A, 130B, 140A, 140B

Upper Division Requirements

Areas of Specialization

All coursework for the biomedical engineering programs or the areas of specialization, with the exception of the Premedical Specialization, consist of the coursework outlined above.

<table>
<thead>
<tr>
<th>Units</th>
<th>Mathematics 21A-21B-21C-21D</th>
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<td>Units</td>
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<td>Units</td>
<td>Engineering 5, 17, 35</td>
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<td>Comparative Literature 1, 2, 3, or 4</td>
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<td>Units</td>
<td>Communication 1 or 3</td>
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<td>Units</td>
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<tr>
<td>Units</td>
<td>Biomedical Engineering 1</td>
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<tr>
<td>Units</td>
<td>Minimum Lower Division Units</td>
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</table>

Minimum Upper Division Units

86

Additional upper division elective policies:

– 2 units from CHE118A and 118B maybe applied toward Engineering and Physical Science electives if 118A and 118B are also used to satisfy lower division subject credit.

– 2 units from ECE100 maybe applied toward Engineering and Physical Science elective if ECE100 is taken to satisfy upper division subject credit.

– 4 units of BI199 may be counted toward Engineering and Physical Science elective with approval of BME undergraduate committee.

– Life Sciences electives and Engineering and Physical Science Electives are to be selected in consultation with a staff or faculty advisor.

Courses in Biomedical Engineering (BIM)

Lower Division Courses

1. Introduction to Biomedical Engineering (1)

Lecture—1 hour. Introduction to the field of biomedical engineering with examples taken from the various areas of specialization within the discipline. Areas include cellular and molecular engineering; biomedical imaging; biofluids and transport; musculoskeletal biomechanics; and bioinstrumentation. (P/ NF grading only).–I. (I.)

99. Special Study for Undergraduates (1-5)

(P/NF grading only).

Upper Division Courses

106. Biomechanical Phenomena (4)

Lecture—4 hours. Prerequisite: Neurobiology, Physiology and Behavior 101 or equivalent, Physics 9B, Mathematics 22B. Principles of heat and mass transfer with applications to biomedical systems; emphasis on mass transfer across cell membranes and the design and analysis of artificial human organs, and basic fluid transport. –II. (II.)

107. Mathematical Methods for Biological Systems (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 22A-22B. Restricted to upper division Engineering majors. Essential mathematical and numerical techniques for engineering problems in medicine and biology. Focus on ordinary differential equations, the calculus of linear transforms, ordinary and partial differential equations, and an introduction to probability and stochastic processes. –II. (II.)

108. Biomedical Signals and Control (4)

Lecture—4 hours. Prerequisite: Mathematics 22B; Engineering 100 (may be taken concurrently). Restricted to upper division Engineering students. Systems and control theory applied to biomedical engineering problems. Time-domain and frequency-domain analyses of signals and systems, convolution, Laplace and Fourier transforms, transfer functions, dynamic behavior of first and second order processes, and design of feedback control systems for biomedical applications. No credit for students

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

110A-10B. Biostatistical Biomedical Engineering Design (2-2)

Lecture—3 hours; laboratory/discussion—1 hour. Prerequisite: course 107, 108, 109. Application of biostatistical theory and experimental analysis culminating in the design of a unique solution to a problem. The design may be geared towards current applications in applied biomechanics, biotechnological and medical technology. Prerequisite: consent of instructor. May be repeated for credit. (P/NP grading only) —II, (II) Willig-Onwaachi.

111. Biomechanical Instrumentation Laboratory (I)

Lecture—1 hour; laboratory—9 hours. Prerequisite: Biological Sciences 1A, course 107. Basic principles of sensors and actuators include pressure, strain, temperature, electrical, optical, magnetic, and acoustic elements. Prerequisite: Mechanical Engineering 171. —III. (III.) Qi

112. Physiology for Biomedical Engineers (4)

Lecture—5 hours. Prerequisite: Biological Sciences 104 or Molecular and Cellular Biology 202. Cell signaling and function, cell motility, DNA replication and repair, protein synthesis, and molecular diagnostics. GE Credit: SciEng.—III. (III.) Louie

116. Biophysics for Biomedical Engineers (5)

Lecture—4 hours. Prerequisite: Engineering 102. Techniques of biomolecular engineering such as in vitro mutagenesis. Protein crystallography, mass spectrometry, and computational methods for analysis of such data. Prerequisite: Mechanical Engineering 171. —III. (III.) Yokobayashi

142. Biomedical Imaging: Basic Principles and Practice (4)

Lecture—3 hours; term paper. Prerequisite: Physics 9D and Mathematics 22B. Basic physics, engineering principles, and applications of biomedical imagining techniques including x-ray imaging, computed tomography, magnetic resonance imaging, ultrasound and nuclear imaging. —I. (I.) Cherry

161A. Biomechanical Engineering (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: Biomedical Sciences 1A, Chemistry 8B, upper division standing in other Biomedical Engineering courses. Introduction to the basic principles in biomechanics, lecture and discussion sessions will cover basic techniques in DNA cloning, bacterial cell culture, protein expression, and data analysis. GE Credit: SciEng.—II. (II) Yokobayashi

161L. Biomechanical Engineering Laboratory (2)

Laboratory/discussion—6 hours. Prerequisite: course 161A, upper division Biomedical Engineering major. Prerequisite: Physics 103 or Chemical Engineering 150B or the equivalent. Application of principles of heat and mass transfer to biomedical systems related to 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. —II. (II.) Alderidge

122. Biomedical Heat and Mass Transport Processes (3)

Lecture—3 hours; discussion—1 hour. Prerequisite: Mechanical Engineering 165, Biomedical Systems Engineering 125, Chemical Engineering 153 or the equivalent. Mechanical properties that govern blood flow in the microcirculation and cell adhesion and motility. Constitutive equations of vascular tissue analysis. Blood rheology and viscoelasticity. Red and white blood cell mechanics. Remodeling of blood vessels in disease and engineering of blood vessels and cells. —I. Simon

216. Advanced Topics in Cellular Engineering (4)

Lecture—4 hours. Prerequisite: course 214 or consent of instructor. Advanced research strategies and technologies used in the study of immune function and inflammation. Static and dynamic measurements of stress, strain, and molecular scale forces in blood and vascular cells, as well as genetic approaches to the study of disease. —III. (III.) Simon

223. Multibody Dynamics (4)

Lecture—4 hours. Prerequisite: Engineering 102. Coupled rigid-body kinematics/dynamics; reference frames; vector differentiation; configuration and motion constraints; holonomic constraints; nonholonomic 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/Rodrigues parameters. (Same course as Mechanical and Aeronautical Engineering 223.)—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 modeling, real-time architecture and software implementation. (Same course as Mechanical and Aeronautical Engineering 225.) Offered in alternate years. —II. Cheng
Engineering: Chemical Engineering and Materials Science

(Graduate of College) Engineering: Chemical Engineering and Materials Science

Robert L. Powell, Ph.D., Chairperson of the Department
M.S. 752-5132; Fax (530) 674-6350

Department Office, 3120 Bainer Hall
M.S. 752-0400; Fax (530) 752-1031
http://www.chms.ucdavis.edu

Faculty

Mark D. Aston, Ph.D., Professor (Material Sciences and Engineering, Computational Science and Engineering)
Dewey D.Y. Ryu, Ph.D., Associate Professor (Chemical Engineering, Viticulture and Enology)
Ronald J. Phillips, Ph.D., Professor
Robert L. Powell, Ph.D., Professor and Endowed Chair (Chemical Engineering, Viticulture and Enology)

Clinical Faculty

Karen A. McDonald, Ph.D., Professor
Tonya L. Kuhl, Ph.D., Associate Professor
Alan P. Jackman, Ph.D., Professor
Jeffery C. Gibeling, Ph.D., Professor
Roland Faller, Ph.D., Associate Professor
Nael El-Farra, Ph.D., Assistant Professor

Emeriti Faculty

Roger B. Boulton, Ph.D., Professor and Endowed Chair (Chemical Engineering, Viticulture and Enology)
Nael El-Farra, Ph.D., Assistant Professor
Ranil E. Gunawardena, Ph.D., Professor
Richard L. Bell, Ph.D., Professor Emeritus
Benjamin J. McCoy, Ph.D., Professor Emeritus
Howard L. Needles, Ph.D., Professor Emeritus
J. M. Smith, Sc.D., Professor Emeritus
Benjamin J. McCoy, Ph.D., Professor Emeritus
Stephen Whitaker, Ph.D., Professor Emeritus

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.

Chemical Engineering Program

Chemical engineers apply the principles of chemistry and engineering to produce useful commodities, ranging from fuel to polymers. Chemical engineers are increasingly concerned with chemical and engineering processes related to the environment and food production. They work in areas as diverse as integrated circuits and isolated 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 treating 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 educate students as independent, critical thinkers who can also function effectively as a team; to educate students with a sense of community, ethical responsibility, and professionalism; to educate students for careers in industry, government, and academia; to teach students the necessity for continuing education and self-learning; and to help students learn to communicate proficiently in written and oral forms.

The Chemical Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Lower Division Required Courses

Mathematics 21A-21B-21C-21D 16
Mathematics 22A-22B 6
Physics 9A-9B-9C 15
Chemistry 2A, 2B, 2C or Chemistry 2A, 2B, 2C 15
Chemistry 128A, 128B, 129A 8
Chemical Engineering and Materials Sciences 5, 6 5
Chemical Engineering 51 4
Chemical Engineering 80 1
Engineering 45 4
English 3 or University Writing Program, or Comparative Literature 1, 2, 3, or 4, or Native American Studies 5 4
General Education electives 12

Minimum Lower Division Units 91

Options for Junior and Senior Years

The focus of your junior year is on fundamentals, such as thermodynamics, fluid mechanics, energy transfer, and mass transfer phenomena. In the senior year, you’ll take part in these fundamentals and apply them in a study of kinetics, process design, and process dynamics and control. The control program includes ten units of technical electives, and six units of chemical engineering and materials science electives that allow you to strengthen specific areas in chemical engineering, explore new areas, or pursue new areas of specialization.

Areas of Specialization

The most popular areas of specialization, together with lists of suggested technical electives, are identified and discussed in the following listing. Talk to the instructors of the courses listed about possible prerequisites before choosing the electives.

Suggested Technical Electives

Applied Chemistry: Chemistry 100, 115, 115C, 129C, 129C, 130, 131, 135, Fiber and Polymer Science 100, 110, 150


Automatic Control: Biological and Agricultural Engineering 165; Electrical and Computer Engineering 150B, 157B; Biological and Agricultural Engineering 165; Mechanical Engineering 172

Environmental Engineering: Air Environment: Civil and Environmental Engineering 149; Atmospheric Science 121A, 121B, 158; Civil and Environmental Engineering 150; Environmental Studies 110, Environmental Toxicology 101, 112A, 112B, 131

Environmental Engineering: Water Environment: Civil and Environmental Engineering 161A, 161B, 161C; Civil and Environmental Engineering 140; 140L, 148A, 148B, Microbiology 102; Biological Sciences 110, 147; Civil and Environmental Engineering 147; Environmental Studies 110, 150A, 151; Environmental Toxicology 101, 112A, 112B; Soil Science 100, 102, 107; Hydrologic Science 124

Food Process Engineering: Biological Systems Engineering 132; Food Science and Technology 104A, 104B, 104C; Food Science and Technology 1008

Management and Marketing: Engineering 190; Management 230, 251; Agricultural Economics 113, 130, 136; Statistics 103

Polymer Science: Chemistry 108, 128B, 129B, 129C, Fiber and Polymer Science 150; Chemical Engineering 150C; Materials Science and Engineering 147

Pre-Biomedical Engineering: Four to six courses from: Anatomy, Physiology and Cell Biology 100; Biological Sciences 1A, 1B, 1C, 101, 102, 103, 104, Molecular and Cellular Biology 140A, 141, 142; Physiology, and Behavior 101, 112, 113, 114

Pre-Medical: Anatomy, Physiology and Cell Biology 100, Chemistry 128B, 129B, 129C, and six biology or biochemistry courses, such as Biological Sciences 18C, 1C, 101, 103, 104; Microbiology 102; Molecular and Cellular Biology 140A, 141, 142; Physiology, and Behavior 101, 112, 113, 114

Chemical Engineering Upper Division Required Courses

Chemical Engineering 140, 141, 142, 143, 146, 152A, 152B, 155A, 155B, 157, 158A, 158B, 158C
Chemistry 110A, 110B, 110C
Biological Sciences 102
Statistics 100
Chemical Engineering and Materials Science Electives

Choose from the following: Chemistry 110C, 129B, 129C; Chemical Engineering 144, 160, 161A, 161B, 161L, 166, 170; Materials Science and Engineering 147, 160, 164; Fiber and Polymer Science 150.

Technical Elective

General Education electives

Minimum Upper Division Units 12

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

GE Credit: ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Social-Cultural Diversity; Wrt=Wriiting Experience
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 physical and chemical behavior of engineering materials. The Chemical Engineering/Materials Science program provides the background for activities in research, processing, and the design of materials. The curriculum is based on a common core of courses basic to engineering; courses taken during your first two years provide a strong foundation in fundamental engineering concepts.

### Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A 21B 21C 21D</td>
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<tr>
<td>Mathematics 22A 22B</td>
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<tr>
<td>Physical Chemistry A</td>
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<td>Chemistry 2A 2B Chemical 2AH</td>
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<td>Chemistry 128, 128B, 129A</td>
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<tr>
<td>Chemical and Materials Science 5, 6</td>
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<td>Chemical Engineering 51</td>
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<td>Chemical Engineering 80</td>
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<td>Engineering 45</td>
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<td>English 3 or University Writing Program 1</td>
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<td>Comparative Literature 1, 2, 3, or 4</td>
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<td>General Education courses</td>
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<tr>
<td><strong>Total Lower Division Units</strong></td>
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### Upper Division Required Courses

<table>
<thead>
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<th>Course</th>
<th>UNITS</th>
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<tr>
<td>Chemical Engineering 140, 141, 142, 143, 146, 152A, 152B, 155A, 155B, 157, 158A, 158B, 158C, 159, 159A</td>
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<tr>
<td>Chemistry 110A, 110B</td>
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<tr>
<td>Biological Sciences 102</td>
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<td>Statistics 100</td>
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<tr>
<td>Materials Science and Engineering 160</td>
<td>162, 162L, 164, and two courses chosen from Materials Science and Engineering 147, 172, 174, 180, 181, 182, 188A</td>
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<tr>
<td>Chemical Engineering 172 or 174L must also be taken in order to obtain the minimum unit requirement</td>
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<td>General Education elective</td>
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<td><strong>Minimum Upper Division Units</strong></td>
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<tr>
<td><strong>Minimum Units Required for Major</strong></td>
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### Biochemical Engineering Program

As the biotechnology industry expands and matures, there is increasing need for engineers who can move products from the research stage to large-scale manufacturing. As they fill this need, engineers must also understand the production, purification, and regulatory issues surrounding biopharmaceutical manufacturing.

Chemical engineers—with their strong foundations in chemistry, biological sciences, and chemical process engineering—are in a unique position to tackle these problems. Biochemical engineers apply the principles of cell and molecular biology, biotechnology, chemistry, and engineering to develop, design, scale-up, optimize, and operate processes that use living cells, organisms, or biological molecules for the production of useful commodities (such as monoclonal antibodies, vaccines, therapeutic proteins, antibiotics, and industrial enzymes); for health and/or environmental monitoring (such as diagnostic kits, microarrays, biosensors); or for environmental improvement (such as bioremediation).

An Honors Program is available to qualified students in the Chemical Engineering and Biochemical Engineering majors. The Chemical Engineering/Materials Science 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 honors seminars or a freshman honors seminar (EWM 5), two sophomore-year courses (ECMS and ECH 51) and at least one junior-year course (ECH 140 or 141) required by these majors. In the junior and senior years, students will complete either an honors thesis or a project that might involve local industry (ECH 194 A,B,C). Students must maintain a grade-point average of 3.5 to continue in the program. Successful completion of the Honors Program will be acknowledged on the student's transcript.

### Materials Science and Engineering Program

Materials science and engineering is directed toward an understanding of the structure, properties, and behavior of materials. Society demands new and improved materials with capabilities far superior to common metals, polymers, and ceramics. New materials are needed for high-speed transportation systems, surgical and dental implants, new generations of power plants, and solid-state electronic 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 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 behavior in petrochemical refineries to radiation-induced damage in nuclear power plants; and from the fabrication of steel to the design of semiconductors. Materials engineers are also increasingly involved in developing the new materials needed to attain higher efficiencies in existing and prospective energy schemes and will play a central role in the development of new technologies based on composites and high-temperature superconductivity.

The undergraduate materials science and engineering program provides the background for activities in research, processing, and the design of materials. The curriculum is based on a common core of courses basic to engineering; courses taken during your first two years provide a strong foundation in fundamental engineering concepts.

There are several combined majors with Materials Science and Engineering: Chemical Engineering/ Materials Science and Engineering, Electrical Engineering/ Materials Science and Engineering, and...
Objective.

1. Educate students in the fundamentals of materials science and engineering, balanced with the application of these principles to practical problems; educate students as independent, critical thinkers who can also function effectively in a team; educate students with a sense of community, ethical responsibility, and professionalism; educate students for careers in industry, government, and academia; teach students the necessity for continuing education and self-learning; and help students learn to communicate proficiently in written and oral form.

The Materials Science and Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Materials Science and Engineering Program

The Materials Science and Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Lower Division Required Courses

<table>
<thead>
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<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<td>Mechanics 21A-21B-21C-21D</td>
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<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, 2B, or 2AH, 2B</td>
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<td>Engineering 6, 17, 35, 45</td>
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<td>Comparative Literature 1, 2, 3, or 4, or Native American Studies 5</td>
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<td>Communication 1</td>
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<tr>
<td>General Education electives</td>
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<td>16</td>
</tr>
</tbody>
</table>

Minimum Upper Division Units ..... 90

Upper Division Requirements

In your third and fourth years, you will take “fundamentals” courses (Materials Science and Engineering 160, 162, 164, 174). With this background, you are then ready for the “applications” courses (Materials Science and Engineering 147, 180, 181, 182, 188) during the fourth year.

If you need a technical elective course in your program, you may select it from the College list of Technical Electives.


Upper Division Required Courses

Engineer 100, 102, 103, 104, 105, 190 | | 10 |
Selected from Aeronautics and Astronautics 137, 138, Civil and Environmental Engineering 132, 135 | | 22 |
Mechanical Engineering 150A, 150B | | 8 |
Select one course from Engineer 180, Mathematics 131, Statistics 120, 131A, Civil and Environmental Engineering 114, Chemical Engineering 140, or Applied Science Engineering 115 | | 4 |
Select one Chemistry 110A, 128A, Physics 121 or Geology 161 | | 3 or 4 |
Technical electives | | 0 or 1 |

Minimum Upper Division Units ..... 90

Minimum Units Required for Major ..... 180

Electrical Engineering/Materials Science and Engineering Program

The Electrical Engineering/Materials Science Program is a combined major, including portions of the Electrical Engineering curriculum in the Department of Electrical and Computer Engineering and the Materials Science curriculum in the Department of Chemical Engineering and Materials Science. In the past decade, the fields of solid-state electronics, opto-electronics, magnetics, and superconductors have developed rapidly, and demand for new materials now sets the pace for progress in these fields. Materials scientists with an electronics background are key players in these areas.

The Electrical Engineering/Materials Science curriculum provides students with the background necessary to pursue careers in electrical engineering or materials science. Students gain experience in graduate study and complete the Electrical Engineering/Materials Science curriculum to receive a Bachelor of Science in Electrical Engineering/Materials Science.

Objective.

The Electrical Engineering/Materials Science and 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, physics, science, and the fundamentals of electrical engineering/materials science and 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 with sufficient breadth in electrical engineering/materials science, and independent thought. This breadth is required for students to understand engineering tradeoffs that cross disciplines, for them to contribute effectively to multi-disciplinary projects and for them to make an informed decision about their area of study. Depth—To provide our graduates with sufficient depth in a specific area of electrical engineering/materials science and engineering. This depth is necessary to solve complex real-world engineering problems and to prepare to contribute to a specific discipline within electrical engineering/materials science and 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.

The Electrical Engineering/Materials Science and Engineering program, as adopted by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>Mathematics 21A-21B-21C-21D</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-2B</td>
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<td>10</td>
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<td>Engineering 6, 17, 35, 45</td>
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<tr>
<td>English or University Writing Program</td>
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<tr>
<td>Comparative Literature 1, 2, 3, or 4, or Native American Studies 5</td>
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<td>4</td>
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<tr>
<td>Communication 1</td>
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<td>4</td>
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<tr>
<td>General Education electives</td>
<td></td>
<td>16</td>
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</tbody>
</table>

Minimum Upper Division Units ..... 93

Upper Division Courses

5. Analysis in Biochemical, Chemical, and Materials Engineering (ECM) Courses in Chemical and Materials Science Engineering (ECM) are listed below; courses in Chemical Engineering (ECM) are listed immediately following; courses in Materials Science and Engineering (EMS) follow.

Lower Division Courses

- **90X. Honors Discussion Section** (1) Discussion—1 hour. Prerequisite: open only to students enrolled in the Chemical Engineering or Biochemical Engineering Honors program.
- **94H. Honors Seminar** (1) Seminar—1 hour. Prerequisite: open only to students enrolled in the Chemical Engineering or Biochemical Engineering Honors programs.

Upper Division Courses

**190X. Honors Discussion Section** (1) Discussion—1 hour. Prerequisite: open only to students enrolled in the Chemical Engineering or Biochemical Engineering Honors programs.

Quarter Offered: I = Fall, II = Winter, III = Spring, IV = Summer, 2007/2008 offering in parentheses

General Education (GE) credit: Arts & Humanities, SciEng = Science and Engineering; SoSci = Social Sciences; Div = Social-Cultural Diversity; Wrt = Writing Experience
Euler's laws of mechanics. One-dimensional laminar and turbulent flows. Macroscopic momentum and mass transfer equations. Boundary layer theory. Low Reynolds number flow. Not open for credit to students who have completed course 150B.—II. (III.)

142. Heat Transfer for Biochemical and Chemical Engineers (4)
Lecture/discussion—4 hours. Prerequisite: course 51 with a C- or better, course 141. Conduction, convection, and radiation of thermal energy in applications to chemical and biochemical engineering. Derivation of thermal and mechanical energy equations. Thermal boundary layers. Macroscopic balances. Applications: heat transfer in turbulent channels, and integrated circuits, and analysis of heat exchangers. Not open for credit to students who have completed course 153.—III. (III.)

143. Mass Transfer for Biochemical and Chemical Engineers (4)
Lecture/discussion—4 hours. Prerequisite: course 51 with a C- or better, course 141. Derivation of species conservation equations describing convective and diffusive mass flow. Fick's law and the Stefan-Maxwell constitutive equations. Mass transfer coefficients. Multicomponent mass transfer across gas/liquid interfaces. Applications include drying, heterogeneous catalysis, chemical reactions, and membrane separations.—II. (III.)

144. Rheology and Polymer Processing (3)
Lecture/Discussion—3 hours. Prerequisite: Course 141. Deformation in steady shear, unsteady shear, and elongational flows. Linear and non-linear viscoelastic constitutive models. The principle of material indifference and admissibility of constitutive equations. Introduction to the unit operations of polymer processing. Not open for credit to students who have completed course 150C.—III. (III.)

146. Chemical Kinetics and Reaction Engineering (5)
Lecture/discussion—5 hours. Prerequisite: Course 143 and 152B. Application of principles of kinetics, heat, and mass transfer to the analysis and design of chemical reaction systems. Not open for credit to students who have completed course 156B.—II. (II.)

152A. Chemical Engineering Thermodynamics (3)
Lecture—3 hours. Prerequisite: course 151. Application of principles of thermodynamics to chemical processes. Not open for credit to students who have completed Engineering 105 or Engineering 105A.—II. (II.)

152B. Chemical Engineering Thermodynamics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 152A. Continuation of course 152A. Not open for credit to students who have completed Engineering 105B.—III. (III.)

155A. Chemical Engineering Laboratory (4)
Lecture—3 hours; design—1 hour. Prerequisite: course 150B, 153, and 154A. GE credit: Wrt.—II. (II.)

155B. Chemical Engineering Laboratory (4)
Lecture—6 hours; discussion—1 hour; extensive writing. Prerequisite: courses 154B (may be taken concurrently), 155A, and satisfaction of the Engineering upper division writing requirement. Open only to majors in Chemical Engineering, Chemical Engineering/Materials Science, Chemical Engineering/Biochemical Engineering, Biomedical Engineering, and Biological Systems Engineering. Laboratory experiments in transport phenomena, chemical kinetics, and thermodynamics. GE credit: Wrt.—II. (II.)

157. Process Dynamics and Control (4)
Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: course 140. Fundamentals of dynamics and modeling of chemical processes. Design and analysis of feedback control of chemical processes.—I. (I.)

158A. Process Design and Analysis I (4)

158B. Process Design and Analysis II (4)
Lecture—4 hours. Prerequisite: course 158A. Heuristic and rigorous design of chemical process equipment. Synthesis of reactor and separation networks, heat and power integration.—II. (III.)

158C. Plant Design Project (4)
Laboratory/discussion—2 hours; project. Prerequisite: course 158B or 161C. Conceptual design of chemical and biochemical processes. Design, cost, and profitability analysis of complete plants. Use of computer-aided design techniques.—III. (III.)

160. Fundamentals of Biomaterials (3)
Lecture—3 hours. Prerequisite: Microbiology 102, Biological Sciences 102 or Animal Biology 102. Principles of large scale bioreactor production of metabolites, enzymes, and antibodies. Monoclonal antibody production systems including the development of strains/cell lines, fermentor/bioreactor design, monitoring and operation, product recovery and purification, and biomaterial processing. Credit not open for credit to students who have completed course 161C or both 161A and 161B; only two units of credit to students who have completed either course 161A or 161B.—McDonald

161A. Biochemical Engineering Fundamentals (3)
Lecture—3 hours. Prerequisite: Chemistry 128A, Mathematics 228, Microbiology 102 (or consent of instructor). Biokinetics, bioreactor design and operation; transport phenomena in bioreactors; microbial, plant, and animal cell cultures. Not open for credit to students who have completed course 161.—II. (II.)

161B. Bioseparations (3)
Lecture—3 hours. Prerequisite: course 154A. Product recovery and purification of biochemicals. Cell disruption, centrifugation, filtration, membrane separations, extraction, and chromatographic separation processes.—II. (II.)

161C. Biotechnology Facility Design and Regulatory Compliance (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 161A, 161B (may be taken concurrently). Design of biotechnology manufacturing facilities. Fermentation and purification equipment, and utility systems. Introduction to current good manufacturing practices, regulatory compliance, and documentation—III. (III.)

161L. Bioprocess Engineering Laboratory (4)
Laboratory—9 hours; discussion—1 hour; term paper. Prerequisite: course 161A and 161B, or Viticulture and Enology 186, or Biological Sciences 103 and Molecular and Cellular Biology 120L. Restricted to chemical/biochemical engineering majors during pass 1. Laboratory experiments in the operation and analysis of bioreactors; determination of oxygen mass transfer coefficients in bioreactors and ion exchange chromatography. GE credit: Wrt.—III. (III.)

166. Catalysis (3)
Lecture—3 hours. Prerequisite: course 156A (may be taken concurrently) or consent of instructor. Principles 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 swelling polymers; catalysis in microscopically caged (zeolites); catalysis on surfaces.—II. (II.)

Cates
170. Introduction to Colloid and Surface Phenomena (3)
Lecture—3 hours. Prerequisite: Microbiology 102 and 102L; Biological Sciences 101, 102, 103; Molecular and Cellular Biology 120, 120L, 200A; Food Science and Technology 205 recommended; or consent of instructor. Interaction of chemical engineering, biochemistry, and microbiology. Mathematical representation of colloidal systems. Kinetics and growth, death, and metabolism. Continuous fermentation, agitation, mass transfer and scale-up in fermentation systems, product recovery, enzyme technology. 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 reactor design and optimization, and new applications of enzymes in genetic engineering related biotechnology. Offered in alternate years. —II. Ryu

254. Colloid and Surface Phenomena (4)
Lecture—3 hours. Prerequisite: courses 154A and 156B or the equivalent. Analysis of the performance of chemical reactors and design of chemical reactors based on the principles of chemical kinetics and transport phenomena. Consideration of nancatalytic and catalytic reactions in single fluid phases and emphasis on reactions in multiphase mixtures, especially gas-solid reactors. —II. (I, II, III)

259. Advanced Engineering Mathematics (4)
Lecture—4 hours. Prerequisite: Mathematics 21D, 22A, 22B. Applicaitons of methods of applied mathematics to the analytical and numerical solution of linear and nonlinear ordinary and partial differential equations arising in the study of transport phenomena. —II. (I, II, III)

262. Transport Phenomena in Multiphase Systems (5)
Lecture—3 hours. Prerequisite: course 253C; Heat, mass, and momentum transfer in multiphase, multi-component systems with special emphasis on transport processes in porous media. Derivation of the averaging theorem and application of the method of volume averaging to multicomponent, reacting systems. —II. (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 suspension, especially the development of properly invariant constitutive equations. Topics include linear and nonlinear viscoelasticity, continuum mechanics, kinetic theory. Offered in alternate years. —II. Powell

265. Emulsions, Microemulsions and Bilayers (3)
Lecture—3 hours. Prerequisite: an undergraduate course in physical chemistry. Thermodynamic and mechanical descriptions of surfactant-laden interfaces. Forces between and within interfaces: Physics of micelle and micellar solution structure and stability of emulsions. Properties of phospholipid bilayers, with emphasis on vesicles. —II. (II) Dungan

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, design methods as well as self-tuning control techniques. Offered in alternate years. —III. (I, II, III)

289A-L. Special Topics in Chemical Engineering (1-5)

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.)—I, II, III, (I, II, III)

293. Graduate Student Seminar (1)
Seminar—1 hour. Prerequisite: graduate standing. Presentations by graduate students in research. May be repeated for credit. (S/U grading only)—I, II, III, (I, II, III)

294. Current Progress in Biotechnology (1)
Seminar—1 hour. Prerequisite: graduate standing. Seminars presented by guest lecturers on subjects of their own research activities. May be repeated for credit. (Same course as Molecular and Cellular Biology 294.)—I, II, III, (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 Course

390. Teaching of Chemical Engineering (1)
Discussion—1 hour. Prerequisite: qualifications and acceptance as teaching assistant and/or associate-in in chemical engineering. Participation as a teaching assistant or associate-in in a designated engineering course. Methods of leading discussion groups or laboratory section, grading quizzes, use of laboratory equipment, and grading laboratory reports. May be repeated twice for credit. (S/U grading only.)—I, II, III, (I, II, III)

Courses in Materials Science and Engineering (EMS)

Upper Division Courses

147. Principles of Polymer Materials Science (3)
Lecture—3 hours. Prerequisite: chemistry through organic, or Engineering 45; introductory physics sequence. Basic principles of polymer science presented including polymer structure and synthesis; polymerization mechanisms, polymer classes, properties of polymers; polymer morphology, rheology, and characterization; polymer processing. (Same course as Fiber and Polymer Science 100.)—II. (II)

160. Thermodynamics of Materials Processes and Phase Stability (4)
Lecture—4 hours. Prerequisite: Engineering 45. Review of thermodynamic principles of interest to materials scientists and engineers. Applications of thermodynamics to material processing, phase stability, corrosion and oxidation reactions, and environmental issues. Specific examples from molten metallurgy, glass melting, and solid state materials will be used. Only units of credit allowed to students who have completed course 130. Only 3 units of credit allowed to students who have completed course 144. Not open for credit to students who have completed both courses 130 and 144. —I, II

Lecture—4 hours. Prerequisite: Engineering 45. Description of the structure of engineering materials on the atomic scale by exploring the fundamental concepts of crystallography. The importance of this structure to materials’ properties. Description of experimental determination using x-ray diffraction techniques. Only 2 units of credit allowed to students who have
226 Engineering: Chemical Engineering and Materials Science

completed course 132. Only 3 units of credit allowed to students who have completed course 142. Only 1 unit of credit allowed to students who have completed both courses 132 and 142. —II.

162L. Structure and Characterization of Materials Laboratory (2)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 162L recommended. Experimental investigations of structure of solid materials are combined with techniques for characterization of materials. Laboratory exercises emphasize the experimental aspects of study of 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: Wrt. —II. 164. Rate Processes in Materials Science (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 45 and course 162. Basic kinetic laws and the principles governing phase transformations. Applications in diffusion, oxidation, nucleation, growth, and spinodal transformations. Only 1 unit of credit allowed to students who have completed course 134. Only 3 units of credit allowed to students who have completed course 144. Not open for credit to students who have completed both courses 134 and 144. —III.

172. Electronic, Optical and Magnetic Properties of Materials (4)
Lecture—3 hours; discussion—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 and properties. GE credit: Wrt. —II. 174. Mechanical Behavior of Materials (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 45 and course 162. The microscopic and macroscopic aspects of the mechanical behavior of engineering materials, with emphasis on recent developments in materials characterization by nondestructive testing. The fundamental aspects of plasticity in engineering materials, strengthening mechanisms and mechanical failure modes of materials systems. Only 1 unit of credit allowed to students who have completed course 138. Only 3 units of credit allowed to students who have completed course 142. Not open for credit to students who have completed both courses 138 and 142. GE credit: Wrt. —I.

174L. Mechanical Behavior Laboratory (2)
Lecture—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: Wrt. —II. 180. Materials in Engineering Design (4)
Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: Engineering 45 and upper division standing in Engineering. Quantitative treatment of materials selection for engineering applications. Discussion of the relationship between design parameters and materials properties. Emphasis on the influence of processing and fabrication on the properties of metals, ceramics, polymers and composites as related to the overall design process. Not open for credit to students who have completed course 140. (Former course 140.) GE credit: Wrt. —III. 181. Materials Processing (4)
Lecture—2 hours; lecture/discussion—1 hour. Prerequisite: Engineering 45 and upper division standing in engineering, physics, chemistry, or geology. Principles of phase equilibria, thermodynamics and reaction kinetics applied to materials processing. Effects of processing variables on the structure-property relationship. Fundamentals of the manufacturing processes for electronic, optical, functional and structural materials. Only 2 units of credit allowed to students who have completed both courses 146 or 155. Not open for credit to students who have completed both courses 146 and 155. GE credit: Wrt. —II.

182. Failure Analysis (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 45, upper division standing in science or engineering. 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, x-ray analysis and scanning electron microscopy. Investigation of practical problems. Only 1 unit of credit allowed to students who have completed course 148. Only 3 units of credit to students who have completed course 142 or course 144. Not open for credit to students who have completed both courses 144 and 148. GE credit: Wrt. —II. 188A-188B. Materials Design Project (2-2)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 160, 162, 164, 172, 174. A capstone materials design experience incorporating analysis of real materials processing and applications including economic, manufacturing, and ethical constraints. Various principles of materials science introduced in other courses in the curriculum are integrated into a team design project on supply chain. Only 1 unit of credit to students who have completed course 149. (Deferred grading only, pending completion of sequence.)—II—III. 190C. Research Group Conferences (1)
Discussion—1 hour. Prerequisite: consent of instructor. (P/NP grading only)—II, III. (II, III.) 198. Directed Study (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 Courses 230. Fundamentals of Electron Microscopy (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: Engineering 132. Principles and techniques of scanning and transmission of electron microscopy used in the study of materials. Emphasis upon practical applications. Offered in alternate years. —(II.) Browning 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.) Browning 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 diffraction methods, and high resolution imaging. Offered in alternate years.—II. Browning 232L. Laboratory for Advanced Transmission Electron Microscopy (2)
Discussion—1 hour; laboratory—2 hours. Prerequisite: course 230L. Advanced laboratory in advanced transmission electron microscopy techniques relevant to specific graduate research projects in materials science. Offered in alternate years. 240. Transport Phenomena in Materials Processes (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: graduate standing in Engineering. Phenomenological and atomistic mechanisms in transport processes in condensed and noncondensed phases. Application to heat treatment, chemical and physical vapor deposition, crystal growth, bonding, sintering and Joining of metals. Offered in alternate years.—III. 241. Principles and Applications of Dislocation Mechanics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: graduate standing in Engineering; consent of instructor. Concepts of dislocation theory in plastic deformation and dislocation with solute and/or impurity clouds are discussed. Offered in alternate years. —(II.) Mukherjee 242. Advanced Mechanical Properties of Materials (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 138. Strength and structure of engineering materials. The dependence of their mechanical properties on time, stress, and temperature. Generalized concepts of dislocation theory in plastic deformation, including creep, superplasticity, and cavitation. Influence of microstructure in optimizing the mechanical strength properties. Offered in alternate years. —II. Mukherjee 243. Kinetics of Phase Transformation in Engineering Materials (3)
Lecture—3 hours. Prerequisite: graduate standing in Engineering and consent of instructor; course 130 recommended. Theory of alloying; kinetics of phase changes, homogeneous and heterogeneous transformation, transformation by shear, order-disorder reactions. Offered in alternate years. —III. Groza 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. Special topics in corrosion; microbiological and atmospheric corrosion. Offered in alternate years. —I. Munir 245. Advanced Topics in Structure of Materials (3)
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. Offered in alternate years. —III. Shackelford 247. Advanced Thermodynamics of Solids (3)
Lecture—3 hours. Prerequisite: course 130 or the equivalent. Thermodynamics of gas-solid reactions and solutions; criteria for phase stability, thermodynamics of surfaces and interfaces; thermodynamics of defects in compounds, the influence of transport processes; thermodynamics of EMF cells and application to solid-state electrolytes. Offered in alternate years. —(II.) Munir 248. Fracture of Engineering Materials (3)
Lecture—3 hours. Prerequisite: course 138. Description of failure of materials by crack propagation. Topics include the stress fields about elastic cracks, the Griffith-Irwin analysis, descriptions of plastic...
Mechanisms of Fatigue (3)
Lecture—3 hours. Prerequisite: course 138 or consent of instructor. Special topics in mechanisms of fatigue in metals include 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(II)

Special Topics in Polymer and Fiber Science (3)
Lecture—3 hours. Prerequisite: course 147 or consent of instructor. Special topics include: (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 Chemical Aspects of Oxides. May be repeated for credit when topics differ. —I, II, III (I, II, III)

Graduate Research Conference (1-5)
Discussion—1 hour. Prerequisite: consent of instructor. Special topics include: a major 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)

The 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)

Professional Course
The Teaching of Materials Science (1)
Discussion—1 hour. Prerequisite: meet qualifications for teaching assistant and/or associate-in-charge in materials science and engineering. Participation as a teaching assistant or associate-in-charge 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 twice for credit. [S/U grading only]—I, II, III (I, II, III)

The Civil and Environmental Engineering Programs
Mission. The Department of Civil and Environmental Engineering integrates research, education, and professional service in areas related to civil infrastructure and the environment. We provide the profession and academia with outstanding graduates who advance both engineering practice and fundamental knowledge.

Program Educational Objectives. Fundamentals to educate students in the fundamental principles needed for civil and environmental engineering: mathematics, basic sciences, and engineering sciences. Application to the educational objectives in the implementation of fundamental principles for solving civil and environmental engineering problems; provide proficiency in at least four of the environmental, geotechnical, structural, transportation, and water resource areas; and expose students to current research and professionalism: To imbue students with attributes that lead to professional growth throughout their careers: a sense of community and professional responsibility; an awareness of business practices; a recognition of the need for lifelong learning, continuing education, and participation in professional societies; a preparedness for graduate education; an appreciation for diversity in the engineering profession; the ability to think independently and perform effectively in multidisciplinary teams; and the ability to communicate effectively. Service to State and Profession: To provide an educational program that serves the needs of the state and profession; recruit and retain a diverse student population that is representative of the state; engage in outreach activities; provide an efficient program that minimizes the time-to-degree and maximizes enrollment opportunities; and prepare students for entry into postgraduate education or practice.

Study Abroad and Civil Engineering. It is possible for students to complete a portion of the civil engineering program at an international institution, such as the University of Edinburgh, by participating in an Education Abroad Program. The program encourages interested students to select a campus through the Education Abroad Program, then consult with the undergraduate staff adviser in Civil Engineering about their individual course plan. Often students are in their junior or senior year of study when they participate in this option.

Civil Engineering Program
The Civil Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Lower Division Required Courses
Requirements for the Civil Engineering program. Students may combine their study of engineering, materials science and engineering, and environmental engineering. Undergraduates may emphasize one or more of the following areas of specialization, or generalize across all areas. You are urged to consult with a departmental adviser when developing your individual program. Additional information on areas of specialization and potential faculty advisers can be found in the Engineer's Handbook.
obtained from the College of Engineering Bulletin and the departmental Web page.

**Environmental Engineering.** The focus of this area is the management and improvement of air, land, and water quality in the face of increasing population and expanding industrialization. Examples of environmental engineering problems include innovative advancements in air, water, wastewater, and solid waste treatment systems; mathematical modeling of natural and engineered systems; sampling, analysis, and transport and transformation of natural and anthropogenic pollutants; and modeling of air pollutant emissions.

Suggested technical electives: Applied Science Engineering 116; Atmospheric Science 121A, 158, 160; Chemical Engineering 143, 146, 161A, 161B, 170; Chemistry 107A, 107B, 128A, 128B; Civil and Environmental Science and Policy 150A, 151; Mathematics 128A, 128B, 128C; Mechanical Engineering 161, 163, Microbiology 102, 105, 120, 140, 150; Soil Science 111, 112; Statistics 130A, 130B


**Geotechnical Engineering.** This area deals with civil infrastructure and environmental problems that require quantifying the behavior of geologic materials (e.g., soils and rocks). Examples of geotechnical engineering problems include foundations for buildings and bridges, earthwork (e.g., dams, tunnels, highways), earthquake hazards (e.g., ground motions, liquefaction, soil-structure interaction), and geo-environmental problems (ground water flow, subsurface contaminant transport and remediation).

Suggested technical electives: Civil and Environmental Engineering 131, 132, 135, 137, 138, 139, 140, 144, 171, 171L, 173, 175, 179; Civil and Environmental Engineering 190; Geology 17, 50, 50L, 134, 161; Hydrologic Science 146; Mathematics 128A, 128B, 128C

Suggested Advisers: R. W. Boulanger, Y. F. Dafalias, J. T. DeJong, J. T. Harvey, B. Jeremic, B. L. Kutter

**Structural and Geotechnical Engineering.** This area is the study of the 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.

Suggested technical electives: Civil and Environmental Engineering 130, 131, 132, 135, 136, 137, 138, 139, 171, 171L, 173, 175, 179; Engineering 122, 180; Materials Science and Engineering 174; Mathematics 128A, 128B, 128C


**Transportation Planning and Engineering.** This area is the study of transportation of people and goods in a manner consistent with society’s environment (e.g. air and water quality) and socio-economic goals (e.g. equity and mobility).


**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 hydrologic conditions. Hydrodynamics and fluid mechanics deal with flows in pipes, open-channel water-distribution systems, and natural systems, such as lakes and estuaries. Water resources systems planning and design deals with the comprehensive development of water resources to meet the multiple needs of industry, agriculture, municipalities, recreation, and other activities.

Suggested technical electives: Agricultural and Resource Economics 176; Atmospheric Science, 121A; Biological and Agricultural Engineering 145; Civil and Environmental Engineering 141, 143, 149, 153; Environmental Science and Policy 126, 150A, 151; Hydrologic Science 110.


**Civil Engineering**

**Upper Division Required Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Units</th>
<th>Description</th>
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| Engineering 102, 103, 104, 104I, 105, 105 | 10 | Applied Science Engineering 115
| 114 | 4 | Civil and Environmental Engineering 114 | 10 |
| One course from Applied Science Engineering 116, Civil and Environmental Engineering 153, Mathematics 118A, 121 | 10 | or Statistics 108 | 4 |
| One minimum of four of the following groups options (a minimum of two courses in each of the four areas and a minimum of 19 design units from group option selections, technical electives, and programming elective. Courses listed in more than one group may be counted only once. The maximum number of units from each course is noted on the Civil Engineering degree requirement advising sheet, available from the department, also shown in its entirety on the department’s Web site.) | 28 | *Environment: Civil and Environmental Engineering 148A or 149 and at least one from courses 140, 143, 148B, 150 | 12 |
| Geotechnical: Civil and Environmental Engineering 171 and 171 LAB and at least one from courses 173, 173, 179 | 15 | Structures: Civil and Environmental Engineering 135 and at least one from courses 130, 131, 132, 136, 137, 138, 139, 179 | 4 |
| Transportation: Civil and Environmental Engineering 161 or 163 and at least one from courses 162, 165, 179 | 15 | Water Resources: Civil and Environmental Engineering 141 and 141 LAB and at least one from courses 142, 144, 145, 146, 155 | 4 |
| Technical electives: 18 | 14 | Electrical Engineering 192 or 199 | 12 |
| General Education electives | 12 |

**Minimum Upper Division Units ... 101**

**Minimum Units Required for Major ... 194**

**Courses in Engineering:**

**Civil and Environmental (ECI)**

**Lower Division Courses**

3. **Introduction to Civil and Environmental Engineering Systems (3)** Lecture—2 hours, laboratory—3 hours. Prerequisite: trigonometry. An introduction to civil engineering systems. A general view of the engineering process as obtained by participation in laboratory exercises illustrating the solution of representative, but greatly simplified, engineering problems. Not open for credit to upper division engineering students. I.–II.

10. **Introduction to Surveying (4)** Lecture—2 hours, laboratory—6 hours. Prerequisite: Physics 9A may be taken concurrently. Restricted to majors in Civil Engineering, Civil Engineering/Mate- rials Science and Engineering, and Biological Systems Engineering. Theory and practice of civil engineering surveying. Modern methods of land surveying and computer-aided design and geographic information systems in civil engineering practice. Only 3 units of credit for students who have previously taken Biological Systems Engineering 1. I.–III.

19. **C Programming for Civil and Environmental Engineers (4)** Lecture—3 hours, laboratory—3 hours. Prerequisite: Mathematics 22A may be taken concurrently. Com- putational problem solving techniques for civil and environmental engineering applications using structured C programming. Algorithm design applied to realistic problems. Not open for credit to students who have completed course 119A. I.–II.

**90X. Lower Division Seminar (1-4)** Seminar—1 to 4 hours. Prerequisite: consent of instructor. Examination of a special topic in a small group setting. May be repeated for credit.

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. May be repeated for credit. (P/NP grading only)

98. **Directed Group Study (1-5)** Prerequisite: consent of instructor and lower division standing. (P/NP grading only)

**Quarter Offered:** Fall = I, Winter = II, Spring = III, Summer = IV

**General Education (GE) credit:** ArtHum = Arts and Humanities, SciEng = Science and Engineering, SocSci = Social Sciences, Div = Social-Cultural Diversity, Wrt = Writing Experience
114. Probabilistic Systems Analysis for Civil Engineers (4)
Lecture—4 hours. Prerequisite: Mathematics 21C. Probabilistic concepts and models in engineering. Statistical 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 Statistics 120.—I, II, III. Mohkhtaran

119. Parallel Processing for Engineering Applications (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: C programming or consent of instructor. Fundamentals skills in parallel computing for engineering applications; emphasis on structured parallel programming for distributed memory parallel clusters. Not open for credit to students who have completed course 119B.—III. (III.) Kleeman, Jerome.

123. Urban Systems and Sustainability (4)
Lecture—4 hours. Prerequisite: upper division standing in Engineering, or Materials Science and Engineering. Systems-level approach of how to evaluate and then modify sustainability of urban systems based on interaction with natural environments. Topics include: definition of sustainability, urban sustainability, system analyses of urban systems; enabling technology, policies, legislation; measures and modification of ecological footprints. GE Credit: SciEng, SocSci, Div. Writ.—I. (I.) Loge, Niemeier

130. Structural Analysis (4)
Lecture—4 hours. Prerequisite: Mathematics 22A, Engineering 104. Elastic structural analysis of determinate and indeterminate trusses, beams and frames. Plastic bending and limit analysis.—III. (III.)

131. Matrix Structural Analysis (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 6 and 104. Matrix formulation and computer analysis of statically indeterminate structures. Stiffness and flexibility formulations for elastic structures. Finite element methods for elasticity and bending problems.—I. (I.) Kunnath

132. Structural Design: Metallic Elements (4)
Lecture—4 hours. Prerequisite: Engineering 104. Design of metallic beams, columns, and other members for various types of loading and boundary conditions; design of connections between members; member performance within structural systems.—II. (II.) Bolander

135. Structural Design: Concrete Elements (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 104. Restricted to majors in Civil Engineering, Civil Engineering/Materials Science and Engineering, or Materials Science and Engineering only. Strength design procedures for columns, rectangular beams, T-beams and beams of general cross-section. Building code requirements for bending, shear, axial load, combined stresses and bond. Introduction to prestressed concrete.—I, II, III. (II.) Chary

136. Building Design: Wood, Steel, and Concrete Applications (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 130 or 131, course 135; course 132 recommended. Horizontal and vertical load paths; dead and live loading; earthquake and wind forces. Approximate analyses of building frames; wood engineering for buildings. Steel, concrete and wood building design.—I. (I.) Chary

137. Construction Principles (4)
Lecture—2 hours; laboratory—3 hours. Prerequisite: upper division standing in Engineering; Engineering 104 recommended. Project management, with civil engineering construction and design applications, including project scope, schedule, resources, costs, quality, risk, and control. Construction industry overview. Interactions between planning, design, construction, operations. Construction operations analysis. Contract issues. Project management software, field trip (if required)—(I.) Parv;

138. Earthquake Loads on Structures (4)

139. Advanced Structural Mechanics (3)
Lecture—3 hours. Prerequisite: Engineering 104 or the equivalent. Review of stress, strain, equilibrium, compatibility, and elastic material behavior. Plane stress and plane strain problems in elasticity theory; stress function. Theories for straight, tapered, composite, and curved beams. Beams on elastic foundations. Introduction to plates, curved membranes, and cables.—I. (I.) Rashid

140. Environmental Analysis of Aqueous Systems (3)
Lecture—3 hours. Prerequisite: Chemistry 28; course 148A recommended. Introduction to chemical principles underlying the transport and analysis of water and wastewater and associated data analysis.—I. (I.) Darby

141. Engineering Hydraulics (3)
Lecture—3 hours. Prerequisite: Engineering 103. Nature of flow of a real fluid, flow in pipes, open channel flow; turbomachinery; fluid forces on objects: boundary layers, lift and drag.—I, III. (I, III.) Schladow

141L. Engineering Hydraulics Laboratory
Laboratory—3 hours. Prerequisite: course 141 (may be taken concurrently). Open to Engineering students only. Laboratory experiments and demonstrations on flow measurement, sluice gates, hydraulic jump, flow characteristics, and centrifugal pumps.—I, III. (I, III.) Schladow

142. Engineering Hydrology (4)
Lecture—4 hours. Prerequisite: courses 141 (may be taken concurrently); course 114 recommended. The hydrologic cycle; Equations of regulation, interception, depression storage and infiltration. Streamflow analysis and modeling. Flood routing through channels and reservoirs. Frequency analysis of hydrometric variables. Precipitation analysis for hydrologic design. Hydrologic design.—I. (I.) Kavvas

143. Green Engineering Design and Sustainability (4)
Lecture—4 hours. Prerequisite: upper division standing; restricted to Civil Engineering and Civil Engineering/Materials Science and Engineering majors only. Application of concepts, goals, and metrics of sustainability, green engineering, and industrial ecology to the design of systems. Life-cycle analyses, waste audit and environmental management systems, economics of pollution prevention and sustainability, and substitute materials for products and processes.—I. (I.) Loge

144. Groundwater Systems Design (4)
Lecture—4 hours. Prerequisite: course 141. Groundwater occurrence, distribution, and movement; groundwater flow systems; radial flow to wells and aquifer testing; flow in confined ground; groundwater contamination; solute transport by groundwater; fate and transport of subsurface contaminants. Groundwater supply and transport modeling.—I. (I.) Ginn

145. Hydraulic Structure Design (4)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 141 and 141L; course 142 recommended. Fundamental principles and practical aspects of the design of hydraulic structures including water storage, conveyance, and pumping systems. Emphasis on use of industry-standard computer software for hydraulic design.—III. (III.) Younis

146. Water Resources Simulation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103; Applied Science Engineering 115, course 134 or 142 recommended. 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 dispersion of contaminants in water bodies. GE credit: Wrt.—II. (II.) Younis

148A. Water Quality Management (4)

148B. Water Quality Management Systems Design (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 148A. Application of the principles of fluid mechanics to the analysis and design of flow measurement devices, pumping systems, water distribution systems, wastewater collection systems, water and wastewater treatment plant headloss analysis, and bioremediation systems.—III. (III.) Darby

149. Air Pollution (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 21D, 22B, Chemistry 28, Atmospheric Science 121A or Engineering 102. Physical and technical aspects of air pollution and geophysical processes and air pollution meteorology as well as physical and chemical properties of pollutants. Same course as Atmospheric Science 149.—I, (I.) Chang

150. Air Pollution Control System Design (4)
Lecture—2 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: Engineering 103, 105, 106, course 149. Design and operation of pollution control devices and systems.—II. (II.) Chang

153. Deterministic Optimization and Design (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Mathematics 21C, 22A; computer-programming course; Applied Science Engineering 115 recommended. Operations research. Optimization techniques such as linear programming, dynamic programming, and non-linear programming. Applications in water, transportation, environmental, infrastructure systems, and other civil engineering disciplines through computer-based course projects.—I. (I.) Fan

155. Water Resources Engineering Planning (4)
Lecture—4 hours. Prerequisite: Engineering 106 or Economics 1A, course 114, 142; course 153 recommended. Basic engineering planning concepts; role of engineering, economic, environmental and social information and analysis; institutional, political and legal aspects. Case studies and computer models illustrate the planning of water resource systems. GE credit: Wrt.—(III.) Lund

161. Transportation System Operations (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 6 (or the equivalent) and 102. Principlle of traffic operations, traffic characteristics and methods of measurement; models of transportation operations and congestion applied to urban streets and freeways.—I. (I.) Zhang

162. Transportation Planning (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 161 or 163. Driver, vehicle and roadway factors and their relationship to transportation planning and system design. Generalized design paradigm; group problem solving.—III. (III.) Niemeier
163. Energy and Environmental Aspects of Transportation (4)
Lecture—3 hours; discussion/lecture—3 hours. Prerequisite: Engineering 104. Transportation and associated environmental problems confronting urban areas, and prospective technological and institutional solutions. Draws upon concepts and methods from economics, engineering, political science and environmental studies. Offered in alternate years. GE credit: SciEng, Wrt. —(I.) Sperling

165. Transportation Policy (3)
Lecture—3 hours. Prerequisite: Economics 1A and Engineering 104. Transportation and associated environmental problems confronting urban areas, and prospective technological and institutional solutions. Draws upon concepts and methods from economics, engineering, political science and environmental studies. Offered in alternate years. GE credit: SocSci, Wrt. —(I.) Sperling

166. Scientific Data Management (4)
Lecture—3 hours, discussion—1 hour. Prerequisite: Programming skills at course level 40; Mathematics 21C. Relational databases, SQL, non-standard databases, XML, scientific workflows, interoperability, data analysis tools, metadata. —I. (I.) Gertz, Ludescher

171. Soil Mechanics (4)
Lecture—4 hours. Prerequisite: Engineering 103 and 104 (may be taken concurrently), course 171M must be taken concurrently. Restricted to Civil Engineering and Civil Engineering/Materials Science and Engineering majors only. Soil formations, mass-volume relationships, soil consolidation, effective stress, soil-water-void relationships, compaction, seepage, capillarity, compressibility, consolidation, stress, shear forces and stress failure, lateral earth pressures, and slope stability. —I, III. (I, III.) Kutter

171L. Soil Mechanics Laboratory (1)
Laboratory—3 hours. Prerequisite: course 171 must be taken concurrently. Laboratory studies utilizing standard testing methods to determine physical, mechanical and hydraulic properties of soil and demonstration of basic principles of soil behavior. —I, III. (I, III.) Kutter

173. Foundation Design (4)
Lecture—4 hours. Prerequisite: courses 135 (may be taken concurrently) and 171. Soil exploration and determination of soil properties for design; consolidation of elastic and plastic foundations; bearing capacity of soils and footing design; lateral earth pressures and retaining wall design; pile foundations; excavations and dewatering. —II. (II.) Boulangier

175. Geotechnical Earthquake Engineering (4)
Lecture—4 hours. Prerequisite: course 171 and 171L. Earthquake sources and ground motions; cyclic behavior, triggering, consequences, and mitigation of effects of liquefaction. NEEES [Net-work for Earthquake Engineering Simulation] equipment and techniques for studying earthquake engineering with focus on liquefaction problems. —I. (I.) Kutter

179. Pavement Engineering (4)
Lecture—3 hours, discussion/lecture—3 hours. Prerequisite: Engineering 104. Pavement types (rigid, flexible, unbonded, bonded), their applications (roads, airfields, ports, rail) and distress mechanisms. Materials, traffic and environment characterization. Empirical and mechanistic-empirical design procedures. Maintenance and reconstruction, construction quality; asphalt concrete mix design. —I. (I.) Harvey

189A-J. Selected Topics in Civil Engineering (1-5)
Prerequisite: consent of instructor. Directed group study of selected topics with separate sections in (A) Environmental Engineering; (B) Hydraulics 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 Resources Planning. May be repeated for credit when the topic is different. —I, II, III, (I, II, III)

190C. Research Conference 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.) —I, III. (I, II, III)

192. Internship in Engineering (1-5)
Internship. Prerequisite: upper division standing; approval of project prior to the period of the internship. Supervised work experience in civil engineering. 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: senior standing in engineering and at least a B average. (P/NP grading only.)

Graduate Courses

201. Introduction to Theory of Elasticity (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 104. Basic concepts of elasticity in three dimensions; plane stress and plane strain; flexure and torsion of bars of various shapes. Introduction to variational and approximate methods. —I. (I.) Rashid

203. Inelastic Behavior of Solids (3)
Lecture—3 hours. Prerequisite: course 201. Fundamentals of theories of plasticity, viscoelasticity and viscoplasticity for solids. Macroscopic constitutive modelling for engineering materials, e.g., metals, polymers, soils, etc., and microscopic mechanisms. Offered in alternate years. —II. (II.) Dalalas

205. Continuum Mechanics (3)
Lecture—3 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 topics. Offered in alternate years. —II. (II.) Dalalas

206. Fracture Mechanics (4)
Lecture—4 hours. Prerequisite: course 201; Engineering 104. Linear and nonlinear fracture mechanics, stress analysis, brittle fracture criteria, path independent integrals, Dugdale-Barenblatt model, general cohesive zone models, ductile fracture criteria, crack tip fields for stationary and propagating cracks, fatigue. Application of numerical methods for fracture mechanics. Offered in alternate years. —II. (II.) 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; partially rigid connections; geometric and material nonlinearities; bending, flexibility-based formulations; FEM-software for nonlinear analysis of structures. —II. Kunnath

212A. Finite Element Procedures in Applied Mechanics (4)

212B. Finite Elements: Application to Linear and Non-Linear Structural Mechanics Problems (4)
Lecture—4 hours. Prerequisite: course 212A. Application to linear and nonlinear structural mechanics problems. Linear elasticity, weak form, and finite ele-ments; stress analysis. Incompressible media prob-lems. Non-linear problems with material nonlinearity. —II. (II.) Sukumar

213. Analysis of Structures Subjected to Dynamic Loads (4)
Lecture—4 hours. Prerequisite: courses 138 and 211. Analysis of structures subjected to earthquake, wind and blast loading; distributed, consistent and lumped mass techniques; computer implementation; nonlinear response spectrum; transient and time domain analysis; seismic protection of structures; numerical methods in linear and nonlinear structural dynamics. —II. (II.) Kannath

217. 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, orthotopic and composite plates and shells for irregular and circular plates. Membrane theory for axisymmetric shells and bending of circular shells. —I.

232. Advanced Topics in Concrete Structures (4)
Lecture—4 hours. Prerequisite: courses 130 or 131, 138 and graduate standing. Ductility of reinforced concrete; strength of two-way slabs; modified com-pression field theory. —II. (II.) Chao

233. Advanced Design of Steel Structures (4)
Lecture—4 hours. Prerequisites: courses 130 or 131, 135. Survey of methods and applications; prestress-ing materials and systems; prestress losses, flexural design; design for shear and torsion; deflection com-putation and control; continuous beams and indeter-minate systems; moment frames and bracing systems; connection design; seismic design of steel structures; vibration of flooring systems; steel-concrete composite design. —II. (III.) Bolander

234. Prestressed Concrete (4)
Lecture—4 hours. Prerequisites: courses 130 or 131, 135. Survey of methods and applications; prestress- ing materials and systems; prestress losses, flexural design; design for shear and torsion; deflection com-putation and control; continuous beams and indeter-minate systems; moment frames and bracing systems; connection design; seismic design of steel structures; vibration of flooring systems; steel-concrete composite design. —II. (III.) Bolander

235. Cement Composites (4)
Lecture—3 hours, laboratory—3 hours. Prerequisite: Engineering 104. Applications of cement composites; materials selection and proportioning; compo- nent and composite properties; hydration reactions and microstructure development; mechanisms of fail-ure; nondestructive test methods; fiber reinforcement; concrete durability; novel reinforcing materials; fer-rowcement; repair and retrofit technologies; applica-tions to structural design. Offered in alternate years. —II. Bolander

238. Performance-Based Seismic Engineering (4)
Lecture—4 hours. Prerequisite: Courses 138 and 213. Modern seismic design; performance-based seismic design; seismic hazard; seismic demands: linear and nonlinear procedures; performance assessment; deterministic and probabilistic proce-dure; review of FEMA-350, FEMA-356, ATC-40 and other performance-based guidelines. —III. (III.) Kunath

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. Treatment and removal; water quality modeling. —II. (II.) Schladow
241. Air Quality Modeling (4) Lecture—4 hours. Prerequisite: Applied Engineering 5, course 119A, 149, 150, one from course 242 or 247, or the equivalent, graduate standing. Modeling of urban and regional air quality problems including gas-phase chemical reactions, aerosol-phase chemical reactions, phase partitioning, and numerical solution schemes. Offered in alternate years.—I. Kleeman

242. Air Quality (4) Lecture—4 hours. Prerequisite: Engineering 105, course 119A, 149, 150, one from course 242 or 247, or the equivalent. Factors determining air quality. Effects of air pollutants. Physical and chemical fundamentals of atmospheric transport and reaction. Introduction to dispersion modeling. Offered in alternate years.—II. 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] Darby

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] Darmstadt

245A. Applied Environmental Chemistry: Inorganic (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 105, Chemistry 28 or the equivalent, course 149, or Chemistry 2C or 107A recommended. Chemical structure of water and polluted waters. Topics include chemical, kinetic and equilibrium principles, redox reactions, gas solution and solid-solution equilibria. Topics include application of thermodynamics and coordination chemistry, interfacial phenomena. Offered in alternate years.—III. Young

245B. Applied Environmental Chemistry: Organic (4) Lecture—4 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 thermodynamics to predict solubility and activity coefficients; distribution of organic chemicals between the aqueous phase and air, solvent, or solid phases; chemical, photochemical and biological transformation reactions. Offered in alternate years.—II. Young

246. Pilot Plant Laboratory (4) Lecture—1 hour; discussion—1 hour; laboratory—6 hours. Prerequisite: course 243A, 243B (may be taken as consent of instructor); undergraduate standing. Laboratory investigation of physical, chemical, and biological processes for water and wastewater treatment.—II. [II] Kleeman

247. Aerosols (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 generation, aerosol collection, ions measurement, metals measurement, and carbon measurement. May be repeated once for credit.—I. [I] Kleeman

248. Biofilm Processes (4) Lecture—2 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 structure, microbial processes, fundamental and applied research tools, biofilm reagents, beneficial uses, and detrimental effects.—III. [III] Wuertz

249. Probabilistic Design and Optimization (4) Lecture—4 hours. Prerequisite: courses 114 and 153 and Engineering 106, or equivalents. Design by optimization for probabilistic systems, decision theory, the value of information, probabilistic linear programming, discrete stochastic programming, nonlinear probabilistic optimization. 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. Applications with a focus on modeling, identifying, and controlling dynamic, stochastic, and underdetermined systems. Applications in transportation networks, water resource planning, and other infrastructural systems. 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. Predictions 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. Offered in alternate years.—II. Kleeman

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 sustainable transportation system. Emphasis on technology options, including alternative fuels, electric propulsion, and VHS. Analysis of market demand and travel behavior, environmental impacts, economics and politics. (Same as course as Environmental Science and Policy 252.) Offered in alternate years—III. Young


256. Urban Traffic Management and Control (4) Lecture—4 hours. Prerequisite: course 114. Basic concepts, models and applications 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 hydraulic flow theory.—II. [II] Zhang

257. Flow in Transportation Networks (4) Lecture—4 hours. Prerequisite: course 153, 161 or 256 recommended. Elements of graph theory; survey of pertinent optimization techniques, extremal principles in network flows, deterministic equilibrium assignment, stochastic equilibrium assignment, extensions of equilibrium assignments and dynamic transportation network assignment.—II. [II] Zhang

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 on identifying appropriate technologies, policies, and planning methods for designing transportation systems in regions of differing socioeconomic, geographic, and institutional settings. Offered in alternate years.—III. Spalding

259. Asphalt and Asphalt Mixes (4) Lecture—4 hours. Prerequisite: course 179 or consent of instructor. Rheology and asphalt mix properties and their use in civil engineering structures, with primary emphasis on pavements. Asphalt, aggregate properties and effects on complex designs. Design, construction, recycling. Recent developments and research. Offered in alternate years.—III. Harvey

260. Sediment Transport (4) Lecture—4 hours. Prerequisite: course 141 or equivalent. Sediment transport in hydrologic systems. Process-oriented course which will emphasize how sediment moves and the physical processes that affect sediment transport. Field trip. Offered in alternate years.—I. Schmocker

262. Transit Systems Analysis (3) Lecture—3 hours. Prerequisite: course 251. Theoretical presentation of transit planning and analysis techniques. Five modules: policy and funding, management and operation of public transit, transit and other transportation issues; planning and forecasting methods for performance evaluation. Review of transit studies from other regions. Offered in alternate years.—II. Niemeier

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 impact on water quality. Case studies of specific lakes and rivers. Offered in alternate years.—III. Schladower

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 impact on water quality. Topics include advection/diffusion, tides, transverse mixing, longitudinal dispersion; nutrient cycling; computer modeling of estuaries. Case studies of specific systems. Offered in alternate years.—III. Schladower


266. Applied Stochastic Methods in Engineering (4) Lecture—4 hours. Prerequisite: course 114 or Mathematics 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 stochastic differential equations; Fokker-Planck equation; stochastic differential equations with random coefficients. Offered in alternate years.—I. Kovvas

267. Water Resources Management (3) Lecture—3 hours. Prerequisite: courses 114, 141 and 142; course 153 recommended. Engineering, institutional, economic, statistical 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.—I. [I] Aurbach

268. Infrastructure Economics (3) Lecture—3 hours. Prerequisite: Economics 1A, Engineering 106 or the equivalent. Economics applied to infrastructure engineering planning, operations, maintenance, and management problems; microeconomic and macroeconomic theories; benefit-cost
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 air pollution. Principles of modeling vehicle emissions. Conformity issues and the regulatory framework. Regional and micro-scale modeling. Offered in alternate years. —(II.) Nienire

270. Aqueous, Ion Exchange, and 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, institutional issues, pricing model application, economic development, forecasting, operations, and other topics. Offered in alternate years. — III. Yunis

272A. Advanced Hydrogeology (4)

272B. Hydraulics (4)

272C. Multiphase Reactive Transport (4)
Lecture—4 hours. Prerequisite: courses 142, 144, 148A. Multicomponent reactive transport including multiple phases. Advective/dispersive transport, chemical equilibria, and mass transport in subsurface systems. Application of deterministic and stochastic optimization techniques. Water quality distribution, and design and operation of reservoir systems. Surface water and groundwater management. Offered in alternate years. — I. Marine

273. Water Resources System 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 quality distribution, and design and operation of reservoir systems. Surface water and groundwater management. Offered in alternate years. — I. Marine

275. Hydraulic Time-Series Analysis (4)
Lecture—4 hours. Prerequisite: course 114 and 142. Application of statistical methods for analysis and modeling of hydraulic series. Statistical simulation and prediction of hydraulic sequences using time series methodology. Offered in alternate years. — II. 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, including taking place on a hill slope. — II. Kavvas

277. Computational River Mechanics I (4)
Lecture—4 hours. Prerequisite: Applied Science Engineering 115, course 141 (both may be taken concurrently). Unsteady open channel flows, computation of water surface profiles, shallow water equations, St. Venant equations, methods of characteristics. Numerical methods, stability and accuracy of explicit and implicit schemes, flow routing in simple and compound channels, advection of plumes. Not open for credit to students who have completed course 277B—II, III. Yunis

277B. Computational River Mechanics II (4)
Lecture—4 hours. Prerequisite: course 277A. Open channel flows, physical aspects of river mechanics, formulation of depth-averaged equations, boundary conditions, computation of grid generation, finite difference solution techniques, application to two-dimensional momentum and pollutant transport in rivers. Offered in alternate years. — III. Yunis

277C. Turbulence and Mixing Processes (4)
Lecture—4 hours. Prerequisite: graduate standing. Nature of turbulent flows, conservation equations, momentum, heat and mass transport in free and well mixed systems, flow forces and mixing, roughness effects, turbulence modeling and simulation. Offered in alternate years. — III. Yunis

278. Hydrodynamics (3)
Lecture—3 hours. Prerequisite: course 141. Perturbation methods for basic water waves. Governing equations for fluid motion on a rotating earth. Rotation effects, vorticity dynamics, Ekman layer. Stratification effects, internal waves and turbulent mixing. Combined effects. Offered in alternate years. — II, III. Ginn

279. Advanced Mechanics of Fluids (4)

281A. Advanced Soil Mechanics (4)

281B. Advanced Soil Mechanics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 281A. Site investigation methods: CPT, SPT, pressuremeter, vane, seismic investigation, electrical properties. Slope stability, seepage phenomena, and earthquake effects. Slope stabilization and reinforcement methods. Centrifuge modeling. — II. Boulanger

281V. Pavement Design and Rehabilitation (4)
Lecture—4 hours. Prerequisite: course 179 or consent of instructor. Advanced pavement design and construction/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. — II. Harvey

283. Physico-Chemical Influences and In Situ Evaluation of Soil Behavior (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 171. Analysis of the mechanical behavior of soils from consideration of clay mineralogy, colloidal phenomena, ion-exchange. Soil-water-electrolyte characteristics and soil structure. Laboratory includes methods of characterization of soils, quantification of soil structure, and rotating cylinder tests to evaluate soil erosion. — I, II

284. Theoretical Geomechanics (4)

285N. Computational Geomechanics (4)
Lecture—4 hours. Prerequisite: courses 212A and 213. Development of computational methods for simulating solids and structures made of geomaterials (soils, rocks, concrete, foams, powders). Static and dynamic inelastic simulations for single and two phase material (solid and pore fluid). — III, IV. Jere- mic

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; coffer dams, nailing, and anchor systems; casser dam; loads on buried conduits; ground modification techniques; and other related topics. — III, IV. Boulanger

287. Geotechnical Earthquake Engineering (4)
Lecture—4 hours. Prerequisite: courses 138 and 281A. Characteristics and estimation of earthquake ground motions; wave propagation and local site response, liquefaction potential and remediation, residual strength and stability considerations; ground deformations; dynamic soil-structure interaction. — III, IV. Boulanger

288. Earthquake and Rockfill Dams (4)
Lecture—4 hours. Prerequisite: courses 281A and 281B (may be taken concurrently). Site selection; design considerations; layout; seismic effects including considerations of fault movements; construction; environmental considerations; instrumentation; maintenance remediation and retrofit of existing dams. Offered in alternate years. — II

289A. Selected Topics in Civil Engineering (1-5)

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, IV, V, VI, VII.

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, IV, V, VI, VII.

296. 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, IV, V, VI, VII.

298. Group Study (1-5)
Prerequisite: consent of instructor. (S/U grading only)

299. Research (1-12)
(S/U grading only)

Professional Course

290. The Teaching of Civil Engineering (1)
Discussion—1 hour. Prerequisite: meet qualifications for teaching assistant and/or associate-in in Civil Engineering. Participation as 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. May be repeated for total of 9 units. (S/U grading only) — I, II, III, IV, V, VI, VII.
Engineering: Computer Science

[College of Engineering]
Zhaojun Bai, Ph.D., Chairperson of the Department

Department Office, 2063 Kemper Hall
(530) 752-7004; http://www.cs.ucdavis.edu

Faculty
Demet Aksoy, Ph.D., Assistant Professor
Nina Amenta, Ph.D., Associate Professor
Zhaojun Bai, Ph.D., Professor
Matthew Bishop, Ph.D., Professor
John Bruno, Ph.D., Professor
Hao Chen, Ph.D., Assistant Professor
Premkumar T. Devanbu, Ph.D., Professor
Mathew K. Farrens, Ph.D., Professor
Vladimir Filkov, Ph.D, Assistant Professor
Matthew Franklin, Ph.D., Professor
Michael Garey, Ph.D., Associate Professor
Dipak Ghosal, Ph.D., Professor
Dipak Ghosal, Ph.D., Professor
Karl Levitt, Ph.D., Professor
Daniel Gusfield, Ph.D., Professor
Premkumar T. Devanbu, Ph.D., Professor
Manfred G. Ruschitzka, Ph.D., Professor Emeritus
Zhaojun Bai, Ph.D., Chairperson of the Department

Academic Senate Distinguished Teaching Award
Karl Levitt, Ph.D., Professor
Xin Liu, Ph.D., Assistant Professor
Bertram Ludewicher, Ph.D., Associate Professor
Charles U. Martel, Ph.D., Professor
Norman S. Matloff, Ph.D., Professor
Nelson Max, Ph.D., Professor
Prasanna Mohapatra, Ph.D., Professor
Biswa Nath Mukherjee, Ph.D., Professor
Ronald A. Olsson, Ph.D., Professor
Academic Senate Distinguished Teaching Award
Rajai Pandey, Ph.D., Associate Professor
Philip Rogaway, Ph.D., Professor
Oliver Staudt, Ph.D., Assistant Professor
Zhendong Su, Ph.D., Assistant Professor
S. Felix Wu, Ph.D., Associate Professor
Emeriti Faculty
Lawrence T. Kou, Ph.D., Professor Emeritus
Peter Linz, Ph.D., Professor Emeritus
Manfred G. Ruschitzka, Ph.D., Professor Emeritus
Richard F. Walters, Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award

Affiliated Faculty
Sean Davis, M.S., Lecturer

The Computer Science and Engineering Major 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 a minor in the College of Letters and Science. For information on the Computer Science curriculum and minor, see Computer Science, on page 185, in this catalog.

The field of Computer Science and Engineering encompasses the organization, design, analysis, theory, programming, and application of digital computers and computing systems. It develops versatile engineers with backgrounds spanning a broad computer hardware/software spectrum.

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 which form the focus of the curriculum.

A key theme of this curriculum is the hardware/software interaction in today’s computer systems design, a theme that provides the balance between computer hardware and computer software aspects in the course requirements. The key theme of hardware/software interaction is also reflected in the orientation of the major.

The Computer Science and Engineering major also requires additional general education electives, helping to develop the verbal skills and intellectual breadth demanded by today’s employers.

The Computer Science and Engineering program prepares students to do further work in hardware, software, or electronics, either in industry or postgraduate study.

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 of the University 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; these programs provide a framework for life-long learning and an appreciation for multidisciplinary activities. Second, through its research programs, the department contributes to the development of fundamental 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 educate the public—through publications, public service, and professional activities.

Department Objectives. Teaching—To provide undergraduate students with a thorough understanding of the key principles and practices of computing, which include a strong theoretical background in mathematics, basic sciences, and engineering fundamentals, and an ability to apply this knowledge to practical problems. To provide students with sufficient breadth to work creatively and productively in multidisciplinary work teams; this breadth, in its broadest context, will form the basis for an appreciation and interest in life-long learning. To provide students with the ability to design and conduct experiments, and to collect and analyze data in core, as well as specialized, areas of computer science. To provide students with breadth in the humanities and social sciences so they learn to communicate effectively, understand professional and ethical issues in society, and appreciate the interrelatedness between computing and society. To educate graduate students to be our next generation of teachers or leaders in industry, or to pursue meaningful, creative, and research in industry, government, or academia. Research—To develop and maintain research programs that produce fundamental scientific advances, as well as useful technological innovations, while simultaneously training the next generation of researchers and leaders in the field of computer science.

Objectives. Students will work well on a team; work well independently; communicate well in writing; communicate well in speaking, write good correct, easily maintainable programs; solve complex problems in their discipline; understand computer systems; understand the relationship between hardware and software; effectively gather and use experimental data (e.g., profiling data); act with professional ethics and responsibility; understand the knowledge and skills to contribute to the betterment of the society; achieve distinction in their careers; think creatively about new problems; do well in graduate school for students who plan to go to graduate school, lead new developments.

Integrated B.S./M.S. Program. An integrated B.S./M.S. plan in Computer Science allows Davis students in Computer Science, Computer Science Engineering, or Computer Engineering to complete a master's degree in Computer Science in one year. Formal course work for the master's degree is reduced by 6 units for students. Students can begin graduate studies immediately after completing their B.S. degree. A plan is available in the graduate section of the College of Engineering; Bulletin, or at http://www.cs.ucdavis.edu/graduate/bms.html.

Computer Science and Engineering Program

The Computer Science and Engineering program is accredited by the Engineering Accreditation Commission of ABET. The Computer Science Accreditation Commission of the Accreditation Board for Engineering and Technology.

Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A</td>
<td>Calculus</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 22A</td>
<td>Calculus</td>
<td>6</td>
</tr>
<tr>
<td>Physics 9A</td>
<td>Physics</td>
<td>19</td>
</tr>
<tr>
<td>Chemistry 2A</td>
<td>Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>Computer Science Engineering 20</td>
<td>Computer Science</td>
<td>40</td>
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<tr>
<td>Computer Science Engineering 50</td>
<td>Computer Science and Engineering</td>
<td>12</td>
</tr>
<tr>
<td>Electrical and Computer Engineering 70</td>
<td>Electrical and Computer Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Engineering 17</td>
<td>Engineering</td>
<td>4</td>
</tr>
<tr>
<td>English 3 or Undergraduate Writing Program</td>
<td>English</td>
<td>4</td>
</tr>
<tr>
<td>Comparative Literature 1, 2, 3, or 4</td>
<td>Comparative Literature</td>
<td>4</td>
</tr>
<tr>
<td>Native American Studies 5</td>
<td>Native American Studies</td>
<td>4</td>
</tr>
<tr>
<td>Communication 1</td>
<td>Communication</td>
<td>3</td>
</tr>
<tr>
<td>General Education electives</td>
<td>General Education</td>
<td>12</td>
</tr>
<tr>
<td>Unrestricted electives</td>
<td>Unrestricted</td>
<td>4</td>
</tr>
</tbody>
</table>

Minimum Lower Division Units: 90

Upper Division Requirements

Upper Division Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science Engineering 188</td>
<td>Electrical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Electrical and Computer Engineering 100</td>
<td>Electrical and Computer Engineering</td>
<td>180A</td>
</tr>
<tr>
<td>Mathematics 131 or Statistics 131A</td>
<td>Mathematics</td>
<td>10</td>
</tr>
<tr>
<td>Computer Science Engineering 110</td>
<td>Computer Science Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science Engineering 120T</td>
<td>Computer Science Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science Engineering 152A, 154A, 154B, and Electrical and Computer Engineering 172</td>
<td>Computer Science Engineering</td>
<td>16</td>
</tr>
<tr>
<td>Computer Science Engineering 140A, 150</td>
<td>Computer Science Engineering</td>
<td>16</td>
</tr>
<tr>
<td>and 160</td>
<td>Computer Science Engineering</td>
<td>12</td>
</tr>
<tr>
<td>Computer electives—a minimum of 4 courses and a minimum of 13 units chosen from Computer Science Engineering 120T, 122AT, 122B, 130, 140B, 142, 145, 152B, 152C, 153, 158, 163, 165A, 165B, 170, 175, 177, 178; one course (minimum 3 units from one single course) from approved 199 or 199 and Electrical or Computer Engineering 194; Electrical and Computer Engineering 180B, 180C</td>
<td>Electrical and Computer Engineering</td>
<td>13</td>
</tr>
<tr>
<td>General Education electives</td>
<td>General Education</td>
<td>21</td>
</tr>
<tr>
<td>Unrestricted electives</td>
<td>Unrestricted</td>
<td>3</td>
</tr>
</tbody>
</table>

Minimum Upper Division Units: 90

Minimum Units Required for Major: 180

† Completion of both Computer Science Engineering 120T and 122AT satisfies the computer science theory requirement and a computer elective requirement.

Courses in Engineering: Computer Science (ECS)

Lower Division Courses

10. Basic Concepts of Computing (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: two years of high school algebra. Introduction to principles of computing. Methods and algorithms for solving problems by use of a digital computer. Not intended for students in physical sciences, engineering, or mathematics. Not open for credit to students who have completed course 30, Engineering 5, or former course 30H. Lecture—3 hours; laboratory—3 hours. Computer uses in modern society. Emphasis on uses in non-scientific disciplines. Includes word processing, other applications, elementary programming, overview of current/projected computer uses. Intended for Letters and Science and other non-computer majors. Not open for credit to students who have completed course 30, Engineering 5, or former course 30H. Only 2 units of credit allowed to

Quarter Offered: **I**—Fall; **W**—Winter; **S**—Spring; **IV**—Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div+—Societal-Cultural Diversity; Wrt—Writing Experience

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students who have completed Agricultural Systems and Environment 21. GE credit. SciEng, Wrt.—I, II, III, II, III, Joy 15AT. Introduction to Computers (4) Independent study—4 hours. Prerequisite: consent of instructor. Use of computer in modern society. Includes word processing, spreadsheet, DOS, networks and programming concepts. Independent study course paralleling course 15 lectures. Not open to students who have completed course 15, 30, or Engineering 5. Only 2 units of credit allowed to students who have completed Agricultural Systems and Environment 21. GE credit. SciEng, Wrt.—I, II, III, II, III, Joy 20. Discrete Mathematics for Computer Science (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 21A. Discrete structures and applications in computer science. Proofs, particularly induction. Introduction to propositional logic, logic circuit design, combinatoirics, recursion and solution of recurrence relations, analysis of algorithms, graph theory and trees, finite state machines. Not open for credit to students who have completed course 100.—I, II, III, II, III, BAI, GUSFIELD, KOEHL, MAX, ROGAWAY 30. Introduction to Programming and Problem Solving (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 16A or 21A [may be taken concurrently]; prior basic programming concepts [variable, loops, conditional statements] recommended. Introduction to computers and computer programming, algorithm design, and debugging. Elements of programming and problem solving. Programming in the C language. Use of basic UNIX tools. —I, II, III, II, III 40. Introduction to Software Development and Object-Oriented Programming (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 30 or the equivalent with a grade of C- or better. Elements of program design, style, documentation, efficiency. Methods for debugging and verification. Operating system tools. Principles and use of object-oriented programming in C++. Basic data structures and their use. —I, II, III, I, II, III 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 language of various machines. Role of system software in program execution. Design of operating systems. On one unit of credit allowed for students who have taken Electrical and Computer Engineering 70.—I, III, III, I, II, III FARRANS, MATLOFF 89A-L. Special Topics in Computer Science (1-5) Lecture, laboratory or combination. Prerequisite: consent of instructor. Special topics in [A] Computer Science theory, [B] Architecture, [C] Programming Languages and Compilers, [D] Operating Systems, [E] Software Engineering, [F] Databases, [G] Artificial Intelligence, [H] Computer Graphics, [I] Networks, [J] Computer-Aided Design, [K] Scientific Computing, [L] Computer Science. May be repeated for credit when the topic is different. —I, II, III, III, I, III 92. Internship in Computer Science (1-5) Internship. Prerequisite: lower division standing; prior approval and permission of period of internship supervised work experience in computer science. May be repeated for credit. (P/NP grading only.) 98. Directed Group Study (1-5) (P/NP grading only) 99. Special Study for Lower Division Students (1-5) (P/NP grading only) 110. Upper Division Courses 110. Data Structures and Programming (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 20 and 40 with a grade of C- or better. Design and analysis of data structures for a variety of applications. Trees, heaps, searching, sorting, hashing, graphs. Extensive programming.—I, II, III, I, III, JOY 120. Introduction to the Theory of Computation (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 20; Mathematics 100 recommended. Fundamentals of the theory of computation, including formal languages, computability and complexity. Reducibility among computational problems.—I, II, III, I, II, III, RAGAWAY, GUSFIELD, MERTEL, BAI, FRANKLIN 122A. Algorithm Analysis (4) Lecture—3 hours; discussion—1 hour. Prerequisite: courses 20, 110. Complexity of algorithms, bounds on complexity, algorithms for searching, sorting, pattern matching, graph manipulation, combinatorial problems, introduction to NP-complete problems. Not open for credit to students who have taken course 122.—I, II, III, I, II, III, RAGAWAY, GUSFIELD, MERTEL, BAI, FRANKLIN 122B. Software Design and Analysis (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 122A. Theory and practice of hard problems, and problems with complex algorithm solutions. NP-completeness, approximation algorithms, randomized algorithms, algorithmic efficiency, algorithmic aspects of branch and bound. Students do theoretical analysis, implementation and practical evaluations. Examples from parallel, string, graph, and geometric algorithms.—I, II, RAGAWAY, GUSFIELD, MERTEL 124. Theory and Practice of Bioinformatics (4) Lecture—3 hours, laboratory—1 hour. Prerequisite: course 100, 140 or Engineering 5 or 6, Statistics 12 or 0 or 100 or Mathematics 111A/Statistics 131A, Biological Sciences 1A or Molecular and Cellular Biology 10. Fundamental biological, mathematical and algorithmic models underlying bioinformatics, sequence analysis, database search, gene prediction, molecular structure comparison and prediction, phylogenetic trees, high throughput biology, massive datasets; applications in molecular biology and genetics; use and extension of common bioinformatics tools.—III, III, GUSFIELD, FIKLOV 129. Computational Structural Bioinformatics (4) Lecture—3 hours; discussion—1 hour. Prerequisite: college level programming course, Biological Science 1A or Molecular and Cellular Biology 10. Fundamental biological, chemical and algorithmic models underlying computational structural biology; protein structure prediction, database search; comparison of protein structures; protein structure prediction; molecular simulations; databases and online services in computational structural biology.—I, I, KOEHL 130. Scientific Computation (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 110, Mathematics 22A. Matrix-vector approach using MATLAB for floating point arithmetic, error analysis, interpolations, numerical integration, matrix computations, nonlinear equations and optimization. Parallel computing for matrix multiplications and the Cholesky factorization.—III, III, BAI, HAMANN, ROGAWAY 140A. Programming Languages (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 50 or Electrical and Computer Engineering 70; course 110. Syntaxic definition of programming languages: programming language features including variables, data types, data abstraction, scoping, parameter disciplines, exception handling. Comparative study of several high-level programming languages. Not open for credit to students who have taken course 140.—I, II, III, I, II, III, I, III, OLSSON, PANDER 140B. Programming Languages (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 140A. Continuation of programming language principles. Further study of programming language paradigms such as functional and logic; additional programming language paradigms such as concurrent [parallel], dataflow, and constraint; key implementation issues for those paradigms; and programming language semantics.—I, II, OLSSON, PANDER 142. Compilers (4) Lecture—3 hours; discussion—1 hour. Prerequisite: courses 20, 140A; course 120 recommended. Principles and techniques of lexical analysis, parsing, semantic analysis, and code generation and implementation of compilers.—II, III, PANDER, SU 145. Scripting Languages and Their Applications (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 110. Goals and philosophy of scripting languages, with Perl and Python as prime examples. Applications include networking, thread programming, and graphical user interfaces [GUI’s]. Offered in alternate years.—I, II, III, LEVITT, MAFFOL, OLSSON, WU 150. Operating Systems and System Programming (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 40, course 154A or Electrical and Computer Engineering 70; course 154B or Electrical and Computer Engineering 170 strongly recommended. Basic concepts of operating systems and system programming. Processes and interprocess communication; synchronization; virtual memory and paging; file and I/O subsystems; utility programs. Study of a real operating system.—I, II, III, I, II, III, LEVITT, MAFFOL, OLSSON, WU 152A. Computer Networks (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 110 or Engineering Electrical and Computer 73; Mathematics 131A or Statistics 12A or Statistics 32. Overview of local and wide-area computer networks. ISO seven-layer model. Physical aspects of data transmission. Data-link layer protocols. Network architectures. Routing. TCP/IP protocol suite. Local area networks. Medium access protocols. Network performance analysis. Only 2 units of credit for students who have taken course 157. [Same course as Electrical and Computer Engineering 173A.—I, II, III, GHOSAL, LIU, MOLAPATRA, CHUAH, MAFFOL, MUKEHRJEE 152B. Computer Networks (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 152A. ISO standard and TCP/IP protocol suite, network layer protocols, transport layer protocols, transport layer interfaces, sockets, UNIX network programming, computer networking applications, remote procedure calls and network management.—I, II, III, II, III, MUKEHRJEE, GHOSAL, MAFFOL, MUKEHRJEE 154. Design Projects in Communication Networks (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 152A, 150, TCP/IP protocol suite, network layer protocols, transport layer protocols, transport layer interfaces, sockets, UNIX network programming, computer networking applications, remote procedure calls and network management. I, II, III, III, II, III, IV, CHUAH, LIV, VAN DER SCHAAF, MUKEHRJEE 153. Computer Security (4) Lecture—3 hours; discussion—1 hour. Prerequisite: courses 150 and 152A. Principles, mechanisms, and implementation of computer security and data protection. Policy, encryption and authentication, access control, and integrity models and mecha- nisms; network security, password protection and vulnerabilities analysis. Study of an existing operating system. Not open for credit to students who have completed course 155.—II, III, II, III, CHUAH, BISHOP, CHEN 154A. Computer Architecture (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 50 or Electrical and Computer Engineering 70, and course 110. Introduction to digital design. Interfacing of devices and memory management. Input/output programming, via wait loops, hardware interrupts and calls to operating system services. Hardware support for operating sys- tems software. Only one unit of credit allowed for
154B. Computer Architecture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 154A or Electrical and Computer Engineering 170; and course 110. Hardwired and microprogrammed CPU design. Memory hierarchies. Uniprocessor performance analysis under varying program mixes. Introduction to pipelining and multiprocessors. I, II, III. Ill, II, Ill. Farrens, Mukherjee

154C. Computer Security for Non-Majors (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: programming skill at the level of course 30; Mathematics 21C. Principles, mechanisms, implementation, and sound practices of computer security and data protection. Cryptography. Authentication and access control. Internet security. Malicious software. Common vulnerabilities. Practical security in everyday life. Not open for credit to students who have completed course 154B. II, III. II, Ill. O’Reilly, Ludaescher

156. Discrete-Event Simulation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: programming skill at the level of course 110; calculus-based course in probability theory, such as Statistics 110. Simulation of computer systems and networks of workstations. Locks, barriers, and other techniques for synchronization. Emphasis on recent machines and applications that drive them. Not open for credit to students who have completed course 152A or 152B. II, III. Ghosal, Liu, Matloff, Mahapatra, Mukherjee

157. Computer Networks for Non-Majors (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: programming skills at the level of course 30. Shorter version of course 152AB featuring World Wide Web and e-mail design. Memory and wide-area computer network structures. ISO seven-layer model. Network protocols for data transmission and inter-networking. Introduction to basic TCP/IP and Web programming. No credit allowed to students who have completed courses 152A or 152B. II, III. Ghosal, Liu, Matloff, Mahapatra, Mukherjee

158. Programming on Parallel Architectures (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 150; course 154B recommended. Techniques for software development using the shared-memory and message-passing paradigms, on parallel architectures and network of workstations. Locks, barriers, and other techniques for synchronization. Introduction to parallel algorithms. III. Ill. Farrrens, Matloff, Pantry

160. Introduction to Software Engineering (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 140A. Requirements, specification, design, implementation, testing, and verification of large software systems. I, II, III. Ill, II, Ill. Levitt, Devanbu

163. Information Interfaces (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 110; course 175 recommended. Art and science of information visualization and interfaces for information systems. Design principles of human-computer interaction. Visual display and navigation of real and virtual structures and algorithms for event data. Implementations, performance issues, tradeoffs, and evaluation of interactive information systems. III. III. Matloff

165A. Database Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 110. Database design, entity-relationship and relational models, relational algebra, query language SQL, storage and file structures, query processing, system architectures. II, III. II. Gertz, Ludaescher

165B. Database Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 165A. Advanced topics in database systems. Object-oriented and object-relational database systems; distributed and multidatabase systems; advanced database applications: Web-based database access, data warehousing. Ludaescher

166. Scientific Data Management (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: programming skills at course level 40; Mathematics 21C. Relational databases, SQL, non-standard databases, XML, scientific workflows, interoperability, data analysis tools, metadata. I, II. Gertz, 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 organization. Memory and inference. Problem solving. Natural language processing. II. II. Levine

175. Introduction to Computer Graphics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 110 or Electrical and Computer Engineering 73; Mathematics 22A. Principles of computer graphics. Current computer graphics hardware and software. Computer graphics applications in two- and three-dimensional space. II. II. Joy, Hamann, Ma, Staadt

177. Introduction to Visualization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 175. Graphics techniques for generating images of various phenomena and computer-simulated data. Typical applications for these graphics techniques include study of air flows around car bodies, medical data, and molecular structures. II, III. III, II, Ill, I. Amenta, Joy, Hamann, Ma, Staadt

178. Introduction to Geometric Modeling (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 175. Interactive graphics techniques for defining and manipulating of geometrical shapes used in computer animation, car body design, aircraft design, and architectural design. I, III. Joy, Hamann, Ma, Staadt

188. Ethics and the Information Age (3)
Seminar—2 hours, term paper. Prerequisite: upper division standing. Responsibilities of computer scientists as influenced by growth in computer use and networks. I, II, III. I, II, III

189A-L. Special Topics in Computer Science (1-5)
Lecture, laboratory or combination. Prerequisite: consent of instructor. Special topics in (A) Computer Science Theory; (B) Architecture; (C) Programming Languages and Compilers; (D) Operating Systems; (E) Software Engineering; (F) Data Bases; (G) Artificial Intelligence; (H) Computer Graphics; (I) Networks; (J) Computer-Aided Design; (K) Scientific Computing; (L) Computer Science. May be repeated for credit when topics differ. I, II, III, I, II, III

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. Seminar Seminar (2)
Seminar—2 hours. Prerequisite: senior standing. Examination of a special topic in a small group setting.

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)

197T. Tutoring in Computer Science (2-3)
Discussion—1 hour; laboratory/discussion—3-6 hours. Prerequisite: upper division standing, consent of instructor. Tutoring in computer science courses, especially introductory courses. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only)

Graduate Courses

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 microprocessors and processor co-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. II, Farrens

201B. High-Performance Uniprocessor (4)
Lecture—3 hours; term paper. Prerequisite: course 154A. Maximizing uniprocessor performance. Barriers to high performance; solutions to the problems; historical and current processor designs. Not open for credit to students who have completed course 250B. II. Farrens

201C. Parallel Architectures (4)
Lecture—3 hours; project—1 hour. Prerequisite: course 201A. Evolution of parallel architectures from special-purpose machines to commodity servers. Emphasis on recent machines and applications that drive them. Not open for credit to students who have completed course 250C. II, 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 techniques, including algorithms, devices, and fault tolerance. A survey of other unconventional technologies including 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. Rogaway

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 applying these algorithms to a broad range of applications. Methods for recognizing and dealing with difficult problems. I, II, III. I, II, III. Amenta, Franklin, Gusfield, Martel, Rogaway

222B. Advanced Design and Analysis of Algorithms (4)

235. Parallel Algorithms (4)
Laboratory/discussion—3 hours; project—1 hour. Prerequisite: course 222A. Models 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. III. Martel
224. String Algorithms and Applications in Computational Biology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 122A. Algorithms that operate on strings. Pattern matching, sets of patterns, regular expression pattern matching, suffix trees and applications, inexact string matching, string matching algorithms, string matching via automata, search for mentions in plain text, applications in bio-informatics, and optimal string matching using suffix trees.

225. Graph Theory (3)
Lecture—3 hours. Prerequisite: graduate standing in electrical engineering or computer science or consent of instructor. Fundamental concepts. Vector spaces and graphs. Planar graphs: Whitney’s and Kuratowski’s theorems. Graph parameters: packing and coverings. Connectivity. Menger’s theorems. Hamiltonian graphs: Pósa’s and Chvátal’s theorems. Graph factorization: Tutte’s theorem. Graph coloring: Brooks; and Vizing’s theorem. — I. (I.) Franklin

236. Computational Geometry (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 175, 222A. Mathematics of unstructured data. Algorithms such as Voronoi diagrams, oct-trees, and arrangements. Applications in computer graphics, concentrating on problems in three-dimensions. Offered in alternate years. — III. Amita, Max

237. 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, pseudorandomness, encryption, digital signatures, zero-knowledge, secure protocols. — II. (II.) Rogaway

238. 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, including content distribution mechanisms, payment mechanisms, pricing mechanisms, anonymity and privacy mechanisms, fair exchange mechanisms. Offered in alternate years. — II. Franklin

239. 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. Koehl

300. Applied Numerical Linear Algebra (4)
Laboratory/discussion—3 hours; discussion—1 hour. Prerequisite: course 130 or Engineering Mathematics 167. Numerical linear algebra (NLA) with emphasis on applications in engineered systems; matrix factorizations; perturbation and rounding error analyses of fundamental NLA algorithms. Offered in alternate years. — I. Bai

241. Large-Scale Scientific Computation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 130. Algorithms and techniques for large-scale scientific computations, including basics for high performance computing, iterative methods, discrete approximation, fast Fourier transform, Poisson solvers, particle methods, spectral graph partition and its applications. Offered in alternate years. — II. Bai

266. Computer Security: Intrusion Detection Based Approach (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 150. Intrusion detection, anomaly detection based on machine learning, signature-based detection using pattern matching, automated response to attacks using application firewall, intrusion detection, tracking intruders based on principal component analysis, security policy languages. Offered in alternate years. — I. Levit
272. Information Visualization (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 152 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. (II.) Ma

273. Applied Visual Computing (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: graduate standing in computer science or permission of instructor. Developing a complete virtual reality application. Offered in alternate years.—I. Hamann, Joy, 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 theorem rewriting. Decision procedures. Induction. Applications to program verification, question-answering and plan generation. Study existing mechanical theorem provers. Offered in alternate years.—II. (II.)

275A. Advanced Computer Graphics (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 175 or 177 or 178. Advanced topics in computer graphics. Hidden surface models, rendering of various surface subdivision methods, shading techniques, anti-aliasing, modeling techniques.—II. (II.) Joy, Hamann, Ma, Staadt

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, image synthesis, visualization and geometric modeling. Discussion of current research in the field. Offered in alternate years.—II. (II.) Joy, Hamann, Ma, Staadt

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 advanced software and hardware techniques to achieve interactive visualization.—III. (III.) Hamann, Joy, Ma, Max

277. Advanced Visualization (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 177. Visualization of 3D data, including scalar fields, vector fields, and medical data.—III. (III.) Hamann, Joy

278. Computer-Aided Geometric Design (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 175 or 177 or 178. Mathematical techniques for the description and manipulation of curves and surfaces. Coon’s patches, Bézier curves and surfaces, B-spline curves and surfaces, beta-splines, box-splines. Integration into various computer graphics rendering models, and computer-aided design systems. Offered in alternate years.—III. (III.) Joy, Hamann

279. Computer Animation (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 175 or 177 or 178. Control of camera and object motion necessary to produce computer animation, modeling of articulated objects made from jointed segments, and of deformable objects. Students will complete a final animation project. Offered in alternate years.—III. Hamann, Joy, Max, Ma

280. Virtual Reality Technology (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 175 or 177 or 178. Study of principles 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, Staadt

289A-M. Special Topics in Computer Science (1-5) Lecture, laboratory, or combination. Prerequisite: consent of instructor. Special topics in (A) Computer Science Theory; (B) Architecture; (C) Programming Languages and Compilers; (D) Operating Systems; (E) Software Engineering; (F) Data Bases, (G) Artificial Intelligence; (H) Computer Graphics; (I) Networks; (J) Computer-Aided Design; (K) Scientific Computing; (L) Computer Science, (M) Security. May be repeated for credit when topic differs.—I, II, III, (II, III.)

290. Seminar in Computer Science (1) Seminar—1 hour. Participating seminar; discussion and presentation of current research and development in computer science. (S/U grading only.)—I, II, III, (II, III.)

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, (II, III.)

293. Research in Computer Science (2) Lecture—2 hours. Prerequisite: graduate standing in computer science. Study of important research topics in computer science, Ph.D. level research methodologies (experimental, applied and theoretical), presenting research results for the computer science community, and learning necessary to successfully find/solve significant research problems. (S/U grading only.)—I, II, (II, III.)

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 Courses

315. Teaching Computer Science (3) Lecture—2 hours; discussion/laboratory—1 hour. Prerequisite: course 110. Fundamentals of instructional methodology applied to teaching computer science, especially at the introductory level. Behavioral objectives, testing methods, course design, evaluation, technology in instruction.—I, (I)

390. The Teaching of Computer Science (1) Discussion—1 hour. Prerequisite: meet qualifications for teaching assistant and/or coinstructor in Computer Science. Participation as a teaching assistant or coinstructor 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 for credit. (S/U grading only.)—I, II, III, (II, III.)

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only)

Engineering: Electrical and Computer Engineering

(College of Engineering) Bahram Ravani, Ph.D., Chairperson of the Depart- ment Jean-Pierre Colinge, Ph.D., Vice Chairperson for Undergraduate Studies Zhi Ding, Ph.D., Vice Chairperson for Graduate Studies Department Office. 2064 Kemper Hall (530) 752-0583; http://www.ece.ucdavis.edu

Faculty
Khaled Abdel-Ghaffar, Ph.D., Associate Professor Venkatasesh Akella, Ph.D., Associate Professor Hassan Al-Arazi, Ph.D., Assistant Professor Rajeevan Amirtharajah, Ph.D., Assistant Professor Bevan Bass, Ph.D., Assistant Professor G. R. Branner, Ph.D., Associate Professor Tsu-Shuh Chang, Ph.D., Associate Professor John Cong, Ph.D., Associate Professor Chen-nee Chua, Ph.D., Associate Professor Jean-Pierre Colinge, Ph.D., Professor K. Wayne Current, Ph.D., Professor Zhi Ding, Ph.D., Professor Gary E. Ford, Ph.D., Professor, Academic Senate Distinguished Teaching Award Saheil Ghiasi, Ph.D., Assistant Professor A. Nozli Giudice, Ph.D., Associate Professor Charles E. Hunt, Ph.D., Professor Paul J. Hurst, Ph.D., Professor Salf Islam, Ph.D., Assistant Professor Andre Knoesen, Ph.D., Professor H. Brian Kolner, Ph.D., Professor (Electrical and Computer Engineering, Applied Science) Bernard C. Levy, Ph.D., Professor Stephen H. Lewis, Ph.D., Professor Neville C. Luhmann, Jr., Ph.D., Professor (Electrical and Computer Engineering, Applied Science) Vojin G. Oklobdzija, Ph.D., Professor John Owens, Ph.D., Assistant Professor Ahn-Vu Pham, Ph.D., Associate Professor G.R. Redinbo, Ph.D., Professor Richard R. Spencer, Ph.D., Professor Jamal Tugan, Ph.D., Assistant Professor Kent D. Wilken, Ph.D., Associate Professor S.J. Ben Yoo, Ph.D., Professor Qing Zhao, Assistant Professor Emeriti Faculty V. Ralph Algazi, Ph.D., Professor Emeritus Robert W. Bower, Ph.D., Professor Emeritus John N. Churchill, Ph.D., Professor Emeritus Andrew J. Dienes, Ph.D., Professor Emeritus Richard C. Dorf, Ph.D., Professor Emeritus Herman J. Fish, Ph.D., Professor Emeritus William A. Gardner, Ph.D., Professor Emeritus Mohammed S. Ghaisi, Ph.D., Professor Emeritus/ Dean Emeritus S. Louis Haskins, Ph.D., Professor Emeritus Jonathan P. Heritage, Ph.D., Professor Emeritus T.C. Steve Hsia, Ph.D., Professor Emeritus Ronald F. Soohoo, Ph.D., Professor Emeritus Shih-Ho Wang, Ph.D., Professor Emeritus

Affiliated Faculty Shu Lin, Ph.D., Adjunct Professor Rosemary Smith, Ph.D., Adjunct Professor_Mihai van der Schaar, Ph.D., Assistant Adjunct Professor Diego Yankelevich, Ph.D., Associate Adjunct Profes- sor

The Electrical and Computer Engineering Major Programs

The department administers two curricula in the Col- lege of Engineering: (1) the Electrical Engineering curriculum, (2) the Computer Engineering curriculum, and (3) the Electrical Engineering/Materials Science and Engineering curriculum. The Electrical Engineering and the Computer Engi- neering curricula are all accredited by the Engineer- ing Accreditation Commission of the Accreditation Board for Engineering and Technology. Integrated Degree Program (IDP). The IDP leads to both the Bachelor of Science and the Master of Sci- ence degrees. The program provides a student the opportunity to obtain undergraduate and graduate degrees in electrical engineering, computer engineering, or electrical engineering/materials science. Students interested in obtaining both degrees within the 4-year time frame may apply for the IDP by March 31. For more information on IDP, see http://www.ece.ucdavis.edu.
Mission. Under its land grant status, the University of California has a mission to provide the state with the trained workforce needs and to advance knowledge and research in directions that contribute to the general welfare of the state and the nation. The Department of Electrical and Computer Engineering contributes to the mission of the University in three ways: First, its undergraduate and graduate education programs seek to provide students with an understanding of the fundamental principles of electrical and computer engineering, the skills needed to solve the complex technological problems of modern society and the ability to continue to learn and develop throughout their careers. Second, through its research programs, the department contributes to the development and progress of electrics, communications, and computer technology. Finally, the department helps to transfer research results to industry through publication, public service and professional activities.

Objectives. Teaching—To provide undergraduate students with sufficient breadth to allow them to participate in their own education after graduation and select a focus area intelligently; to provide undergraduate students with sufficient depth in a narrower discipline to allow them to develop the ability to solve complex engineering problems; to educate the students in the graduate program to be leaders in industry or to do meaningful research in industry, government or academia. Research—To develop and maintain research programs that produce useful technological advances while simultaneously training the next generation of researchers and leaders; to update and/or shift the foci of these programs frequently in response to the needs of our constituency and the nation; to provide a stimulating environment that encourages our graduate students to develop their abilities as far as possible.

Electrical Engineering Program

The Electrical Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

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, medicine, 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. This breadth is required for long-term interests of our students and the industries of Northern California and the nation.

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.

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 with sufficient breadth in electrical engineering. This breadth is required for students to understand engineering tradeoffs that cross disciplinary boundaries and to contribute effectively to multidisciplinary projects and for them 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. This depth is necessary to solve complex real-world engineering problems and to prepare 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.

Lower Division Required Courses

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<tr>
<th>Course</th>
<th>UNITS</th>
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<tr>
<td>Mathematics 21A:21B:21C:21D</td>
<td>16</td>
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<td>Mathematics 22A:22B</td>
<td>6</td>
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<tr>
<td>Physics 9A:9B:9C:9D</td>
<td>19</td>
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<tr>
<td>Chemistry 2A</td>
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<td>Computer Science Engineering 64</td>
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<td>Computer Science Engineering 50</td>
<td>4</td>
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</table>

Minimum Lower Division Units: 90

Upper Division Requirements

Electrical Engineering Curriculum

The Electrical Engineering curriculum prepares students for careers in electrical engineering or for graduate studies by providing a solid background in mathematics, physical sciences, and traditional electrical engineering subjects of (1) physical electronics, (2) electromagnetics, (3) communication electronics, (4) digital electronics, and (5) communication controls and signal processing. Through the proper choice of 29 units of flexible design and technical electives, you may focus on any of 15 specialty areas to distribute the 29 units of electives among these areas.

Areas of Specialization

Physical Electronics: solid-state devices, circuits and fabrication and the theory courses supporting those subjects.

Recommended elective courses:

Core electives: Electrical and Computer Engineering 120B, 150B
Design Project Elective: Electrical and Computer Engineering 132B or 135
Senior Design Sequence: Electrical and Computer Engineering 194A-194B or 194A-194C

Select remaining upper-division design electives from Electrical and Computer Engineering 110B, 116, 170 or 171
Technical electives: Select from Electrical and Computer Engineering 112, 116, 128 and 160 or 146A or 146 B or 160 or 210

Suggested Advisers: R. Amirtharajah, K.W. Current, P.J. Hurst, S.H. Lewis

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 140B, 150B
Design Project Elective: Electrical and Computer Engineering 151 or 183, or 194A-194B or 195A-195B or 195A-195B

Select remaining upper-division design electives from Electrical and Computer Engineering 110B, 116, 170 or 171
Technical electives: Select from Electrical and Computer Engineering 120B or 130B, 132A or 135


Upper Division Required Courses

Electrical and Computer Engineering 100, 110A, 130A, 140A, 150A, 180A........ 26
Statistics 120, 131A, Mathematics 131, or Civil and Environmental Engineering 114
Engineering 160, 190 or Computer Science Engineering 188....................... 4
Design Electives: At least two design electives

Design electives: At least two design electives


Engineering: Electrical and Computer Engineering


One course sequence: Electrical and Computer Engineering 196A-196B

The remaining design electives may be chosen from the lists above or from the following courses: Electrical and Computer Engineering 110B, 133, 158, 160, 170, 171, 173A, Computer Science and Engineering 110, 150, 152B, 163, 175, 177, 178

Technical electives***, ***** 9

General Education electives 12

Minimum Upper Division Units 90

Minimum Units Required for Major 180

* A maximum of one course appearing on both the core elective list and the design elective list may be counted in both categories.

** One course appearing on both the laboratory elective list and the project elective list may be counted toward both the laboratory and project requirement simultaneously.

*** After completion of the upper-division elective requirements (eight core and design courses) any additional units of 29 may be counted toward the technical elective requirement.

**** ECS 157 may not be counted toward the technical elective requirement.

Computer Engineering Program

The Computer Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

The program in Computer Engineering provides the student with a broad and well-integrated background in the concepts and methodologies that are needed for the analysis, design, development, organization, theory, programming, and applications of information processing systems. Although such systems are popularly called “computers,” they involve a far wider range of disciplines than merely computation, and the Computer Engineering curriculum is correspondingly broad. The program presents the essentials of real in electrical circuits, digital logic, discrete mathematics, computer programming, data structures, and other topics. Students who complete the Computer Engineering curriculum receive a Bachelor of Science in Computer Engineering.

Objectives. The Computer 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 computer 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 with sufficient breadth in computer engineering. This breadth is required for students to understand engineering trades that cross disciplines, for them to contribute effectively to multi-disciplinary projects and for them to make an informed decision about their area of specialization. Depth—To provide our graduates with sufficient depth in a specific area of computer engineering. This depth is necessary to solve complex real-world engineering problems and to prepare to contribute to a specific discipline within computer 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.

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<td>19</td>
</tr>
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</table>

Chemistry 2A ........................................ 5

Computer Science Engineering 20, 30, 40 .................................. 12

Engineering 6 ................................................................ 4

Electrical and Computer Engineering 110, 120, 130, 131, 132C, 133, 146B, 157A, 160, 171, 173A

Computer Science Engineering 70 ........................................ 4

Computer Science Engineering 50 ........................................ 4

Engineering 17 ................................................................ 4

English 3 or University Writing Program 1, or Comparative Literature 1, 2, 3, or 4, or Native American Studies 1 ........................................ 4

Communication 1 or 3 ................................................ 4

General Education electives 12

Total Lower Division Units 91

Upper Division Requirements

The Computer Engineering curriculum prepares students for careers in computer engineering or for graduate studies by providing a solid background in mathematics, physical sciences, and the traditional computer engineering subjects: electronics, computer hardware, and computer software. Here electronics refers to the five Electrical Engineering specialties: (1) physical electronics, (2) electromagnetics, (3) analog electronics, (4) digital electronics, and (5) communications, control, and signal processing. The 63 upper-division units in electrons, computer hardware and computer software consist of 13 units in electronics courses, 18 units in computer hardware, and 12 units in computer software courses. The remaining 20 units consist of 11 units of design electives and 9 units of technical electives. By carefully selecting these 20 design and technical electives, students can focus on electronics, computer hardware, or computer software, or can distribute these units among the three areas.

Areas of Specialization

Computer Systems and Software: computer architecture, design, networking, and systems software.

Recommended elective courses:

- Project Design Elective: Electrical and Computer Engineering 122A, 122B, 125, 126
- Senior Design Sequence: Electrical and Computer Engineering 140A, 140B, 140C

Minimum Upper Division Units 89

Unrestricted electives.......................................7

Technical electives** .........................................9

General Education electives 12

Minimum Upper Division Units 89

Minimum Units Required for Major 180

* Computer Science Engineering 154B may be substituted for the Electrical and Computer Engineering 170 requirement.

** After completion of the upper-division elective requirements any units in excess of 11 may be counted toward the technical elective requirement.

*** ECS 157 may not be counted toward the technical elective requirement.

Courses in Engineering: Electrical and Computer Engineering (EEC)

Lower Division Courses

1. Introduction to Electrical and Computer Engineering (EEC)

Lecture—1 hour. Overview of Electrical and Computer Engineering programs and advising; setting and attaining goals; ethics; introduction to major topics in ECE. (P/NP grading only)—II, III

2. Computer Structure and Assembly Language

Lecture—3 hours; workshop—1 hour. Prerequisite: Computer Science Engineering 30 or 35. Computer architecture; machine language; assembly language; macros and conditional macros; subroutine/parameter passing, interrupt and trap; direct-memory-access, absolute and relocatable code; reentrant code; program development in an operating system. Only 1 unit of credit to students who have completed Computer Science Engineering 50.—I, II, III

90C. Research Group Conference in Electrical and Computer Engineering (EEC)

Discussion—1 hour. Prerequisite: consent of instructor; lower division standing. Research group conferences. May be repeated for credit. (P/NP grading only)—I, II, III, IV, V

90X. Lower Division Seminar (1-4)

Lecture—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 (EEC)

Internship—3-15 hours. Prerequisite: lower division standing; project approval prior to period of internship. Supervised work experience in Electrical and Computer Engineering. May be repeated for credit. (P/NP grading only)

98. Directed Group Study (1-5)

Directed Group Study (1-5)

99. Special Study for Lower Division Students (1-5)

Special Study for Lower Division Students (1-5)
Upper Division Courses

100. Circuits II (5) Laboratory—3 hours; lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 17, course 101 (may be taken concurrently). 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. 3 units of credit to students who have completed Engineering 100.—I, II, III (I, II).

106. Introduction to Image Processing and Computer Vision (5) Lecture—3 hours; laboratory—3 hours; Prerequisite: course 150B. Imaging geometry; transforms and sampling; enhancement, restoration, and conversion; image compression; time–varying image analysis; elementary pattern recognition; segmentation; multi-resolution analysis.—III (III).

110A. Electronic Circuits I (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, 140A (may be taken concurrently). Operation of bipolar and field-effect transistors. 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.—I, II, III (I, II, III).


112. Communication Electronics (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 110B and 150A. Electronic circuits for analog and digital communication, including oscillators, mixers, tuned circuits, modulation, and phase-locked loops. Circuits for amplitude modulation (AM) and frequency modulation (FM) are emphasized.—II (II).

114. Analog Integrated Circuits (3) Lecture—2 hours; laboratory—3 hours. Prerequisite: courses 110B and 140B. Analysis and design of analog integrated circuits. Emphasis on MOS logic circuit families. Logic gate construction, voltage transfer characteristics, and propagation delay. Regenerative circuits, RAMs, ROMs, and PLAs.—III (III).


130B. Electromagnetics II (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 130A. Plane wave propagation in lossy media, reflections, guided waves, simple modulated waves and dispersion, and basic antennas.—III (III).

132A. High Frequency Systems, Circuits and Devices (5) Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 110B, 130B, 140B. Application of electromagnetic theory to analysis and design of practical devices, circuits, and systems operating at radio frequencies. Energy transfers at high–frequency. Transmission lines, microwave integrated circuits, circuit analysis of electromagnetic energy transfer systems, the scattering parameters.—I, II, III (I, II, III).

132B. High Frequency Systems Circuits and Devices (5) Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 132A. Passive high frequency device analysis, design, fabrication, and testing. Microwave amplifier and coupler design. Introductory analysis and design of microwave transistor amplifiers.—II (II).

132C. RF Amplifiers, Oscillators and Mixers (5) Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 132B. 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.—III (III).

133. Electromagnetic Radiation and Antenna Analysis (4) Lecture—3 hours; discussion—1 hour. Prerequisites: course 130B. Properties of electromagnetic radiation; analysis and design of antennas: ideal cylindrical, small loop, aperture, and arrays; antenna field measurements.—I (I).


136. Opto-Electronics and Fiber Optics Laboratory (3) Lecture—1 hour; discussion—1 hour; laboratory—3 hours. Prerequisite: courses 135 and 150A. Characteristics and applications of state-of-the-art opto-electronic components (semiconductor detectors, optical modulators and optical fibers), and fiber optic communication systems.—II (II).

140A. Principles of Device Physics I (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 17, Physics 9D, course 101 (may be taken concurrently). Semiconductor device fundamentals, equilibrium and non-equilibrium statistical mechanics, conductivity, diffusion, density of states, electrons and holes, p-n junctions, Schottky junctions, and junction field effect transistors.—I, II, III (I, II, III).

140B. Principles of Device Physics II (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 140A. Electrical properties, design, and models for Bipolar and MOS devices.—III (III).

146A. Integrated Circuits Fabrication (3) Lecture—2 hours; laboratory—3 hours; prerequisite: course 140B. Restricted to Electrical, Computer, and Electrical/Materials Science majors and Electrical Engineering graduate students. Non-majors accommodated when space is available. 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.—I (I).

146B. Advanced Integrated Circuits Fabrication (3) Lecture—2 hours; laboratory—3 hours; prerequisite: course 146A. Restricted to Electrical, Computer, and Electrical/Materials Science majors and Electrical Engineering graduate students. Non-majors accommodated when space is available. Basic fabrication processes for CMOS VLSI. Laboratory projects examine deposition of thin films, ion implantation, process simulation, anisotropic plasma etching, sputter metallization, and thick film technology. Isolated device isolation, projection alignment, epitaxial growth, thin gate oxidation, and rapid thermal annealing.—II (II).

150A. Introduction to Signals and Systems I (4) Lecture—4 hours. Prerequisite: Engineering 6 (may be taken concurrently), course 100. Characterization and analysis of continuous-time linear systems. Fourier series and transforms with applications. Introduction to communication systems. Transfer functions and block diagrams. Elements of feedback systems. Stability of linear systems.—II, III (II, III).

150B. Introduction to Signals and Systems II (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 150A. Characterization and analysis of discrete-time linear systems. Difference equation models. Z-transform analysis methods. Discrete and fast Fourier transforms. Introduction to digital filter design.—II (II).

151. Instrumentation, Interfacing, Signals and Systems (4) Lecture—2 hours; laboratory—4 hours. Prerequisite: courses 100, 150A, 180A. Study of instrumentation interfacing systems, including software development, hardware interfacing, transducers, dynamic response, signal conditioning, A/D conversion, and data transmission.—II (II).

152. Digital Signal Processing (4) Lecture—2 hours; laboratory—6 hours. Prerequisite: courses 70 and 150B. Theory and practice of real-time digital signal processing. Fundamentals of real-time systems. Programmable architectures including I/O, memory, peripherals, interrupts, DMA. Interfacing issues with A/D and D/A converters to a programmable DSP. Specification driven design and implementation of simple DSP applications.—II, III (II, III).

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 modeling of systems, stability criteria, root locus and frequency domain design methods.—I (I).

157B. Control Systems (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 157A. Control system design; transfer function and state-space methods; sampled-data implementation, digital control. Laboratory includes feedback system experiments and simulation studies.—II (II).

158. Control System Design Methods (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 157A. Design methods for feedback control systems, including quantitative feedback theory and linear quadratic Riccati equations.

160. Signal Analysis and Communications (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 150A. Signal analysis based on Fourier methods. Fourier series and transforms, time–sampling, convolution, and filtering; spectral density; modulation: carrier- amplitude, carrier-frequency, and pulse-amplitude.—I (I).


170. Introduction to Computer Architecture
Lecture—3 hours; discussion—1 hour. Prerequisite: course 180A; course 70 or Computer Science Engineering 50. Introduction to basic aspects of computer architecture, including computer performance measurement, instruction set design, computer arithmetic, pipelined and non-pipelined implementation, and memory hierarchies (cache and virtual memory). Presents a simplified Reduced Instruction Set Computer (RISC) design methodology and an example of an RISC processor. (P/NP grading only.)—I, II, III. (I, II, III.)

171. Parallel Computer Architecture
Lecture—3 hours; discussion—1 hour. Prerequisite: course 170. Organization and design of parallel processing systems, including memory, multiprocessors, cache coherency, memory consistency, snooping protocols, synchronization, scalable multiprocessors, message passing protocols, distributed shared memory and interconnection networks.—III. (III.)

172. Microcomputer-Based System Design
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 170 or Computer Science Engineering 154B, course 180A; course 180B recommended. Microprocessor architecture and software. I/O interface design with emphasis on devices such as timers, ADCs and DACs, as well as converters and timers. System design using polling, interrupts, and DMA as I/O techniques. Programming in both assembly and high-level languages.—I, II. (I, II.)

173A. Computer Networks (4)

173B. Design Projects in Communication Networks
Lecture—3 hours; discussion—1 hour. Prerequisite: course 173A or Computer Science and Engineering 152A. Advanced topics and design projects in communication networks. Examples include topics such as wireless networks, multimedia networking, network design and management, traffic analysis and modeling, network simulations and performance analysis. Offered in alternate years. (Same course as Computer Science and Engineering 152C.—II.)

175. Compiler Optimization (5)
Laboratory—9 hours; discussion—1 hour; project—1 hour. Prerequisite: course 170 or Computer Science Engineering 110. Computer Science Engineering 110. Program analysis and transformation techniques for improving program performance and reducing code size. Fundamental optimizations including instruction scheduling, register allocation, code motion, common subexpression elimination, dead code elimination, strength reduction and branch alignment.—II. (III.)

180A. Digital Systems I (5)
Lecture—3 hours; laboratory—6 hours. Prerequisite: course 70 or Computer Science Engineering 50, courses 100 and 101 (may be taken concurrently). Introduction to digital system design including combinational logic design, sequential and asynchronous circuits, computer systems, and algorithmic state machine design; computer aided design (CAD) methodologies and tools.—I, II, III. (I, II, III.)

180B. Digital Systems II (5)
Lecture—3 hours; laboratory—6 hours. Prerequisite: course 110A, 180A. Restricted to majors in Electrical Engineering, Computer Engineering, Computer Science and Engineering, Electrical Engineering/Materials Science Engineering, and Electrical Engineering and Computer Science graduate students. Computer aided design of digital systems with emphasis on hardware description languages (VHDL) and schematic capture tools. Pipelining, memory system design, and testing digital circuits.—II, III. (I, III.)

183. Testing and Verification of Digital Systems (4)
Lecture—3 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; formal verification; timing analysis.—II, III. (I, III.)

189A-V. Special Topics in Electrical Engineering and Computer Science (1-5)

190C. Research Group Conferences in Electrical and Computer Engineering (1-5)
Discussion—1 hour. Prerequisite: upper division standing in Electrical and Computer Engineering, course 101, consent of instructor. Research group conferences. May be repeated for credit. (P/NP grading only.)—I, II, III. (I, II, III.)

192. Internship in Electrical and Computer Engineering (1-15)
Internship—3-15 hours. Prerequisite: course 101, completion of a minimum of 84 units, project approval prior to period of internship. Supervised work experience in electrical and computer engineering. May be taken concurrently. Project is different. (P/NP grading only.)—I, II, III. (I, II, III.)

194A-194B-194C. Micromouse Design Project (2-2-1)
Discussion—1 hour; laboratory—3-2 hours. Prerequisite: courses 194A, 194B only. Prerequisite: course 70 or Computer Science Engineering 50, Engineering 17 (may be taken concurrently); course 100 or Engineering 100 recommended (may be taken concurrently). Design of robotic mouse for the IEEE Micromouse competition. Limited enrollment. May be repeated once for credit. (Deferred grading only, pending completion of sequence.)—I, II, III. (I, II, III.)

195A-195B-195C. Student Design Project (2-2-1)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 110A. Design projects and/or contests sponsored by industry in conjunction with department for availability. Course offering subject to demand/availability of resources. Limited enrollment. May be repeated twice for credit if project is different. (Deferred grading only, pending completion of sequence.)—I, II, III. (I, II, III.)

196A. Senior Design Project (1)
Discussion/laboratory—1 hour. Prerequisite: English 101, 102, or 104, or successful completion of English Composition Examination; senior standing in Electrical or Computer Engineering; restricted to the Electrical Engineering or Computer Engineering major. Integration of principles and concepts of computer science design project for Electrical and Computer Engineering. Project incorporates engineering standards and realistic constraints including economic, manufacturability, sustainability, health and safety, environmental, social, and political. Completion of portfolio of upper division course work. (Deferred grading only, pending completion of sequence.)—I. (I.)

196B. Senior Design Project (1)
Term paper or discussion—1 hour. Prerequisite: course 196A; any course from department listing of approved project courses; restricted to Electrical Engineering and Computer Engineering majors. Integration of principles and concepts of capstone design project for Electrical and Computer Engineering. Project incorporates engineering standards and realistic constraints including economic, manufacturability, sustainability, ethical, health and safety, environmental, social, and political. Completion of portfolio of upper division course work. (Deferred grading only, pending completion of sequence.)—I. (I.)

1977. Tutoring in Electrical and Computer Engineering (1-3)
Discussion—1 hour; discussion/laboratory—2-8 hours. Prerequisite: upper division standing, consent of instructor, course 101; restricted to Electrical and Computer Engineering courses, especially introductory courses. For upper-division undergraduate students who will provide tutorial assistance. (P/NP grading only.)—I, II, III. (I, II, III.)

198. Directed Group Study (1-5)
Prerequisite: course 101, consent of instructor. (P/NP grading only.)

Special Study for Advanced Undergraduates (1-5)
Prerequisite: course 101, consent of instructor. (P/NP grading only.)

Graduate Courses

201. Digital Signal Processing (4)
Lecture—4 hours. Prerequisite: course 150B; Statistics 120 or Mathematics 131 or Mathematics 167 recommended. Theory and design of digital filters. Classification of digital filters, linear phase systems, all-pass functions, FIR and IIR filter design methods and optimality measures, numerically robust structures for digital filters.—II. (II.)

202. Advanced Digital Signal Processing (4)
Lecture—4 hours. Prerequisite: courses 201, 269, and 265, and Mathematics 167 are recommended. Multirate DSP theory and wavelets, optimal transform and subband coders in data compressions, advanced sampling theory and oversampled A/D converters, transmultiplexers and precoders in digital communication systems, genomic signal processing. Offered in alternate years. —III. (III.)

206. Digital Image Processing (4)
Lecture—3 hours. Prerequisite: courses 202, 269, and 265. Prerequisite: course 150B. Two-dimensional systems theory, image perception, sampling and quantization, transform theory and applications, enhancement, filtering and restoration, image analysis, and image processing systems. (Deferred grading only.)

207. Pattern Recognition and Classification (3)
Lecture—3 hours. Prerequisite: Statistics 120. Topics in statistical pattern recognition and classification: linear decision functions and minimum distance classification, Bayes decision theory, clustering algorithms, the generalized perception, multi-layer neural networks and feature extraction. Offered in alternate years. (Deferred grading only.)

208. Image Analysis and Computer Vision (3)
Lecture—3 hours. Prerequisite: course 150B. Geometry of two-dimensional objects. Edge detection and image segmentation. Image formation and fundamental principles of computer vision. Recovery of three-dimensional structure from shading or stereo information. Analysis of motion and estimation of
motion parameters. Geometry and representation of three-dimensional objects. Offered in alternate years.—I.

209. Multimedia Compression and Processing (4)
Lecture—3 hours; project—2 hours. Prerequisite: knowledge of a programming language (Matlab, C, or C++); Statistical 120, 131A, Engineering Civil & Environmental 114, or Mathematics 131, or equivalent; course 106 or 206 recommended. Principles and practices of state-of-the-art multimedia compression and processing. State-of-the-art multimedia coding standards; scalable multimedia coding; new paradigms in wavelet compression for image and video data; synthetic-natural hybrid coding. Offered in alternate years.—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 circuit stabilizers. State of the art of feedback amplifiers. Introduction to noise analysis in MOS circuits.—I. (I)

211. Advanced Analog Circuit Design (3)
Lecture—3 hours. Prerequisite: course 210; Statistics 131A or equivalent recommended. Noise and distortion in electronic circuits and systems. Application to communication circuits. Specific applications include mixers, low-noise amplifiers, power amplifiers, phase-locked loops, oscillators and receiver architectures.—II. (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. (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. (III)

214. Computer-Aided Circuit Analysis and Design (3)
Lecture—3 hours. Prerequisite: courses 110A, 110B 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.—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.—III.

216. Low Power Digital Integrated Circuit Design (3)
Lecture—3 hours. Prerequisite: course 118 IC design for low power and energy consumption. Low power architectures, logic styles and circuit design. Variable supply and threshold voltages. Leakage management. Power estimation. Energy sources, power electronics, and energy recovery. Applications in portable electronics and sensors. Thermodynamic limits.—II. (II)

218A. Introduction to VLSI Circuits (3)
Lecture—3 hours. Prerequisite: courses 110A and 111B. Theory and practice of VLSI circuit and system design. Extensive use of VLSI computer-aided design aids to undertake a VLSI design example.—I.

218B. Multiprocessor Chip Design (1)
Laboratory—3 hours. Prerequisite: course 218A. CMOS and NMOS multiprocessor chip layout and design of projects begun in courses 218A, 212, and 219 are assembled and submitted to the DARPA/NSF MOSIS program for fabrication.—II.

218C. IC Testing and Evaluation (1)
Laboratory—3 hours. Prerequisite: courses 218A and 218B. Chips submitted in course 218B are tested and evaluated. Issues involving design of ICs for testability are discussed.—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 sense amplifiers. Advanced MOS families. Multi-valued logic.—III.

221. Analog Filter Design (3)
Lecture—3 hours. Prerequisite: courses 100 and 150A. Design of active and passive filters including filter specification and approximation theory. Passive LC filter design will cover doubly-damped resonator two-port synthesis. Active filter design will include op-amp building blocks, cascade, multi-loop, ladder and active-R filter design. Offered in alternate years.—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 circuit design techniques; use of non-linear computer-aided (CAD) tools; RF power amplifier design.—II. (III) Phm

228. Advanced Microwave and Antenna Design Techniques (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 132B. Theory, design, fabrication, analysis of advanced microwave devices, antennas. Includes wideband transformers, tapered waves, stripe line and microstrip broadband, couplers, and hybrids. Lumped and distributed filter synthesis. Broadband matching theory applied to microwave devices. FET amplifiers. Antenna design, analysis of horns, microstrip, log periodic, arrays, spirals, and reflectors. Offered in alternate years.—III.

230. Electromagnetics (3)
Lecture—3 hours. Prerequisite: course 130B. Maxwell’s equations, plane waves, reflection and refraction, complex waves, waveguides, resonant cavities, and basic antennas.—I. (I)

232A. Advanced Applied Electromagnetics I (3)
Lecture—3 hours. Prerequisite: course 132B. The exact formulation of electromagnetic problems using Green’s functions. Application of these techniques to transmission circuits. Offered in alternate years.—II.

232B. Advanced Applied Electromagnetics II (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 132B. Advanced treatment of electromagnetic with applications to passive microwave devices and antennas. Offered in alternate years.—III.

235. Photonics (4)
Lecture—3 hours; project—1 hour. Prerequisite: course 230 (may be taken concurrently). Optical propagation of electromagnetic waves and beams in photonic components and the design of such devices using numerical techniques. Offered in alternate years.—II.

236. Nonlinear Optical Applications (3)
Lecture—3 hours. Prerequisite: course 130B, course 230 (may be taken concurrently). Nonlinear optical interactions in optical communication, optical information processing and integrated optics. Basic concepts underling optical nonlinear interactions in materials and guided media. Not open for credit to students who have completed course 233. Offered in alternate years.—I.

237A. Lasers (3)
Lecture—3 hours. Prerequisite: course 130B or the equivalent and course 235. Theoretical and practical description of lasers. Theory of population inversion, amplification and oscillation using semiclassical oscillator model and rate equations. Design and fabrication of lasers and laser systems. Offered in alternate years.—II.

237B. Advanced Lasers (3)
Lecture—3 hours. Prerequisite: course 237A. Quantum mechanical description of lasers and interaction of materials with laser light. Relationship to rate equation approach. Optical Bloch equations and coherent effects. Theory and practice of active and passive mode-locking of lasers. Injection locking. Not open for credit to students who have completed course 226A. Offered in alternate years.—II.

238. Semiconductor Diode Lasers (3)
Lecture—3 hours. Prerequisite: course 243A. Undergraduate students. Fundamentals of semiconductor diode lasers and quantum-confined systems are applied to diode lasers and selected photonic devices. The importance of radiative and non-radiative recombination, simulated emission, excitons in quantum wells, and strained quantum layers are considered. Offered in alternate years.—III.

239A. Optical Fiber Communications Technologies (4)
Lecture—4 hours. Prerequisite: course 130B. Physical layer issues for component and system technologies in optical fiber networks. Sources of physical layer impairments and limitations in network scalability. Enabling technologies for optical networks—is based on wavelength-division multiplexing and time-division-multiplexing networks. Optical amplifiers and their impact in optical networks (signal-to-noise ratio, gain-equilization, and cascadability).—I. (I)

239B. Optical Fiber Communications Systems and Networking (4)
Lecture—4 hours. Prerequisite: course 239A. Physical layer optical communications systems in network architectures and protocols. Optical systems design and integration using optical component technologies. Comparison of wavelength routed WDM, TDM, and NGI systems and networks. Case studies of next generation technologies. Offered in alternate years.—III.

240. Semiconductor Device Physics (3)
Lecture—3 hours. Prerequisite: course 140B. Physical principles, characteristics and models of fundamental semiconductor devices; including PN-J, Schottky diodes, MOSFETs and MESFETs Bipolar Junction Transistors, and light emitters/detectors.—I. (I)

241. Advanced Silicon Devices (3)
Lecture—3 hours. Prerequisite: course 140B; course 240 recommended. Use of modern electron device design to enhance performance of basic device architectures to satisfy specific requirements in circuits. High-performance devices, silicon bipolar transistor, high-frequency devices, solid-state power devices and field-emission triodes are considered. Offered in alternate years.—II.

242. Advanced Nanostructured Devices (3)
Lecture—3 hours. Prerequisite: courses 130A and 140A. Physics of nano-structured materials and device operation. Overview of new devices enabled by nanotechnology; fabrication and characterization methods; applications of nano-structures and devices. Offered in alternate years.—II.

243. Silicon-on-Insulator (SOI) Technology (3)
Lecture—3 hours. Prerequisite: course 140B or 240 recommended. SOI (silicon-on-insulator) technology from all major points of view: materials fabrication, processing technology, device physics, and circuit basics. Offered in alternate years.—III.

244A. Design of Micromechanical Systems (MEMS) (3)
Lecture—3 hours. Prerequisite: course 140A, 140B or consent of instructor. Theory and practice of MEMS design. Micromechanical fundamentals,
244B. Design of Microelectromechanical Systems (MEMS) (1)
Lecture—3 hours. Prerequisite: course 244A. Testing of surface micromachined MEMS devices including post-processing, design of test fixtures and test methodology, measurements, and data analysis. (S/U grading only.) Offered in alternate years.—(III.)

245C. Advanced Statics (3)
Lecture—3 hours. Prerequisite: course 140A and Physics 111A. Physics of solids relevant to device applications. Topics include atomic structure of solids, quantum theory of electronic and vibrational states in crystals, stress-strain-temperature properties, electron dynamics, and quantum transport theory.—(III.)

246. Advanced Projects in IC Fabrication (3)
Discussion—1 hour; laboratory—6 hours. Prerequisite: course 146B. Individualized projects in the fabrication of analog or digital integrated circuits. Offered in alternate years.—II.

247. Advanced Semiconductor Devices (3)
Lecture—3 hours. Prerequisite: course 240. Physics of various semiconductor devices, including metal-oxidesemiconductor field-effect transistors (MOSFETs), IMPATT and related transit-time diodes, transferred-electron devices, light-emitting diodes, semiconductor lasers, photodetectors, and solar cells. Offered in alternate years.—(II.)

249. Microfabrication (3)
Lecture—3 hours. Prerequisite: course 140B. Theory and practices of several major technologies of microfabrication, used for producing integrated circuits, sensors, and microstructures. Major topics include sputtering, chemical vapor deposition, plasma processing, micromachining, and ion implantation. Offered in alternate years.—III.

250. Linear Systems and Signals (4)
Lecture—4 hours. Prerequisite: course 150A. Mathematical description of systems. Selected topics in linear algebra. Solution of the state equations and an analysis of stability, controllability, observability, realizability, state feedback and state estimation. Discrete-time signals and systems, and the z-transform.—I.

251. Nonlinear Systems (3)
Lecture—3 hours. Prerequisite: course 250. Nonlinear systems (with emphasis on second-order systems: approximation methods, Lyapunov stability, absolute stability, Popov criterion, circle criterion, feedback linearization techniques. Offered in alternate years.—III.

252. Multivariable Control System Design (3)

253. Adaptive Systems (3)
Lecture—3 hours. Prerequisite: course 150B, course 200 (may be taken concurrently). Theory and practice of adaptive systems. Concepts of learning and adaptation. Structure of adaptive filters and the related parameter adaptive algorithms. Applications to system identification, recursive system estimation, adaptive state feedback, and adaptive control. Offered in alternate years.—I.

254. Optimization (3)
Lecture—3 hours. Prerequisite: Mathematics 22A, knowledge of FORTRAN or C. Modeling optimization problems in engineering design and other applications; optimality conditions; unconstrained optimization (gradient, Newton, conjugate gradient and quasi-Newton methods); duality and Lagrangian relaxation constrained optimization. (Primal method and an introduction to penalty and augmented Lagrangian methods.) Offered in alternate years.—II.

255. Robotic Systems (3)
Lecture—3 hours. Introduction to robotic systems. Mechanical design, sensorics, manipulator positioning and path planning. Dynamics of manipulators. Robot motion programming and control algorithm design. Offered in alternate years.—II.

260. Random Signals and Noise (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Statistics 120, course 150A; course 250 recommended. Random processes as probabilistic models for signals and noise. Review of probability, random variables, and expectation. Study of correlation function and spectral density, ergodicity and duality between time averages and expected values, filters and dynamical systems. Applications.—II.

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 for communication systems. Array processing. Offered in alternate years.—II.

262. Multi-Access Communications Theory (4)
Lecture—3 hours; project. Prerequisite: Statistics 120 or equivalent; course in engineering Computer Science 152A. Maximum stable throughput of Poisson collision channels. Classic collision resolution algorithms. Carrier sensing multiple access and its performance and analysis. Joint detection of the physical medium access control layers. Capacity region of multi-access channels. Multi-access with correlated sources. Offered in alternate years.—II.

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 detection 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. Offered in alternate years.—II.

265. Principles of Digital Communications (4)
Lecture—4 hours. Prerequisite: courses 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 signaling over bandwidth-constrained linear filter channels and over fading multipath channels. Spread spectrum signals.—II.

266. Information Theory and Coding (3)
Lecture—3 hours. Prerequisite: Statistics 120. Information theory and coding. Measure of information. Redundancy reduction encoding of an information source. Capacity of a communication channel, error-free communication, channel coding. 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, coding techniques.—II.

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 algorithm, reliability-based decoding, trellis-based decoding, and multistage decoding. Offered in alternate years.—II.

270. Computer Architecture (3)
Lecture—3 hours. Prerequisite: course 170 or Computer Science Engineering 154B. Introduction to computer architecture. Topics include CPU design, instruction set architecture, memory hierarchy design, cache and buffer management, pipelining, computer performance analysis, computer architecture for embedded systems, and advanced microarchitecture techniques such as superscalar and out-of-order execution. Offered in alternate years.—II.

271. Multimedia Networking and Communications (4)
Lecture—3 hours; project—2 hours. Prerequisite: knowledge of programming language (Matlab, C or C++); basic knowledge of computer networks and multimedia compression preferred, but not required. Concepts and principles of multimedia transmission of multimedia across heterogeneous wired and wireless IP networks. Multimedia communication over Internet and wireless networks; error resilient multimedia compression techniques, error concealment strategies; multimedia streaming architectures; channel models and channel estimation strategies; joint source-channel coding techniques. Offered in alternate years.—II.

272. High-Performance Computer Architecture and Implementation (3)
Lecture—3 hours. Prerequisite: course 170 or Computer Science Engineering 154A, 154B and course 270 or Computer Science Engineering 250A. Architectural issues in achieving high-performance via concurrent execution of instructions and associated problems and limitations. Specialized architectures. Offered in alternate years.—II.

273. Computer Networks (4)
Lecture—3 hours; project. Prerequisite: Mathematics 131 or Statistics 120 or 131A, Computer Science Engineering 152A. Concepts and design principles of computer networks. Network architectures, protocol mechanisms and implementation principles (transport/network/data-link layers), network algorithms, router mechanisms, design requirements and implementation. Offered in alternate years.—II.

274. Advanced Topics in Networking (4)
Lecture—3 hours; project. Prerequisite: Computer Science Engineering 154A, 154B, 155, and 262. 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.

276. Fault-Tolerant Computer Systems: Design and Analysis (3)
Lecture—3 hours. Prerequisite: courses 170, 180A. Introduces fault-tolerant digital system theory and practice. Covers recent and classic fault-tolerant techniques based on hardware redundancy, time redundancy, information redundancy, and software redundancy. Examines hardware and software reliability analysis, and example fault-tolerant designs. 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 154A. Design and analysis of the architecture of computer graphics systems. Topics include the graphics pipeline with a concentration on hardware techniques and algorithms, exploiting parallelism in graphics, and case studies of noteworthy and modern graphics architectures. Offered in alternate years.—II.
278. Computer Arithmetic for Digital Implementation (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 performance requirements. Addition (subtraction), multiplication and division operations are covered, and fixed and floating-point representation are examined. Offered in alternate years.—II.

280. High-Performance System Design (3)
Lecture—3 hours. Prerequisite: course 118, 180B. Advanced digital circuits. Logic families of high-performance systems: processors and DSP. Timing, clock generation, clock distribution and clock storage elements. Pipelining in high-performance systems. Power issues and design for low-power. VLSI arithmetic and implementation in digital systems.—I, II.

281. VLSI Digital Signal Processing (3)
Lecture—3 hours. Prerequisite: courses 150B, 170, 180B and 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, III.

282. Hardware Software Codesign (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 re-use, 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 verification techniques to microprocessors. Offered in alternate years.—II.

286. Introduction to Digital System Testing (3)
Lecture—3 hours. Prerequisite: course 180A; Statistics 120 or 131A. A review of several current techniques used to diagnose faults in both combinational and sequential circuits. Topics include path sensitization procedures, Boolean difference, D-algorithm 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, (I, II, III).

291. Solid-State Circuit Research Laboratory Seminar (1)
Seminar—1 hour. Prerequisite: graduate standing. Lectures on solid-state technology in industrial design by various visiting experts in the field. May be repeated for credit. (S/U grading only).—II, III.

292. Seminar in Solid-State Technology (1)
Seminar—1 hour. Prerequisite: graduate standing. Lectures on solid-state technology by various visiting experts in the field. May be repeated for credit. (S/U grading only).—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. Lectures on current topics in signal processing and robotics research and robotics technology. May be repeated for credit. (S/U grading only).—II, III.

295. Systems, Control and Robotics Seminar (1)
Seminar—1 hour. Prerequisite: graduate standing. Seminars on current work in systems and control by faculty and visiting experts. Technical presentations and lectures on current topics in robotics research and robotics technology. May be repeated for credit. (S/U grading only).—II, III.

296. Photonic Research Seminar (1)
Seminar—1 hour. Prerequisite: graduate standing. Lectures on photonic and related areas by faculty and visiting experts. May be repeated for credit. (S/U grading only).—II, III.

298. Group Study (1-5)
Prerequisite: consent of instructor. (S/U grading only.)

299. Research (1-12)
(S/U grading only.)

Professional Course

300. The Teaching of Electrical Engineering (1)
Discussion—1 hour. Prerequisite: consent of teaching assistant and/or associate-in in Electrical Engineering. Participation as a teaching assistant or associate-in in a designated engineering course. Methods of teaching 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.

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).

Engineering: Mechanical and Aeronautical

[College of Engineering]
JeanJacques Chatatt, Ph.D., Chairperson of the Department
Fidelis O. Eke, Ph.D., Vice Chairperson of the Department

Department Office. 2132 Bainer Hall
(530) 752-0580, Fax (530) 752-4158, http://www-mae.engr.ucdavis.edu

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JeanJacques Chatatt, Ph.D., Professor
Harry H. Cheng, Ph.D., Associate Professor
Roger Davis, Ph.D., Assistant Professor
Jean-Pierre Delplanque, Ph.D., Associate Professor
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Morteza Dwyer, Ph.D., Professor
(Aeronautical Science and Engineering)
Paul A. Erickson, Ph.D., Assistant Professor
(Warren H. Giedt, Ph.D., Professor Emeritus)
Rida T. Farouki, Ph.D., Associate Professor
Andrew A. Frank, Ph.D., Professor
Mohamed M. Hafez, Ph.D., Professor
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David A. Horsley, Ph.D., Assistant Professor
Mont Hubbard, Ph.D., Professor
Maury L. Hull, Ph.D., Professor
Sanjay S. Joshi, Ph.D., Assistant Professor
Dean C. Karnopp, Ph.D., Professor
Ian M. Kennedy, Ph.D., Professor
Wolfgang Kollmann, D’Ing., Professor
(Aeronautical Science and Engineering)
Valeria La Saponara, Ph.D., Assistant Professor
Donald L. Margolis, Ph.D., Professor
Barbara Ravoni, Ph.D., Assistant Professor
Nesrin Sarigul-Klijn, Ph.D., Professor
(Aeronautical Science and Engineering)
Benjamin D. Shaw, Ph.D., Professor
(C) P. (Case) van Doren, Ph.D., Professor
(Aeronautical Science and Engineering)
Steven A. Velinsky, Ph.D., Professor
Anthony S. Wexler, Ph.D., Professor
Bruce R. White, Ph.D., Ph.D., Professor
(Aeronautical Science and Engineering)
Kazu Yamazaki, Ph.D., Professor
Emeriti Faculty
Charles W. Beadle, Ph.D., Professor Emeritus
Warren H. Giedt, Ph.D., Professor Emeritus
Jerald M. Henderson, D’Engr., Professor Emeritus
Myron A. Hoffman, Sc.D., Professor Emeritus
John D. Kemper, Ph.D., Professor Emeritus
Lawrence W. Rehfield, Ph.D., Professor Emeritus
Allan A. McKillop, Ph.D., Professor Emeritus
Affiliated Faculty
Oleg Ryzhov, Ph.D., Visiting Professor
James Schaaf, Ph.D., Lecturer
Division of Aeronautical Science and Engineering
Mission. The Department of Mechanical and Aeronautical Engineering is committed to educating future engineers so they may contribute to the economic growth and well-being of both the state and the nation and to the advancement of knowledge in the mechanical and aeronautical sciences.

Objectives. We provide: a foundation in the mathematical and physical sciences appropriate for the solution of engineering problems; competitive engineering design experiences in an interdisciplinary environment that emphasize written and oral communication skills, team work, and team and individual decision making; an environment and approach to the requisite engineering disciplines that allow and encourage life-long learning; the basic computational, experimental and manufacturing skills necessary for the conduct and assessment of engineering tasks; an awareness of the ethical, societal, and business responsibilities that accompany the practice of engineering, including pertinent legal issues such as intellectual property; an awareness of current research and state-of-the-art in the field.

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer: 2007/2008 offering in parentheses
The Aeronautical Science and Engineering Major Program

Aeronautical Science and Engineering is the branch of engineering that applies scientific knowledge to the design, manufacture and operation of aircraft. Our Bachelor of Science degree in Aeronautical Science and Engineering provides a broad background and fundamental education in mathematics, the physical sciences, and the engineering sciences. These fundamentals, when complemented by the required technical courses, prepare you for employment in government or industry, while simultaneously establishing an excellent foundation for graduate studies.

The fundamental disciplines of this branch of engineering apply to all bodies and vehicles whose applied loads are influenced by aerodynamic forces.

Courses in fundamental engineering principles are supplemented with courses in aircraft propulsion, aerodynamics, performance, stability and control, aircraft preliminary design, aeronautical structures, and aerelasticity.

Aeronautical Science and Engineering Program

The Aeronautical Science and Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Lower Division Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 22A-22B</td>
<td>6</td>
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<tr>
<td>Physics 9A-9B-9C-9D</td>
<td>19</td>
</tr>
<tr>
<td>Chemistry 2A-2B or 2AH-2BH</td>
<td>10</td>
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<tr>
<td>Engineering 4</td>
<td>4</td>
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<tr>
<td>Engineering 6 or Mechanical Engineering 5</td>
<td>4</td>
</tr>
<tr>
<td>Engineering 17, 35, 45</td>
<td>11</td>
</tr>
<tr>
<td>English 3 or University Writing Program 1, or Comparative Literature 1, 2, 3, or 4</td>
<td>4</td>
</tr>
<tr>
<td>Native American Studies 5</td>
<td>4</td>
</tr>
<tr>
<td>Communication 1 or 3</td>
<td>4</td>
</tr>
<tr>
<td>General Education electives</td>
<td>16</td>
</tr>
</tbody>
</table>

Minimum Lower Division Units | 93 |

Upper Division Requirements

A broad range of technical elective courses is available; some students choose these electives from one area of study in order to begin developing a specialty. Others choose from several areas in order to broaden their background in the sciences and engineering.

Typical aeronaughtical science and engineering specialties include aero-thermodynamics, propulsion systems, aircraft performance, stability, and control, aeronautical structures, aerelasticity, flight testing, or component and mechanism design.

There are a number of electives that could be recommended to all aeronautical science and engineering students regardless of their chosen area of specialization.

Suggested technical electives:

- Aeronautical Science and Engineering 137, 139

Upper Division Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Engineering 100, 102, 103, 104, 105</td>
<td>19</td>
</tr>
<tr>
<td>Select one course from Applied Science Engineering 113, Engineering 180</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics 128C</td>
<td>4</td>
</tr>
<tr>
<td>Engineering 190</td>
<td>3</td>
</tr>
<tr>
<td>Technical electives</td>
<td>7</td>
</tr>
</tbody>
</table>

A combined maximum of four units may be selected from project/independent study courses (184A, 184B, 185A, 185B, 192, 199).

General Education electives | 8 |

Minimum Upper Division Units | 93 |

Minimum Units Required for Major | 188 |

The Mechanical Engineering Major Programs

The mechanical engineer uses basic science in the design and manufacture of complex engineering systems requiring the application of physical and mechanical principles in 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, fluid mechanics, thermodynamics, heat transfer, mass transfer, electricity, manufacturing processes, and economics.

Mechanical Engineering Program

The Mechanical Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Lower Division Required Courses

Requirements for the Mechanical Engineering and Mechanical Engineering/Materials Science and Engineering programs.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics 21A-21B-21C-21D</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics 22A-22B</td>
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<tr>
<td>Physics 9A-9B-9C-9D</td>
<td>19</td>
</tr>
<tr>
<td>Chemistry 2A-2B or 2AH-2BH</td>
<td>10</td>
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<tr>
<td>Engineering 4</td>
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</tr>
<tr>
<td>Engineering 6 or Mechanical Engineering 5</td>
<td>4</td>
</tr>
<tr>
<td>Engineering 17, 35, 45</td>
<td>11</td>
</tr>
<tr>
<td>Mechanical Engineering 50</td>
<td>4</td>
</tr>
<tr>
<td>English 3 or University Writing Program 1, or Comparative Literature 1, 2, 3, or 4</td>
<td>4</td>
</tr>
<tr>
<td>Native American Studies 5</td>
<td>4</td>
</tr>
<tr>
<td>Communication 1 or 3</td>
<td>4</td>
</tr>
<tr>
<td>General Education electives</td>
<td>12</td>
</tr>
</tbody>
</table>

Minimum Lower Division Units | 93 |

Upper Division Requirements

You spend your third year in further study of fundamental courses, and in the fourth year you may tailor your studies to your own interests by selecting courses in controls and systems analysis, fluid mechanics, heat transfer, mechanical design or thermodynamics.

For purposes of graduation, study in Mechanical Engineering or obtain a broad background for entering engineering practice at the bachelor’s level.

You are encouraged to select elective courses from among the areas of specialization listed below:

Areas of Specialization

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 generation to detailed 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 mechanical systems.

The engineer-designer must have a solid and relatively broad background in the physical and engineering sciences and have the ability to synthesize the information from such a background in 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:

- Aeronautical Science and Engineering 138
- Mechanical Engineering 160 (only one unit of credit towards technical requirements); Engineering 180
- Chemical Engineering 161A, 161B
- Civil and Environmental Engineering 144, 149
- Mechanical Engineering 161, 162, 163


Combustion and the Environment. Combustion is widely used for energy generation, propulsion, heating, and waste disposal, as well as for many other applications. The processes and reactions that occur and are often heavily involved with the design of combustion systems (internal combustion engines, gas turbines, furnaces, etc.) and deal with aspects of combustion ranging from increasing engine 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 pollutant emissions 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, 184A with 184B (both courses must be taken)
- Civil and Environmental Engineering 149, 150

Suggested Advisers: R.C. Aldredge, H.A. Dwyer, P. A. Erickson, I.M. Kennedy, W. Kollmann, 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 first course in this specialization is to introduce you to the fundamental processes of heat transfer and thermodynamics in complex engineering systems so that you are able to design more efficient, cost effective, reliable systems with less environmental pollution and impact. An understanding of heat transfer and thermodynamics is required for the design of efficient, cost effective systems for...
power generation, propulsion, heat exchangers, industrial processes, refining, and chemical processing. This area of specialization is important to many industries—aerospace, defense, automotive—as well as to the thermal design of electronic and computer packages.

Suggested technical electives:
- Aeronautical Science and Engineering 138 Engineering 111; Mechanical Engineering 161, 162, 163

Suggested Advisers: R.C. Aldredge, R. Davis, H.A. Dwyer, P.A. Erickson, I.M. Kennedy, W. Kollmann, B.D. Shaw

Manufacturing. Manufacturing is concerned with the conversion of raw materials into finished products by a variety of processes, such as machining, forming, casting, and molding. Modern manufacturing technology is increasingly dependent upon integration with computer-aided design systems and precision computer controls. State-of-the-art laboratories offer the opportunity for hands-on experience with a wide spectrum of manufacturing equipment. Manufacturing engineers must have expertise in design, materials, controls, statistical methods, computer software, and microprocessor applications.

Suggested technical electives:
- Electrical and Computer Engineering 160 Materials Science and Engineering 180, 181 Mechanical Engineering 151, 154


Systems Dynamics and Control. Engineers are increasingly concerned with the performance of integrated dynamic systems in which it is not possible to optimize component parts without considering the overall system. Systems 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 to change the dynamic characteristics of systems in useful ways. The emphasis 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 suspension systems, modeling and control of vehicle dynamics, electronics for control of actuator design, electronically controlled steering, analysis of fuel management systems, and the design of flight-control systems with humans in the loop.

An Automotive System Dynamics Laboratory is being used for testing devices such as engines, transmissions, brakes, and steering systems as well as testing complete vehicles.

Suggested technical electives:
- Aeronautical Science and Engineering 129, 139
- Engineering 122
- Mechanical Engineering 134, 152, 184A with 184B (both courses must be taken)


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 fields of competence in vehicle dynamics, control of vehicle dynamics, power sources and power transmission, lightweight structures and systems, and systems, including electrical drives and fuel cells, and mechanical systems.

Transportation Systems. As society recognizes the increasing importance of optimizing transportation systems to minimize environmental degradation and energy expenditure, engineers will need to consider major innovations in the way people and goods are moved. Such innovations will require competence in vehicle dynamics, propulsion and control, and developments in the problems caused by present-day modes of transportation.

Vehicle control requires an understanding of sensors and actuator, and the integration of yet-to-be-proposed concepts in road/rail/air dynamics. Competence in these areas allows for the development of alternative propulsion concepts, such as electric, hybrid, and fuel cell.

Suggested technical electives:
- Aeronautical Science and Engineering 127, 129
- Civil and Environmental Engineering 131, 149
- Engineering 122, 160 (only one unit of credit towards Technical Electives requirement)
- Mechanical Engineering 134, 150B, 161, 162, 163


Mechanical Engineering Upper Division Required Courses

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering 100, 102, 103, 104, 105</td>
<td>15</td>
</tr>
<tr>
<td>Mechanical Engineering 150A and 152; and one course chosen from 159A with 159B (both courses must be taken in consecutive quarters), or Aeronautical Science and Engineering 130A</td>
<td>12</td>
</tr>
<tr>
<td>Engineering 190</td>
<td>3</td>
</tr>
<tr>
<td>Select one course from Applied Science Engineering 115; Engineering 180</td>
<td>12</td>
</tr>
</tbody>
</table>

Selected from the following: Engineering 122, Mechanical Engineering 150B, 154. In order to satisfy design requirements, two courses must be chosen from Aeronautical Science and Engineering 129, 130B, 130C, 137, 138, 139, Materials Science and Engineering 147, 180, 181, 182; Mechanical Engineering 134, 151, 152, 154, 161, 162, 163. You may also choose from Mechanical Engineering 150B, 184A with 184B (these courses must be taken in consecutive quarters), or 185A with 185B (these courses must be taken in consecutive quarters), if these courses are not used for a core design requirement above. A maximum of 4 units of courses numbered 184A, 184B, 185A, 185B may be applied to the technical elective degree requirement.

General Education electives... 12

Minimum Upper Division Units ... 101

Minimum Units Required for Major ..... 194

Courses in Engineering: Mechanical (EME)

Courses in Aeronautical Science and Engineering (AE) are listed immediately following; graduate courses in Mechanical and Aeronautical Engineering (MAE) follow.

Lower Division Courses

1. Mechanical Engineering (1)
Lecture—1 hour. Description of the field of mechanical engineering with examples taken from industrial applications, discussions of the practice with respect to engineering principles, ethics, and responsibilities. (P/NP grading only.)—I. I. Cheng

5. Computer Programming for Engineering Applications (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Mathematics 16A or 21A (may be taken concurrently). Structure 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.—I. I. Cheng

50. Manufacturing Processes (4)
Lecture/discussion—3 hours; laboratory—3 hours. Prerequisite: Engineering 4 with grade of C or better; Physics 9A. Modern manufacturing methods, safety, manufacturing instructions, computer-aided manufacturing and their role in the engineering design and development process.—I. I. Yamazaki, Schauf

92. 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.)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor; lower division standing. (P/NP grading only.)

Upper Division Courses

106. Thermo-Fluid Dynamics (4)
Lecture—4 hours. Prerequisite: Engineering 103 and 105. Restricted to Mechanical Engineering, Aeronautical Engineering and Mechanical Engineering/

107A. Experimental Methods (3)
Lecture—2 hours; laboratory—1.5 hours. Prerequisite: course 86, open to Mechanical Engineering, Aerospace Science & Engineering; and Mechnical/ Materials Science Engineering majors only. Experiments to illustrate principles of thermal-fluid systems. Statistical and uncertainty analysis of data; statistical design of experiments; measurement devices; Experiments involving thermodynamic cycles, combustion, compressible and incompressible flows of gases. Only one unit of credit for students who have previously taken Chemical Engineering 155A; only one unit of credit for students who have taken Chemical Engineering 155B; only two units of credit for students who have taken Civil and Environmental Engineering 141L. —I, II, III. (I, II, III.) Hubbard

107B. Experimental Methods (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Engineering 100, Engineering 104, (both may be taken concurrently), and course 107A. Experiments to illustrate principles of mechanical systems. Theory of measurements; Signal analysis; Demonstration of basic sensors for mechanical systems; Experimental project involving voltage measurement; strain gages, dynamic systems of 0th, 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. —I, II, III. (I, II, III.)

134. Vehicle Stability (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 171. Introduction to the static and dynamic stability characteristics of transportation vehicles with examples drawn from aircraft, high-performance automobiles, rail cars and boats. Laboratory exposure to experimental static and dynamic behavior of auto mobiles, race cars, bicycles, etc. —I, II, III. (I, II, III.) Hubbard

150A. Mechanical Design (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 45 and 104; Mechanical Engineering 50 or may be taken concurrently. Principles of engineering mechanics applied to mechanical design. Statics and dynamics of structures. Analysis of mechanisms. Theory of mechanisms and its use in the design of engineering systems. —I, II, III. (I, II, III.)

Ravani

150B. Mechanical Design (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 150A. Principles of engineering mechanics applied to the design and selection of mechanical components. Design projects, which concentrate on conceptual design, engineering analysis, methods of manufacturing, materials selection, and cost. Introduction to Computer-Aided Design. —II. (II.) Hull

151. Statistical Methods in Design and Manufacturing (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 107 and 150A. 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. —II. Hull

152. Computer-Aided Mechanism Design (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 5 or Engineering 6 and 102. Principles of computer-aided mechanism design. Computer-led kinematic, static, and dynamic analysis and design of planar mechanisms such as multiple-loop linkages and geared linkages. Introduction to kinematic synthesis of mechanisms. —II. (II.) Cheng

154. Mechatronics (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 100, 102, course 50. Mechatronics system concept and overview, control system design overview, control software architecture, control hardware architecture, microcontroller and interface technology for mechatronics system, control design sensor for mechatronics systems, actuator drivers. —I, II, III. Yamazaki

161. Combustion and the Environment (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 104. Introduction to combustion kinetics; the theory of pre-mixed flames and diffusion flames; turbulent combustion, formation of air pollutants in combustion systems; examples of combustion devices which include internal combustion engines, gas turbines, furnaces and waste incinerators; alternative fuel sources. —I, II, III. (I, II, III.) Kennedy, Shaw

162. Modern Power Plants (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 106. Modern power plants for electric power generation and cogeneration. Thermodynamic analysis of different types of power plants using various fuels. Design studies of specific power plants. —II. Hoffman

163. Internal Combustion Engines and Future Alternatives (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 103 and 105. Fundamentals of internal combustion engine design and performance. Future needs to adapt to environmental concerns, and the feasibility of better alternatives in the future. —I, II, III. Dwyer

165. Heat Transfer (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 5 or Engineering 6, 103 and 105. Conduction, convection, and radiation heat transfer. C omputational modeling of heat transfer in engineering. Applications to engineering equipment with the use of digital computers. —I, II, III. (I, II, III.) Baught

171. Analysis, Simulation and Design of Mechatronic Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 171, Engineering 100. Classical feedback control, block diagrams, control systems performance specifications; steady state errors, rise and settling times; root locus, PID controllers; control design with Bode and Nyquist plots; stability; phase and gain margin; lead and lag compensators; state variable feedback controllers. —II, III. Farouki, Eke

184A. Senior Design Project (2)
Laboratory—6 hours. Prerequisite: courses 150B, 165, and 172, consent of instructor, senior standing in Mechanical Engineering. Performance of practical mechanical engineering projects which include one or more of the following: analysis, design, development, and evaluation of mechanical engineering system. (Deferred grading only, pending completion of sequence.) —I, II, III. (I, II, III.)

184B. Senior Design Project (2)
Laboratory—6 hours. Prerequisite: course 184A in a previous quarter from the same instructor; consent of instructor. Performance of practical mechanical engineering projects which include one or more of the following: analysis, design, development, and evaluation of a mechanical engineering system. —I, II, III. (I, II, III.)

185A-185B. Mechanical Engineering Systems Design Project (2-2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 150A. Introduction to Mechanical Engineering or Aeronautical Science and Engineering. Capstone mechanical engineering design course; the mechanical engineering design process and its use in the design of engineering systems. (Deferred grading only, pending completion of sequence.) —II, III. (II, III.)
133. Finite Element Methods in Structures (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 104. Open to Engineering students only. An introduction to the aerospace structural design process. History of aircraft materials. Effects of loading beyond elastic limit. Deflections and stresses due to combined loading. Virtual work principles, and finite element methods. Applications to aerospace structures. — III. Saigal-Klijn

135. Aerospace Structures (4)
Lecture—4 hours. Prerequisite: course 133. Analysis and design methods used in aerospace structures. Shear flow in open, closed and multicell beam cross-sections, buckling of flat and curved sheets, tension field beams, local buckling. — I. (I) Saigal-Klijn

137. Structural Composites (4)
Lecture—3 hours; laboratory—1 hour. Prerequisite: Engineering 104. Overview of materials and technology for creating structures from fiber reinforced resin matrix composite material systems. Elementary design methodologies and case studies emphasizing aero-nautical applications. — II. (II)

138. Aircraft Propulsion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 45, 103 and 105. Analysis and design of modern aircraft engines. Development and application of cycle performance prediction techniques for important engine configurations. Introduction to the operation and design of inlet, compressor, turbine, nozzle. Cycle design studies for specific applications. — II. (II) Baughn

139. Structural Dynamics and Aeroelasticity (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Engineering 103 and 102. Structural dynamics of flexible structures. Introduction to fluid-structure interaction. Design of subsystems or systems under aeroelastic constraints. Dynamics instabilities. Control effectiveness. Unsteady aerodynamics. Flutter. Aeroelastic tailoring in design, Applications to aerospace, mechanical and biomedical systems. — III. (III) Saigal-Klijn

189A. Rocket Propulsion (4)
Lecture—4 hours. Prerequisite: Engineering 103 and 105, upper division standing. Fluid and thermody-namics of rocket engines, liquid and solid rocket propulsion systems. Propulsion concepts and space mission requirements. — White

189B. Orbital Mechanics (4)
Lecture—4 hours. Prerequisite: course 102, upper division standing. Satellite orbits, multistage rockets, current global boosters, and new technologies. Design application problems include satellites, trajectory optimizations, and interplanetary trajectories. — Saigal-Klijn

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 course in Aeronautical Science and Engineering and Mechanical Engineering.

Graduate Courses

207. Engineering Experimentation and Uncertainty Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 107. Design and analysis of engineering experiments with emphasis on measurement standards, data analysis techniques and general and detailed uncertainty analysis, including statistical treatment of experimental data intervals, propagation of bias and precision errors, correlated bias approximations, and using jitter programs. — II. (II) Baughn

208. Measurement Methods in Fluid Mechanics and Combustion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 165 and Engineering 103. Application of shadowgraphy, schlieren and laser velocimeter methods. Introduction to optics and lasers. Measurement of velocity and concentrations in reacting and non-reacting flows with laser diagnostic techniques including pyrometry, high Raman and fluorescence scattering and CARS. Offered in alternate years. — III. Kennedy

210A. Advanced Fluid Mechanics and Heat Transfer (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103, 105 and Mechanical Engineering 165. Development of differential equations governing continuum, momentum and energy transfer. Solutions in laminar flow for exact cases, low and high Reynolds numbers and lubrication theory. Dynamics of inviscid flow. — I. (I) Dwyer, Kollmann, White

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 energy transfer. Solutions in laminar flow for exact cases, low and high Reynolds numbers and lubrication theory. Dynamics of inviscid flow. — II. (II) Baughn

212. Biomechanical Health 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 systems related to 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 Biomedical Engineering 212.) Offered in alternate years. — III. (III) Alredge

213. Advanced Turbulence Modeling (4)
Lecture—4 hours. Prerequisite: course 210B. Methods of analyzing turbulence; kinematics and dynam-ics of homogeneous turbulence; Reynolds stress and heat-flux equations; second order closures and their simplification; numerical methods; application to boundary layer flows; twodimensional and three-dimensional hydraulic and environmental flows. Offered in alternate years. — I. (I) Alredge, Kollmann

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 physiological and pathological conditions. Topics include circulatory 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 215.) — III. (III) Barakat

216. Advanced Thermodynamics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 105. Study of topics important to energy conversion and other systems using high temperature gases. Classical thermodynamics and quantum statistical mechanics of nonreacting and chemically reacting gases, gas mixtures, and other systems. — II. (II)

217. Combustion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103 and 105. Review of chemical ther-modynamics and chemical kinetics. Discussions of reacting flows, their governing equations and transport phenomena; detonations, laminar flame structure and turbulent combustion. Offered in alternate years. — II. Alredge, Kennedy, Shaw

218. Advanced Energy Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103 and 105, or the equivalent. Review of applied analysis of power generation. Detailed study of basic power balances, component efficiencies, and overall powerplant performance for one advanced concept such as a fusion, magnetohydrodynamic, or solar electric power plant. Offered in alternate years. — (I) Hoffman

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 and finite difference methods for multi-dimensional problems in solid and fluid dynam-ics are performed with examples in C, C++, FOR-TRAN, and MATLAB script files. Derivation of the basic equations of motion in finite volume form with applications to elasticity, waves. Offered in alternate years.

220. Mechanical Vibrations (4)
Lecture—4 hours. Prerequisite: Engineering 122. Multiple degrees of freedom; damping measures; Rayleigh’s method; vibration absorbers; eigenvalues and modal shapes; modal coordinates; forced vibrations; random processes; auto-correlation; spectral density; first passage and fatigue failure; nonlinear systems; phase plane. — III. (III) Margolis

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; modern dynamics; orthogonality; wave dynamics; dispersion. — I. (I) Eke

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/theo-rem; angular momentum; generalized forces; comparing Newton/Euler, Lagrange’s, Kane’s methods; computer-aided equation derivation; orientation; Euler; Rodrigues parameters. (Same course as Biomedical Engineering 222.) Offered in alternate years. — III. (III) Karnopp

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 work-space, path planning, robot programming, real-time architecture and software implementation. (Same course as Biomedical Engineering 225.) Offered in alternate years. — II. (II) Chi

226. Acoustics and Noise Control (4)
Lecture—4 hours. Prerequisite: Engineering 122. Description of sound using normal modes and waves; interaction between vibrating solids and 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. Offered in alternate years. — III. (III) Karnopp

227. Research Techniques in Biomechanics (4)
Lecture—2 hours; laboratory—4 hours; term paper or discussion—1 hour. Prerequisite: Mathematics 125 and consent of instructor. Research and laboratory techniques and data analysis and presentation, 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)—II. (III.) William, Hawkins

231. Musculo-Skeletal System Biomechanics (4)
Lecture—4 hours. Prerequisite: Engineering 102. Mechanics of skeletal muscle and mechanical models of muscle, statics and dynamics of the inverse dynamics problem, theoretical and experimental methods of kinematic and kinetic analysis, computation of inter-segmental load and muscle forces, applications to gait and rehabilitation therapy. Same course as Biomedical Engineering 231.—II. (III.) Hull

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 the changes 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)—II. (III.) Martin

234. Design and Dynamics of Road Vehicles (4)
Lecture—4 hours. Prerequisite: Mechanical Engineering 134. Analysis and numerical simulation of road vehicles with an design applications. Offered in alternate years.—III. (III.) Velinsky

236. Aerodynamics in Nature and Technology (4)
Lecture—4 hours. Prerequisite: Engineering 103. Introduction to aerodynamics in nature, fundamentals and applications of atmospheric, weather, collision and animal locomotion, atmospheric flows, boundary layers, pedestrian-level winds in urban areas. Criteria for laboratory modeling of atmospheric flows, wind-tunnel testing. Offered in alternate years.—III. (III.) White

237. Analysis and Design of Composite Structures (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Aeronautical Science and Engineering 137. Modeling and analysis methodology for composite structures including response and failure. Laminated plate bending theory. Introduction to failure processes. Offered in alternate years.—III. (III.) La Saponara

238. Advanced Aerodynamic Design and Optimization (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: consent of instructor. Application of aerodynamic theory to obtain optimum aerodynamic shapes. Both analytic and numerical solutions obtained with numerical optimization techniques will be examined. Includes introduction to the calculus of variations and numerical optimization techniques. Offered in alternate years.—III. (III.) White

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 methods. Numerical treatment of nonlinear dynamics; classification of coupled problems; applications of finite element methods to mechanical, aeronautical, and biological systems. Offered in alternate years.—Same course as Biomedical Engineering 240.—II. (III.) Sarigökgöz

247. Analysis of Thin-Walled Structures (4)
Lecture—4 hours. Prerequisite: Engineering 204 or equivalent. Static stability of thin-walled aerospace structures treated from both theoretical and practical design perspectives. Both monolithic and composite constants of structural buckling of stiffened panels, shells, and thin-walled beams, experimental methods and failure/crushing processes. Offered in alternate years.—III. (III.) White

248. Gas Turbine and Combustion (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 turbo-

250A. Advanced Methods in Mechanical Design (4)
Lecture—4 hours. Prerequisite: Mechanical Engineering 150A and 150B or the equivalents, or consent of instructor. Applications of advanced techniques of solid mechanics to mechanical design problems. Coverage of advanced topics in variational, boundary and field theories with emphasis in design of machine elements. Design projects utilizing advanced design analysis tools for life cycle evaluation. (I.) Faurot

250B. Advanced Methods in Mechanical Design (4)
Lecture—4 hours. Prerequisite: course 250A. Applications of advanced techniques of solid mechanics to mechanical design problems in variational methods with emphasis in design of machine elements. Design projects emphasizing advanced design analysis tools.—II. (II.) 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. Use of stress and strain to predict crack initiation. Use of fracture mechanics to predict failure and crack propagation. Effects of stress concentration, manufacturing, load sequencing, and residual stress on fatigue and fracture. Offered in alternate years.—III. (III.) Hill

251. Mechatronics System Design (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mechanical Engineering 154 and 172 or Electrical and Computer Engineering 157A, 157B. Motion mechanism design, electric actuator, power electronics motion control, sensor technologies, personal computer-based control systems design, motion control general operating system and real-time operating systems, motion control software design, discrete event control software design. Offered in alternate years.—I. (I.) Yarmand

252. Information Processing for Autonomous Robotics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 6, Mechanical Engineering 5, or equivalent programming experience, Mechanical Engineering 154, 157A, 157B. Knowledge of Matlab. Computational principles for sensing, reasoning, and navigation for autonomous robots. Offered in alternate years.—III. (III.) Hill

254. Engineering Software Design (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Mechanical Engineering 5, Engineering 180. Principles and design of engineering software. Advanced topics in engineering software design applications, object-oriented design, software design patterns, real-time mechatronic systems, real-time multi-threaded computer and sensor fusion, Web-based network computing, graphics, and GUI in engineering. Offered in alternate years.—III. (III.) Kattwinkel

255. Computer-Aided Design and Manufacturing (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Mechanical Engineering 5, Engineering 180. Principlles and design of engineering software. Advanced topics in engineering software design applications, object-oriented design, software design patterns, real-time mechatronic systems, real-time multi-threaded computer and sensor fusion, Web-based network computing, graphics, and GUI in engineering. Offered in alternate years.—III. (III.) Kattwinkel

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. Offered in alternate years. Advanced vehicle design for fuel economy, performance, and low emissions, considering regulations, societal demands and market trends, and system and control of electric vehicle systems in real vehicle tests. Advanced vehicle design concepts. Offered in alternate years.—III. (III.) Frank

260. Advanced Aerodynamics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103 or the equivalent. Flow of compressible fluids. Isentropic flow. Flow with friction, heat transfer, chemically reacting, and aircraft mixture conditions. Normal and oblique shock waves, combustion, blast and expansion waves. Method of characteristics. Offered in alternate years.—II. (II.) van Dam, Halez, Chottat, White

263. Introduction to Computational Aerodynamics and Engineering (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Engineering 103 or consent of instructor. Introduction to numerical methods for solution of fluid flow problems. Discretization techniques and solution algorithms. Finite difference, finite element and spectral model equations pertinent to wave phenomena, diffusion phenomena, or equilibrium. Application to the incompressible Navier-Stokes equation. Offered in alternate years.—II. (II.) Chottat, Dywer, Halez, Vidic

264. Computational Aerodynamics (4)

266. Advanced Wind-Tunnel Testing (4)
Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: undergraduate course in fluid dynamics. Analysis of low-speed wind-tunnel testing for solving aerodynamic and non-aerodynamic problems including tunnel corrections, scale effects, forces and moments measurement, and model test descriptions. Offered in alternate years.—III. (III.) van Dam

271. Advanced Modeling and Simulation of Mechatronic Systems (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Mechanical Engineering 172 or the equivalent. Multiport models of mechanical, electrical, hydraulic, and thermal devices; bond graphs, block diagrams and state space equations; modeling of multi-energy domain systems; three-dimensional mechanism; digital simulation laboratory.—I. (I.) Kannop, Margolis

272. Theory and Design of Control Systems (4)
Lecture—4 hours. Prerequisite: Mechanical Engineering 172 or the equivalent. Mathematical representations of linear dynamical systems. Feedback principles, benefits and cost of feedback. Analysis and design of control systems based on classical and modern approaches, with emphasis on applications to mechanical and aeronautical systems.—II. (II.) Hasley, Kannop

Lecture—3 hours; discussion—1 hour. Prerequisite: Mechanical Engineering 172. Discrete systems analysis; digital filtering, sample data systems; state space and transform design techniques; quantization effects; multi-input, multi-output systems.—III. (III.) Hess

276. Data Acquisition and Analysis (4) Lecture—3 hours; discussion—1 hour. Application of computers for data acquisition and control. Topics include computer architecture, characteristics of transducers, hardware for laboratory applications of computers, fundamentals of interfaces between computers and experimental equipment, programming techniques for data acquisition and control, basic data analysis. Offered in alternate years. – Ill. I. Hill

290C. Graduate Research Conference (1) Discussion—1 hour. Prerequisite: consent of instructor. Individual and/or group conference on problems, progress, and grading quizzes, use of laboratory equipment, grading students, and grading laboratory reports. May be repeated for credit. (S/U grading only.) – I, II, III. I, II, III.

297. Seminar (1) Discussion—1 hour. Prerequisite: consent of instructor. Current topics in engineering including developments in mechanical and aeronautical engineering with presentations by students, faculty, and visitors. May be repeated for credit. (S/U grading only.) – I, II, III.

298. Group Study (1-5)

299. Research (1-12) Prerequisite: consent of instructor. (S/U grading only.)

Professional Courses

390. The Teaching of Aeronautical Science and Engineering (1) Discussion—1 hour. Prerequisite: meet qualifications for teaching assistant and/or associate in Aeronautical Science and Engineering. 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. 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.

The Major Program

The study of English develops skills in reading analytically and perceptively and in writing clearly and effectively.

The Program. The English department offers three kinds of courses: composition courses, undergrad-uate courses, and graduate courses. Composition courses develop skills in reading analytically and in writing persuasively. Undergraduate and graduate courses cover the entire range of English and American literature, as well as creative writing. Students majoring in English may elect a teaching emphasis, a creative writing emphasis, or a general literature emphasis. The teaching emphasis focuses on the study of composition and the writing process. The writing emphasis focuses on fiction, poetry, and article writing. Creative writing majors have an opportunity to work with distinguished professional writers of fiction and poetry. The general literature emphasis focuses on a series of related courses in various historical periods of English and American literature.

Career Alternatives. Graduates have found the major excellent pre-professional training for graduate and professional schools, and in the field of law. English majors should see their advisers, individually, in the spring quarters of their sophomore and junior years.

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 Web site at http://www/english.ucdavis.edu or the Department Advising Office, 177 Voorhies Hall.

Minor Program Requirements:

English 110A or 110B............................ 4
English 123, 130, 155A.......................... 4
English 123, 130, 155B.......................... 4
English 117A, 117B, or 117C.................. 4

One course from the following six historical fields: (a) Medieval: English 111, 113A, 113B (b) Renaissance: English 115, 122 (c) British Literature—Restoration through Romantic period: English 123, 130, 155A (d) British Literature—Victorian or Twentieth Century: English 133, 137N, 138, 155B, 155C (e) American Literature pre-1865: English 142, 143, 158A (f) American Literature post-1865: English 144, 146N, 147, 158B, 166, 167, 181B, 182

The following courses may be used to satisfy the above requirement if they fall into that category for subject, time period, etc. (Please refer to quarterly expanded course descriptions): English 150A, 150B, 152, 159, 165, 178, 179, 181A, 185A, 185B, 186

Upper Division Seminar, one course selected from English 187, 188, 189, 194H………………… 4

Area of Emphasis (choose one)………………12

General Emphasis: Three upper division English electives ………………. 12

Creative Writing Emphasis: Three sections of English 100F, 100P and/or 100NF……………………….. 12

(Subgroups pursuing the Creative Writing Emphasis may replace the upper division seminar portion of the core requirement with an upper division English elective.)

Teaching Emphasis: University Writing Program 101 or 104A, 104B, 104C, 104D, 104E, or 104F….. 4

English 105 or 106/Linguistics 106……………. 4

One course selected from English 179, 179, 181A, 181B, or an upper division ethnic literature course from outside the English department…………………………. 4

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.


Meeting for Majors. All new and prospective English majors are invited to attend a general meeting for majors at the beginning of each term, and should consult with the graduate adviser.

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses.

General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Sociocultural Diversity, Wrt=Writing Experience
bility criteria and application materials may be obtained at the Undergraduate Advising office in 177 W XSS. See Academic Affairs, Information, on page 62, for Dean’s Honors List information.

Education Abroad options. The department strongly encourages interested students to pursue their studies abroad. It is possible for students to complete a significant portion of the major coursework 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 the Education Abroad Center; the student presents copies of the coursework syllabus, term papers, 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 advisor 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. See http://wwwenglish.ucdavis.edu.

Subject A. Students must have met the Subject A requirement before taking any course in English. C. Bates, Director.

Prerequisites. English 3 or University Writing Program 1 is required for admission into courses 30A, 42, 43, 44, 45, 46A, 46B, 46C, and all upper division courses, unless otherwise stated in the course listings. Course 43 is recommended as preparation for the 46 series and all upper division literature courses. Comparative Literature 1, 2, 3, or 4 or Native American Studies 3 may normally be substituted for English 3 or University Writing Program 1.

Courses in English (ENL)

Lower Division Courses

3. Introduction to Literature (4)

Lecture—2 hours; discussion—2 hours. Prerequisite: completion of Subject A requirement. Introduction to the 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 will be made. GE credit: ArtHum, Writ. [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously].—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, Writ.—I, II, III. (I, II, III.)

5F. Introduction to Creative Writing: Fiction (4)

Lecture/discussion—4 hours. Prerequisite: completion of Subject A requirement. The elementary principles of creative fiction. Students will write both in prescribed forms and in experimental forms of their own choosing. No final examination. GE credit: Writ.—I, II, III. (I, II, III.)

5P. Introduction to Creative Writing: Poetry (4)

Lecture/discussion—4 hours. Prerequisite: completion of Subject A requirement. The elementary principles of creative poetry. Students will write both in prescribed forms and in experimental forms of their own choosing. No final examination.—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, Writ.—III.

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, Writ.—I.

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 literature from a variety of traditional and contemporary approaches. Topics include textual and historical approaches, formalism, deconstruction, and psychological criticism; feminism and gender; reader-response; materialist approaches. Frequent written assignments. GE credit: Writ.—II, III.

43. Introduction to the Study of Drama (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Close reading of selected works of British and American drama from a range of historical periods. Introduction to criticism, formalism and dramatic genres. Frequent written assignments. GE credit: Writ.—II, III.

44. Introduction to the Study of Fiction (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Close reading of British and American fictional forms (short stories, novellas, novels). Frequent written exercises. GE credit: Writ.—I, II.

45. Introduction to the Study of Poetry (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Close reading of selections from English and American poetry. Frequent written exercises. GE credit: Writ.—II.

46A. 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. History of literary conventions and backgrounds in religious thought, intellectual and social history, and related art forms. GE credit: Writ.—II.

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. History of literary conventions and backgrounds in religious thought, intellectual and social history, and related art forms. GE credit: Writ.—II.

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 the present. The history of literary conventions and backgrounds in religious thought, intellectual and social history, and related art forms. GE credit: Writ.—II.

92. Internship in English (1-12)

Internship—3-36 hours. Prerequisite: course 3 or University Writing Program 1. 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 Courses

100F. Creative Writing: Fiction (4)

Discussion—4 hours; development and evaluation of written materials, and conferences with individual students. Prerequisite: course 5F or 5P, 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. —I, II, III. (I, II, III.)

100N. 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 the equivalent. Writing of poetry. May be repeated for credit with consent of instructor. No final examination.

100P. Creative Writing: Poetry (4)

Discussion—4 hours; development and evaluation of written materials, and conferences with individual students. Prerequisite: course 5F or 5P, 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. —I, II, III. (I, 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 English language. Examination of the language as recorded from Old English to present-day English. Relationship of English to other languages; developments in phonology, and grammatical patterns. GE credit: ArtHum, Writ.

106. English Grammar (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or Linguistics 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 according to context; their development, and their usefulness in describing the conventions of English. (Same course as Linguistics 106.) Not open for credit to students who have completed Linguistics 104. GE credit: ArtHum.—I, II.

106P. 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 and contemporary controversies about freedom of expression, with emphasis on literary and artistic censorship. Not open for credit to students who have completed Rhetoric and Communication 125 or Communication 127. (Former course Rhetoric and Communication 125.) GE credit: ArtHum.—II.

110A. Introduction to Principles of Criticism (4)

Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Essentials of literary criticism and its history from Aristotle to the modern era, with emphasis on the major critics. GE credit: Writ.—I, II.

110B. Introduction to Principles of Criticism (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. The history of literary criticism in the modern era, with emphasis on the ties with psychology and the special problems presented by modern literary theory. —I, II.

111. 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 and thematically focused intensive examination of selected topics in Medieval British literature. May be repeated one time for credit when topic differs. GE credit: Writ.—I.
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.—III.

113B. Chaucer: The Canterbury Tales (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. Historically or thematically focused study 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.—III.

115. Renaissance Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Historically or thematically focused study of works of the Renaissance. May be repeated for credit when content differs. GE credit: Wrt.—III.

117A. Shakespeare: The Early Works (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. A historically or thematically focused study of works from Shakespeare’s early period, up to 1599. GE credit: ArtHum, Wrt.—I.

117B. Shakespeare: The Middle Works (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. A historically or thematically focused study of works of the 17th and 18th centuries. May be repeated for credit when content differs. GE credit: Wrt.—III.

117C. Shakespeare: The Later Works (4)
Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 3 or University Writing Program 1 or the equivalent. A historically or thematically focused study of works of Shakespeare’s later period, between 1604 and the end of his career. GE credit: ArtHum, Wrt.—II.

118. Shakespeare (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Selected major works by Shakespeare. Recommended for not being applied toward the English major. GE credit: ArtHum, Wrt.—II.

122. Milton (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Selected major works, including Paradise Lost. GE credit: ArtHum, Wrt.—II.

123. 18th-Century British Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Historically or thematically focused study of 18th-century English literature. May be repeated for credit when content differs. GE credit: Wrt.

130. British Romantic Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Historically or thematically focused study of works of Romantic English literature. May be repeated for credit when content differs. GE credit: Wrt.—II.

133. 19th-Century British Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Historically or thematically focused study of works of British literature [drama, poetry, prose fiction] from the period between 1845 and the present. May be repeated for credit when content differs. GE credit: Wrt.—III.

137N. British Literature, 1900-1945 (4)
Lecture—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1. Historically or thematically focused study of works of British literature (drama, poetry, prose fiction) from the period between 1945 and the present. May be repeated for credit when topic differs. Only 2 units of credit to students who have completed course 137. GE credit: Wrt.—II.

138. British Literature, 1945 to Present (4)
Lecture—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1. Historically or thematically focused study of works of British literature [drama, poetry, prose fiction] from the period between 1945 and the present. May be repeated for credit when topic differs. Only 2 units of credit to students who have completed course 138. GE credit: Wrt.—II.

142. Topics in 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 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 the 17th and 18th centuries. May be repeated for credit when content differs. GE credit: Wrt.—III.

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 American literature from 1865 to the Civil War. May be repeated for credit when content differs. GE credit: Wrt.—II.

144. Post-Civil War American Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Historically or thematically focused study of works of American literature from the post-Civil War American literature. May be repeated for credit when content differs. GE credit: Wrt.—II.

146H. American Literature: 1900-1945 (4)
Lecture—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1. Historically or thematically focused study of American literature (drama, poetry, prose fiction) from the period between 1900 and World War II. May be repeated for credit when topic differs. Only 2 units of credit to students who have completed course 146. GE credit: Wrt.—I.

147. American Literature, 1945 to the Present (4)
Lecture—3 hours; extensive writing. Prerequisite: course 3 or University Writing Program 1. Historically or thematically focused study of American literature (drama, poetry, prose fiction) from the period between 1945 and the present. May be repeated for credit when topic differs. Only 2 units of credit to students who have completed course 147. GE credit: Wrt.—I.

149. Topics in Literature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Intensive examination of literature considered in topical terms, not necessarily historically. May be repeated for credit when content differs. GE credit: Wrt.—I, III.

150A. British Drama to 1800 (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 English drama prior to 1800. May be repeated for credit when content differs. GE credit: Wrt.—II.

150B. British Drama from 1800 to the Present (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 English drama from 1800 to the present. May be repeated for credit when topic differs. GE credit: Wrt.—II.

152. American Drama (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Study of American dramatic literature. Either a historical survey from 18th-century beginnings to the present or an in-depth analysis of fewer playwrights, such as O’Neill, Miller, Williams. May be repeated for credit when content differs. GE credit: Wrt.
162. Film Theory and Criticism (4)  Lecture/discussion—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.

163S. Topics in British Literature and Culture (4)  Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. Study of writers, playwrights and novelists who worked in London. Examinations of Elizabethan, Restoration, Augustan, Romantic/Victorian, and the Modernist/Past/Modernist periods. To be taught in London. GE credit: ArtHum, Wrt.

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 all periods of English and American literature. May be repeated for credit when topic covers different poets and poems. GE credit: Wrt.

166. Love and Desire in Contemporary American Poetry (4)  Lecture—3 hours; discussion—1 hour. Prerequisite: course 3 or University Writing Program 1. Close reading of contemporary American poems on the theme of love and desire by poets of diverse ethnicities and historical orientations. Offered in alternate years. GE credit: Div, Wrt.—II.

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 literary traditions. Authors covered may include Gwendolyn Brooks, Countee Cullen, Robert Hayden, and Langston Hughes. Offered in alternate years. GE credit: Div, Wrt.

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. Offered in alternate years. GE credit: ArtHum, Div, Wrt.

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. Offered in alternate years. GE credit: ArtHum, Div, Wrt.

173. The Literature of Science Fiction (4)  Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Study of the literary modes and methods of science fiction. The course will analyze representative novels and short stories which exemplify major themes and styles in this genre—e.g., time travel; alternative universes; utopian and dystopian visions; sociological science fiction. GE credit: ArtHum, Wrt.

175. American Literary Humor (4)  Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1, or standing above freshman level. American humorous literature, with some consideration of Biblical and European antecedents. Major attention given to Chaucer, Shakespeare, or Milton. May be repeated for credit when a different author is studied. GE credit: Wrt.—III.

178. Special Topics in Ethnic Literature (4)  Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Intensive study of a topic drawn from multiethnic literature. Course topics may include diverse races and ethnicities (African American, Asian, Jewish, Latin American, Native American, and mixed ancestry) clarifying the roles of storytelling and cultural heritage in constructing identity, experiencing displacement, recovering history, and cultivating an inclusive society. GE credit: ArtHum, Div, Wrt.

180. Children’s Literature (4)  Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Offered in alternate years. GE credit: Div, Wrt.—III.

181A. African American Literature to the Harlem Renaissance (4)  Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Major African American writers in the context of cultural history from 1840 to the present. Writers may include Richard Wright, Ann Petry, James Baldwin, Ralph Ellison, Pauline Marshall, Toni Morrison, Alice Walker, Clarence Major. Offered in alternate years. GE credit: Div, Wrt.—I.

181B. African American Literature from the Harlem Renaissance to the Present (4)  Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Major African American writers in the context of cultural history from 1940 to the present. Writers may include Richard Wright, Ann Petry, James Baldwin, Ralph Ellison, Pauline Marshall, Toni Morrison, Alice Walker, Clarence Major. Offered in alternate years. GE credit: Div, Wrt.—II, III.

182. Literature of California (4)  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 authors of the century novelists, the Beats, and writers of the last two decades. GE credit: ArtHum, Div, Wrt.—III.

183. Adolescent Literature (4)  Lecture—3 hours; term paper. Prerequisite: admission to the English Department Subject Matter Preparation Program or consent of instructor. Theoretical, critical, and literary complexities that inform the study and teaching of American adolescent literature. GE credit: ArtHum, Wrt.

185A. Literature by Women I (4)  Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. English language literature by women from Bradstreet and Artemisia Gentileschi to Dickinson and Dickinson. The effects of social constraints upon women’s art; the rise of feminism; new trends in literary criticism. GE credit: Div, Wrt.

185B. Literature by Women II (4)  Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1; course 185A recommended. English language literature by women from Chopin and Woolf to Plath, Rich, and Morrison. The effects of social constraints upon women’s art; the rise of feminism; new trends in literary criticism. GE credit: Div, Wrt.—III.

186. Literature, Sexuality, and Gender (4)  Lecture/discussion—3 hours; term paper. Prerequisite: course 3 or University Writing Program 1. Historical or thematically focused intensive examinations of gender and sexuality in British and American literature. May be repeated for credit when content differs. GE credit: Div, Wrt.—III.

187. Literature and the Other Arts (4)  Seminar—3 hours; term paper. Prerequisite: junior or senior standing with a major in English or consent of instructor. Group study of the relationship between the forms of literature and the forms of the other arts, with detailed study of one of the period's artistic development in western culture. GE credit: Wrt.—I.

188. Special Topics in Literary Studies (4)  Seminar—3 hours; term paper. Prerequisite: junior or senior standing with a major in English or consent of instructor. One major writer's artistic development with attention to intellectual and literary milieu. Limited enrollment. GE credit: Wrt.—I, II, III (I, II, III).

189. Seminar in a Major Writer (4)  Seminar—3 hours; term paper. Prerequisite: junior or senior standing as a major in English or consent of instructor. One major writer's artistic development with attention to intellectual and literary milieu. Limited enrollment. GE credit: Wrt.—I, II, III (I, II, III).

190. Internship in English (1-12)  Internship—3-36 hours. Prerequisite: course 3 or University Writing Program 1 or the equivalent. Field experience, with individuals or in small voluntary discussion groups affiliated with one of the department's regular courses. Does not fulfill requirement for major. May be repeated for credit for a total of 12 units. (P/NP grading only.)

194H. Special Study for Honors Students (4)  Seminar—3 hours; term paper. Prerequisite: admission to English Department Senior Honors Program. Study of a special literary topic or of the works of a major writer, and preparation for writing an honors thesis in course 195H. GE credit: Wrt.—I, II, III (I, II, III).

195H. Honors Thesis (4)  Independent study—12 hours. Prerequisite: course 194H. Preparation of a major paper under the supervision of an instructor. Students satisfying requirements for the general major or the teaching emphasis write on a scholarly or critical subject; creative writing students submit a volume of poems or fiction.

197. Tutoring in English (1-5)  Tutoring—1-5 hours. Prerequisite: upper division standing and consent of Chairperson. Leading of small voluntary discussion groups affiliated with one of the department's regular courses. Does not fulfill requirement for major. May be repeated for credit for a total of 8 units. (P/NP grading only.)

197T. Community Tutoring in English (1-4)  Tutoring—1-4 hours. Prerequisite: upper division standing and a major in English or consent of instructor. Field experience, with individuals or in class-room in instruction in English language, literature, and composition. Does not fulfill requirement for major. May be repeated for credit. (P/NP grading only.)

198. Directed Group Study (1-5)  Lecture/discussion—4 hours. Prerequisite: course 3 or University Writing Program 1. GE credit: Div, Wrt.—III.

198S. Directed Group Study (4)  Lecture/discussion—4 hours. Prerequisite: course 3 or University Writing Program 1. May be repeated for credit for a total of 12 units. GE credit: Div, Wrt.—III.

General Education (GE) credit: ArtHum—Arts and Humanities, SciEng—Science and Engineering; SocSci—Social Sciences; Div—Social-Cultural Diversity; Wrt—Writing Experience.
Investigations of historical sites, museums, galleries, and performances. To be taught in London. (P/NP grading only.) (II, III, III, III.)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.)

Graduate Courses

200. Introduction to Graduate Studies in English (4) Seminar—3 hours; term paper or discussion—1 hour. Prerequisite: graduate standing. Introduction to literary scholarship with special attention to the elements of professionalism and to different modes of literary investigation. (S/U grading only.) (I.)

205. Anglo-Saxon Language and Culture (4) Lecture—3 hours; conference and term paper. The language and culture of Anglo-Saxon England; readings in Old English prose and poetry. Offered in alternate years.

206. Beowulf (4) 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. Offered in alternate years.

207. Middle English (4) Discussion—3 hours; term paper. Study of the phonology, morphology, syntax, and lexicology between 1100 and 1500 with special investigation of the regional dialects, pertinent facts on both the internal and external linguistic history; intensive reading of texts.

210. Readings in English and American Literature (4) Seminar—3 hours; conference—1 hour. Prerequisite: upper division course in area studied. Content varies according to specialty of instructor. May be repeated if topic differs.

225. Topics in Irish Literature (4) Seminar—3 hours; conference—1 hour. Prerequisite: graduate standing. Varied topics, including the sixteenth-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 (4) 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. —II.

232. Problems in English Literature (4) 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 (4) 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, II, III.

234. Dramatic Literature (4) Lecture—3 hours; conference—1 hour. Historical introduction to dramatic theory; the genres of tragedy, comedy, and tragedy. May be repeated for credit if topic differs.

235. Theory of Fiction (4) 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—by the instructor’s discretion. For students in the Creative Writing Program. May be repeated for credit when focus differs. —I, II, III.

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 list differs. Offered in alternate years. —I.

240. Medieval Literature (4) Seminar—3 hours; conference—1 hour. Studies of medieval 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. —I, II, III.

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. —I, II, III.

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. —I, II, III.

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. —I, II, III.

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. —I, II, III.

250. Romantic Literature (4) Seminar—3 hours; conference—1 hour. Studies in Romantic 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. —I, II, III.

252. Victorian 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. —I, II, III.

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. —I, II, III.

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. —I, II.

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. —I, II.
Entomology

[College of Agricultural and Environmental Sciences]

Robert K. Washino, Ph.D., Professor Emeritus, Chairperson of the Department
Lynn S. Kimsey, Ph.D., Vice Chairperson
Frank G. Zalom, Ph.D., Vice Chairperson

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Faculty

James R. Carey, Ph.D., Professor
Peter S. Cranson, Ph.D., Professor
Lester E. Ehler, Ph.D., Professor
Jeffrey Granett, Ph.D., Professor
Peneleope J. Guiteras, Ph.D., Professor
Bruce D. Hammad, Ph.D., Professor
Richard Karban, Ph.D., Professor
Harry K. Kaya, Ph.D., Professor
(Entomology, Nematology)
Lynn S. Kimsey, Ph.D., Professor
Sharon P. Lawler, Ph.D., Associate Professor
Walter S. Leal, Ph.D., Professor
Edwin Lewis, Ph.D., Professor
(Entomology, Nematology)
Fumio Matsumura, Ph.D., Professor
(Entomology, Environmental Toxicology)
Michael P. Parrella, Ph.D., Professor
(Entomology, Environmental Horticulture)
Jay A. Rosenheim, Ph.D., Professor
Thomas W. Scott, Ph.D., Professor
Diane E. Ullman, Ph.D., Professor
Richard E. Rice, Ph.D., Lecturer Emeritus
Philip S. Ward, Ph.D., Professor
Emeriti Faculty

Oscar G. Bacon, Ph.D., Professor Emeritus
Richard M. Bohart, Ph.D., Professor Emeritus
Hugh Dingle, Ph.D., Professor Emeritus
John D. Edman, Ph.D., Professor Emeritus
Bruce E. Eldridge, Ph.D., Professor Emeritus
Norman E. Gary, Ph.D., Professor Emeritus
Albert A. Grigarick, Jr., Ph.D., Professor Emeritus
Charles L. Judson, Ph.D., Professor Emeritus
Donald I. Matsumura, Ph.D., Professor Emeritus
Robert E. Page Jr., Ph.D., Professor Emeritus
Christine Y. S. Peng, Ph.D., Professor Emeritus
Timothy Prout, Ph.D., Professor Emeritus
Richard E. Rice, Ph.D., Lecturer Emeritus
Rabin W. Tharp, Ph.D., Professor Emeritus
Robert K. Washino, Ph.D., Professor Emeritus

Affiliated Faculty

Anton Cornel, Ph.D., Lecturer
Mary L. Flint, Ph.D., Lecturer
Larry Godfrey, Ph.D., Lecturer
Robert Kimsey, Ph.D., Associate Adjunct Professor
Greg C. Lanzaro, Ph.D., Lecturer
Eric C. Massen, Ph.D., Lecturer
Richard T. Roush, Ph.D., Academic Administrator
Frank G. Zalom, Ph.D., Lecturer

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 beneficial species 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, behavior and ecology, medical entomology, and insect molecular biology, physiology 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. A student interested in applied entomology, for example, could enroll in courses such as arthropod pest management and biological control.

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 careers in insect diagnostic laboratories, conducting insect surveys, and/or developing entomological research. 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:

English Composition Requirement 0-8
See college requirement.

Preparatory Subject Matter 46-47
Biology Sciences 1A, 1B, 1C 15
Chemistry 2A, 2B, 88 16
Mathematics 16A 3
Physics 1A, 1B 6
Statistics 13, 32, Agricultural Systems and Environment 21, 2-Agricultural Systems and Environment 21, 2-Engineering 5, or Mathematics 168 3

Breadth Subject Matter 6-24
Satisfaction of General Education requirement.

Depth Subject Matter 34-40
Microbiology 102, Plant Biology 118, Plant Pathology 120 or Pathology, Microbiology, and Immunology 128 3
Biological Sciences 101 4
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 7

Restricted Electives 34-36
Upper division entomology courses 14
Upper division electives related to student’s interest with approval of adviser 20
Note: No more than a total of 6 units from Entomology 192, 197 and 199 may count toward fulfilling depth subject matter or restricted elective units.

Unrestricted Electives 26-60
Total Units for the Major 180

Minor Program Requirements:
The Department of Entomology has five minor programs open to students who have completed the major or course 10 or Biological Sciences 1B or consent of instructor. Ecological roles of insects in different habitats and environmental systems. The uses of insects in terrestrial and aquatic survery and environmental monitoring. Field and laboratory research, data analysis and scientific writing. —III. (III.) Crotzon, Gullan

Seminar—2 hours. Freshman seminar course for incoming students.

Insect Ecology and Evolution 20
Entomology 100, 101L, 101L 9
At least seven units from Entomology 103, 107, 109, 116, 158 6
Evolution and Ecology 149 or Environmental Science and Policy 121 3-4

Forensic Entomology 19
Entomology 100, 101, 104, 153, 156 15
At least four units from Entomology 156, 158, Pathology, Microbiology, and Immunology 126, 126L, 128 4

Minor Adviser. S. Lawler

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 97 and the Graduate Announcement, for further details.

Graduate Advisers. See the Class Schedule and Registration Guide.

Related Courses. See courses in Nematology.

Courses in Entomology (ENT)

Lower Division Courses

1. Art, Science and the World of Insects (3)
Leisure—3 hours; laboratory—3 hours. Fusion of entomology and art to create an appreciation of insect biology, ecology, interactions with humans and importance in human culture. Multidisciplinary approaches in education and career paths in entomology and art. GE credit: ArtHum or SciEng. —I. (I.) Ullman

2. Biodiversity (3)
Leisure—2 hours; lecture/discussion—1 hour. Introduction to nature, scope and geographical distribution of biodiversity (the essence of life, with emphasis on plants and animals, especially insects). Humans and biodiversity—domestication, aesthetics, ethics and valuation. Species richness and “suc-

10. Natural History of Insects (3)
Leisure—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. —II. (II.) Kaya, Tharp

50. Insects in the Environment (3)
Leisure—1 hour; discussion—1 hour, laboratory—3 hours. Prerequisite: course/Evolution and Ecology 2 or course 10 or Biological Sciences 18 or consent of instructor. Ecological roles of insects in different habitats and environmental systems. The uses of insects in terrestrial and aquatic surveys and environmental monitoring. Field and laboratory research, data analysis and scientific writing. — III. (III.) Crotzon, Gullan

90X. Special Topics in Entomology (2)
Seminar—2 hours. Freshman seminar course for in-depth examination of a special topic within the subject. May be repeated twice with credit. (P/NP grading only)—I. I. Ill.
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Entomology

92. Internship (1-12) Internship—3-36 hours. Prerequisite: consent of instructor. Work—on 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.)

99. Special Study for Undergraduates (1-5) (P/NP grading only.)

Upper Division Courses

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. —II. (III.) Cranston, Gullan, Kimsey

100L. 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 of all orders and of major families. GE credit with concurrent enrollment in course 100. Wrt.—I. (I.) Kimsey

101. Functional Insect Morphology (3) Lecture—2 hours; laboratory—3 hours. Prerequisite: course 100. Basic systemic 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. (III.)

102. 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 environment. Insect models as basic and applied research through detailed analysis of metabolic, physiological, and behavioral processes. Emphasis on analysis of metabolism, life cycle, and activity. GE credit: SciEng. —II. (III.) Hammock, Lent

103. Insect Systematics (3) Lecture—2 hours; discussion—1 hour. Prerequisite: introductory course in zoology or entomology. Principles and methods of identification with particular reference to insects. Emphasis on different theories of classification, and analysis of phylogenetic relationships. Offered in alternate years. GE credit: SciEng, Wrt. —III. Cranton, Gullan


107. California Insect Diversity (5) Lecture—1 hour; laboratory—6 hours; fieldwork—6 hours. Prerequisite: an introductory course in entomology. Survey of the diversity of insects from selected ecological zones in California with emphasis on collection, identification, and natural history. Offered in alternate years. GE credit: SciEng, Wrt. —III. Ward

109. Field Taxonomy and Ecology (7) Lecture—2 hours; laboratory—36 hours; five-week course. Prerequisite: an introductory course in entomology or consent of instructor. The study of insects in their natural habitats; their identification and ecology. Offered in alternate years. GE credit: SciEng, Wrt. —IV. (IV.)

110. Arthropod Pest Management (5) Lecture—3 hours; laboratory—6 hours. Prerequisite: Biological Science 1B. Development of the ecological basis for coordination and pest management paradigms with emphasis on agriculture. Ecological and practical aspects of control tactics. Laboratory emphasizes identification of pests and beneficials of agricultural and urban situations. GE credit: SciEng, Wrt. —II. (II) Granett, Ehler

116. Biology of Aquatic Insects (3-5) Lecture—2 hours and laboratory [Saturday field trips], optional laboratory on identification and/or aquatic insect collection. Prerequisite: course 100 or consent of instructor. A study of the life history, ecology, and identification of insects associated with streams, pools, and lakes. GE credit: SciEng. —III. (III.) Lawler

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 humans; emphasis on implications of findings from non-human model systems including natural history, ecology and evolution of life span; description of basic demographic, genetic and physiological mechanisms and life table methods. (Same course as Human Development 117.) GE credit: SciEng. Wrt.—I. (I.)

119. Apiculture (3) Lecture—3 hours; papers. Prerequisite: Biological Sciences 1C. Recommended. Biology and behavior of honeybees; communication, orientation, social organization, foraging activities, honey production, pollination activities. GE credit: SciEng, Wrt. —III. (III.)

123. Plant-Virus-Vector Interaction (3) Lecture—3 hours; prerequisite: Biological Sciences 1A, 1C, 101; Plant Biology 105, Plant Pathology 120, and course 100 recommended. Analysis of the 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 factors involved in viral infection and modern experimental approaches to the interaction of viral movement. Offered alternate years. (Same course as Plant Biology 123, Plant Pathology 123.)—(I.) Lucas, Gilbertson, Ullman

1405. Biodiversity and Conservation in South Africa (8) Lecture—3 hours; lecture/discussion—2 hours; term paper; fieldwork. Prerequisite: Biological Sciences 1A, 1B, 1C. A course that surveys the biota of South Africa in its geographic, historical, and environmental context. GE credit: SciEng. —III. (III.)

1407. Biological Control of Insects and Weeds (4) Lecture—2 hours; laboratory—3 hours. Prerequisite: course 100 or 110. Principles of biological control of arthropod pests of agriculture or pests of pathogens, entomopathogenic nematodes, parasites, and predators. Implementation in classical and augmentative biological control. Role of biological control in pest management. Offered in alternate years.—III. Ehler, Kaya

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. —III. (III.)

156. Biology of Parasitism (3) Lecture—3 hours. Prerequisite: Biological Sciences 1A or consent of instructor. Lectures on the biology and ecology of parasites affecting both humans and other vertebrates using selected examples from protozoan and metazoan fauna. GE credit: SciEng. —III. (III.) Kimsey, Thoms, Paranjape

156L. Biological Parasitism Laboratory (1) Laboratory—3 hours. Prerequisite: course 156 (concurrently) or consent of instructor. Laboratory demonstrations using selected examples from protozoan and metazoan parasites along with various techniques used in parasitology concepts presented in the lecture course. GE credit with concurrent enrollment in course 156. Wrt.—III. (III.) R. Kimsey

158. Forensic Entomology (3) Lecture—2 hours; laboratory—4 hours. Prerequisite: Biological Sciences 1B or Entomology 100, upper division standing. Arthropods, their general biology, succession, developmental cycles and population biology in matters of criminal prosecution and civil litigation. Emphasis on basic arthropod biology, ecological and developmental concepts and methods, development of reasoning abilities, development, development of opinions and evidence. GE Credit: SciEng or SocSci, Wrt.—III. (III.) R. Kimsey

192. Internship (1-12) Internship—3-36 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.)

197T. Tutoring in Entomology (1-3) Discussion—1-3 hours. Leading small discussion groups. Preview assignments and prepare guidelines for discussion. (P/NP grading only.)

198. Directed Group Study (1-5) Prerequisite: consent of instructor. Offered in alternate years. GE credit: SciEng

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.)

Graduate Courses

212. Molecular Biology of Insects and Insect Viruses (3) Lecture—3 hours. Prerequisite: consent of instructor. A molecular biological analysis of insect systematics, physiology, and defense mechanisms of major insect viruses. Baculovirus expression vectors and post-translation modification of expressed polypeptides. Biological control of using neuropeptides and toxin genes in insect viruses.—II. (II.)

214. Vector-Borne Infectious Diseases: Changing Patterns (2) Lecture/discussion—2 hours. Vector-borne infectious diseases especially as they relate to changing patterns associated with climate change, vertebrate and human population movement. (Same course as Population Health and Reproduction 214.)—I. (I.) Chomel

225. Terrestrial Field Ecology (4) Seminar—1 hour; fieldwork—12 hours. Prerequisite: introductory ecology and introductory statistics or consent of instructor. A field course in terrestrial ecology over spring break and four weekends atodega Bay, emphasizing student projects. Ecological hypothesis testing, data gathering, analysis and written and oral presentation of results. (Same course as Ecology 225/Population Biology 225.)—III. (III.) Karban

230. Advanced Biological Control (4) Lecture—2 hours; laboratory—6 hours. Prerequisite: graduate or upper division standing in biological science or consent of instructor. Principles and current issues in biological control of arthropod pests and weeds. Laboratory devoted to identification and life history of the major groups of parasites and predaceous insects. Offered in alternate years.—I. (I.) Ehler

253. Advanced Medical Entomology (3) Lecture—2 hours; discussion—1 hour. Prerequisite: one upper division course in entomology (other than course 153) and one course in microbiology: course 133 strongly recommended. An analysis of several arthropod-borne human diseases and emphasis on the relationships of the vectors of the disease to the ecology of the disease. Discussion includes demonstration of vectors and techniques. Offered in alternate years.—II. (II.)

290. Exploratory Topics in Entomology (2) Seminar—2 hours. Interdisciplinary topics in entomology, including innovative applications of entomological concepts to other fields of research and human endeavors. (e.g. medicine, technology, art, criminology.) May be repeated for up to 8 units of credit when topic differs.—I., II., III.
291. Current Topics in Medical and Veterinary Entomology (2)  
Seminar—2 hours. Prerequisite: course 102 if topic is physiology, a course in behavior if topic is behavior, or either if topic bridges both. Analysis of contemporary advances in insect physiology, biochemistry and/or behavior. Interpretation and description of physiological and behavioral mechanisms and functions. Application of general principles to solution of problems in the laboratory and field. May be repeated for up to 8 units of credit if topic differs. Not offered every year.—I, II, III. Hammock, Leal

293N. Current Topics in Insect Biotechnology and Genomics (2)  
Seminar—2 hours. Prerequisite: course 212. Discussion of advances in insect biotechnology, including genetic engineering and genomics. May be repeated for up to 6 units of credit if topic differs. Not offered every year.—I, II, III. Hammock, Leal

294. Current Topics in Insect Ecology, Evolution, and Systematics (2)  
Seminar—2 hours. Prerequisite: course 103, general course in ecology or evolution. Discussions of advanced topics in ecology, evolution and systematics with emphasis on analysis of factors influencing the distribution, abundance, adaptations and evolutionary relationships of insects. Includes consideration of applications of basic theory (e.g., biological control) that may be repeated for credit up to eight units if topic differs. Not offered every year.—I, II, III. Stouthamer, Leal

295. Current Topics in Agricultural Entomology and Bee Biology (2)  
Seminar—2 hours. Prerequisite: course 110 if topic covers pests and beneficial predators, course 119 if topic is bee biology, or either if topic bridges both. Discussion of advanced topics about the biology, ecology, behavior, and management of pest and beneficial insects. May be repeated for up to 8 units of credit if topic differs. Not offered every year.—I, II, III.

297N. Seminar in Entomology (1)  
Seminar—1 hour. Weekly entomology seminar. May be repeated up to 9 units of credit if topic differs. (S/U grading only.)—I, II, III.

298. Group Study (1-5)  
(S/U grading only.)

299. Research (1-12)  
(S/U grading only.)

Environmental Biology and Management  
(College of Agricultural and Environmental Sciences)  
Faculty  
See the Department of Environmental Science and Policy, on page 262.

The Major Program  
The environmental biology and management major offers an education in the basic natural sciences, especially ecology, together with a set of management and public policy analysis courses. 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 in the United States and worldwide.

Any student in good standing is eligible to transfer to the major; to do so, please see the major adviser, Marcel Holechek (1144, 1154 or 21A-21B Hall) or staff adviser (2134 Wickson Hall).

The Program. Courses in chemistry, physics, mathematics, biology, and earth sciences form the foundation of the curriculum; these are then tied together by courses in current ecology, genetics, evolution and biogeochemistry, resource economics, environmental policy making, quantitative analysis and field experience. This option emphasizes the study of biological diversity and the natural and human processes that control it. Key areas of the option include the design of nature reserves, the management of small populations of endangered species, environmental law, policy and economics.

Students in the Environmental Biology option take course work in population ecology, physiology, and other biological specialties, as well as quantitative analysis.

Students in the Environmental Management option take courses in resource economics, planning and public policy, and, especially, quantitative management techniques. This option emphasizes the management of public lands and natural resources in wildlands and urban areas. Students in this option may take courses in level planning and management are featured. Students interested in urban problems and/or legislative approaches should examine the Environmental Policy Analysis and Planning major.

Career Alternatives. The major prepares students to enter careers in management of natural resources and public lands, as well as basic ecological research. Students interested in professional schools (e.g., medicine) should consult an advisor early to plan their special requirements, such as organic chemistry. Graduates who choose the Environmental Biology option are prepared for graduate or professional training and, eventually, careers working for public agencies and private firms specializing in environmental quality, natural resources, or ecological research. Graduates with the Environmental Management option are prepared for jobs in public agencies at the federal, state, or local levels.

B.S. Major Requirements:  
UNITS  
English Composition Requirement ..........7-16  
See College requirement ..........8  
University Writing Program 102A, 102B, 102C, 102D, 102F, 102G ..........4  
Creatures of Beauty ..........10  
Art 10 .............................................3-4  
Preparatory Subject Matter .................47-49  
Biological Sciences 1A, 1B, 1C ..........15  
Chemistry 2A-2B or 2AH-2BH .............10  
Environmental Science and Policy ..........4  
Political Science 1 or Economics 1A;  
choose Economics 1A if Environmental  
Management option is selected ..........4-5  
Mathematics 16A-16B or 21A-21B ..........8  
Physics 7A-7B or 9A-9B ..........8-10  
Breath/Generic Education ..................24-28  
Satisfaction of General Education requirement to include 12 units of humanities and/or  
Civilization and Culture ..........12-24  
Depth Subject Matter ....................28-33  
(These units must be taken for a letter grade attaining an overall grade-point average of 2.0 or higher.)  
Select one course from Plant Biology 117,  
Environmental Science and Policy 100,  
Evolution and Ecology 101, Wildlife, Fish,  
and Conservation Biology 151 ..........4  
Environmental Science and Policy 110 and  
172 ..........8  
Select two courses from Atmospheric Science 120, 133,  
Environmental Science and Policy 116, 150A, 150B,  
Environmental and Resource Sciences 121, 134,  
Hydrologic Sciences 141, Soil Science  
100, 118 ..........6-8  
Select one course from Environmental Science and Policy 160, 161, 163, 169, 171, 179,  
Agricultural and Resource Economics 147,  
175, 176 ..........3-4  
Select one course from: Mathematics 16C,  
21C, 22A, 22B, Statistics 100, 102, 104,  
or upper division mathematics, computing or  
statistics ..........3-4  
Select one course from Environmental Science and Policy 123, 178; or Wildlife, Fish, and  
Conservation Biology 100. Management  
students should enroll in Environmental  
Science and Policy 178 ..........4-8  

Areas of Specialization ....................23-38  
Conservation Biology and Management  
Option  
Wildlife, Fish, and Conservation Biology  
154 ..........4  
Select two courses from Biological Sciences  
101, Evolution and Ecology 100, 102, 138,  
147, Geology 107 ..........6-8  
Agricultural and Resource Economics 147 or  
Environmental Science and Policy 175 ..........4  
Students must select a course that was not  
taken in “Depth Subject Matter.”  
Select one course from Agricultural  
and Resource Economics 147, Environmental  
Science and Policy 160, 161, 169, 171, 172 ..........3-4  
Students must select a course that was not  
taken in “Depth Subject Matter.”  
Select one course from Environmental Science and Policy 121, Wildlife, Fish, and  
Conservation Biology 122 or Applied Biological Systems Technology 180 ..........4  
Select one course from Environmental Science and Policy 123, 124, 151L, 155L, Wildlife,  
Fish, and Conservation Biology 100, 102 ..........4-10  
Students may select Biological Sciences  
22A or a course at an approved field station  
or an off-campus biology research site.

Environmental Biology Option  
Select one course from Anthropology 154A,  
Entomology 104, Neurobiology, Physiology,  
and Behavior 102, Psychology 122, Wildlife,  
Fish, and Conservation Biology 141 ..........3-5  
Select one course from Biological Sciences  
101, Evolution and Ecology 100, Geology  
107 ..........3-4  
Select two courses from Mathematics 22A- 
22B, Statistics 100, 102, 104, 106, 108, or  
Applied Biological Systems Technology 180.  
Students must select a course that was not  
taken in “Depth Subject Matter.” ..........6-8  
Select one course from Entomology 103,  
Evolution and Ecology 112-112L, Plant  
Biology 102, 108, 116, Wildlife, Fish, and  
Conservation Biology 110, 110L, 111L, 1111,  
120, 120L, 123 ..........4-8  
Select one course from Entomology 102,  
Environmental Horticulture 102,  
Neurobiology, Physiology, and Behavior  
101, 101L, Plant Biology 111, or Wildlife,  
Fish, and Conservation Biology 121 ..........3-5  
Select two courses from the following: Avian  
Sciences 100, Environmental Horticulture  
160, Environmental Science and Policy 121,  
151L, 150B, 155L, 155S, Evolution and  
Ecology 149, Plant Biology 102, 117,  
Wildlife, Fish, and Conservation Biology  
100, 120, 120L, 122, 130, 154 ..........4-8
Environmental Geology

The minor in Environmental Geology examines the multidisciplinary factors of geography and related earth science fields, and planning and resources oriented programs. Students in the minor are encouraged to participate in internship programs 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 Geology in 174 Physics/Geology Building.

Minor Program Requirements:

Environmental Geology .......... 22-24
Geology 130, 134, and Environmental and Resource Sciences 186 ........ 9
Soil Science 118 .................... 4
Hydrologic Science 141 or Civil and Environmental Engineering 142 .... 3
Two courses chosen from Environmental Science and Policy 160, 171, 179, Geology 135, Hydrologic Science 144, 146 .... 6-8
Minor Adviser. K. Vernooy, (Geology) 378 Physics/Geology Building. (530) 752-0911

Environmental Horticulture

(College of Agricultural and Environmental Sciences)

Faculty. See Plant Sciences, on page 419.

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 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/Turf or Plant 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, consulting as an urban, landscape, or restoration horticulturist, business ownership, working for public agencies, landscape and turf management 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:

Environmental Horticulture .......... 23-25
Environmental Horticulture 6 and 105 .......... 8
Plant Biology 171 .................... 4
Select three courses from Environmental Horticulture 100, 120, 125, 130, 133 11-13
Minor Advisers. J.A. Harding or D.W. Burger (Plant Sciences)

Related Undergraduate Programs. See the undergraduate majors in Environmental Horticulture and Urban Forestry, on page 259, Agricultural Management and Rangeland Resources, on page 124, Crop Science and Management, on page 187, and Plant Biology, on page 413.

Graduate Study. For graduate study related to this field, see the M.S. degree program in Horticulture and Agronomy, and the M.S. and Ph.D. degree programs in the graduate groups of Plant Biology, Ecology, and Genetics. Also see Graduate Studies, on page 97 in this catalog.

Related Courses. See Plant Biology and Plant Sciences.

Courses in Environmental Horticulture (ENH)

Questions pertaining to the following courses should be directed to the instructor or to the Plant Sciences Advising Office in 1224 Plant Sciences Building (530) 752-7738.

Lower Division Courses

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.—II. (I) Burger

6. Introduction to Environmental Plants (4)
Lecture—1 hour; discussion—1 hour; laboratory—3 hours. Classification, nomenclature and variation of environmental plants. The use of floral and vegetative characteristics and terminology to key unknown plants. Characteristics of plant groups and basics of climate, soils and plant selection. Identification of 150 common landscape plants. —I. (I) Young

Upper Division Courses

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. Tree appraisal, natural resource inventory, and development of long-term urban forest management plans. —II. (I) Harding

102. Physiological Principles in Environmental Horticultural Sciences (3)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1C. Physiological principles and processes essential to floriculture, nursery crop production, turf culture and landscape horticulture. Emphasis on the control of vegetative and reproductive development for a broad species range in greenhouse and extensive landscape environments. —III. (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 introduced and native species used in urban forests, with emphasis on ornamental and vegetative characteristics of the prominent families of angiosperms and gymnosperms, adaptations to environmental variations in western landscapes, and horticultural classification. —III. (II) Harding

120. Management of Container Media (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Soil Science 10. Principles of soil science and practices related to management of container media are taught. Emphasis is placed on techniques for the use of soils and amendments, irrigation, and fertilizers. Physical and chemical properties are tested and effects of management on crops are evaluated in the laboratory. —II. (I) 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. —II. (II) Ueth

129. Analysis of Horticultural Problems (4)
Lecture—1 hour; laboratory—1 hour. Clinical seminar. Includes course 102, Entomology 110, Plant Pathology 120, and Soil Science 100 or the equivalents. Methods of
Environmental Horticulture and Urban Forestry

(College of Agricultural and Environmental Sciences)

Faculty. See Department of Plant Sciences, on page 419.

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 in ecosystems, landscape settings and social ecological aspects of plant/people interactions in the urban environment. Plants are used to revegetate and restore disturbed 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, interspecies and commercial sites is an important aspect of this major. Students may select one of the following four areas of specialization: Urban Horticulture, Forestry/Nursery, Landscape Management/Turf, or Plant Biodiversity/Restoration.

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 department’s greenhouse facility, 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, consulting on 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

English Composition Requirement ........... 0-8

See College requirement.

Preparatory Subject Matter...................... 63-70

Environmental Horticulture 1 and 6 .......... 7
Landscape Architecture 30 ..................... 4
Biological Sciences 1A, 1B, 1C .................. 15
Environmental Science and Policy 1 or 10 . 3-4
Chemistry 2A-2B ................................. 10
Physics 1A-1B ..................................... 6
Plant Sciences 21 and either Mathematics 16A or Statistics 12 . 5
Select two lower division resource science courses and two lower division science/humanities courses in consultation with adviser. 1-12

Breadth/General Education ..................... 0-24

Depth Subject Matter .......................... 32-37

Environmental Horticulture 102 ................. 4
Soil Science 100 .................................. 5
Plant Biology 171 .................................. 4
Environmental Horticulture 105 or Plant Biology 102 or 105 .............................. 4-5
Plant Sciences 192 (minimum of 3 units). 3
Select two upper division resource science courses and two upper division social science/culture courses in consultation with adviser ................................. 12-16

Environmental Policy Analysis and Planning

(College of Agricultural and Environmental Sciences)

The Major Program

The major in environmental policy analysis and planning develops an understanding of governmental policy-making and skills for analyzing policy in fields related to environmental quality.

Any student in good standing is eligible to transfer to the major; to do so, please see the major adviser, Paul Sabatier, 4A-Wickson Hall or staff adviser (2134 Wickson Hall).

The Program. This major provides students with a general background in the natural sciences relevant to environmental policy. It also provides sufficient training in mathematics, economics, and research methodology to quantitatively analyze environmental problems and policy options. A strong background in policy analysis, including the evaluation of policy alternatives and the study of factors affecting policy formulation and implementation is included. In addition, students are encouraged to develop substantive knowledge in a specific field of environmental...
Environmental Science and Policy 179 …................. 3-4
Environmental and Resource Sciences 186, 186L ………………… 4-5
Select one course from Socio Science 118 or Environmental and Resource Sciences 196, 196L ………………… 4-5
Select one course from Civil and Environmental Engineering 165, Environmental Science and Policy 163 ………………… 3-4
Select one course from Socio Science 118 or Environmental Science and Policy 179 ………………… 3-4
Environmental Science and Policy 169 ………………… 3-4
Select one course from Political Science 100, Community and Regional Development 152, 154, 156, 168, 172, 174 ………………… 4
Environmental Science and Policy 163 ………………… 4

Environmental Science Option

Students choosing the Environmental Science area of specialization must consult with a faculty adviser to identify an emphasis within this specialization and to select suitable courses. Possible areas of emphasis are biological conservation, pollutants in the environment, ecology, planning in the presence of environmental hazards. If you are considering this area of specialization, please contact the major adviser as soon as possible.

Transportation Planning Option

Select either Civil and Environmental Engineering 165 or Environmental Science and Policy 163 ………………… 3-4
Select either Environmental Science and Policy 167 or 171 ................................. 4
Applied Biological Systems Technology 180 ………………… 4
Environmental and Resource Sciences 131 ………………… 3-4
Economics 145 ………………… 4

Water Quality Option

Environmental Science and Policy 169 ………………… 3
Select either Environmental and Resource Science 121, or Hydrologic Science 150 ………………… 3
Select one course from Hydrologic Science 141, 143, Geology 134, Soil Science 118 ………………… 3
Select one course from Environmental Science and Policy 151, 155, Environmental and Resource Sciences 100, Wildlife, Fish, and Conservation Biology 143 ………………… 3-4
Select one course from Applied Biological Systems Technology 180, 185, or Environmental Resource Sciences 186, 186L ………………… 4-5

Unrestricted Electives ………………… 16-58

Total Units for the Degree ………………… 180

Major Adviser, P. Sabatier (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 for natural and social science students desiring basic training in policy analysis theory and methods.

UNITS

Environmental Policy Analysis ………………… 23-24
Preparation: Economics 1A; basic course in political science.

Environmental Science and Policy 1 ………………… 4
Environmental Science and Policy 160, 163, 168A ………………… 3
Environmental Science and Policy 163, 169, 171, 172, 179 ………………… 6-8

Minor Adviser, P. Sabatier (Environmental Science and Policy)
Environmental and Resource Sciences 261

Atmospheric Science 60 or Environmental and Resource Sciences 121 ........................................ 3-4
Soil Science 100 ........................................ 3-4
Environmental and Resource Sciences 100 or 121 .............................................................................. 3-6
Agricultural Management and Rangeland Resources 101, Environmental Science and Policy 161, 179, Environmental Toxicology 138, Geology 134, Nature and Culture 120, Political Science 107, 171 or Wildlife, Fish, and Conservation Biology 154 ........................................ 3-4
Agricultural Management and Rangeland Resources 130, Entomology 104, Environmental and Resource Sciences 144, Environmental Science and Policy 100, Evolution and Ecology 101, or Plant Biology 117 or 142 .............................................................................. 3-4
Atmospheric Science 192 ........................................ 3

Areas of Specialization (choose one)

Air Resource Option ........................................ 26-28
Directed towards a general understanding of the atmosphere as a finite resource and of environmental problems currently faced by humankind. The option provides a broad understanding of the physical and chemical properties of the atmosphere, including the impacts of air pollution and global climate change. Employment opportunities include positions within federal, state, and county agencies concerned with air quality and with private companies.

Atmospheric Science 30, 110, 116, 124, 133 .............................................................................. 3-4
Environmental Science and Policy 110 ........ 4
Choose two from Atmospheric Science 115, 149, 160, Environmental and Resource Sciences 131, 173, 185, 186; or Environmental Science and Policy 116 .......................... 6-8

Unrestricted electives (to total 180) .................................................................................. 25-52

Environmental Resource Option ........................................ 18-26
For the general study of the physical, chemical, and biological features of renewable natural resources, and the economic and social considerations associated with their use, protection, and management. For those who plan careers associated with resource utilization and management, and those pursuing post-baccalaureate, academic, or professional training.

Environmental Science 110, 116, 124, 133, 160; Environmental Toxicology 131, 138 .............................................................................. 6-7
Choose at least two from Atmospheric Science 115, 149, 160; Environmental and Resource Sciences 131, 173, 185, 186; Geology 135; Hydrologic Science 134, 141, 145 .............................................................................. 6-10

Unrestricted electives (to total 180) .................................................................................. 25-60

GIS and Remote Sensing Option ........................................ 26
Conceptual and practical training in the application of remote sensing technology and geographical information systems to natural resource assessment and to monitoring human impacts on the environment. Appropriate training for those seeking employment in GIS and remote sensing management agencies or environmental consulting firms.

Environmental and Resource Sciences 105, 185, 186; Applied Biological Systems Technology 180 .............................................................................. 18-26

Unrestricted electives (to total 180) .................................................................................. 25-52

Hydrobiology Option ........................................ 32-35
Training in the biological aspects of water resources focusing on the understanding and protection of polluted and unpolluted water systems; the structure, function, and principles of aquatic systems. Graduates may seek employment with state and federal agencies such as Water Resources Control Board, Department of Fish and Game, Department of Water Resources, or consulting firms concerned with environmental impacts.

Choose 28-35 units from Entomology 116, Environmental Science and Policy 123, 124, 151, 155; Environmental Toxicology 101, Geology 116, 135, 139; Hydrologic Science 134, 141; Plant Biology 118, 178; Wildlife, Fish, and Conservation Biology 120, 123, 153 .............................................................................. 28-35

Unrestricted Electives (to total 180) .................................................................................. 16-50

Land and Water Management Option 17-29
A broad background in management of soil and water resources in both natural and agricultural ecosystems. Emphasis on analysis of soils and plants for estimating crop yields and principles of irrigation and drainage of agricultural land. Appropriate for those seeking employment with state and federal agencies or with agribusiness.

Choose at least two from Soil Science 105, 109, 111, 118, 120; or Hydrologic Science 110, 124, 134, 141, 143, 144 .............................................................................. 6-12
Choose at least one from Agricultural Management and Rangeland Resources 132; Environmental and Resource Sciences 144, 173; Geology 134, 135 .............................................................................. 3-4

Unrestricted Electives (to total 180) .................................................................................. 22-61

Plant Environmental Interactions Option ........................................ 22-28
Provides background in plant functioning and allows integration of biological and environmental science to provide understanding of natural and managed ecosystems.

Note: Chemistry 8A, prerequisite to Plant Biology 111 and 112

Choose 23-28 units from Agricultural Management and Rangeland Resources 130, 131; Atmospheric Science 133; Environmental and Resource Sciences 144, 173; Environmental Science and Policy 123, 125; Hydrologic Science 124; Plant Biology 111, 111D, 111L, 112, 1120, 117, 141, 142, 157, 158; Soil Science 109, 111, 112; or Hydrologic Science 110, 124, 134, 141, 143, 144 .............................................................................. 6-12

Unrestricted Electives (to total 180) .................................................................................. 23-55

Total Units for the Major .................................................................................. 180
Major Adviser. Mark Grismer (Land, Air, and Water Resources)

Advising Center for the major is located in 1152 Plant and Environmental Science Building (530) 752-1669.


Courses in Environmental and Resource Sciences

Questions pertaining to the following courses should be directed to the instructor of the Resource Sciences Teaching Center 1152 Plant and Environmental Science Building (530) 752-1669.

Lower Division Courses

6. Map Reading and Remote Sensing (3)
Lecture/discussion—3 hours. Basic skills in map reading, map grid systems, projections, aerial photography, photogrammetry, remote sensing sensors and platforms, the role of aerial photography and remote sensing in environmental analysis.—I.

8. Water Quality at Risk (3)
Lecture—2 hours; discussion—1 hour. Natural and human threats to water quality. Balance of science and policy in identifying, maintaining, and managing water quality, water contamination. Decoding popular media coverage of water quality and water contamination. GE credit: SciEng, SocSci, Wrt. (Same course as Science and Society 8.)—II. (Ill.)

47. Watershed Processes and Water Quality in the Tahoe Basin (2)
Lecture/laboratory—21 hours; fieldwork—9 hours; discussion—3 hours; term paper. Prerequisite: basic knowledge of environmental science and sciences. Course involves 3 days of instruction in Tahoe City. Watershed processes, runoff water quality management, and restoration in the Lake Tahoe Basin. Salts, precipitation-runoff, revegetation and adaptive management related to erosion control, effective solutions, and development of restoration strategies. Students develop and initiate a water quality restoration. (Same course as Hydrologic Science 47.)—I. (II.)

50. Global Environmental Interactions (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: high school algebra and chemistry or biology. Relationships among climate, hydrology, biogeochemical cycles and vegetation distribution of diverse landscapes and biomes. Emphasis on physical, chemical, and biological processes affecting ecosystems from the sea to the equator. GE credit: SciEng, Wrt.—II. (Ill.) (Southland 2, 4-50)

92. Resource Sciences 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.)

97. 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 Courses

100. Principles of Hydrologic Science (4)
Lecture—4 hours. Prerequisite: Chemistry 2B, Mathematics 168, and 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. GE credit: SciEng.—I. (Ill.) (Grismer)

100L. Principles of Hydrologic Science Laboratory (2)
Laboratory—3 hours; discussion—1 hour. Prerequisite: Chemistry 2B, Mathematics 168, and 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. GE credit: SciEng.—I. (Ill.) (Grismer)

121. Water and Society (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: Physics 10 or Geology 1. The role of water as an essential natural resource in contemporary society. Aspects of the scientific method, including descriptions of natural phenomena, measurement techniques, and predictive models. Supply and use of water for municipalities, agriculture, industry, wildlife and recreation. GE credit: SciEng, Wrt.—I. (Ill.) (Silk)

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. Evaluation of primary gaseous and particulate pollutants and discussion of their impact. GE credit: SciEng, Wrt.—I. (Ill.) (Floriani)

136. Chemistry of the Hydrosphere (3)
Lecture—3 hours. Prerequisite: Chemistry 28 and an upper division course in soil science, hydrologic science, geology, or limnology. Chemical characteristics of water in the hydrologic cycle. Understanding processes and conditions regulating chemical composition of natural waters with particular emphasis on dissolved mineral constituents. Not open for credit to students who have completed Water Science 180 or Hydrologic Science 136. (Former course Hydrologic Science 136.)—II. (Ill.)
Environmental Science and Policy

(College of Agricultural and Environmental Sciences)
Andrew Sih, Ph.D., Chairperson of the Department
Department Office. 2132 Wickson Hall
(S30) 752-3026

Faculty
Howard V. Cornell, Ph.D., Professor
Charles R. Goldman, Ph.D., Professor
Susan L. Handy, Ph.D., Associate Professor
Susan P. Harniss, Ph.D., Professor
Alon M. Hastings, Ph.D., Professor
Marcel Holyoak, Ph.D., Associate Professor
John L. Largier, Ph.D., Associate Professor
Mark N. Lubell, Ph.D., Assistant Professor
Stephen G. Morgan, Ph.D., Professor
Joan M. Ogden, Ph.D., Associate Professor
Benjamin S. Orlove, Ph.D., Professor
James F. Quinn, Ph.D., Professor
Eliska Rejmankova, Ph.D., Professor
Peter J. Richerson, Ph.D., Professor
Paul A. Sabatier, Ph.D., Professor
Mark W. Schwartz, Ph.D., Professor
Andrew Sih, Ph.D., Professor
Daniel Sperling, Ph.D., Professor (Environmental Sci-
ence and Policy, Civil and Environmental Engi-
neering)

Affiliated Faculty
Edwin D. Grasholz, Ph.D., Associate Specialist,
Cooperative Extension

Emeriti Faculty
William J. Hamilton III, Ph.D., Professor Emeritus
Jack D. Ives, Ph.D., Professor Emeritus
Robert A. Johnston, M.S., Professor Emeritus
Mark N. Lubell, Ph.D., Assistant Professor
Marcel Holyoak, Ph.D., Associate Professor
Alan M. Hastings, Ph.D., Professor
Andrew Sih, Ph.D., Professor
Joan M. Ogden, Ph.D., Associate Professor
John L. Largier, Ph.D., Associate Professor
Mark N. Lubell, Ph.D., Assistant Professor
Susan P. Harniss, Ph.D., Professor
Alon M. Hastings, Ph.D., Professor
Marcel Holyoak, Ph.D., Associate Professor
Andrew Sih, Ph.D., Professor
Daniel Sperling, Ph.D., Professor (Environmental Sci-
ence and Policy, Civil and Environmental Engi-
neering)

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 problems of human-environment relations.
The department offers Bachelor of Science degrees in
Environmental Biology 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 dis-
ciplines, although highly motivated undergraduates who find existing majors unsuited to their educa-
tional objectives are encouraged to contact the chairperson and faculty of the department regarding
individual majors in the College of Agricultural and Environmental Sciences (see Individual Major, on
page 310).

Current Information. Through its continuing con-
tact with many other departments and teaching divi-
sions on the campus, the department develops a
variety of special courses and workshops each year
that cannot be listed here. Check with the Depart-
ment office and with the expanded course descrip-
tion handbook of the College of Agricultural and
Environmental Sciences for up-to-date information
about courses.

Graduate Study. The faculty of the department
offers the M.S. and Ph.D. degree programs of the
Graduate Group in Ecology, as well as instruction
through the graduate programs of the disciplines
with which they are associated, such as agricultural
and resource economics, evolution and ecology,
sociology, political science, civil engineering, and
anthropology. Further information about graduate
programs in ecology should be obtained from the
chairperson of the Graduate Group in Ecology.

Graduate Adviser. Mark W. Schwartz (Ecology)

Courses in Environmental Science and Policy (ESP)

Lower Division Courses

1. Environmental Analysis (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
University Writing Program 1; Economics 1A, 1B;
Biological Sciences 1A, 1B; Political Science 1, and Uni-
versity Writing Program 102 recommended. Analysis
of the biological, physical, and social interactions
which constitute environmental problems, such as
food production, energy dependence and conserva-
tion, pollution, and the conservation of natural envi-
ronments. Emphasis on analysis of problems and the
consequences of proposed solutions. —II. (II.) Has-
cock

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, envi-
ronmental perception and conservation. Integrative
case studies. Not open for credit to students who
have completed course 1. GE credit: SciEng. —I. (I.)
Schwartz

The Global Ecosystem (3)
Lecture—3 hours; 1 one-day field trip. Prerequisite:
Biological Sciences 10 or Geography 1. Introduces
ecosystem models. The interaction of climate and
biotic adaptation and the production of ecological systems.
The limits and opportunities for human use of different
natural environments, and the role of the earth’s biotic
resources. GE credit: SciEng.

30G. The Global Ecosystem: Laboratory/
Discussion (2)
Laboratory/discussion—3 hours. Prerequisite:
course 30. Discusses natural history skills
in plant and animal identification, soils, and geol-
ogy. Emphasis on the diverse organisms and habi-
tats of Northern California. GE credit with
concurrent enrollment in course 30. Wrt. —I. (I.)
Schwartz

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.
Internships supervised by members 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 Courses

100. General Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisites:
Biological Sciences 1A, 1B, 1C, Mathematics 16A,
16B; Statistics 13 recommended. Theoretical and
experimental analysis of the distribution, growth
and regulation of species populations; predator-prey
and competitive interactions; and the organization of nat-
ural communities. Application of evolutionary and
ecological principles to selected environmental prob-
lems. —I, II. (II.) Cornell, Sih

Lecture—2 hours; discussion—1 hour. Prerequisite:
Anthropology 1 or course 30 or Evolution or
Ecology 100 or Biological Sciences 101. Interdisci-
plinary study of diversity and change in human soci-
eties, using frameworks from anthropology, evolu-
tional ecology, history, archaeology, psychol-
ogy, and other fields. Topics include population
dynamics, subsistence transitions, family organiza-
dation, disease, economics, world politics, and
resource conservation. (Same course as Anthropol-
ygy 101.) GE credit: Sci/Eng, Wrt.—I. (II.) Borg-
enhoff Mulder
102. Cultural Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in the social sciences. upper division standing. Comparative survey of the interaction between diverse human cultural systems and the environment. Primary emphasis given to people in rural and relatively undeveloped environments as a basis for interpreting complex environments. Not open for credit to students who have completed course 133. (Former course 133.) (Same course as Anthropology 102.) GE credit: SocSci; Div, Wrt.—Ill. (III.) Orlove

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 mental mutations, evolution of technology and institutions, evolutionary transitions in human history, coevolution of genetic and cultural variation. Only 2 units of credit to students who have completed course 101 or Anthropology 101 prior to fall 2004. (Same course as Anthropology 105.) GE credit: SocSci, Wrt.—Ill. (III.) McElreath, Richardson

(a) Environmental Science
110. Principles of Environmental Science (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Physical Sciences 1A or 1B, Mathematics 16A or 16B, and Biological Sciences 1A. Application of physical and chemical principles, ecological concepts, and systems approach to policy analysis of atmospheric environments, freshwater and marine environments, land use, energy supplies and technology, and other resources. —II. (II.) Richerson

116. The Oceans (3)
Lecture—3 hours. Introductory survey of the marine environment, including physical phenomena, chemical constituents, geological history, the sea’s biota, and utilization of marine resources. (Same course as Geology 116.) GE credit: SciEng.

116G. The Oceans: Discussion (2)
Discussion—2 hours. Prerequisite: course 116; Geology 116 concurrently. Scientific method applied to the discovery of the processes, biota, and history of the oceans. Group discussion and preparation of papers related to the topic. (Same course as Geology 116G.) GE credit with concurrent enrollment in course 116. Wrt.

(b) Ecological Analysis
121. Population Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1B, 1C, Mathematics 16A-16B. Development of the mathematical and logistic growth models for plant and animal populations, analysis of age structure and genetic structure, analysis of competition and predator-prey systems. Emphasis is on development of the theory of demographic predictions and solving problems. Offered in alternate years. GE credit: SciEng, Wrt.—II. Hastings

123. Introduction to Field and Laboratory Methods in Ecology (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 100 or the equivalent, Statistics 102 or the equivalent. Introduces students to methods used for collecting ecological data in field and laboratory situations. Methods will include population ecologists and community ecologists; emphasis on experimental design, scientific writing and data analysis.—III. (III.) M. Sih

124. Marine and Coastal Field Ecology (10)
Lecture—6 hours; discussion—4 hours; seminar—1 hour; laboratory—18 hours (Summer Session I). Prerequisite: Biological Sciences 1A; Statistics 13; course 100. Full-time study at Bodega Marine Laboratory. In this field-oriented laboratory-field study of current ecological theory and problems with emphasis on marine populations and communities; techniques and evaluation of quantitative field research.—IV.

125A. Field Ecology (4)
Lecture—15 hours; discussion—10 hours; field work—15 hours (two week period). Prerequisite: consent of instructor. Designed to instruct and demonstrate to students the value and approaches of experimental research using the hypothetico-deductive experimental simulation. May be taken only as part of the White Mountain Research Supercourse.

125B. Physiological Ecology (4)
Lecture—15 hours; discussion—10 hours; laboratory—15 hours (for two-week period). Prerequisite: consent of instructor. Introduction to the functional means by which animals and plants cope with their environments, the physiological limits that determine the boundary conditions of various ecological niches. Unifying principles that describe the regulatory features of all animals or plants emphasized. May be taken only as part of the White Mountain Research Supercourse. —Quinn

125C. Applied Conservation Biology (4)
Lecture—10 hours; discussion—10 hours; field work—15 hours (for two-week period). Prerequisite: consent of instructor. Designed to introduce students to the complexities, and realities, of natural resource exploitation and conservation, reevaluating the trade-offs between economic benefits and ecosystem stability and sustainability. May be taken only as part of the White Mountain Research Supercourse.

126. Environmental and Occupational Epidemiology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: introductory course in statistics and upper division standing. Methods and contemporary issues in environmental and occupational epidemiology, effects of carcinogens, reproductive hazards, lifestyle factors, air and water pollution, infectious agents, and other hazards on human populations. Discussion of epidemiologic study methods, bioethics and risk assessment.

(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.)—I. (I.) 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 sea-floor spreading theory. (Same course as Geology 150B.)—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. Segment devoted to human use. (Same course as Geology 150C.)

151. 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. —III. (III.) C. Goldman

151L. Limnology Laboratory (3)
Laboratory—6 hours; two weekend field trips. Prerequisite: course 151 concurrently. Junior, senior, or graduate standing. Limnological studies of lakes, streams, and reservoirs with interpretation of aquatic ecology. —III. (III.) C. Goldman

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. —I. (I.) Rejmankova

155L. Wetland Ecology Laboratory (3)
Lecture—1 hour; laboratory—6 hours; field work— two 1-day weekend field trips. Prerequisite: course 155 required (may be taken by consent). Modern and classic techniques in wetland field ecology. Emphasis on sampling procedures, vegetation analysis, laboratory analytical procedures, and examples of successful wetland restoration techniques. —I. (I.) Rejmankova

(e) Environmental Policy Analysis
160. Environmental Decision Making (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Political Science 1, Economics 1A, intermediate statistics, course 1 and course 166 or Political Science 182; upper division standing or consent of instructor. Alternative models of environmental policymaking, and application to case studies of decision making in the U.S. and California. —III. (III.) Sabatier

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 Studies 100, or course 116/Geology 116); Political Science 1 and University Writing Program 1 recommended. Introduction for non-law School students to some of the principal issues in environmental law. Emphasis on the interpretation of some important environmental statutes, e.g., NEPA. GE credit: SocSci, Wrt.—III. (III.)

163. Energy and Environmental Aspects of Transportation (4)
Lecture—3 hours; extensive writing. Prerequisite: Economics 1A and Civil and Environmental Engineering 162. Engineering, economic, and systems planning concepts. Analysis and evaluation of energy, air quality and selected environmental attributes of transportation technologies. 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: Wrt.—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.—III. (III.) Sabatier

165. Science, Experts and Public Policy (4)
Lecture—4 hours. Prerequisite: upper division standing in the social or biological sciences; course 160 or Political Science 108 recommended. Analysis of factors affecting the influence of scientists, planners, and other experts in policymaking. Several cases and controversies will be examined.

166. Policy Making in Natural Resource Agencies (4)
Lecture—3 hours; laboratory/discussion—2 hours. Prerequisite: Political Science 1. Analysis of factors that shape the behavior and performance of public agencies responsible for regulation and environmental protection. Internet resources and field work used to design and execute a research and writing project on a selected agency or inter-agency program. GE Credit: Wrt.

167. Energy Policy (4)
Lecture—4 hours. Prerequisite: Resource Sciences 3 or Engineering 160; course 160 or Political Science 101, 107, or 109. Overview of U.S. energy policy; policy analysis, philosophy and methods; major policy issues, such as renewable vs. nonrenewable;
and applied studies of power plants, solar residential, and state policy options. Offered in alternate years.—III (III). Ogden

168A. Methods of Environmental Policy Evaluation (5)
Lecture—3 hours; discussion—1 hour, term paper. Prerequisite: Economics 12, Economics 100 or Agricultural and Resource Economics 100A; Mathematics 168 or 218; course 1; upper division standing. Evaluation of alternatives for solution of complex environmental problems; impact analysis, benefit cost analysis, political analysis, decision making under uncertainty, and multi-objective evaluation. —I. (I.) 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.

169. Water Policy and Politics (3)
Lecture—3 hours. Prerequisite: Economics 1A or Political Science 1. The governance of water, including issues of water pollution/quality and water supply. The politics of water decision-making and effectiveness of water policy. Broad focus on federal water policies with case examples from nationally significant U.S. watersheds. GE credit: SocSci.—I. (I.) Lubell

(I) Environmental Planning

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 impact the success or failure of conservation policies. Valuation of endangered species and biodiversity. Criteria for deciding conservation priorities.

171. Environmental Planning (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1; a course in social science and a course in environmental science. Laws, institutions, design and analysis methods, and means of implementation of plans for land use, air and water quality, transportation, and energy are examined. Theoretical and practical readings are used. Political and technical problems common to all planning processes emphasized. —III (III). Handy

172. Public Lands Management (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Economics 1A. Investigation of alternative approaches to public lands management by Federal and state agencies. The role each agency’s legislation plays in determining the range of resource allocations. GE credit: SocSci.—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 (Applied Behavioral Science 137, 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.

175. Natural Resource Economics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Agricultural and Resource Economics 100B or Economics 100 or the equivalent. Economic concepts and policies related with natural resources, renewable resources (ground water, water, forests, fisheries, and wildlife populations) and non-renewable resources (minerals and energy resources, solar). [Same course as Agricultural and Resource Economics 175.] GE credit: SocSci.—I. (I.) Farzin

178. Applied Research Methods (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Statistics 102 or Statistical 100 or the equivalent. Research methods for analysis of urban and regional land use, transportation, and environmental problems. Survey research and other data collection techniques, demographic forecasting, data quality, and transportation models. Collection, interpretation, and critical evaluation of data. —II. (II.) Handy

179. Environmental Impact Reporting (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: upper division standing; Biological Sciences 1A; one course from the following: course 1, 10, 110, Environmental Toxicology 10, Environmental and Resource Economics 100A. Methods of analysis used in environmental impact reporting. Emphasis on effective writing, review and management of impact reports in the context of rational planning systems. —II. (II.) Quimby

179L. Environmental Impact Reporting
Using Geographic Information (2)
Lecture/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.

(g) Other Courses

190. Workshops on Environmental Problems (1-8)
Laboratory/discussion—2 hours; laboratory—4 hours. Prerequisite: course 179 concurrently. Workshops and/or field-based practical analyses of contemporary environmental problems by multidisciplinary student teams. Guided by faculty and local 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 on application. (P/NP grading only).—I, II, III, (I, II, III)

192. Internship (1-12)
Internship—3-36 hours. Prerequisites: 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).

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 Courses

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 166); course in statistics (e.g., Sociology 106 or Agricultural and Resource Economics 100A). Introduction to selected topics in the policy process, applications to the field of environmental policy. Focuses on the content, skills, understanding of frameworks of the policy process, and the ability to apply multiple frameworks to the same phenomena. Offered in alternate years. (Same course as Ecology 212A)—III. Sabatier

212B. Environmental Policy Evaluation (4)
Lecture—1 hour; discussion—1 hour, seminar—2 hours. Prerequisites: 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.—II. (II.)

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 stressed. Offered in alternate years.—III (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 environmental system modeling.

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 alternative options, including alternative fuels, electric propulsion, and IVHS. Analysis of market demand and travel behavior, environmental impacts, economics and politics. (Same course as Policy and Environmental Engineering 252).—III. Sperling

275. Economic Analysis of Resource and Environmental Policies (4)
Lecture/discussion—4 hours. Prerequisite: Agricultural and Resource Economics 204/Economics 204. Development of externality theory, market failure concepts, welfare economics, theory of renewable and non-renewable resource use, and political economic models. Application as policy issues regarding the agriculture/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 and empirical 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 inter-subjectively reliable fashion with explicit recognition of its uncertainties. Offered in alternate years. —III. Sabatier

298. Directed Group Study (1-5)

299. Research (1-12)
Prerequisite: graduate standing. (S/U grading only)

Environmental Sciences

See Agricultural Management and Rangeland Resources, on page 124; Atmospheric Science, on page 152; Environmental and Resource Sciences, on page 260; Environmental Biology and Management, on page 257; Environmental Horticulture and Urban Forestry, on page 259; Environmental Policy Analysis and Planning, on page 259; Environmental Toxicology, on page
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://www.envtox.ucdavis.edu

Faculty
Gary N. Chen, Ph.D., Professor (Nutrition)
Michael S. Denison, Ph.D., Professor
Fumio Matsunuma, Ph.D., Professor (Entomology)
Marion G. Miller, Ph.D., Professor Emeritus
Patricia Oleaize, Ph.D., Associate Professor, (Nutrition)
Robert H. Rice, Ph.D., Professor
Takahuki Shibamoto, Ph.D., Professor
Ronald S. Tjeerdema, Ph.D., Professor
Barry W. Wilson, Ph.D., Professor (Animal Science)
Matthew J. Wood, Ph.D., Assistant Professor
Emeriti Faculty
Donald G. Crosby, Ph.D., Professor Emeritus
Dennis P. Hsieh, Sc.D., Professor Emeritus
James N. Seiber, Ph.D., Professor Emeritus
Michael W. Stimmann, Ph.D., Lecturer Emeritus
Barry W. Wilson, Ph.D., Professor Emeritus
James N. Seiber, Ph.D., Professor Emeritus
Donald G. Crosby, Ph.D., Professor Emeritus
Emeriti Faculty
George V. Alexeiff, Ph.D., Associate Adjunct Professor
Susan Anderson, Ph.D., Associate Adjunct Professor
Deborah Bennett, Ph.D., Instructor, Assistant Adjunct Professor (Public Health Sciences, School of Medicine)
Arthur Craigmill, Ph.D., Cooperative Extension Specialist
Mari Golub, Ph.D., Adjunct Professor (CNPRC)
Dirk Holstege, Ph.D., Assistant Adjunct Professor
Mike Johnson, Ph.D., Instructor, Director (Biological and Ecological Laboratory)
Norman Kado, Ph.D., Associate Adjunct Professor
John Knezovich, Ph.D., Adjunct Professor (USGS)
Debbie Lauth, Ph.D., Instructor (USGS)
Alyson E. Mitchell, Ph.D., Associate Professor (Food Science and Technology)
Ruby Reed, Ph.D., Lecturer
Cecilia Von Beroldinge, Ph.D., Lecturer (UC Davis Extension Forensics Program and Department of Justice)

Affiliated Faculty
Bill Johnson, Ph.D., Director
Cecilia Von Beroldinge, Ph.D., Instructor
John Knezovich, Ph.D., Adjunct Professor
Michael S. Denison, Ph.D., Professor
Gary N. Cherr, Ph.D., Professor

The Major Program

Toxic agents found in the environment include pesticides, food additives, industrial waste, metals and chemicals produced by animals, plants, fungi and bacteria. Students in the Environmental Toxicology major learn about the potential for toxicants to produce adverse effects by understanding both their environmental fate and biological activity. They learn about monitoring concentrations and the distribution and persistence of agents found in water, soil, air and foods. Toxicity testing procedures and exposure assessment are used to help signal potential for harm to humans and other species. By understanding 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 use.

The Program. Preparatory courses in biology, chemistry, mathematics, and physics are required to provide the chemical and biological principles which underlie toxicology. Students in the major are expected to understand the environmental fate and biological activity of different classes of toxic substances, and the legislative issues which arise from chemical use. Students are now able to develop in-depth understanding in areas of emphasis through selection of electives.

Internships and Career Alternatives. Occupations that use environmental toxicology include risk assessment, pharmaceutical or food additive toxicity testing and research, managing regulatory compliance and safety assessment, research, pest control, environmental monitoring, and pharmaceutical research. 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 or pharmacy 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 set future goals.

B.S. Major Requirements:

English Composition Requirement 0-8
See College requirement
Preparatory Subject Matter 64-70
Biological Sciences 1A, 1B, 1C—15
Agricultural Management and Rangeland Resources 21—3
Environmental Toxicology 101, 102A, 102B. Quantitative Analysis of Environmental Toxicology (3)

Breadth/General Education 36
Satisfaction of the General Education requirement to include courses selected with advisor’s approval to complement the major: courses in agricultural economics, environmental studies, political science, psychology, and sociology are particularly recommended. Additional breadth in humanities and social sciences 12

Depth Subject Matter 34-35
Biological Sciences 101, 102 or 103 6
Environmental Toxicology 101, 102A-102B, 103A-103B, 138 and (128, 131, 135, or 146) 23

Restricted/Other Electives 24
Electives selected for area of specialization with advisor’s approval; see department Web page for details.

Unrestricted Electives 7-14

Total Units for the Degree 180

Major Adviser. Takayuki Shibamoto
Advising Center for the major is in 4111 Meyer Hall. Contact the Academic Program Adviser at (530) 752-1042.

Minor Program Requirements:

Preparatory Courses in Biology, Chemistry, and Toxicology. Students in the major must complete the above requirements.

Environmental Toxicology 102A, 103A—12
Minor Adviser. M.S. Denison
Graduate Study. Programs of study leading to M.S. and Ph.D. degrees are available through related Graduate Groups such as Pharmacology and Toxicology, Biochemistry and Molecular Biology, and Agricultural and Environmental Chemistry.

Courses in Environmental Toxicology (ETX)

Lower Division Courses

10. Introduction to Environmental Toxicology (3)
Lecture—3 hours. Hazardous substances, their effects on humans and their actions and movement in the environment. Emphasis on substances of current concern. GE credit: SciEng. I. (I) Tjeerdema

20. Introduction to Forensic Science (4)
Lecture—3 hours; discussion—1 hour. Basic principles of forensic sciences and the investigative techniques on which investigations focus, how the information is obtained and how it is used in criminal investigations. Types of scientific skills that are required to practice forensic sciences and guidance on future training. Real cases will be discussed, and demonstrations of certain methods provided. GE credit: SciEng. Writ—III. (II) Howitt, Rice

30. Chemical and Drug Use and Abuse (3)
Lecture—3 hours. An overview of chemical use and abuse in society. The effects of chemicals (therapeutical drugs, pesticides, food additives, herbal remedies, environmental contaminants, and recreational drugs) on humans and other living systems. GE credit: SciEng. II. (II) Craigmill

92. Internship (1-12)
Internship—3-36 hours. Prerequisite: lower division standing and consent of instructor. Work experience off and on campus in all subareas of interest. Offered in the College of Agricultural and Environmental Sciences. Internships supervised by a member of the faculty. (P/NP grading only)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Upper Division Courses

101. Principles of Environmental Toxicology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 8B, 118B, or 128B and Biological Sciences 1A, 1B, or 1C. Principles of environmental toxicology. Concepts and techniques of advanced analytical instrumentation. Interpretation and use of analytical data. Not open for credit to students who have completed course 112A, I. (I) Denison

102A. Environmental Fate of Toxicants (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 8B, 118B, or 128B. Properties of toxic chemicals influencing their distribution and transformations; action of environmental forces affecting toxicant breakdown, movement, and accumulation; sources and fates of classes of environmental toxicants. Not open for credit to students who have completed course 112A. II. (II) Tjeerdema

102B. Quantitative Analysis of Environmental Toxicants (4)
Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 102A. Sample preparation methods for trace analysis of environmental toxicants. Concept and techniques of advanced analytical instrumentation. Interpretation and use of analytical data. Not open for credit to students who have completed course 112A. III. (III) Shibamoto

103A. Biological Effects of Toxicants (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 102; course 101 and Neurobiology, Physiology, and Behavior 101 recommended. Biological effects of toxic substances in living organisms. Metabolism, cellular and tissue targets, mecha-...
nisms of action, and pathological effects. Not open for credit to students who have completed course 114A.—II. (II.) Rice

103B. Biological Effects of Toxins: Experimental Approaches (5)
Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 103A. Experimental approaches for studying the biological effects of toxins. Not open for credit to students who have completed course 114B.—III. (III.) Miller

104. Environmental and 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 103. Cellular regulation from nutritional/toxicological perspective. Emphasis: role of biofactors on modulation of signal transduction pathways, role of specific organelles in the regulation of metabolic transformations, major cofactor functions in protein and nucleic acid synthesis, and importance of understanding nutrient/toxicant metabolism. (Same course as Nutrition 104.)—III. (III.) Chert, Rucker

110. Traumatic Injuries and Their Impact on Society (2)
Lecture—2 hours. Prerequisite: Biological Sciences 10 or the equivalent or consent of instructor; Chemistry 118A recommended. Examination of toxic tragecies, their frequency, causes, and effects of toxicants. Offered in alternate years. GE credit: Writ.—(II.) Rice

111. Introduction to Mass Spectrometry (3)
Lecture—3 hours. Prerequisite: Chemistry 118C. Introduction to mass spectrometry, including ionization techniques, mass analyzers, interpretation of mass spectra, and applications of mass spectrometry. Emphasis on fundamental concepts of mass spectrometry necessary to identify and quantify organic molecules.—II. (II.) Charles

120. Perspectives in Aquatic Toxicology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 8B, 118B or 128B, Biological Sciences 1A, or consent of instructor. Toxic substances, their fate in marine and freshwater systems, and their effects on aquatic organisms, populations, and ecosystems. Emphasis on substances and issues of current concern. Offered in alternate years.—II. Cherr, Tjemdem

127. Environmental Stress and Development in Marine Organisms (10)
Lecture—4 hours; laboratory—12 hours; discussion—2 hours. Prerequisite: course 101 or Biological Sciences 102 or 104 or the equivalent; course 114A or Nutrition 114 recommended. Course taught at Bodega Marine Laboratory. Effects of environmental stress, including pollution, on development and function in embryos and larvae of marine organisms. Emphasis on advanced experimental methods. (Same course as Nutrition 127.) GE credit: SciEng.—III. (III.) Shibamoto, Mitchell

128. Food Toxicology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 102 and 103. Chemistry and biochemistry of toxins occurring in foods, including plant and animal toxins, intentional and unintentional food additives, and assessment of food safety and toxic hazards. (Same course as Food Science and Technology 128.) GE credit: SciEng.—III. (III.) Shibamoto, Mitchell

131. Environmental Toxicology of Air Pollutants (3)
Lecture—3 hours. Prerequisite: Chemistry 8B (may be taken concurrently) or the equivalent; Biological Sciences 102 recommended. Field trip required. Toxicology of air pollutants in the ambient, indoor, and occupational environments. Health effects, sources, environmental factors, pulmonary responses, sampling and analyses, and air-quality criteria and standards.—I. (I.) Kado

135. Health Risk Assessment of Toxicants (3)
Lecture—3 hours. Prerequisite: course 101; course 114A recommended. Current practices of health risk assessment of environmental chemicals using toxicological principles and their application to regulatory control of these chemicals. GE credit: SciEng.—I. (I.) Reed

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.—II. (II.) Alexeiff

146. Exposure and Dose Assessment (3)
Lecture—3 hours. Prerequisite: course 112A; course 135 recommended. The exposure component of risk assessment; specifically, the presence and/or formation of toxic substances in environmental media, their movement within and between contaminated media, and the contacts of human populations with those media. Offered in alternate years. GE credit: SciEng.—I. (I.) Bennett

190. Seminar (1)
Seminar—1 hour. Prerequisite: consent of instructor. Selected topics presented by students, faculty, or outside speakers in current research and instructional activities within environmental toxicology. Reports and discussion concerning oral and written presentations, literature sources, and career opportunities. (P/NP grading only.)—II. (II., III., III.)

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/NP grading only.)—I. (I.)

1905. 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/NP grading only).—I. (I.)

192. Internship (1-12)
Internship—3.36 hours. Prerequisite: completion of 84 units and consent of instructor. Work experience off and on campus. Areas are offered in the College of Agricultural and Environmental Sciences. Internships supervised by a member of the faculty. (P/NP grading only.)

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 supervision of a faculty sponsor. Experience to include experimental design, learning new techniques, data analysis and interpretation of findings. (P/NP grading only; deferred grading pending completion of sequence.)

194HC. Honors Research (3)
Laboratory—6.9 hours; discussion—1 hour. Prerequisite: senior standing, minimum GPA of 3.250, and consent of instructor. Continuation of course 194HA-194HB. (P/NP grading only.)

1971. 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 for regular departmental courses under direct guidance of staff. May be repeated for credit up to a total of 5 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 Courses

203. Environmental Toxicants (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 128C (or the equivalent), or Chemistry 8B and consent of instructor. Toxic chemicals: selected topics illustrating their occurrence, structure, and the reactions underlying detection, toxicity, fate, and ecological importance. Offered in alternate years.—II. Matsuura

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 chemicals. Students are required to write a grant proposal and participate in a grant review panel. Offered in alternate years.—III. Denison, Hammock

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 methods. (Same course as Forensic Science 220.)—I. (I.) Wood

220L. Analysis of Toxicants Laboratory (2)
Lecture—6 hours. Prerequisite: course 220 (may be taken concurrently) and consent of instructor. Laboratory techniques for microanalysis of toxicants. Separation, detection, and quantitative determination of toxicants using chemical and instrumental methods.—I. (I.)

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. Preferential to environmental toxicology graduate students.—II. (II.) Holstege

234. Neurophysiological Basis of Neurotoxicology (3)
Lecture—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101 or the equivalent, basic understanding of neurophysiology. Mechanisms of action at the cellular and systemic level of a number of different neurotoxins and toxicants. Examples of ways toxins may act on the nervous system and techniques for study of neurotoxicology. (Same course as Physiology 234.)—I. (I.) Woolley

240. Ecotoxicology (3)
Lecture—3 hours. Prerequisite: elementary course in toxicology and ecology or the equivalent, or consent of instructor. Principles of toxicology as applied to chemical action on natural populations, communities, and ecosystems. Physical, chemical, and biological characteristics which influence ecotoxic effects, modeling, and field research. Selected case histories are analyzed and presented in class.—III. (III.) Johnson, Miles

250. Reproductive Toxicology (3)
Lecture—1.5 hours; lecture/discussion—1.5 hours. Prerequisite: Physiology 220 or Pharmacology—Toxicology 203. Application of toxicological principles in reproductive studies. Effects of agents 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. (II.) Miller, Golub

260. Immunotoxicology (3)
Lecture—3 hours. Prerequisite: undergraduate or graduate introduction to immunology coursework recommended, but not required; graduate standing or 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.—I. (I.) Golub

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: Arts & Humanities =Arts and Humanities; SciEng =Science and Engineering; SocSci =Social Sciences; Div =Social-Cultural Diversity; Writ =Writing Experience
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, and mechanisms by which they affect human health and ecological health and methods of risk benefit analyses. Offered in alternate years. —(II) Mattsumoto

278. Molecular Techniques (3)  
Lecture—3 hours. Prerequisite: graduate standing or consent of instructor. Recombinant DNA technology and its applications. [Same course as Forensic Science 278.] Offered in alternate years. —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 loci, capillary electrophoresis of amplified products, and analysis of STR typing data. [Same course as Forensic Science 280.] Offered in alternate years. —Von Beroldingen

290. Seminar (1)  
Seminar—1 hour. Current topics in environmental toxicology. (S/U grading only) —(I, II, III) (I, II, III)

290C. Advanced Research Conference (1)  
Lecture/discussion—1 hour. Prerequisite: consent of instructor. Presentation and critical discussion of research results. Designed primarily for graduate students. (S/U grading only) —(I, II, III) (I, II, III)

297T. Tutoring in Environmental Toxicology (1-5)  
Hours and duties will vary depending upon course being tutored. Prerequisite: graduate standing in Environmental Toxicology, a related major, or the equivalent experience, and consent of instructor. Teaching toxicology including conducting discussion groups for required departmental courses under direct guidance of staff. May be repeated for credit up to a total of 5 units. (S/U grading only)

298. Group Study (1-5) (S/U grading only)

Professional Course

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)

Epidemiology

See Epidemiology and Preventive Medicine (EPP), on page 335; and Medicine and Epidemiology (VME), on page 473.

Epidemiology  
(A Graduate Group)

Laurel A. Beckett, Ph.D., Professor (Epidemiology and Preventive Medicine)  
Debbie Beeman, Ph.D., Department of Public Health Services  
Robert BonDurant, D.V.M., Professor (Population Health and Reproduction)  
Walter Boyce, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)  
Ken Brown, M.D., Professor (Nutrition)  
Lesley Butler, Ph.D., Department of Public Health  
Tim E. Carpenter, Ph.D., Professor (Medicine and Epidemiology)  
James Case, D.V.M., Ph.D., Professor of Clinical Diagnostic Medicine (Medicine and Epidemiology)  
Diana Cassidy, DrPH, Department of Public Health Sciences  
Bruno Chomel, D.V.M., Ph.D., Professor (Population Health and Reproduction)  
Stuart Cohen, M.D., Professor (Internal Medicine)  
Patricia Conrad, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)  
Rosemary Cress, DrPH, Department of Public Health Sciences  
Kathy DeKluijver, Ph.D., Department of Public Health Sciences  
Kathryn Dewey, Ph.D., Professor (Nursing)  
Christiana Drake, Ph.D., Associate Professor (Statistics)  
Jonathan Ducore, M.D., Pediatrics  
Thomas B. Farver, Ph.D., Professor (Population Health and Reproduction)  
Neil Flynn, M.D., Professor (Internal Medicine)  
Janet Foley, M.D., D.V.M. (Medicine and Epidemiology)  
Ian A. Gardner, M.P.V.M., Ph.D., Professor, (Medicine and Epidemiology)  
Jeff Gill, Ph.D. (Biostatistics)  
David R. Gibson, Ph.D., Associate Professor  
Ellen Gold, Ph.D., Professor (Epidemiology and Preventive Medicine)  
Lynette Hart, Ph.D., Associate Professor (Population Health and Reproduction)  
Danielle Harvey, Ph.D., Department of Public Health Sciences (Biostatistics)  
Ira Hertz-Friedman, Ph.D., Ph.D., Department of Public Health Sciences  
Sharon Hietala, Ph.D., Associate Professor of Clinical Diagnostic Medicine (Medicine and Epidemiology)  
David W. Hird, M.P.V.M., D.V.M., Ph.D., Professor (Medicine and Epidemiology)  
Calvin H. Hirsch, M.D., Associate Professor (Internal Medicine)  
Bruce Haar, Ph.D. (Medicine & Epidemiology)  
Wes Johnson, Ph.D., Professor (Statistics)  
Philip Kass, M.P.V.M., D.V.M., Ph.D., Associate Professor (Population Health and Reproduction)  
Richard L. Kravitz, M.D., Professor (General Medicine)  
Christine Kuebler, Ph.D. (Wildlife Health Center)  
Paul Leigh, Ph.D., Department of Public Health  
Bruce Leistikow, M.D., Associate Professor (Epidemiology and Preventive Medicine)  
James Marcin, M.D., MPH (Pediatrics/Critical Care Medicine)  
Jonna Mazzet, Ph.D. (Wildlife Health Center)  
Stephen McCurdy, M.D., Associate Professor (Epidemiology and Preventive Medicine)  
Mike M. Mueller, Ph.D., Ph.D., Professor (Statistics)  
John Robbins, M.D., Associate Professor (Internal Medicine)  
David M. Rocke, Ph.D., Professor (Management)  
Patrick Romano, M.D., Associate Professor (Internal Medicine)  
Joan Dean Rowe, M.P.V.M., D.V.M., Ph.D., Associate Professor (Population Health and Reproduction)  
Marc Schenker, M.D., Professor (Epidemiology and Preventive Medicine)  
Thomas Scott, Ph.D., Professor (Entomology)  
Robert Smunway, Ph.D., Professor (Statistics)  
Robert Szabo, M.D., Professor (Orthopaedic Surgery)  

Steve Tharratt, M.D. (Pulmonary & Critical Care Medicine)  
Mark Thomas, D.V.M., M.P.V.M., Ph.D., Professor (Medicine and Epidemiology)  
Alexander Tsiodruk, Ph.D. (Public Health Sciences/Genetics)  
Jessica Uts, Ph.D., Professor (Statistics)  
Jacob Wegelin, Ph.D., Department of Public Health Sciences (Biostatistics)  
Michael Ziccardi, Ph.D. (Wildlife Health Center)  

Emeriti Faculty

Nancy East, M.P.V.M., D.V.M., Professor Emeritus  
Bruce Eldridge, Ph.D., Professor Emeritus  
Alvin Wiggins, Ph.D., Professor Emeritus

Affiliated Faculty

Robert Atwill, D.V.M., Ph.D., Associate Professor Agronomic/Assistant Cooperative Extension Specialist (Population Health and Reproduction)  
Rahman Azari, Ph.D., Lecturer (Statistics)  
Nicholas Lurché, Ph.D., Associate Adjunct Professor, (Population Health and Reproduction)  
Jonna Mazzet, M.P.V.M., D.V.M., Ph.D., Assistant Clinical Professor (Wildlife Health Center)  
Steven Samuels, Ph.D., Assistant Clinical Professor (Epidemiology and Preventive Medicine)

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 epidemiology; infectious disease epidemiology; infectious disease epidemiology; demographic methods and biostatistics; health services and economics; nutrition and epidemiology; and wildlife epidemiology. For detailed information regarding the program, address the chairperson of the group or see the Web page.

Graduate Advisers. P. Kass (Population Health and Reproduction), Tim Carpenter (VM, Medicine & Epidemiology) Danielle Harvey (Public Health Sciences, Biostatistics)

Required Courses for the Program

Prerequisite Courses. Prerequisites may be taken concurrently with required 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 204, 205A, 205B, 206, 207, 208 and 290  
Statistics 130A-130B  
One course from Population Health and Reproduction 202 or Statistics 144

Related Courses. For additional course work in Epidemiology, please see Medicine and Epidemiology, Preventive Veterinary Medicine, Population Health and Reproduction, Epidemiology and Preventive Medicine, and Statistics.

Courses in Epidemiology (EPI)  
Graduate Courses

204. Statistical Models, Methods, and Data Analysis for Scientists (4)  
Lecture—3 hours; laboratory/discussion —1 hour. Prerequisite: Statistics 130B or 131B, or 133; Statistics 108 recommended. Development of broad statistical skills useful for the analysis of scientific data. Special emphasis given to determining factors associated with characteristics like disease and time-to-event. Analysis of data that can be modeled as generalized linear and generalized linear mixed models, parametric and non-parametric survival models, and models for correlated, clustered, longitudinal data. —II. Johnson

205A. Principles of Epidemiology (4)  
Lecture—4 hours. Prerequisite: Preventive Veterinary Medicine 402 or consent of instructor. Basic epidemiologic concepts and approaches to epidemiologic research, with examples from veterinary and human
206. Epidemiologic Study Design (3) Lecture—2 hours; laboratory—3 hours; discussion—0.9 hours; laboratory—1.8 hours. Prerequisite: Preventive Veterinary Medicine 405 or course 205A, course 205B. Builds on concepts presented in course 205A. Concepts of epidemiologic study design—clinical trials, observational cohort studies, case control studies—instructor; background in statistics, including multivariable 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, animal and human behavior and agent—Emphasis on the assessment of risk.—I, II, III. Carpenter

222. Epidemiological Modeling (3) Lecture—2 hours; laboratory—3 hours. Prerequisite: Preventive Veterinary Medicine 405 or consent of instructor; background in statistics, including multivariable 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, animal and human behavior and agent—Emphasis on the assessment of risk.—I, II, III. Carpenter

228. Quantitative Methods for Epidemiology (4) Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: Mathematics 16A-B or Mathematics 17A-B or Mathematics 21B-A or equivalent; basic knowledge of the principles of linear algebra, such as those taught in mathematics 22A or the equivalent, is assumed. The application of calculus and linear algebra techniques to epidemiological problems. Topics include applications of derivatives, integrals, exponentials and logarithms, multivariable calculus, infinite series, and vector and matrix algebra, with examples and problems taken from epidemiological study design and statistical analysis of data. Topics include confounding, effect modification under additive and multiplicative models, internal and external validity, bias, statistical classification, alternative designs, source populations, statistical power and sample size, causation, and genetic epidemiology.—I. Gold, Kass

250. Introduction to Clinical Research Design and Epidemiology (1) Lecture—1 hour. Prerequisite: consent of instructor; background in statistics, including multivariable 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, animal and human behavior and agent—Emphasis on the assessment of risk.—I, II, III. McCurdy, Romano

260. Epidemiology of Chronic Diseases and Aging (3) Lecture—2 hours; 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, musculoskeletal disorders, diabetes, dementia, functional status and prevention of disease.—I, II, III. Carpenter

272. Cancer Epidemiology (2.0) 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 cancerization and progression/progression model.—II, III. Butler, Cress

290. Seminars in Epidemiology (1-12) Seminar—1 hour. Students will actively participate in presentation and discussion of ongoing or published research projects in epidemiology. (S/U grading only)—I, II, III.

299. Research (1-12) Seminar—1 hour. Group study in selected areas of epidemiology. (S/U grading only)
The major in Evolution, Ecology and Biodiversity offers the student a broad background in the theoretical and empirical basis of our understanding of the diversity and distribution of living organisms.

The Program. The program study for the major begins with a core of introductory courses in mathematics, physical sciences, and biology. These are followed by survey courses in biodiversity, evolution and ecology and various more specialized courses that focus the student on particular disciplines or organisms, with an emphasis on problem-solving and critical thinking. Evolution, Ecology and Biodiversity majors may earn either a Bachelor of Science or a Bachelor of Arts degree. The requirements for the B.S. degree program include more science courses, such as biochemistry, whereas those for the B.A. degree program allow room for more electives, such as biochemistry, whereas those for the B.A. degree program allow room for more electives.

Additional upper division course work in biological science to achieve a total of 36 or more units includes the following courses: 24-25 units and courses numbered 197 and 197T are not applicable to the upper division elective requirement. Evolution, Ecology and Biodiversity majors may not substitute courses not on the above list for major requirements.

The major in Evolution, Ecology and Biodiversity is associated with the Graduate Group in Evolutionary Biology, which consists of faculty from the departments of Biological Sciences, Entomology, Plant Science, Wildlife, Fish and Conservation Biology, and the College of Environmental Design. Students transferring to 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 Office of Pre-Advising and major preparation for certification, see the Teaching Credential/M.A. Program on page 102.

Courses in Evolution and Ecology (EVE)

Lower Division Courses

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 and conservation. Biomes—global and Californian (same course as Entomology 2). GE credit: SciEng. Wrt.—I. (I.) Gullan, Cranston, Shaffer, Ward

Lecture—3 hours; discussion—1 hour. Prerequisite: elementary biology 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 biosphere. GE credit: SciEng. Wrt.—III. (III.) Williams

92. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Additional upper division course work in biological science to achieve a total of 36 or more units includes the following courses: 24-25 units and courses numbered 197 and 197T are not applicable to the upper division elective requirement. Evolution, Ecology and Biodiversity majors may not substitute courses not on the above list for major requirements. All new students in the major should contact the Office of Pre-Advising and major preparation for certification, see the Teaching Credential/M.A. Program on page 102.

Courses in Evolution and Ecology (EVE)

Lower Division Courses

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 and conservation. Biomes—global and Californian (same course as Entomology 2). GE credit: SciEng. Wrt.—I. (I.) Gullan, Cranston, Shaffer, Ward

Lecture—3 hours; discussion—1 hour. Prerequisite: elementary biology 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 biosphere. GE credit: SciEng. Wrt.—III. (III.) Williams

92. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)
112. Biology of Invertebrates (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1B; courses in morphology, development, natural history, ecology, and phylogeny recommended. Survey of the invertebrate phyla, emphasizing aquatic forms, and focusing on morphology, development, natural history, ecology, and phylogenetic relationships.—(II.) Grosberg, Sta- chowicz, Sanford

112L. Biology of Invertebrates Laboratory (2)
Laboratory—5 hours. Prerequisite: course 112 concurrently. Laboratory work emphasizes exploration and evaluation of selected aspects of the major invertebrate phyla. Emphasis on behavioral, morphological, ecological, and evolutionary comparisons among the phyla. Laboratories emphasize design of experiments and identification and preparation of invertebrate animals.—(II.) Grosberg, Stachowicz, Sanford

115. Marine Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Environmental Science and Policy 100 or course 101 or consent of instructor. Marine productivity; distribution, abundance, and diversity of plant and animal life in the sea. Introduction to marine habitat diversity and human impacts on marine ecosys- tems.—(I.) Shapiro, Stachowicz, Sanford

117. Plant Ecology (4)
Lecture—3 hours; fieldwork—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C; 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 112L—1.) Rejmánek

119. Population Biology of Weeds (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C; introductory statistics recommended. Origin and evolution of weeds, reproduction and dispersal, seed ecology, modeling of population dynamics, interactions of weeds and crops, biological control. Laboratories emphasize design of competition experiments and identification of weedy species. (Same course as Plant Biology 119.) Not open for credit to students who have com- pleted Plant Biology 121.—(III.) Rejmánek

134. Herpetology (3)
Lecture—2 hours; term paper. Prerequisite: Biologi- cal Sciences 1A, 1B, 1C; Evolution and Ecology 100 rec- ommended. The world-wide diversity of amphibians and reptiles with emphasis on behavior, ecology, functional morphology, and evolutionary history. Offered in alternate years.—III. Shaffer

134F. Field Herpetology (2)
Fieldwork—5 hours; lecture/discussion—1 hour. Pre- requisite: Biological Sciences 1A, 1B, concurrent enrollment in course 134 and 134F. Multi-day field trips to major California localities; emphasis on identification of, and ecological experiments on, amphibian and reptile species. Students work in teams to plan experiments, collect and analyze data, write up results, and give oral presentations to the class. Offered in alternate years.—III. Shaffer

134L. Herpetology Laboratory (2)
Laboratory—6 hours. Prerequisite: Biological Sci- ences 1A, 1B, course 134 concurrently. The diag- nostic characteristics that contribute to the morphological diversity of amphibians and reptiles, emphasizing ecological, biogeographic and phylogenetic patterns. Field experience with common species of reptiles and amphibians in the Davis area. Offered in alternate years.—III. Shaffer

138. Ecology of Tropical Latitudes (5)
Lecture—3 hours; discussion—1 hour. Extensive writ- ing. Prerequisite: one course in Biological Sciences, Entomology, Wildlife, Plant Biology, Ecological Evolution, Biology, Geography, or tropical experience, or consent of instructor. Biological, physical, 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.—Shapiro

140. Paleobotany (4)
Lecture—3 hours, laboratory—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C. 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.—(I.) Doyle

141. Principles of Systematics (3)
Lecture—2 hours, biweekly research projects. Pre- requisite: Biological Sciences 18 or 1C; course 100 recom- mended. Historical background, phylogenetic rationale, contemporary approaches, and working rules of biosystematics, including International Code of Zoological Nomenclature. Offered in alternate years. GE credit: SciEng, Writ.—(III.) Shapiro

147. Biogeography (1)
Lecture—3 hours, term paper. Prerequisite: Biological Sciences 1A, 1B. Movements of terrestrial organ- isms. The role of geologic, climatic, and biologic changes in the geographic distribution of organisms. Offered in alternate years.—(I.) Shapiro

149. Evolution of Ecological Systems (4)
Lecture—3 hours, term paper. Prerequisite: course 101 or Environmental Studies 100 (or the equiva- lent) and course 100 (or the equivalent). Evolution as an organizing force in natural communities. Co- adaptation in trophic and competitive relationships. Ecology of polymorphisms, clines, and speciation. Offered in alternate years.—III. Ayling

150. Evolution of Animal Development (3)
Lecture—3 hours. Prerequisite: molecular and cellular biology 150 or 163 or equivalent course in developmental biology; may be waived for graduate students with consent of instructor. Introduction to a general purpose computer language (Python), computational statisti- cal methods, and applications such as QTL map- ping, linkage detection, estimation of rates of evolution, and gene finding.

180A-180B. Experimental Ecology and Evolution in the Field (4-4)
Lecture/laboratory—3 hours, fieldwork—3 hours. Prerequisite: course 101; course 100 or Environmen- tal Science and Policy 100. Experimental design in field ecology. Students will design an experiment, gather and analyze data. Students required to write original research paper based on field experiments. Offered in alternate years. (Deferred grading only possible the completion of sequence.)—(III.) Strauss, Stanton

189. Introduction to Biological Research (1)
Discussion—1 hour. Prerequisite: upper division standing in Evolution and Ecology or related biologi- cal sciences, consent of instructor. Introduction to research methods in biology. Presentation and dis- cussion of research by faculty, graduate, and under- graduate students. May be repeated for credit up to a total of 3 units. (P/NP grading only.)—I, II, III, (II, III, III)

190. Undergraduate Seminar (2)
Seminar—2 hours. Prerequisite: upper division standing in the biological sciences or a related disci- pline. Student reports on current topics with empha- sis 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.)—I, II, III, (II, III, 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 the Section of Evolution and Ecology. Internships supervised by a member of the faculty. (P/NP grading only)
Exercise Biology

See Neurobiology, Physiology, and Behavior, on page 392.

Exercise Science (A Graduate Group)

Dave Hawkins, Ph.D., Chairperson of the Group

Group Office, 310 Life Sciences Addition
(530) 752-2981; http://www.dbs.ucdavis.edu/
grad/exx_sci_gg/default.html

Faculty

Sue Bodine, Ph.D., Professor (Neurobiology, Physiology & Behavior)
George Brooks, Ph.D., Professor (Integrative Biology-UC Berkeley)
Gretchen Casazza, Ph.D., Research Director (Sports Medicine)
Chao-Yin Chen, Ph.D., Adj. Professor (Med: Biochemistry and Molecular Medicine)
Youngran Chung, Ph.D., Assistant Research Biochemist (Med: Pharm & Tox)
Fadi Fathallah, Ph.D., Associate Professor (Biological and Agricultural Engineering)
Charles A. Fuller, Ph.D., Professor (Neurobiology, Physiology & Behavior)
Dave Hawkins, Ph.D., Professor (Neurobiology, Physiology & Behavior)
Robert G. Holly, Ph.D., Senior Lecturer (Neurobiology, Physiology & Behavior)
James H. Jones, Ph.D., Professor (Surgical and Radiological Sciences)
Thomas Jue, Ph.D., Professor (Med: Biochemistry and Molecular Medicine)
Marc Kaufman, Ph.D., Professor (Internal Medicine)
Ulike Kreutzer, Ph.D., Assistant Adjunct Professor (Med: Biochemistry and Molecular Medicine)
Marta Van Loan, Ph.D., Associate Adjunct Professor (Nutrition)
Craig M. McDonald, Ph.D., Associate Professor (Physical Medicine and Rehabilitation)
Edward S. Schlegel, Ph.D., Assistant Professor (Anatomy, Molecular, Cellular, and Integrative Physiology)
Espen Spangenberg, Ph.D., Assistant Professor (Neurobiology, Physiology & Behavior)
Charles Stebbins, Ph.D., Professor (Internal Medicine)
Susan M. Stover, Ph.D., Professor (Anatomy, Physiology, and Cell Biology)
Keith R. Williams, Ph.D., Associate Professor (Neurobiology, Physiology & Behavior)

Graduate Study. The Graduate Group in Exercise Science offers a program of study and research leading to an M.S. degree. Advanced training is provided in two areas of emphasis. The Exercise Physiology Area involves the study of functional, metabolic, nutritional, and regulatory aspects of the cardiovascular, respiratory, and skeletal muscle systems as they relate to movement and exercise. The Biomechanics Area includes the study of skeletal muscle mechanics, motor control, biomechanical analysis of human movement, tissue mechanics, motor control, and clinical biomechanics.

Graduate Advisers. M. Kaufman, C. Stebbins, K. Williams

Courses in Exercise Science (EXS) Graduate Courses

200. Introduction to Research in Exercise Science (3) Discussion—2 hours; seminar—1 hour. Prerequisite: graduate standing in Exercise Science or consent of instructor. Principles of scientific research in Exercise Science: scientific method, literature review, experimental design, hypotheses formulation, data collection, analysis, inferences, biases, human subject and animal protocols, ethics. —I. Jue

201. Exercise Cardiorespiratory Physiology (3)
Discussion/discussion—3 hours. Prerequisite: undergraduate course in systemic physiology, exercise physiology, and biochemistry (intermediary metabolism). Advanced course on integrated responses of the cardiovascular and respiratory systems to exercise. Includes hemodynamic, neurohumoral, and autonomic aspects of cardiac and vascular function, principles of myocardiac metabolism, and mechanisms underlying changes in pulmonary function and gas transport. —I. Stebbins

206. Exercise Metabolism (3)
Discussion—3 hours. Prerequisite: undergraduate course in metabolism (Biological Sciences 103, Nutrition 101) or consent of instructor. The integrated metabolic response to exercise. Includes bioenergetics and metabolic regulation of skeletal muscle, and role of cardiovascular, respiratory, hemodynamic, and neurohumoral control. —III. Jue

210. Introduction to Human Performance Testing (2)
Discussion—1 hour; laboratory—3 hours. Introduction to human exercise testing and measurement. Safety procedures and measurement capabilities of the Human Performance Laboratory at UC Davis. Potential areas for graduate research. —I. (I.) Shaffrath

221. Anthropometry in Physical Activity (3)
Discussion—2 hours; laboratory—five 3-hour sessions to alternate weekly with five 1-hour discussion sessions. Prerequisite: Exercise Science 101 and 102. Consideration of physical constitution, body proportions, and body composition in man as they affect physical performance, and of body structural and compositional changes accompanying prolonged, systematic physical conditioning.

222. Metabolic Functions in Exercise (4)
Discussion—2 hours; discussion—discussion—1 hour; laboratory—3 hours. Prerequisite: Exercise Science 102, Neurobiology, Physiology, and Behavior 101. Review of the current research literature on the metabolic responses to exercise in man; a laboratory survey of respiratory response, metabolic and acid-base balances, blood gas adjustments and acid-base balance with particular reference to the effect of environmental conditions.

244. Exercise Electrocardiography (2)
Discussion—2 hours. Prerequisite: Exercise Science 112 or consent of instructor. Physiological bases and clinical implications of normal and abnormal exercise electrocardiograms (ECG) are treated in detail. Exercise prescription is considered as is the predictive significance of normal and abnormal ECG.

225. Seminar in Cardiac Rehabilitation (2)
Seminar—2 hours. Prerequisite: Exercise Science 112 or graduate standing and consent of instructor. Critical examination of literature dealing with the causes, prevention and treatment of cardiovascular disease with particular emphasis on intervention through cardiac rehabilitation. Both the theoretical bases and practical approaches to cardiac rehabilitation will be examined.

227. Research Techniques in Biomechanics (4)
Discussion—2 hours; laboratory—4 hours; term paper/discussion—1 hour. Prerequisite: consent of instructor, Mathematics 228, Exercise Science 115 recom-
Family and Community Medicine
See Medicine, School of, on page 345.

Feminist Theory and Research

Anna K. Kuhn, Ph.D., Program Director
Program Office. 2222 Hart Hall
(M30) 752-4686;
http://www.ucdavis.edu/wgssite/index.htm

Graduate Study. The program in Women and Gender Studies offers courses leading to a designated emphasis in Feminist Theory and Research. The courses provide theoretical and interdisciplinary perspectives to students already preparing for the Ph.D. in one of 12 participating departments [Anthropology, Comparative Literature, Cultural Studies, Education, English, French and Italian, Geography, German, History, Native American Studies Psychology, Spanish and Classics, Sociology, Theatre and Dance]. Students complete all requirements for the Ph.D., including the dissertation, in one of the participating departments. The additional requirements leading to the designated emphasis consist of two core courses (Women’s Studies 200A and 200B) and two additional courses on gender, one of which must be in the student’s home department. It is expected that an analysis of gender will be a central component of the student’s doctoral examination and dissertation.

Graduate Adviser. Consult the Women and Gender Studies office (M30) 752-4686.

Fiber and Polymer Science

Emphasis include data acquisition and analysis by computer, force platform analysis, strength and power analysis of human movement, and biomechanical modeling. [Same course as Biomedical Engineering 227/Mechanical and Aeronautical Engineering 227]—(I.) K. Williams

228. Skeletal Muscle Mechanics: Form, Function, Adaptability (4)
Lecture—4 hours. Prerequisite: basic background in biology, physiology, and engineering; Engineering 35 and M30 210; and Neurobiology, 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. [Same course as Biomedical Engineering 228]—(I.) Hawkins

290. Seminar in Exercise Science (1)
Seminar—1 hour. Prerequisite: graduate standing; required of all first year students for first two quarters. Presentation and discussion of topics of interest, and the analysis of research in exercise science. Not open for credit to students who have taken Exercise Science 228. See Medicine, School of, on page 346.

290C. Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing. Student presentations of research in Exercise Science and discussions among participating students and faculty. May be repeated for credit. [S/U grading only]—I, II, III.

298. Group Study (1-5)
Prerequisite: graduate standing; consent of instructor.

299. Research (1-12)
Prerequisite: graduate standing; consent of instructor and Department Chairperson. [S/U grading only.]

Professional Course

296. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. [S/U grading only.]

299. Research (1-12)
Prerequisite: graduate standing; consent of instructor and Department Chairperson. [S/U grading only.]

Family and Community Medicine

Feminist Theory and Research

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Graduate Adviser. Consult the Women and Gender Studies office (M30) 752-4686.

Fiber and Polymer Science

(Conference of Agricultural and Environmental Sciences) Faculty. See Textiles and Clothing, on page 460.

The Major Program

The fiber and polymer science major is concerned with the physical, chemical, and structural properties of polymers and fibers and how these relate to fiber and polymer performance. [Same course as Biomedical Engineering 228]—(I.) Hawkins

290. Seminar in Exercise Science (1)
Seminar—1 hour. Prerequisite: graduate standing; required of all first year students for first two quarters. Presentation and discussion of topics of interest, and the analysis of research in exercise science. Not open for credit to students who have taken Exercise Science 228. See Medicine, School of, on page 346.

290C. Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing. Student presentations of research in Exercise Science and discussions among participating students and faculty. May be repeated for credit. [S/U grading only]—I, II, III.

298. Group Study (1-5)
Prerequisite: graduate standing; consent of instructor.

299. Research (1-12)
Prerequisite: graduate standing; consent of instructor and Department Chairperson. [S/U grading only.]

Professional Course

296. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. [S/U grading only.]

B.S. Major Requirements:

English Composition Requirement …… 7-12
See College requirement ………… 0-8
Communication 1 ………… 4
University Writing Program 104A, 104B, 104C, 104D, 104E, or 104F ………… 4
Preparatory Subject Matter ………… 52-55
Chemistry 2A-2B-2C-2D ……… 15
Computer Science Engineering 15 or 30 ……… 4
Mathematics 16A-16B-16C or 21A-21B-21C ……… 9-12
Physics 7A-7B-7C or 9A-9B-9C ……… 12
Statistics 13 or Agricultural Management and Rangeland Resources 120 ……… 4
Textiles and Clothing 6 and 8 or Engineering 45 ……… 4-6
 breadth/General Education ……… 6-24
Satisfaction of General Education requirement; see Advising office for breadth requirement.

Depth Subject Matter ……… 37
Textiles and Clothing 163, 163L ……… 4
Fiber and Polymer Science 100, 150, 161, 161L, 180A, 180B ……… 14
Restricted Electives ……… 30
Select courses from the following:
Computer Science and Mathematics:
Science and Technology 135, Mathematics 222, 224, 228
Marketing/Management: Agricultural and Resource Economics 100A, 100B, 113, 136, 137, Economics 1A, 1B, Statistics 103
Material and Advanced Fiber/Polymer Science: Aeronautical Science and Engineering 137, Engineering 104A, 104B, Textiles and Clothing 250A-F, 290, 293
Textiles: Textiles and Clothing 162, 162L, 164, 165, 173, 174

Unrestricted Electives ……… 23-40
Total Units for the Degree ……… 180

Minor Adviser. Y.-L. Hsieh (Textiles and Clothing)
Advising Center for the major is located in 1298 Everson Hall (M30) 752-4417.

Minor Program Requirements:

UNITS
Fiber and Polymer Science ……… 18
Textiles and Clothing 6 or Engineering 45 ……… 4
Courses selected from the following:
Fiber and Polymer Science 100, 150, 161, 161L, 180A and 180B; and Textiles and Clothing 163 and 163L

Minor Adviser. Y. L. Hsieh

Courses in Fiber and Polymer Science (FPS)

Upper Division Courses

100. Principles of Polymer Materials Science (3)
Lecture—3 hours. Prerequisite: Chemistry 2A-2B; Chemistry 8A-8B or Engineering 45; introductory physics. The basic principles of polymer science are presented including polymer structure and synthesis, polymerization mechanisms, polymer classes, properties, and reactions, polymer morphology, rheology, and characterization; polymer processing. [Same course as Materials Science Engineering 147]—II, (II.) Pan

110. Plastics in Society and the Environment (4)
Lecture—3 hours, discussion—1 hour. Prerequisite: Chemistry 10 or introductory course in physical sciences. Basic concepts and methodologies in the study of plastics. Formation, classification, structure, properties, processing, and formulation; their application to societal needs, and their impact on society and the environment. GE credit: SciEng or SocSci, Wrt.

150. Polymer Syntheses and Reactions (3)
Lecture—3 hours. Prerequisite: Chemistry 128B or 88, and Chemistry 107A. Organic and physical chemistry aspects of polymer syntheses and reactions including polymerization mechanisms, kinetics and thermodynamics for major types of organic high polymers. —II, (II.) Hsieh

161. Structure and Properties of Fibers (3)
Lecture—3 hours. Prerequisite: Textiles and Clothing 6 and Chemistry 88. The structure, properties and reactions of natural and man-made fibers; the relations between molecular structure, fiber properties; interactions of fibers and detergents. —II, (II.) Hsieh

161L. Textile Chemical Analysis Laboratory (1)
Laboratory—3 hours. Prerequisite: course 161 (may be taken concurrently). Laboratory methods and procedures employed in qualitative and quantitative analysis of textile fibers and auxiliaries. —I, (I.) Hsieh

180A-180B. Introduction to Research in Fiber and Polymer Science (2)
Laboratory/discussion—6 hours. Prerequisite: senior standing in major related to Fiber and Polymer Science, 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.)—I, II, III

192. Internship in Fiber and Polymer Science (1-12)
Internship—3.6 hours. Prerequisite: consent of instructor. Work experience off campus in a fiber and polymer science related area. Supervision by a member of the Textiles and Clothing faculty. (P/NP grading only.)

197T. Tutoring in Fiber and Polymer Science (1-12)
Tutorial—3.15 hours. Prerequisite: upper division fiber and polymer science related major and consent of instructor. Tutoring of students in Fiber and Polymer Science courses. Assistance with discussion groups and laboratory sections under supervision of instructor. May be repeated for credit if tutoring in another Fiber and Polymer Science 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: upper division standing and consent of instructor. (P/NP grading only.)

Graduate Courses
250A-F. Special Topics in Polymer and Fiber Science (3)
Lecture—3 hours. Prerequisite: Fiber and Polymer Science 100 or consent of instructor. Selected topics of current interest in polymer and fiber science. Topics will vary each time the course is offered. (Same course as Materials Science and Engineering 250A-F.)—I, III; II, III; Hsieh, Pan, Sun

299. Research (1-12)
Independent study—3.6 hours. (S/U grading only.)

Professional Course
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.

Film Studies
(College of Letters and Science)
Eric Smoodin, Ph.D., Program Director
Program Office, 513 Sproul Hall
(530) 752-0830, http://filmstudies.ucdavis.edu

Committee in Charge
Christine Acham, Ph.D.
(African American and African Studies)
Sergio de la Morra, Ph.D.
(Chicana/Chicana Studies)
Frances Dyson, Ph.D. (Technocultural Studies)
Jaimie Fisher, Ph.D. (German and Russian)
Sheldon Lu, Ph.D. (Comparative Literature)
Pablo Ortiz, Ph.D. (Music)
Scott Simon, Ph.D. (English)
Eric Smoodin, Ph.D. (American Studies)
Georges van den Abbeele, Ph.D.
(French and Italian)

The Major Program
This interdisciplinary major takes one of the most influential art forms of the twentieth century and today—film—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 economy); 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 gain practical experience in 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 production companies, local television newsrooms, community television stations, computer graphic companies, advertising and marketing companies, public relations departments, and film distribution companies. Students wishing to pursue graduate work will be prepared to go on in film studies, as well as in several other fields that draw on interdisciplinary study: for example, American studies, English, literatures and languages, drama, communication, computer science, cultural studies, women’s gender studies, and ethnic studies programs. Many film 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 11 ........................................ 4
A four-course sequence in a single language or equivalent .......................... 0-20
One course from American and African Studies 15, 50; American Studies 1A, 21, 30; Art History 5; Art 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, 50, Asian American Studies 1, 2; China, Japan, Korea 10, 50, 60; Native American Studies 1, 10, 32, 33; Women’s Studies 20, 25, 50, 70, 80 ....... 4
Two courses from Art 115, 18, 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 48; History 4C, 10C, 178, 728; Humanities 5; Japanese 10; Music 10, 28; Native American Studies 33, Russian 41, 42;

Note: One of these two courses may be from Design 15, 16 or Dramatic Art 10, 21A, 21B, 24.

Depth Subject Matter: 36-40

One course from English 161A, 161B or Film Studies 124; 125
One course from English 162; Film Studies 127; Philosophy 127; Women and Gender Studies 162

One course each from three of the following topic areas: Cinematic Traditions and Movements, Visual and Popular Culture, Gender/Sexuality/Class, Race/Ethnicity/Class, Production and Performance ....... 12
A current list of approved classes is available from the Program Office and from the faculty adviser.

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 Qualifying units and 16-20 units and have an overall GPA of 3.500 may choose the senior thesis option (194H-194H) 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

A.B. Requirements:

Mathematics
Advanced Placement Credit
Foreign Language Placement Credit

Field of Study

General Education (GE) credit: ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Socio-Cultural Diversity; Wrt—Writing Experience

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

Senior Honors Thesis (194H, 194H)
Prerequisite: course 194. Exploration of one advanced film/video production, especially as they represent ethnic, gender, and social class of Italian Americans.

Upper Division Courses
120. Italian-American Cinema (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 1. Exploration of representations of Italian-American identity in American (U.S.) cinema. Analysis of both Hollywood and independent produced films, especially as they represent ethnic, gender, and social class of Italian Americans.
Not open for credit to students who have completed Humanities 120. GE credit: ArtHum, Div, Wrt—I—III. (III) Heyer, 1986.

124. Topics in U.S. Film History (4)
Lecture—3 hours; film viewing—3 hours. Prerequisite: course 1. Study of an aspect of American film history (such as the silent era, the studio system, U.S. avant-garde cinema, the documentary) and the influences of technological, economic, regulatory, cultural, and artistic forces. Not open for credit to students who have completed Humanities 124 unless topic differs. May be repeated for credit if topic differs. GE credit: ArtHum, Wrt—I—III. (III) Simmon

125. Topics in Film Genres (4)
Lecture—3 hours; film viewing—3 hours. Prerequisite: course 1. A study of one or more of the film genres (such as the documentary, the musical, film noir, screwball comedy, or the western), including genre theory and the relationship of the genre(s) to culture, history, and film industry practices. Not open for credit to students who have completed Humanities 125 unless topic differs. May be repeated twice for credit if topic differs. GE credit: ArtHum, Wrt—I—II—III. (II) McConnell, Simmon

127. Film Theory
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 1 or consent of instructor. Survey of the conceptual frameworks used to study film (including semiotics, psychoanalysis, spectatorship, auteur, genre and narrative theories). Historical survey of major film theorists. (Same course as Philos 127.) GE credit: ArtHum, Wrt—I—III. (III) Wilson

142. New German Cinema (4)
Lecture/discussion—3 hours. German filmmakers of the 1960s-1980s such as Fassbinder, Herzog, Syberberg, Brückner, Schlöndorf, Kluge, Wenders. Knowledge of German not required. May be repeated for credit with consent of instructor. (Same course as German 142) GE credit: ArtHum, Wrt—I. (I) Fisher

162A. Classic Weimar Cinema (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 1. A study of classic Weimar cinema (ca. 1919-33, including films by Murnau, Pabst, and Lang), and its representations of German national myths, modern urban culture, and the nation's uncertain social and political order. Not open for credit to students who have completed Humanities 176. Offered in alternate years. GE credit: ArtHum, Wrt—I. Menges

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. Includes study of postwar "rubble films," "escapist" "homeland films," and New German Cinema of the 1960s-1980s including films by Fassbinder, Herzog, Syberberg, and Kluge. Not open for credit to students who have completed Humanities 176. Offered in alternate years. GE credit: ArtHum, Wrt—I. Menges

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. Group study of a special topic in film, one of several traditions, a major film-maker, or a specific era. May be repeated three times for credit. GE credit: Wrt—I, III, III, III, III, III; Lu

190X. Upper Division Seminar (4)
Seminar—4 hours. Prerequisite: 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, III, III, III, III, III

192. Internship (1-12)
Supervised individual 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 to 5 hours; independent study—3-15 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 1 or for the creation of an honors project. May be repeated twice for credit. (P/NP grading only)—I, II, III, III, III, III

195H. Honors Thesis (1-5)
Independent study—3-15 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 twice for credit. (P/NP grading only)—I, II, III, III, III

196H. Honors Project (1-5)
Project—3-15 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 twice for credit. (P/NP grading only)—I, II, III, III, III

197. 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 regular 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 Course

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (P/NP grading only)

Fisheries

See Animal Science, on page 134; Biological and Agricultural Engineering, on page 158; and Wildlife, Fish, and Conservation Biology, on page 483.

Food Science

College of Agricultural and Environmental Sciences

The Major Program

Food science applies chemical, physical, biological, engineering, and social sciences to processing, preservation, development, packaging, storage, evaluation, identity and utilization of foods.

The Program. Students majoring in food science spend the first two years of study developing the scientific and general background necessary for upper division study. The science courses include chemistry, biology, physics, and mathematics. General background is provided by courses in the social science/humanities area and by optional courses in introductory food science. At the upper division level, students take courses in nutrition, food microbiology, food chemistry, food analysis, food commodities, food processing, and food engineering, and may choose to specialize in one of seven career-oriented options. The major, including all seven options, is accredited by the Institute of Food Technologists. Students enrolled in the program are eligible for various scholarships, including scholarships from the Institute of Food Technologists.

Career Alternatives. Opportunities for employment include positions in the food and allied industries, local, state, and federal 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, engineering, microbiology, and nutrition.

B.S. Major Requirements:

English Composition Requirement

See College requirement.

Preparatory Subject Matter

University Writing Program 102F, 104A, or 104E (if not already taken to satisfy college English requirement)

Communication 1 (if not already taken to satisfy college English Requirement)

Mathematics 1A-16B-16C

Biological Sciences 1AC

Chemistry 2A-2B-2C

Organic chemistry (see option for requirement)

Physics 7A-7B-7C

Food Science and Technology 1 and/or 10

Food Science and Technology 50

Nurition 10 or approved substitute

Breadth/General Education

Satisfaction of General Education requirement plus social science and humanities electives to total 24 units

Depth Subject Matter

Biological Sciences 102, 103

Agricultural Management and Rangeland Resources 120

Food Science and Technology 100A, 100B, 101A, 101B, 103, 104, 104L, 160

Food Science and Technology 110A-110B, Applied Biological Systems Technology 110L

Food Science and Technology 127 or 107

Select one of the following five options:

Food Technology Option

The Food Technology option provides a broad exposure to food chemistry, food microbiology, food engineering and food processing. Students find positions in quality assurance, product development, and food processing in the food industry.

Specific course requirements

Chemistry 8A-8B

Food Science and Technology 108, 109

Selected additional courses

Select courses from a master list available from the department Advising Center.

Food Business and Management Option

The Food Business and Management option allows students to integrate study of the science and technology of food with that of business and economics in a unique program. Students prepare for positions of management in small food companies, and research-and-development oriented marketing or technical sales opportunities in corporate food industries.

Specific course requirements

Chemistry 8A-8B

Economics 1A

Agricultural and Resource Economics 112, 113

Management 100

Food Science and Technology 109

Selected additional courses

Select courses from a master list available from the department Advising Center.

Consumer Food Science Option

The Consumer Food Science option prepares students for jobs in food product formulation, research-and-development oriented marketing, quality assurance, extension service, creative writing, and community service. Students who fulfill the requirements for the teaching credential...
teach elementary or secondary school home economics.

**Specific course requirements** .......... 19

Chemistry 8A-8B .................................. 6
Food Science and Technology 47, 109, 159 ..................... 6
Additional Food Science and Technology 107 or 127 .......... 6
Consumer Science 100 .................................. 3

**Selected additional courses** .......... 10

Select courses from a master list available from the department Advising Center.

**Brewing Science 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). This option also prepares students for graduate study in food science. The option exposes the student to a diversity of coursework, including chemistry, biochemistry, microbiology and engineering as they pertain to the malting and brewing processes. Issues of quality assurance, plant sanitation and packaging are also key. Of course, there is a thorough grounding in malting and brewing.

**Specific course requirements** .......... 26-29

Chemistry 8A, 8B .................................. 6
Food Science and Technology 3 (recommended but not required) ........ 2
Food Science and Technology 102A, 102B, 108, 109, 123, 131 ..................... 20

**Selected additional courses** .......... 9

Select courses from a master list available from the department Advising Center.

**Food Biology/Microbiology Option**

The Food Biology/Microbiology option is for students interested in research and development careers with food companies or government laboratories, in teaching and research at academic institutions, or in professional (medical, veterinary, or dental) school. This option prepares students for graduate study and research in several areas, including food science, biochemistry, biotechnology, microbiology, and post-harvest biology.

**Specific course requirements** .......... 18-24

Biological Sciences 1B .................................. 5
Chemistry 8A-8B or 118A-118B-118C ..................... 6-12
Microbiology 102, 102A, 102B, 108, 109, 123, 131 ..................... 7

**Selected additional courses** .......... 10

Select courses from a master list available from the department Advising Center.

**Food Biochemistry Option**

The Food Biochemistry option prepares students for graduate study and research in food science, biochemistry, biotechnology, microbiology, pharmacology, and nutrition. It is designed for graduate or professional school, leading to careers in research and development in universities, food companies or government laboratories, or in teaching at academic institutions. The option exposes the student to a diversity of coursework, including chemistry, biochemistry, microbiology and engineering as they pertain to the processing, preservation, quality evaluation, public health aspects, and utilization of foods. For the M.S. degree, there are areas of specialization: chemistry-biochemistry, microbiology, engineering-technology and sensory science. Individually designed programs are also acceptable. For the Ph.D., there are four areas of specialization: biochemistry, chemistry, biotechnology, and sensory science. Detailed information regarding graduate study is available through the Group Chairperson or the Group office.

**Graduate Advisers.** Contact the Food Science Grad Group office at kjhunten@ucdavis.edu.

**Food Science (A Graduate Group)**

Gary M. Smith, Ph.D., Chairperson of the Group

**Graduate Office.** 111 Crues Hall

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 adviser.

Kathryn 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)

Alyson Mitchell, Ph.D., Associate Professor

David M. Ogrydziak, Ph.D., Professor

Michael A. O’Mahony, Ph.D., Professor

Robert Powell, Ph.D., Professor

Chester W. Price, Ph.D., Professor

David S. Reid, Ph.D., Professor

Mashe Rosenberg, Ph.D., Professor and Specialist in Cooperative Extension

Gerald F. Russell, Ph.D., Senior Lecturer

Barbara O. Schneeman, Ph.D., Professor (Food Science and Technology, Internal Medicine, Nutrition)

Charles F. Shoemaker, Ph.D., Professor

R. Paul Singh, Ph.D., Professor (Food Science and Technology, Biological and Agricultural Engineering)

Gary M. Smith, Ph.D., Professor

Glenn M. Young, Ph.D., Associate Professor

Emeriti Faculty

Everett Bandman, Ph.D., Professor Emeritus

Erica L. Barrett, Ph.D., Professor Emeritus

Richard A. Bernhard, Ph.D., Professor Emeritus

Walter L. Dunkley, Ph.D., Professor Emeritus

Robert E. Feeney, Ph.D., Professor Emeritus

Dieter W. Gruenwedel, Ph.D., Professor Emeritus

Norman F. Haard, Ph.D., Professor Emeritus

Jerald M. Henderson, D.Engr., Professor Emeritus

Walter G. Jennings, Ph.D., Professor Emeritus

Michael J. Lewis, Ph.D., Professor Emeritus

Academic Senate Distinguished Teaching Award

R. Larry Messer, Ph.D., Professor Emeritus

Thomas Richardson, Ph.D., Professor Emeritus

Howard G. Schutz, Ph.D., Professor Emeritus

Lloyd M. Smith, Ph.D., Professor Emeritus

Alloys L. Tappel, Ph.D., Professor Emeritus

John R. Whitaker, Ph.D., Professor Emeritus

Affiliated Faculty

Diane M. Barrett, Ph.D., Specialist in Cooperative Extension

Christine M. Bruhn, Ph.D., Specialist in Cooperative Extension

John C. Bruhn, Ph.D., Specialist in Cooperative Extension

Edwin N. Frankel, Ph.D., Adjunct Professor

Linda J. Harris, Ph.D., Specialist in Cooperative Extension

Carl K. Winter, Ph.D., Specialist in Cooperative Extension and Lecturer

Major Program and Graduate Study. See the major in Food Science, on page 274; and for graduate study, see Graduate Studies, on page 97 in this catalog.

**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)
beverage quality, including wholesomeness; role of scientific expertise in brewing. GE credit: SciEng—II, II, III. Bamforth

10. Food Science, Folklore and Health (3)
Lecture—3 hours. Ancient and modern food folklore in relation to health and well-being. Food safety, organic food, herbalism, food preservation, and nutritional enrichment open to credit for students who have completed course 2. GE credit: SciEng or SocSci—II, III, III, II, III, III. Russell

47. 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 food 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 47J) (P/NP grading only)—III. (III.)

50. Introduction to Food Preservation (3)
Lecture—3 hours. Prerequisite: Chemistry 2A, Biological Sciences 1A. Introduction to fruit, vegetable, cereal, dairy, seafood, and meat commodity groups. Overview of food preservation principles, including heat processing, refrigeration and freezing, dehydration, fermentation, high pressure processing, irradiation, and antifungal treatments. (III.) Young

106. Food Sensory Science (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Agricultural Management and Rangeland Resources 120 or course 117 (may be taken concurrently). Critical examination of theories and principles of sensory measurement of food; measures of consumer perception and acceptance. An introduction to the sensory and cognitive systems associated with the perception of food. Not open for credit to students who have completed course 107A. I—II. I. O’Mahony

108. Food Processing Plant Sanitation (2)
Lecture—2 hours. Prerequisite: Chemistry 8B, Biological Sciences 1A, course 104 (may be taken concurrently) or consent of instructor. Sanitary control of food processing, including water treatment, chemical and physical sanitizing agents; principles of cleaning and hard surface dermatapy, pest control, and waste disposal; role of regulatory agencies.

109. Principles of Quality Assurance in Food Processing (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: Statistics 13 or Agricultural Management and Rangeland Resources 120. Quality assurance measurement techniques applied to selected food processed products emphasizing Rational Rate processes: conduction, convection, and radiation heat transfer; microwave heating, refrigeration, freezing, and mass transfer during drying and storage—II. I. McCarthy

110B. Heat and Mass Transfer in Food Processing (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: Physics SA and SB or A27B-7C or the equivalent; calculus recommended. Introduction to heat transfer in foods. Fundamental concepts and algebraic equations for quality assurance.—I. (I.) O'Mahony

112. Food Freezing (1)
Discussion—1 hour; online lecture. Prerequisite: course 10A or the equivalent. Mechanics of ice crystalization, interpretation of phase diagrams, and modes of heat transfer. Food properties at sub-freezing temperatures, refrigeration requirements, and estimation of freezing times. Industrial systems used in freezing foods.—III. I. Singh

113. Introduction to Enzymology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 103. Principles of physical, chemical and catalytic properties of enzymes and their importance. Purification, characterization, and applications of enzymes. (Former course Biochemistry and Biophysics 213L)—III. (III.) G. 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 methods of sensory measurement applied to food and beverage systems; descriptive analysis and consumer tests and their application to quality assurance, product development and optimization. —II. (III.) Guinard

131. Food Toxicology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 102, 103. Chemistry and biochemistry of toxins occurring in foods, including plant and animal toxins, intentional and unintentional food additives. The assessment of food safety and toxic hazards. (Same course as Environmental Toxicology 128.) GE credit: SciEng—III. I. Mitchell, Shibamoto

133. Food Packaging (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Chemistry 8B, Biological Sciences 1A. Functions of packaging. Emetics, intentional and unintentional food additives. The assessment of food safety and toxic hazards. (Same course as Environmental Toxicology 128.) GE credit: SciEng—III. I. Mitchell, Shibamoto

139. Food Science and Technology 110L recommended (may be taken concurrently). Composition, structure and properties of milk and products derived from milk. Relates chemical, microbiological, and technological principles to commercial practices in processing of milk and its products. —II. I. Lee

140. Principles of Meat Science (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A. Anatomical, physiological, developmental and biochemical aspects of muscles underlying the conversion of muscle to meat. Includes meat processing, preservation, microbiology and public health issues associated with meat products. (Same course as Animal Science 120.) GE credit: SciEng. —III. (III.) Lee

120. 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 live animal to carcass and meat. Stress changes related to meat quality, chemical and sensory evaluation of meat, and field trips to packing plant and processing plants. (Same course as Animal Science 120.)—III. (III.) Lee

276 Food Science and Technology
19. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only)

Graduate Courses

201. Food Chemistry and Biochemistry (3)
Lecture—3 hours. Prerequisite: Biological Sciences 103. Topics on enzymes, proteins, pigments, lipids, and vitamins. Biochemical principles and methods related to food composition, preservation, and processing. Research proposals and group problem solving. — I. (I) G. Smith, Shoemaker, Frankel

202. Chemical and Physical Changes in Food (4)
Lecture—3 hours; term paper. Prerequisite: Biological Sciences 103, Chemistry 107B. Fundamental principles of chemistry and physics are applied to a study of changes in water binding properties and activity, changes in proteins, nutrients, toxic constituents, and other compounds during storage, heating, freezing, dehydrating, and concentrating of food materials. — III. (II) Dungan

203. Food Processing (3)
Lecture—3 hours. Prerequisite: course 110A, Physics 9C or 7C, Chemistry 107B, and one undergraduate food processing course. Principles of food engineering applied to food processing. Relationship of Newtonian and non-Newtonian fluid properties to heat and momentum transfer. Application of mass transfer in controlling kinetics and quality changes of foods. — II. (I) K. McCammon, M. McCammon

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 preservation, virulence and detection, parameters of microbial growth in food, and the microbiology of food and beverage fermentations. — III. (III) Price, Ogrydziak, Young

205. Industrial Microbiology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A, 102, 103, Microbiology 130A, 130B, or Biological Sciences 101 recommended. Use of microorganisms for producing substances such as amino acids, peptides, enzymes, antibiotics and organic acids. Emphasis on metabolic regulation of pathways leading to fermentation products, on yeast fermentations, and on genetic manipulations (including recombinant DNA techniques) of industrial microorganisms. Offered in alternate years. — III. Ogrydziak

207. Advanced Sensory-Instrumental Analyses (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 107E and consent of instructor. Basic principles of measurement of color, texture, and flavor of foods by sensory and instrumental methods. Advanced statistical analysis of relation of colorimetry, texturometry, and chemistry of volatile compounds to perception of appearance, texture, flavor. Offered in alternate years.

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 107B, 128B. Chemistry of lipids as it pertains to research in food and nutrition. Relations between lipid structure and their physical properties in tissues and foods. Metabolism of absorption, transport, and metabolism of lipids. Implications of dietary fats and health. — II. (II) German

217. Advanced Food Sensory Science (2)
Lecture—2 hours. Prerequisite: course 107A (may be taken concurrently). 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. — II. (I) O'Mahony

227. Food Perception and the Chemical Senses (2)
Lecture—2 hours. Prerequisite: course 107B (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. (II) Guiraud

290. Seminar (1)
Seminar—1 hour. May be repeated for credit. (S/U grading only.)—I., II., III., (I), (II), (II), (II)

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), (II), (II)

291. Advanced Food Science Seminar (1)
Seminar—1 hour. Prerequisite: completion of at least one quarter of course. 290C. Oral presentation of student’s original research, discussion, and critical evaluation. (S/U grading only.)—III. (III)

298. Group Study (1-5)

299. Research (1-12)

Professional Course

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I., II., (I), (II), (II), (II)

Food Service Management

(At College of Agricultural and Environmental Sciences)

Faculty. See under the Department of Nutrition, on page 398.

The Major Program and Graduate Study. Food Service Management is incorporated within the major of Clinical Nutrition. If you are interested in preparing for a career in commercial organizations such as hotels, restaurants, industrial cafeterias, or contract food services, as well as in public or private institutions such as hospitals, correctional institutions, schools, or colleges, consult the Department of Nutrition.

Related Courses. See Food Science and Technology and Nutrition.

Courses in Food Service Management (FSM)

Questions pertaining to the following courses should be directed to the instructor or to the Nutrition Department Advising office in 2211 Meyer Hall (530) 752-2512.

Upper Division Courses

120. Principles of Quantity Food Production (3)
Lecture—3 hours. Prerequisite: Food Science and Technology 100B and 101B. Fundamental principles of food service management including quantity food preparation, institutional equipment, receiving and storage, service, menu planning, merchandising, and safety. — III. (III) Hudson

120L. Quantity Food Production Laboratory (2)
Laboratory—6 hours. Prerequisite: course 120. Laboratory experience in quantity food production and service. — III. (III) Hudson

122. Food Service Systems Management (3)
Lecture—3 hours. Prerequisite: Agricultural and Resource Economics 112, courses 120, 120L, 121. Principles of quantity food production management: production schedules, portion control, financial management, layout and equipment planning, evaluation of alternative systems, and computer applications. — II. (II) Hudson

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: one upper division course in Food Service Management and consent 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

197T. 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 laboratory 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
Forensic Science (A Graduate Group)

David Howitt, Ph.D., Chairperson of the Group
Group Office, 1333 Research Park Drive, Davis, CA 95616 (530-757-8699); http://extension.ucdavis.edu/forensics

Faculty
Faculty members are listed on the Web site.

Graduate Study. The Forensic Science Graduate Group offers the degree of MS in Forensic Science. This program has two tracks enabling the student to take core courses emphasizing the physical or biological sciences. Each track requires the student to take five core courses. Tracks are the DNA and the Criminalistics. Students can take courses in a side area, but they must complete the courses required for their own track. The five core courses total 15 units, two elective courses for 6 units, two required seminar courses for 2 units and 9 units of research for a total of 32 units. The seminar course in the Fall quarter is required for new students and the Spring Seminar can be taken any time.

Preparation. Appropriate preparation is an undergraduate degree. Examples of an appropriate degree are: a degree in one of the physical or natural sciences such as Biochemistry, Chemistry, Molecular Biology, Biotechnology, Bioscience or another closely related field with at least one year of general chemistry, organic chemistry, calculus and physics.

Graduate Advisors. Robert Rice (Forensic Toxicology), You Le Hsieh (Fiber & Polymer Science), Thomas Rost (Biological Science), Ed Imwinkelried (School of Law), Leslie Lyons, (Population Health & Reproduction)

Courses in Forensic Science (FOR)

200. Fundamental Concepts in Forensic Science (3)
Lecture—3 hours. Prerequisite: restriction to students enrolled in the M.S. Forensic Science Program or consent of instructor. Methods for identifying individuals from evidence collected at crime scenes, suspects or victims, crime scene examination and analytical methods used to support such investigations. Topics include forensic anthropology and odontology, latent prints, shoe prints, facial reconstruction/recorded/identifications and other biometric systems. Offered in alternate years. —Howitt

205. Microscopy and Microanalytical Methods in Forensic Science (4)
Lecture—2.5 hours; seminar—1.5 hours. Examination of optics, interferometry and spectroscopy as they are used in microanalysis as utilized in forensic science. May be repeated for credit when topic differs. Offered in alternate years. —Howitt

210. Personal Identification Methods in Forensic Science (3)
Lecture—3 hours. Prerequisite: restriction to students enrolled in the M.S. Forensic Science Program or consent of instructor. Methods for identifying individuals from evidence collected at crime scenes, suspects or victims, crime scene examination and analytical methods used to support such investigations. Topics include forensic anthropology and odontology, latent prints, shoe prints, facial reconstruction/recorded/identifications and other biometric systems. Offered in alternate years. —Howitt

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.) —II, III

240. Homicide Crime Scene Investigation (3)

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. —Denson, 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 loci, capillary electrophoresis of amplified products, and analysis and STR typing data. (Same course as Environmental Toxicology 280.) —Von Baelerdingen

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/fire print impressions, serial number registration, 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, Howitt

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 means 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. in Forensic Science Program. (S/U grading only.) —I, III

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

298. Group Study in Forensic Science (1-5)
Prerequisite: consent of instructor. (S/U grading only.)

299. Research in Forensic Science (1-12)
Prerequisite: consent of instructor. (S/U grading only.)

French
[College of Letters and Science]
Julia Simon, Ph.D., Chairperson of the Department
Department Office, 522 Sproul Hall (530) 752-1219; http://french.ucdavis.edu

Faculty
Bruce Anderson, Ph.D., Assistant Professor
Marc E. Blanchard, Agrégé de Lettres, Professor (French, Comparative Literature)
Elizabeth Constable, Ph.D., Associate Professor
Noah Guyrn, Ph.D., Associate Professor
Leslie Rabine, Ph.D., Professor
(Written and Gender Studies, French)
Eric Russell Webb, Ph.D., Assistant Professor
Julia Simon, Ph.D., Professor
Georges Van Den Abbeele, Ph.D., Professor

Emeriti Faculty
Claude Abraham, Ph.D., Professor Emeritus
Edward M. Bloomberg, Ph.D., Professor Emeritus
Ruby Chom, Ph.D., Professor Emerita
Gerald Herman, Ph.D., Senior Lecturer Emeritus
Margo R. Kaufman, M.A., Senior Lecturer Emerita
Manfred Kusch, Ph.D., Senior Lecturer Emeritus

(French, Comparative Literature)

Marshall Lindsay, Ph.D., Professor Emeritus
Maria I. Manoliv, Ph.D., Professor Emerita
Michele Praeger, Ph.D., Professor Emerita
Ruth B. York, Ph.D., Senior Lecturer Emerita

Afdiliated Faculty
Simone Clay, Ph.D., Lecturer

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 a major tailored to their needs and interests within the broad requirements prescribed by the program and to avow themselves of the guidance of an excellent teaching faculty. The department sponsors an active French Club and a chapter of Pi Delta Phi, the National French Honor Society. 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 seven French universities.

Career Alternatives. Foreign language teachers, a cardiologist, a veterinarian, a naval commander at the Pentagon, a professor of Political Science, lawyers, sales representatives, journalists, an anesthesiologist, a law professor, translators, a senior applications programmer, travel agents, independent business owners, a senior museum preparator, nurses, financial managers, stock brokers, and an industrial attaché for a French Trade Commission, all graduated with an A.B. in French from UC Davis and represent only a small fraction of the career choices documented in a recent survey of department graduates.

A.B. Major Requirements:

<table>
<thead>
<tr>
<th>UNITS</th>
<th>Preparatory Subject Matter</th>
<th>French</th>
<th>Depth Subject Matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-34</td>
<td>French 1, 2, 3 (or the equivalent)</td>
<td>French 101, 102, 103, 104, 200</td>
<td>French 100, 101, 102, 103, 104, 200</td>
</tr>
<tr>
<td>0-15</td>
<td>French 21, 22, 23 A.B.</td>
<td>Two additional upper division French literature courses</td>
<td>Two additional upper division French literature courses</td>
</tr>
<tr>
<td>0-4</td>
<td>Linguistics 1 or 4</td>
<td>Elective courses in French literature, language, or civilization to be chosen in consultation with undergraduate adviser</td>
<td>0-16</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Total Units for the Major</td>
<td>Total Units for the Major</td>
</tr>
<tr>
<td>48-78</td>
<td>Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>French 101, 102, 103, 104, 207, 160 plus other upper division courses for a total of 45 units for students interested in obtaining a “single subject” teaching credential in California.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Major Adviser. E. Russell Webb

Minor Program Requirements:

<table>
<thead>
<tr>
<th>UNITS</th>
<th>French</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>French</td>
</tr>
<tr>
<td>4</td>
<td>French 100, 101, 102, 103, 104, 207</td>
</tr>
<tr>
<td>8</td>
<td>Three elective courses in French language, literature, or civilization one of which must be either French 107 or 108</td>
</tr>
<tr>
<td>12</td>
<td>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 (3 units) and French 192H (3 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 eligi-</td>
</tr>
</tbody>
</table>
ble 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.

Teaching Credential Subject Representative. S. Clay; see the Teaching Credential/M.A. Program on page 102.

Graduate Study. The Department offers programs of study, research, and teaching 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 Critical Theory, Feminist Theory and Research, Classics, or Second Language Acquisition. Detailed information may be obtained from the graduate advisor or the department chairperson.

Graduate Advisers. N.D. Guynn

Prerequisite Credit. Credit will not 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.

Lower Division Courses

1. Elementary French (5)
   Discussion—5 hours; laboratory—1 hour. Students who have successfully completed French 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.—I, II, III. (I, II, III.) Clay

2. Elementary French (5)
   Discussion—5 hours; laboratory—1 hour. Prerequisite: course 1. 1. Continuation of course 1.—I, II, III. (I, II, III.)

3. Elementary French (5)
   Discussion—5 hours; laboratory—1 hour. Prerequisite: course 2. 2. Continuation of course 2.—I, II, III. (I, II, III.)

21. Intermediate French (5)

22. Intermediate French (5)

50. French Film (4)
   Lecture—1 hour; discussion—2 hours; term paper. Introduction to the tradition of French cinema from its invention by the Lumière brothers through Nouvelle Vague (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. —I, II, III. (I, II, III.) Constable, Van Den Abbeele

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, gender, sexual, and ethnic identity. GE credit: ArtHum., Div, Wrt.—II. (II.) Guynn, Van Den Abbeele

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, historical and political developments that have shaped the French-speaking world, with particular attention to mass communication. GE credit: ArtHum., Div, Wrt.—III. (III.) Van Den Abbeele

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 Courses

100. Composition in French (4)
   Lecture—3 hours; term paper. Prerequisite: course 23. Instruction and practice in expository writing in French, with emphasis on organization, correct syntax, and vocabulary building.—I, II, III. (I, II, III.)

101. Introduction to French Poetry (4)
   Lecture—3 hours; short papers. 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.—I, II. Constable

102. Introduction to French Drama (4)
   Lecture—3 hours; short papers. Prerequisite: course 100 or consent of instructor. Analysis and evaluation of works representing the main types of French drama, with emphasis on dramatic structure and technical effects. GE credit: ArtHum.—I. (III.)

103. Introduction to French Prose (4)
   Lecture—3 hours; short papers. Prerequisite: course 100 or consent of instructor. Analysis and evaluation of works representing the main types of French prose, with emphasis on narrative structure and techniques. GE credit: ArtHum.—III. (III.) Simon

104. Translation (4)
   Lecture—3 hours; extensive writing. Prerequisite: course 100 or the equivalent. Practice in French-to-English and English-to-French translation using a variety of non-literary materials, illustrating different problems and styles.—II, III. (II, III.)

105. Advanced French Grammar (4)
   Lecture—3 hours; extensive writing or discussion—1 hour. Prerequisite: course 104 or the equivalent. Understanding of, and extensive practice with, various grammatical structures in French. Lexical-semantic, morphological, and syntactic analysis.—II. (III.) Anderson, Russell Webb

106. French in Business and the Professions (4)
   Lecture—1 hour; discussion—2 hours; frequent written assignments. Prerequisite: course 100 or consent of instructor. Business vocabulary 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.—I, II. (I, II.)

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.—I. (II.)

108. Topics in Contemporary French Culture (4)
   Lecture—3 hours; extensive writing. Prerequisite: course 100 or consent of instructor. Contemporary French culture; description and analysis of the narrative and historical codes of French realist fiction, with emphasis on the representation of history...
140. Study of a Major Writer (4) Lecture—3 hours; term paper. Prerequisite: course 100 and course 101, or 102 or 103 as appropriate to selected topic, or consent of instructor. Concentrated study of works of a single author. May be repeated once for credit as author-subject changes. —II. (II.)

141. Selected Topics in French Literature (4) Lecture—3 hours; term paper or short papers. Prerequisite: courses 100 and 101 or 102 or 103 as appropriate to the selected topic or consent of instructor. Subjects and themes such as satiric and didactic poetry of the Middle Ages, poetry of the Pléiade, theater in the eighteenth century, pre-romantic poetry, etc. May be repeated twice for credit when topic differs. —II. (II.)

160. Topics in French Morphosyntax (4) Lecture/discussion—3 hours; term paper. Prerequisite: course 100 and Linguistics 1. Analysis of conversational grammatical phenomena with emphasis on the semantic content and the pragmatic function of such categories as tense, mood and gender. Offered in alternate years. —III. Anderson, Russell Webb

161. Modern French Syntax (4) Lecture—3 hours; short papers. Prerequisite: course 160. Selected topics such as syntactic and phonological approaches to French syntax. Consideration of new explanations of so-called "irregular" phenomena in current language models. —III. (III.) Anderson, Russell Webb

162. History of French Language (4) Lecture—3 hours; term paper. Prerequisite: course 160. Main 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. GE credit: ArtHum. —II. (II.) Russell Webb

192. Internship (1-12) Internship—3-36 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 a written report on a topic approved by the sponsoring instructor. (P/NP grading only.)

194H. Special Study for Honors Students (4) Independent study—4 hours. Prerequisite: open only to French majors who qualify for honors program. Guided 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.)

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.) —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.)

197Tc. Tutoring in the Community (2-4) Seminar—1-2 hours. Prerequisite: upper division standing and consent of Chairperson. 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.)

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 Courses

200. Literary Analysis (4) Seminar—3 hours; term paper. Prerequisite: graduate standing. Basic principles of applied literary theory. Concepts and methods of the critical analysis of literature and literary texts. Basic principles of bibliographic research will be covered at the beginning of the course. —I. (I.)

201. History of French: Phonology and Morphosyntax (4) Seminar—3 hours; term paper. Prerequisite: courses 159, 160, 250A, or consent of instructor. Presentation of the main changes in the phonematic and grammatical structures of French, from Latin to contemporary spoken aspects. —III. (III.) Russell Webb

204. Topics in Medieval Literature (4) Seminar—3 hours; term paper. Study of Medieval French literature, focusing on a particular period, milieu, literary movement, genre, or theoretical approach. May be repeated for credit when topic differs. —I. (I.)

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.) Van Den Abbeele

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. —II. (II.) Van Den Abbeele

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 as different topics are studied from quarter to quarter. —I. (I.) Van Den Abbeele

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. —III. (III.) Van Den Abbeele

207A. Eighteenth-Century Literature: Philosophies (4) Seminar—3 hours; term paper and/or exposé. 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.) Simon

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.) Constable

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.) Constable
209A. Twentieth-Century: Prose (4)
Seminar—3 hours, term paper and/or exposed.
Study of the works of one or several writers of the period.—II. (II.)

209B. Twentieth-Century: Theater (4)
Seminar—3 hours, term paper and/or exposed.
Study of the works of one or several dramatists of the period. May be repeated for credit with consent of instructor.—II. (II.)

209C. Twentieth-Century: Poetry (4)
Seminar—3 hours, term paper and/or exposed.
Study of the works of one or several poets of the period. May be repeated for credit with consent of instructor.—III. (III.)

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.—II. (II.)

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.)

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.—Constable, Rabine, Van Den Abbeele, Adejumobi

230A. French Linguistics: Morphometrics (4)
Seminar—4 hours. Prerequisite: courses 159, 160, or consent of instructor. Theoretical approach to French grammar, with emphasis on morphometrics, i.e., a semantic analysis of grammatical categories, as well as of their paradigmatic and syntactic relations.—I. (I.)

230B. French Linguistics: Transformational Syntax (4)
Seminar—4 hours. Prerequisite: course 250A or consent of instructor. Presentation of French syntax exemplified by a core of transformational rules (such as subjectivization, passivization, relativization) focusing on the recent developments in the field (e.g., case grammars, generative semantics, trace theory).—I. (I.)

251. Trends in French Contemporary Linguistics (4)
Seminar—3 hours, term paper. Prerequisite: course 250A or 250B or consent of instructor. Issues in contemporary French linguistic thought and their relation to the development of theoretical linguistics. Topics such as pragmatics, semantics, symbolic logic, speech acts, etc. Included are students in French linguistics or those interested in applying linguistic models to literature. May be repeated once for credit with consent of instructor when topic differs.—II. (II.)

261. Current Issues in Modern French Syntax (4)
Seminar—3 hours, term paper. Prerequisite: course 161. Presentation of contemporary approaches to French syntax. Examples of various less regular phenomena, with reference to ongoing changes in modern spoken French. May be repeated for credit with consent of instructor when topic differs. Offered in alternate years.—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)

299D. Dissertation Research (1-12)
(S/U grading only)

Professional Courses

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.)

390A. 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.) Anderson

390B. 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. (S/U grading only)—II. (II.) Anderson

390C. 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. (S/U grading only)—III. (III.) Anderson

390D. Teaching Intermediate French (2)
Lecture/discussion—2 hours. Prerequisite: course 390A, 390B, 390C. Focus on how to teach intermediate French grammar, literature, and composition. (P/NP grading only)—I. (I.) Clay

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.)

Freshman Seminar Program

Jon Wagner, Program Director
Program Office, 17 Wellman (Teaching Resources Center)
(P) 530-752-3249; http://trc.ucdavis.edu/trc

Committee in Charge
John Boe, Ph. D. (University Writing Program)
Annie King, Ph. D. (College of Agricultural and Environmental Sciences)
Jay Meichling, Ph. D. (American Studies)
Jon Wagner, Ph. D. (School of Education)
Fred Wood, Ph. D. (Interim Vice Provost for Undergraduate Studies)

Courses in Freshman Seminar (FRS)
Questions pertaining to the following course should be directed to the instructor or to the Teaching Resources Center.

Lower Division Courses

1. Freshman Seminar (1)
Seminar—1.5 hours. The investigation of a special topic through shared readings, discussions, written assignments, term papers, and special activities

2. Freshman Seminar (2)
Seminar—2-2.5 hours. The investigation of a special topic through shared readings, discussions, written assignments, term papers, and special activities

3. Freshman Seminar (1)
Seminar—1-1.5 hours. The investigation of a special topic through shared readings, discussions, written assignments, term papers, and special activities

4. Freshman Seminar (2)
Seminar—2-2.5 hours. The investigation of a special topic through shared readings, discussions, written assignments, term papers, and special activities

Fungal Biology and Ecology

(Graduate Program in Molecular and Integrative Physiology)

Minor Program Requirements:

UNITS

Fungal Biology and Ecology .......... 18-20
Plant Pathology 130, 148, 150..............11
Select 7-9 units from Food Science and Technology 104, Medical Microbiology and Immunology 130, Plant Biology 146, Plant Pathology 40, 135, 151, Science and Society 30, Soil Science 111, 112; Plant Pathology 224 (available to advanced students with consent of instructor) ........ 7-9

Minor Adviser, J. D. MacDonald

Genetics

See Molecular, Cellular, and Integrative Physiology (A Graduate Group), on page 382; and Genetics, below.
Genetics (A Graduate Group)

James Murray, Ph.D., Chairperson of the Group

Faculty

David G. Gilchrist, Ph.D., Professor (Vegetable Crops)
Robert L. Gilbertson, Ph.D., Professor (Plant Pathology)
Peggy Farnham, Ph.D., Professor (Pharmacology & Toxicology)
Charles S. Gasser, Ph.D., Professor (Molecular and Cellular Biology)
Paul Gepts, Ph.D., Professor (Agronomy and Range Science)
Robert L. Gilbertson, Ph.D., Professor (Plant Pathology)
David G. Gilchrist, Ph.D., Professor (CEPRAP)
Thomas Gradziel, Ph.D., Professor (Molecular and Cellular Biology)
Paul H. Gumerlock, Ph.D., Assistant Professor (Hematology and Oncology)
Nabuko Hagihara, Ph.D., Assistant Professor (Cardiovascular Medicine)
John H. Harada, Ph.D., Professor (Plant Biology)
James A. Harding, Ph.D., Professor (Environmental Horticulture)
Stacey Harmer, Ph.D., Assistant Professor (Agricultural Crop Science)
Neil Hunter, Ph.D., Assistant Professor (Microbiology)
Marie Jasienski, Ph.D., Assistant Professor (Vegetable Crops)

Graduate Study. The Graduate Group in Genet-
ics offers programs of study and research leading to
the M.S. and Ph.D. degrees. To optimize the breadth
available for student training and faculty interaction
while still providing the opportunity for focused cur-
ricula, Focus Groups (FGs) were recently created
within the graduate group. These focus groups con-
stitute of clusters of labs with similar research interests;
faculty members belong to one or more focus groups
(all faculty belong to the General Genetics session of
graduate group). In addition, there are FGs in Ani-
mal Genomics, Chromosome Biology, Human Genet-
ics, Model Plants, and Plant Breeding & Biodiversity
(a FG in Bioinformatics is expected soon). Each of
these groups provides broad training in genetics,
combined with an emphasis specific to its area. Stu-
dents choose their focus group affiliation based on
their research interests and the membership of their
major professor. For additional information regarding
the program, contact the group administrative assistant
(530) 752-4863.

Graduate Adviser. Consult Genetics Graduate
Group office.

Courses in Genetics (GGG)

Graduate Courses

201A. Advanced Genetic Analysis (5)
Lecture/discussion—5 hours. Prerequisite: Biological
Sciences 101, Statistics 100 or the equivalent, grad-
uate standing. Fundamentals of genetic analysis and
chromosome structure using model organisms includ-
ing mutation, transmission, complementation, sup-
pression, and enhancement as well as epigenetic phenomena at the whole organism and molecular levels.

201B. Genomics (5)
Lecture—3 hours; discussion—2 hours. Prerequisite:
course 201A, 201C or the equivalent. Protakaryotic
and eukaryotic genomes. Experimental strategies and
deductive challenges of modern genomic research and the theory and mechanics of data analy-
se. Structural, functional, and comparative genom-
ics. Related issues in bioinformatics.

201C. Molecular Biology (4)
Lecture—4 hours. Prerequisite: Molecular and Cellu-
lar Biology 221A or the equivalent. Pass 1 restricted
to graduate students in biochemistry and molecular biology, microbiology, or genetics. Structure and
organization of DNA and chromatin; DNA replica-
tion, repair and recombination; transcription and RNA processing; protein biosynthesis and turnover;
translational and post-translational control mecha-

isms; examples from eukaryotic and eubacterial
cells, and viruses. [Same course as Molecular and Cellular Biology 221 C.]—II. (III.)

201D. Quantitative and Population Genetics (5)
Lecture—5 hours. Prerequisite: course 201A or con-
sent 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 analyti-
cal methods.

Quarter Offered: I=Fall, II = Winter, III = Spring, IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Social-Cultural Diversity, Wrt=Writing Experience
205. Molecular Genetics Laboratory (5)
Laboratory—15 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 genetic 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.)

207L. Research Methods in Plant Genetics Laboratory (2-5)
Laboratory—6-15 hours. Prerequisite: course 207 (may be taken concurrently). Working knowledge of contemporary methodologies in plant genetics is obtained by participating in research programs of the various Plant Genetics Affinity Group members. (S/U grading only.)—I, II, III. (I, II, III.)

210. Horizontal Gene Transfer (3)
Lecture/discussion—3 hours. Prerequisite: back- ground in basic microbiology and genetics required; introductory course in molecular biology, biotechnology and microbial and animal/plant genetics re- commended. 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 kingdom—1. (II) Kado

211. Concepts in Human Genetics and Genomics (3)
Lecture/discussion—3 hours. Prerequisite: course 201A or the equivalent; course 201C or the equivalent recommended. Human genomic organi- zation; 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 manipula- tion and therapy.—II. (II.)

220. Genetic and Biotechnology of Plant Improvement (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101 or the equivalent. Integration of modern bio- technology 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 resis- tance, and novel output traits. (Same course as Plant Sciences 220.)—II. Michelmore

291. Seminar in History of Genetics (2)
Seminar—2 hours. Prerequisite: Biological Sciences 101. The development of modern genetic theories beginning with Mendel.—II. (II.)

293. Seminar in Animal Genetics (1-3)
Seminar—1-3 hours. Prerequisite: course 201A or consent of instructor. Emphasis on recent advances in the field of animal genetics, ranging from quantita- tive genetic data, molecular biology as it relates to animals. III. (II, III.)

294. Seminar in Human Genetics (2)
Seminar—2 hours. Prerequisite: course 201A and consent of instructor. May be repeated for credit up to five times if topic differs. Topics of current interest in human genetics and genomics. Offered in alter- nate years. —II. Seldin

295. Seminar in Molecular Genetics (1-3)
Seminar—1-3 hours. Prerequisite: course 201A or consent of instructor. Topics of current interest related to the structure, modification and expression of genes.—I. (I)

296. Scientific Professionalism and Integrity (2)
Lecture—1 hour; seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Review of basic skills required of contemporary scientists. Top- ics include scientific conduct, manuscript prepara- tion, grant writing, seminar presentations, and time management. Emphasis on responsibilities of scien- tists to factually and thoughtfully communicate results. (S/U grading only.)—I. (I)

297. Seminar in Plant Genetics (1-3)
Seminar—1-3 hours. Prerequisite: course 201A or consent of instructor. Current topics in plant genetics will be examined in student-conducted seminars and discussion format. The integration of molecular, organismal and population genetics to address ques- tions in plant biology will be emphasized.

298. Group Study (1-5)
Prerequisite: consent of instructor. Group study of selected topics in genetics. (S/U grading only.)

299. Research (1-12)
(S/U grading only.)

Professional Course

300. Methods in Teaching Genetics (1-3)
Lecture/discussion. Prerequisite: graduate standing and consent of instructor. Practical experience in the methods and problems of teaching genetics. Includes analysis of texts and supporting material, discussion of teaching techniques, preparing for and conducting discussion or laboratory sections, formu- lating examinations under supervision of instructor. May be repeated for credit up to 3 times or 9 units if teaching in different genetics related course. (S/U grading only.)—I, II, III.

Geographic Information Systems

[College of Agricultural and Environmental Sciences] The Department of Biological and Agricultural Engi- neering 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, resource management, public utility planning, emergency response, geomarketing, geotech- niques, archaelogical, military exercises, and computer- aided design. Prerequisites include Mathematic 104, 106, Statistics 13.0 or Plant Sciences 120 or Civil and Environmental Engineering 114, and Plant Sci- ences 21 or Computer Science Engineering 15

Minor Program Requirements:

UNITS

Geographic Information Systems ........... 18

Applied Biological Systems Technology 180, 185, Environmental and Resource Sciences 186, 186L, 186M, 187 ........... 13

Select five or more units from Plant Sciences 121, Applied Biological Systems Technology 175, Applied Biological Systems Technology/ Hydrologic Science 182, Environmental Science and Policy 179, 179L ........... 5

Minor Advisers. R.E. Plant (Plant Sciences)

Geographic Studies

[College of Agricultural and Environmental Sciences] The interdepartmental minor in Geographic Studies is defined by its concern with place. Geographers strive to answer spatial questions regarding the earth’s surface, to describe and explain the charac- ter of regions, to ascertain the ways in which histori- cal and contemporary humans have used and shaped the earth’s surface, and to understand the interactions of social, political, and human systems within our global environment. The minor is compati- ble with a variety of environmental majors in the col- lege and also with graduate programs in geography. The minor is sponsored by the Department of Envi- ronmental Design.
solar system. Although often attracted to the study of geology by an aesthetic appreciation and enjoyment of the earth, geologists commonly approach their studies from an interest either in the academic or the applied aspects of the science.

The academic aspects include the study of the history of life, the earth, and the planets, and of the processes that drive the historical evolution. The study of historical evolution through “deep time” is what fundamentally distinguishes geology from most of the other physical sciences. The study of the processes that drive this evolution can involve the application of any of the physical or life sciences to understanding the Earth. In this sense, geology is truly an interdisciplinary science.

The applied aspects of the science generally involve the interaction between humans and the earth. Applied studies include the study of mineral resources including oil and water; identification and mitigation of Earth hazards such as earthquakes, landslides, and volcanic eruptions; identification and mitigation of polluted ground water; and land use planning.

The Program. Students interested in becoming professional geologists or continuing their geological studies at the graduate level should elect 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 pre-professional 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 reasonable coherent, and in-depth program of study. Transfer students should have completed as much of the preparatory subject matter listed below as possible. School preparation for either program should include high school chemistry and four years of mathematics or the equivalent.

Internships and Career Alternatives. The largest employer of geologists has traditionally been the oil industry, although recently more opportunities have become available in environmental geology with consulting firms and government agencies. Government organizations and research laboratories also employ geologists in a variety of other capacities. There is a growing need for earth science teachers at all pre-college levels, and colleges and universities provide opportunities in teaching and research. Entry level positions are available with a Bachelor’s degree. A Master’s degree is the usual professional level degree, and a Ph.D. is generally required for research and academic positions. Internships during undergraduate training are a means of exploring potential career paths and to gain experience 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 including the University of Leeds, the University of Edinburgh, and the University of Auckland.

A.B. Major Requirements:

<table>
<thead>
<tr>
<th>UNITS</th>
<th>GEOMETRY</th>
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<tbody>
<tr>
<td>Geology 3, 3L, 50, 50L, 60 .......... 13</td>
<td>Mathematics 1A-16A or 21A-21B ...... 6-8</td>
</tr>
<tr>
<td>Geology 2A-2B .................................. 10</td>
<td>Chemistry 7A-7B .............................. 8</td>
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<tr>
<td>Statistics 13 or 13A or 32 or 122 .......... 3-4</td>
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<tr>
<td>Depth Subject Matter .......................... 36</td>
<td></td>
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<tr>
<td>Additional upper division electives chosen from upper division courses in geology. Upper division courses in related fields may satisfy this requirement in advance by the major adviser .......... 12</td>
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<tr>
<td>Total Units for the Major ........... 76-79</td>
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Recommended. Chemistry 2C or Hydrologic Science 134, Physics 7C.

B.S. Major Requirements:

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<tr>
<th>UNITS</th>
<th>GEOMETRY</th>
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<tbody>
<tr>
<td>Preparatory Subject Matter ............. 57-59</td>
<td></td>
</tr>
<tr>
<td>Geology 3L, 50, 50L, 60, 62 ........... 15</td>
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<tr>
<td>Mathematics 21A-21B-21C .................. 12</td>
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<tr>
<td>Chemistry 2A-2B ............................. 10</td>
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<tr>
<td>Total of one of the following three options:</td>
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<tr>
<td>General Geology option:</td>
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<tr>
<td>Hydrologic Science 134 or Chemistry 2C .......... 5-6</td>
<td></td>
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<tr>
<td>Statistics 32 or 102 ....................... 3-4</td>
<td></td>
</tr>
<tr>
<td>Physics 7A-7B or 9A-9B-9C .................. 12</td>
<td></td>
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<tr>
<td>Geochronology/Pottery option:</td>
<td></td>
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<tr>
<td>Hydrologic Science 134 or Chemistry 2C .......... 5-6</td>
<td></td>
</tr>
<tr>
<td>Statistics 32 or 102 ....................... 3-4</td>
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<tr>
<td>Mathematics 134 or 136 .................... 4</td>
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<tr>
<td>Physics 9A-9B ................................ 8</td>
<td></td>
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<tr>
<td>Quantitative/Geophysics option:</td>
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<tr>
<td>Mathematics 21D and 22A ................... 7</td>
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<tr>
<td>Physics 9A-9B-9C ............................ 12</td>
<td></td>
</tr>
<tr>
<td>Depth Subject Matter ...................... 52</td>
<td></td>
</tr>
<tr>
<td>Geology 100, 101, 101L, 103, 105, 106, 107, 107L, 109, 109L ............ 24</td>
<td></td>
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<tr>
<td>Additional upper division electives chosen from Geology 130-190 courses, Hydrologic Science 144, 146 and related fields approved in advance by major adviser. No more than 3 units upper division elective credit for Geology 115-129 courses. Maximum of 6 units upper division elective credit for Geology 192 or 194A-194B or 194A-HA-194B ............ 12</td>
<td></td>
</tr>
<tr>
<td>Total Units for the Major ........... 109-111</td>
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English Composition Requirement. It is recommended that all English composition requirement (University Writing Program 101 or 102 or 104 or the equivalent) before or concurrently with the following courses: Geology 100, 101, 105N, 106, 108, 109L, 110. Recommended. Geology majors who are intending to pursue a career in geology or who are planning to apply to graduate programs in the earth sciences, one or more of the following courses are recommended for any of the options or specifically to supplement the options as listed: Note that Mathematics 22A is a necessary prerequisite to Physics 9C.

<table>
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<tr>
<th>GEOMETRY</th>
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Minor Program Requirements:

Students in other disciplines may elect to complete a minor in Geology by choosing a geological subject emphasis listed below. On transcripts the minor will appear as a minor in Geology.

<table>
<thead>
<tr>
<th>GEOMETRY</th>
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<tbody>
<tr>
<td>Geology 100, 101, 101L, 103, 107, 107L, 108, 109, 109L, 110. Additional upper division electives chosen from upper division courses in geology. Upper division courses in related fields may satisfy this requirement in advance by the major adviser.</td>
</tr>
<tr>
<td>Total Units for the Major ........... 12</td>
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</tbody>
</table>

Select one of the five emphases below.

General Geology emphasis ............... 19-20

Geology 50 or 50L ................. 5-6
Geology 100, 109 and 107 or 108 11
Geology 116 or 134 ............... 3


Geology 50 or 50L ................. 5-6
Geology 100, 109 and 107 or 108 11
Geology 116 or 134 ............... 3


Geography 110A and 110B, or Materials Science and Environment 130 and 134. Geology majors may substitute one of the elective courses for Chemistry 110B.


Minor Adviser. R.A. Zierenberg

Oceanography emphasis ............... 21-24

Geology 108, 116, 150A, 150B, 150C ........................................ 24-21
Two courses chosen from Environmental Science and Policy 100, 151, Geology 109, 152 ............... 5-8

Minor Adviser. T. Hill, J.S. McClain

Paleobiology emphasis ............... 20-21

Geology 107 and 107L ........................................ 8-10
Geology 152 ........................................................................ 4
At least eight additional units from the following: Anthropology 151 or 152, Evolution and Ecology 100, 101, 102, 105, 112-112L, 140, 149, Geology 109, 150C ........................................ 8-9

Minor Advisers. F. Molnar or G. Vermeij

Science Teaching Credential. Students who might wish to become a teacher should consult an advisor at their first opportunity in order to combine the prerequisites for a credential program with General Education requirements. Students hoping to teach Earth and Planetary Science may prepare by satisfying the requirements for the B.S. degree in Natural Science (http://www.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 taking the B.S. degree in Geology (108-111 units) and an additional 24 units as indicated by the asterisks below.

<table>
<thead>
<tr>
<th>GEOMETRY</th>
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<tbody>
<tr>
<td>Biological Sciences 1A-1B-1C* .......... 15</td>
</tr>
<tr>
<td>Chemistry 2C ........................................ 5</td>
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<tr>
<td>Physics 7C ........................................ 5</td>
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<tr>
<td>Mathematics 16C ................................. 3</td>
</tr>
<tr>
<td>Geology 36* ....................................... 4</td>
</tr>
</tbody>
</table>
| Geology 116-116G* ......................... 5

Teaching Credential Subject Representative. H.W. Day. See also the Teaching Credential/M.A. Program on page 102.

Graduate Study. The Department of Geology 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 Geology.

Graduate Advisers. S.J. Carlson, C.E. Lesher, J. R. Rusted
Courses in Geology (GEL)

Lower Division Courses

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, and its geographic resources and hazards. Not open for credit to students who have completed course 10. GE credit: SciEng.—I, II, III. (II.) Osleger

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 the relationships between 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.—I. (I.) Summer

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 from their fossil remains. GE credit: SciEng.—II. (II.) Motani

3G. History of Life: Discussion (1)
   Discussion—1 hour. Prerequisite: course 3 concurrently. Small group discussion and preparation of short papers for course 2. GE credit with concurrent enrollment in course 2. Wrt.—I. (I.) Summer

4. Evolution: Science and World View (3)
   Lecture—2 hours; discussion—1 hour. Introduction to biological evolution. Emphasis on historical development, models of evolution, and causes of evolution; relationships between evolution and Earth history; the impact of evolutionary thought on other disciplines. GE credit: SciEng.—I. (I.) Vermeij

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 paleoenvironmental change throughout Earth’s history. GE credit: SciEng.—III. (III.) Montez

12. Evolution and Paleobiology of Dinosaurs (2)
   Lecture—2 hours. Introduction to evolutionary biology, paleobiology, ecology and paleobiology, using dinosaurs as case studies.—II. (I.) Carlson

17. Earthquakes and Other Earth Hazards (2)
   Lecture—2 hours. The impact of earthquakes, volcanoes, landslides and floods on Man, its structures and his environment. Discussion of the causes, effects, and solutions of geologic problems in rural and urban settings.—I., II, III. (III.) Dewey

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.—II. (III.) Hill

16G. The Oceans: Discussion (2)
   Discussion/laboratory—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 116G. GE Credit: SciSci, Wrt.—II. (II.) Hill

20. Geology of California (2)
   Lecture—2 hours. The geologic history of California, the origin of rocks and the environments in which they were formed. Role of structure of the rocks and the interpretation of their structural history, mineral resources, and appreciation of the California landscape.—II. (II.) Osleger

25. Geology of National Parks (2)
   Lecture—2 hours. Appreciation of the geologic framework underlying the beauty of U.S. National Parks. Each park provides a visual focus for understanding a variety of geologic processes such as mountain building, volcanism, stream erosion, and glacial action.—II. (II.) Osleger

32. Volcanoes (3)
   Lecture—3 hours. Role of eruptions, and eruptive products of volcanoes in shaping the planet’s surface, influencing weather patterns, and providing essential human resources. GE Credit: SciEng.—III. (III.) Cooper

35. Rivers (3)
   Lecture—3 hours. Introduction to geomorphology, climate and geologic landforms, and watersheds, with case examples from California. Assessment of impacts of logging, agriculture, mining, urbanization and water supply on river processes. Optional river field trips. GE credit: SciEng.—III. (III.) Mount

36. The Solar System (4)
   Lecture—3 hours; discussion—1 hour. Nature of the sun, moon, and planets as determined by recent manned and unmanned 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 113-113G) GE Credit: SciEng, Wrt.—III. (III.) Osleger

50. Physical Geology (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. —I. (I.) Maddock, —II. (II.) Rastad, —III. (III.) Rudast

50L. Physical Geology Laboratory (1)
   Laboratory—3 hours; one or two one-day field trips. Prerequisite: course 50 (preferably taken concurrently). Introduction to classification and recognition of minerals and rocks and to interpretation of topo-graphic and geologic maps and aerial photographs. Students with credit for course 11 or the equivalent may receive only 1 unit for course 50L.—I. (I.) Maddock, —II. (II.) Rastad, —III. (III.) Rudast

60. Earth Materials: Introduction (4)
   Lecture—3 hours; laboratory—3 hours. Prerequisite: Chemistry 2A, Mathematics 16A or 21A; course 1 or 50, 50L. Physical and chemical properties of rocks, minerals and other earth materials; structure and composition of rocks and minerals, formation of minerals by precipitation from silicate liquids and aqueous fluids and by solid state transformations.—I. (I.) Rastad

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.—I. (I.) Rastad

91. Geology of Campus Waterways (1)
   Lecture/discussion—1 hour; fieldwork—1 hour. Research characterizing geologic processes in waterways on campus among geomorphic, 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)—I. (I.) Rastad, —II. (II.) Osleger, —III. (III.) Summer

99. Special Study for Undergraduates (1-5)
   Prerequisite: consent of instructor; lower division standing. (P/NP grading only)

Upper Division Courses

100. Earth Dynamics I: Extensional and Translational Processes (3)
   Lecture—3 hours. Prerequisite: course 50, 50L, Physics 7A or 9A (may be taken concurrently), or consent of instructor. Introduction to three-dimensional analysis of geologic structures; introduction to field techniques; interpretation of topographic and aerial geologic maps; tectonic analysis of extensional and strike-slip terranes.—I. (I.) Cogswell

100L. Earth Dynamics I: Structure/Tectonics Laboratory (1)
   Laboratory—3 hours; two one-day field trips required. Prerequisite: course 50L and course 100 (may be taken concurrently), or consent of instructor. GE credit: SciEng, Wrt.—I. (I.) Cogswell

101L. Earth Dynamics II: Structure/Tectonics Laboratory (1)
   Laboratory—6 hours; six days of field trips on four separate weekends required. Prerequisite: courses 50L, 100, and 101 (may be taken concurrently), or consent of instructor. Continuation of Geology 100L. Analysis of three-dimensional geologic structures; introduction to field techniques; field mapping projects; interpretation of topographic and aerial geologic maps; tectonic analysis of convergent and collisional terranes.—II. (II.) Billen

103. Field Geology (3)
   Fieldwork and laboratory—9 hours; 7-8 days on weekends during quarter. Prerequisite: course 101L or consent of instructor. Field mapping projects and wind-storm geological reports. Weekly classroom meet- ings devoted to preparation of maps, cross sections, stratigraphic sections, rock descriptions, and reports.—III. (III.) Lester

105. Earth Materials: Igneous Rocks (4)
   Lecture—2 hours; laboratory—6 hours. Prerequisite: courses 60, 62, Mathematics 16A or 21A; Chemistry 2B (may be taken concurrently). Origin and occurrence of igneous rocks. Laboratory exercises emphasize the study of these rocks in hand specimen and thin section. GE credit: SciEng, Wrt.—II. (II.) Lester

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, Wrt.—III. (III.) Day
107. Earth History: Paleobiology (3) Lecture—3 hours. Prerequisite: courses 3-3L or Biological Sciences 1B. The evolution and ecological structure of the biosphere from the origin of life to the present. —I., III, IV. (II., III.) Maton, Carlson

107L. Earth History: Paleobiology Laboratory (2) Laboratory—2 hours. Prerequisite: courses 3-3L or Biological Sciences 1B; 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. —III. (III.) Maton, Carlson

108. Earth History: Paleoclimates (3) Lecture—3 hours. Prerequisite: course 1 or Geol-Environmental Science and Policy 116; 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 600,000 years. Past and current climate records are used to examine potential future climatic scenarios. GE credit: SciEng, Wrt.—III. (III.) Montañez

109. Earth History: Sediments and Strata (2) Lecture—2 hours. Prerequisite: courses 50-50L. Principles of stratigraphic and sedimentologic analysis. Evaluation of the stratigraphic record and sedimentary deposits for the reconstruction of ancient environments. Examination of the plate tectonic, climatic and oceanographic factors controlling the distribution and exploitation of economic fluids within sedimentary rocks. GE credit with concurrent enrollment in course 109L. SciEng.—II. (II.) Zierenberg

109L. Earth History: Sediments and Strata 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 analysis of sedimentary basins. GE credit with concurrent enrollment in course 109F. SciEng.—II. (II.) Zierenberg

110. Summer Field Geology (8) Fieldwork—8 hours/day, 6 days/week for six weeks. Prerequisite: courses 103, 109; course 105 recommended. Advanced application of geologic and geophysical field methods to the study of rocks. Includes development and interpretation of geologic maps, analysis of rock texture, structure, and origin; study of stratigraphic sections; and application of seismic and geophysical methods to the study of geologic structures. GE credit: SciEng, Wrt.—IV. (IV.) McClain

115. Earth Science, History, and People (4) Lecture—1 hour; discussion/laboratory—2 hours. Prerequisite: upper division standing; course 1. Study of interplay between the Earth and its human inhabitants through history, including consideration of acute events such as earthquakes and volcanic eruptions. GE credit: SciEng or SocSci, Wrt.—III. (III.) Verosub

116. The Oceans (3) Lecture—3 hours. Prerequisite: upper division standing; course 1. Introductory survey of the marine environment. Oceanic physical phenomena, chemical constituents, geological history, and the sea’s biota; and utilization of marine resources. (Same course as Environmental Science and Policy 116) GE credit: SciEng.—II. (II.) Hill

116G. The Oceans: Discussion (2) Discussion—2 hours. Prerequisite: course 116/Environmental Science and Policy 116 concurrently. Scientific methodology for the discovery of the ocean’s bottom, biota and history of the oceans. Group discussion and preparation of papers. (Same course as Environmental Science and Policy 116G.) GE credit with concurrent enrollment in course 116F. Wrt.—II. (II.) Hill

129. Sample Preparation and Techniques for Petrology (1) Laboratory—1 hour. Prerequisite: courses 60-60L. Introduction to petrographic laboratory techniques for petrographers. Topics covered may include thin and polished section preparation, rock crushing/grinding, mineral identification, and photomicroscopy. (P/NP grading only).—I. (I.) Winter

130. Non-Renewable Natural Resources (3) Lecture—3 hours. Prerequisite: course 1. Origin, occurrence, and distribution of non-renewable resources, including metallic, nonmetallic, and energy-producing materials. Problems of discovery, production, and management. Estimations and limitations of reserves, and their sociological, political, and economic effects. Offered in alternate years. —II. (II.) Zierenberg

131. Risk: Natural Hazards and Related Phenomena (3) Lecture—3 hours. Prerequisite: upper division standing. Risk assessment for earthquakes, volcanic eruptions, landslides, floods, storms, fires, impacts, global warming. Offered in alternate years. —I. Turcoze

134. Environmental Geology and Land Use Planning (3) Lecture—3 hours. Prerequisite: one course in Geology, preferably course 50 or 1, or consent of instructor. Geologic aspects of land use and development planning. Geomorphology of volcanoes, earthquake and volcanic hazards, land stability, floods, erosion, coastal hazards, non-renewable resource extraction, waste disposal, water resources. GE credit: SciEng, Wrt.—II. (II.) Rustad

136. Ecogeomorphology of Rivers and Streams (5) Lecture—1 hour; discussion/laboratory—2 hours; fieldwork; term paper or discussion. Prerequisite: upper division standing in geology or environmental science. Field measurement and lab analysis of river systems. Field study of rivers, floods, and channel changes. Evaluation of morphologic changes in response to changing land use. Laboratory exercises examine geomorphic processes of river drainage basins. Includes three week-end field trips.—(I.) Mount

138. Introductory Volcanology (4) Lecture—2 hours; fieldwork—6 hours. Prerequisite: upper division standing, course 60 and 109 or the equivalents, 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.—(IV.) Schiffman

139. Fluvial Geomorphology (5) Lecture—3 hours; laboratory—3 hours; fieldwork—3 hours. Prerequisite: Mathematics 21B or 186 recommended. Advanced analysis of fluvial processes, including geomorphic evolution of rivers, floodplains and watersheds at various spatial and temporal scales and in response to changing land use. Laboratory exercises examine methods of geomorphic analysis of rivers. Includes three week-end field trips.—(I.) Mount

141. Evolutionary History of Vertebrates (3) Lecture—3 hours. Evolutionary history of vertebrates; fossil record and phylogeny; timing of major evolutionary events; appearance of major vertebrate groups; physical constraints in vertebrate evolution; paleobiogeography of vertebrates; effect of continental movement on vertebrate evolution; dinosaurs and other strange vertebrates. Offered in alternate years. —III. Mitchell

141L. Evolutionary History of Vertebrates Laboratory (1) Laboratory—3 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. —I. Matani

142. Basin Analysis (3) Laboratory—3 hours; lecture—2 hours. Prerequisite: courses 50, 50L, and 109. Analysis of sedimentary basins from initiation to maturity, including controls on sediment supply, tectonic setting, sequence stratigraphy, core logs, and applications to petro- leum exploration and hydrology. One two-day field trip. Offered in alternate years.—I. Sumner

143. Advanced Igneous Petrology (5) Lecture—3 hours; laboratory—6 hours. Prerequisite: course 105, Mathematics 16C or 21C, Chemistry 2C. Physical and chemical properties of magmatic environments and processes of igneous rock forma- tion. Laboratory study of representative igneous rocks. GE credit: SciEng, Wrt.

144. Historical Ecology (3) Lecture—3 hours. Prerequisite: upper division course in environmental science or ecology, or an introductory course in paleobiology. Ancient ecosystems and the factors that caused them to change. Species, expansion, evolution of new modes of life, geologi- cally induced variations in resource supply, and extinction provide historical context on the bio- sphere of the future. —II. (II.) Vermeij

145. Advanced Metamorphic Petrology (5) Lecture—3 hours; laboratory—6 hours. Prerequisite: course 106; Hydrologic Science 134 or Chemistry 2C, Mathematics 16C or 21C. Introduction to metamorphic processes and the origin of metamorphic rocks. Labora- tory study of representative rock suites. Offered in alternate years. GE credit: SciEng, Wrt.—I. (I.) Hill

146. Isotopic Geochemistry (3) Lecture—3 hours. Prerequisite: Chemistry 2C or consent of instructor. Principles and applications of nuclear chemistry to geology. Methods of determin- ing geologic ages using K-Ar, Rb-Sr, Nd-Sm, and U-Pb isotopes. The interpretation of ages determined by isotopic methods. The age and origin of the earth. Offered in alternate years. —II. (II.) Zierenberg

148. Stable Isotopes and Geochemical Tracers (3) Lecture—3 hours. Prerequisite: Chemistry 2C or Hydrologic Science 134; courses 50, 50L, 60. Use of oxygen and hydrogen isotopes in defining hydro- logic processes; carbon, nitrogen, and sulfur iso- topes as indicators of exchange between the lithosphere, hydrosphere, atmosphere and bio- sphere. Radiogenic, cosmogenic, and noble gas iso- tope tracers. Offered in alternate years. —III. Zierenberg

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- rents, waves, tides, mixing; oceanic geomorphol- ical cycles. (Same course as Environmental Science and Policy 150A).—(I.) McClain, Sprow

150B. Geological Oceanography (3) Lecture—3 hours. Prerequisite: course 50 or 116. Introduction to the origin and 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 sea-floor spreading theory. (Same course as Environmental Science and Policy 150B).—II. (II.) Billen, McClain
150C. Biological Oceanography (4)
Lecture—3 hours; discussion—1 hour; fieldwork—
one weekend away is required. Prerequisite: Biologi-
ical Sciences 1A and a course in general ecology or
consent of instructor. Ecology of major marine habi-
tats, including intertidal, shelf benthic, deep-sea and
planktonic animals, and their interactions. Latest knowl-
dge of contemporary issues in research. Segment devoted
to human use. (Same course as Environmental Science
and Policy 150C)—II, III (II), III
152. Paleobiology of Prehistoric (4)
Lecture—4 hours; laboratory—6 hours. Prerequisite:
courses 107 or Biological Sciences 1A or consent of
instructor. Morphology, systematics, evolution, and
ecology of single-celled organisms that are pre-
served in the fossil record. Offered in alternate
years.—II
156. Hydrogeology and Contaminant
Transport (5)
Lecture—3 hours; laboratory—3 hours; term paper.
Prerequisite: General Education (GE) credit: Geology
Science 145, Civil and Environmental Engineering
144 or the equivalent. Physical and chemical processes
affecting ground-
water flow and contaminant transport, with empha-
sis on regional and large-scale structure of the earth
and to
heat flow. Application to the interpretation of the
sedimentary basin analysis. Emphasis on techniques
associated with faults, landslides, and volcanoes.
Offered in alternate years.—III (II) Rundle
160. Geological Data Analysis (3)
Lecture/discussion—3 hours. Prerequisite: Mathe-
matics 21A or the equivalent. Introduction to quanti-
tative methods of analyzing geological data, includ-
ing 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.—II
161. Exploration Geophysics and
Seismology (3)
Lecture—3 hours. Prerequisite: Mathematics 21C,
Physics 5C or 7C or 9C, or consent of instructor.
Principles of exploration geophysics and seismology.
Use of gravity, magnetic, electrical resistivity, elec-
tromagnetic, and seismic measurements to determine
structure of the Earth’s crust. Interpretation of data
using computers. Survey of well-logging techniques.
Seismology and earthquakes.—III (III) 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. Gravity, magnetism, paleomagnetism, 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.—II
163. Planetary Geology and Geophysics
(3)
Lecture—3 hours. Prerequisite: Mathematics 21C,
Physics 7C or 9C, and course 50 or 36 or Astron-
omy 10, or consent of instructor. Principles of plan-
etary science. Planetary dynamics, including orbital
mechanics, tidal interaction, and rotational dynamics.
Physics of planetary atmos-
pheres. Geological processes, landforms and their
modification. Methods of analysis from Earth-based
observations and spacecraft.—II Kellogg
175. Advanced Field Geology (1-6)
Fieldwork—2-12 hours; discussion—1-6 hours.
Prerequisite: consent of instructor. Advanced field
study of selected areas, including making observations,
interpreting these observations, and discussing
variations in interpretations. May be repeated for up
to 6 units of credit if topic differs. (P/NP grading
only)—II (II), III (II), III
182. 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 bathymetry photography, marine
geochemical sampling, and method of data reduc-
tion and sample analysis. Analysis of data/samples
collected.—III
190. Seminar in Geology (1)
Discussion—1 hour; seminar—1 hour; written
abstracts. Prerequisite: major in Geology. Presenta-
tion and discussion of current topics in geology by
visiting lecturers, staff, and students. May be
repeated for credit. (P/NP grading only)—II, III (I,
II, III)
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 12 units. (P/NP grading only)
194A-194B. Senior Thesis (3-3)
Prerequisite: open to Geology majors who have
directed six terms of college study in a given area of
geophysics. Topics vary. May be repeated for credit.
(P/NP grading only),—II, III (II, III)
205. Advanced Field Stratigraphy (3)
Lecture—1 hour; fieldwork—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 will vary. May be repeated for credit.—III
206. Stratigraphic Analysis (3)
Lecture—3 hours. Prerequisite: courses 109, 109L
or consent of instructor; course 144 recommended.
Topics in advanced methods of stratigraphic analy-
sis, regional stratigraphy, core analysis, and
sedimentary basin analysis. Emphasis on techniques
used to interpret stratigraphic record and on current
issues in stratigraphy and sedimentation. May be
repeated for credit when topics differ.—II, III
Montaillau
214. Active Tectonics (3)
Lecture/discussion—3 hours. Prerequisite: graduate
standing or consent of instructor. Active deformation
associated with faults, landslides, and volcanoes.
Geometric measurement techniques such as triangula-
tion, trilateration, leveling, Global Positioning Sys-
tem (GPS), and radar interferometry. GPS data
acquisition and analysis. Inversion of geodetic data
and mechanical models of crustal deformation.—I
1
216. Tectonics (3)
Lecture/discussion—3 hours. Prerequisite: course
101 or consent of instructor. Nature and evolution of
tectonic features of the Earth. Causes, conse-
quences, and evolution of plate motion, with selected
elements from the Earth’s deformed belts.
Offered in alternate years.—I (II)
217. Topics in Geophysics (3)
Lecture—1 hour; discussion—2 hours. Prerequisite:
consent of instructor. Discussion and evaluation of
current research in a given area of geophysics.
Topics will change from year to year. May be
repeated for credit. (P/NP grading only)—II
218. Analysis of Structures in Deformed
Rocks (3)
Lecture—3 hours. Prerequisite: courses 100, 100L,
101, 101L, 170; or consent of instructor. Recent
advances in the understanding and analysis of struc-
tures in brittlely and ductily deformed rocks.
Detailed investigation of the knowledge of the
structures, models for their formation, and applica-
tions to inferring the kinematics of larger scale tec-
tonics. Offered in alternate years.
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 those structures in rocks associ-
ated with brittle and ductile deformation. Theoretical
analysis, using continuum mechanics, and experi-
mental evidence for the origin of the structures with
emphasis on deformational processes in the earth.
Offered in alternate years.—II (II) Bilhen
220. Mechanics of Geologic Structures
(3)
Lecture—3 hours. Prerequisite: 170, Mathematics
21C, Physics 9A or 5A, or consent of instruc-
tor, Mathematics 21D and 22A recommended.
Development in tensor notation of the balance laws
of continuum mechanics, and constitutive theories of
elasticity, viscosity, and plasticity and their applica-
tion to understanding development of geologic struc-
tures such as fractures, faults, dikes, folds, foliations,
and boudinage. Offered in alternate years.
226. Advanced Sedimentary Petrology (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite:
course 144 or consent of instructor. Advanced petro-
graphy and geochemistry of sediments and sedimen-
tary rocks. Geochronology, textural and miner-
alogical evolution of sedimentary rocks reflecting
depositional or burial processes. Laboratory work
emphasizes thin section study of rocks. May be
repeated for credit when topics differ.—III
227. Stable Isotope Biogeochemistry (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite:
graduating senior standing and consent of instructor.
Discussion and application of stable isotope techniques
for scientific research problems. Course emphasizes car-
bon, oxygen, nitrogen, hydrogen and sulfur iso-
topes. Laboratory will develop basic skills of cya-
ogenic gas extraction and specific techniques for
individual research using stable isotopes.
228. Topics in Paleoclimatology (3)
Lecture—3 hours. Prerequisite: courses 108, 105A
or consent of instructor. Critical discussion and
review of selected topics in paleoclimatology and
paleoecology relating to the history of the pro-
cesses controlling and affecting climate change and
ocean circulation throughout the geologic record.
Topics vary. May be repeated for credit.—II
235. Surface Processes (3)
Seminar—3 hours. Prerequisite: courses 50, 50L,
139; Mathematics 21B or 16B recommended.
Recent advances in the analysis of landforms and their
evolution. Detailed investigation of the tools used
to document surface processes. Evaluation of con-
cepts and processes that govern landscape evo-
lution. May be repeated for credit when topic dif-
fers.—II
236. Inverse Theory in Geology and
Geophysics (3)
Lecture—3 hours. Prerequisite: consent of instruc-
tor. Inversion of data for model parameters. Evalua-
tion of parameter uncertainties. Ray theory. Plane and
spher-
ical waves and boundary conditions. Elastic wave
propagation in stratified media. Offered in alternate
years.—III
238. Theoretical Seismology (3)
Lecture—3 hours. Prerequisite: consent of instructor.
Elastodynamic wave equation. Greens functions and
source representations. Ray theory. Plane and spher-
ical waves and boundary conditions. Elastic wave
propagation in stratified media. Offered in alternate
years.—II, III (II, III)
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Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Social-Cultural Diversity, Writ=Writing Experience
240. Geophysics of the Earth (3) Lecture—3 hours. Prerequisite: Earth Sciences and Resources 201, Physics 95, Mathematics 228. Physics of the earth's crust, mantle, and core. Laplace's equation and spherical harmonic expression of gravity and magnetic fields. Elastic wave equation in geophysical media and surface seismic waves. Equations of state, thermal structure of the earth. Offered in alternate years.—II. T. Turcotte


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 paraphogenesis of metamorphic rocks. Offered in alternate years.—II. Day

247. Metamorphic Petrology Seminar (3) Seminar—3 hours. Prerequisite: course 145 or consent of instructor. Critical review of selected topics in geochemistry including: ore genesis, hydrothermal and geothermal fluids, recent and ancient sediments, isotopic geology, origin and chemistry of the oceans. Subject varies yearly depending on student interest. May be repeated for credit. Offered in alternate years.—II. Day

250. Advanced Geochemistry Seminar (3) Seminar—3 hours. Prerequisite: course 146 or consent of instructor. Seminar 246 recommended. Selected topics in metamorphic petrology e.g., mass transport processes, tectonic settings, geothermometry, thermal structure of metamorphic belts, regional studies. May be repeated for credit when topic differs. Offered in alternate years. (S/U grading only.—II. Day

253. Current Topics in Igneous Petrology (3) Seminar—3 hours. Prerequisite: graduate standing in Geology or consent of instructor. Topics include: paleomagnetism, petrologic evolution, and geologic history. Seminar designed to help graduate students develop and maintain familiarity with current and past literature related to igneous rock petrogenesis. May be repeated for credit when topic differs. (S/U grading only.)

254. Physical Chemistry of Igneous Processes (3) Lecture—3 hours. Prerequisite: course 143 or consent of instructor. Chemistry 110A required. Chemistry 110B and 110C recommended. Introduction of modern concepts in chemical thermodynamics and kinetics, and fluid dynamics of magmatic systems for graduate students in petrology. Offered in alternate years.

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.

260. Palaeontology (3) Seminar—3 hours. Prerequisite: graduate standing in geology or a biological science. Selected problems in palaeontology. Subject to be studied will be decided at an organizational meeting. May be repeated for credit when topic differs.—II, III. I. (I, III) Carlson, Montani, 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 graduate students accepted on an exception-only basis. This course 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, phylogeny of major phyla, and the relation between taxonomy and phylogeny. May be repeated for credit when topic varies.—II, III. I. (I, III) Carlson, Montani, Vermeij

281. 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.—II. Cooper, Yin

285. Field Studies in Marine Geochemistry (2-8) Lecture—3 hours; laboratory—1-3 hours; fieldwork—6-40 hours. Prerequisite: consent of instructor. Marine geochemistry with the opportunity of going to sea or into the field. Techniques of sea-floor mapping using bottom photography, marine geochemical sampling, and method of data reduction and sample analysis. Analysis of data/samples collected.—II. (S/U grading only.)

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.)—II, III. I. (II, III)

291. Geology of the Sierra Nevada (1) Seminar—one day-long session. Prerequisite: consent of instructor. Short oral presentations by students and faculty concerning results of their past work and plans for future work in the Sierra. A written abstract is required following the format required at professional meetings. (S/U grading only.)—III. Day

292. River Forum (1) Seminar—1 hour; optional field trips to evaluate local rivers. Prerequisite: graduate standing. Review and discussion of last year's research and fundamental issues of riverine systems, with emphasis on physical processes. Topics vary. (S/U grading only.)—II, III. I. (II, III)

293. Geologic Event of the Week (1) Discussion—5 hours; seminar—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 three times for up to three units. (S/U grading only.)—II, III. I. (II, III)

294. Structure/Tectonics Forum (1) Seminar—1 hour. Prerequisite: graduate student in geology or consent of instructor. Seminar/discussion group to review and discuss recent developments in structural geology and tectonics, and ongoing 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. (S/U grading only.)—II, III. I. (II, III)

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; students accepted on an exception-only basis. 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.)—III. Dewey

298. Group Study (1-5) Research (1-12) (S/U grading only.)

Geophysics

General Education (GE) credit: ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Social/Cultural Diversity; Wrt—Writing Experience

Geophysics 289

Geophysics

Geophysics is the study of the physical properties and processes within and surrounding the Earth. Many of the Earth Sciences require geophysical techniques for study. The interdisciplinary minor in geophysics is for students with backgrounds in the physical sciences, engineering and other fields who are interested in pursuing graduate or professional career in geophysics, or who require a significant knowledge in the field. The curriculum reflects the need for such students to have a firm foundation of geophysics classes, as well as courses from the vast diversity of subdisciplines from many departments that are included in geophysics. The minor is sponsored by the Department of Geology in 174 Physics/Geology Building.

Minor Program Requirements:

UNITS
Geophysics 289
Engineering 5...21-24
Geology 161, 162...3
Geology 289...3
Applied Science Engineering 115...3
Chemistry 118A, 118B, 118C...3
Physics 104A, 104B...3

Minor Adviser: J. S. McClain, Department of Geology
Geophysics 392 Physics/Geology 530 752-7093

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer, 2007/2008 offering in parentheses
German

(玎college of Letters and Science)

Winder McConnell, Ph.D., Chairperson of the Department

Department Office, (German and Russian), 622 Sproul Hall
(530) 752-4999; http://german.ucdavis.edu

Faculty

Carlee Arnett, Ph.D., Associate Professor
Clifford A. Bernd, Dr.Phil., Professor
Jaimey Fisher, Ph.D., Assistant Professor
Gail Finn, Ph.D., Professor
Elisabeth Krimmer, Ph.D., Associate Professor
Winder McConnell, Ph.D., Professor
Gerhard Richter, Ph.D., Associate Professor

Emeriti Faculty

John F. Fetzer, Ph.D., Professor Emeritus
Ingeborg Henderson, Ph.D., Lecturer Emerita,
Academic Senate Distinguished Teaching Award
Karl R. Menges, Dr.Phil., Professor Emeritus
H. Guenther Nerjes, Ph.D., Professor Emeritus
Fritz Sammann-Frankenberg, Dr.Phil., Lecturer Emeritus

The Major Program

The German major explores in depth the literature and language, culture and commerce of the German-speaking world. Whereas the General Program accommodates specifically those students whose interest lies in literary studies, German Area Studies as well as the Culture and Commerce emphasis are two options that combine advanced language study with courses featuring the contributions of the German-speaking world to fields such as art, philosophy, history, and economics.

The Program. Two of the three major emphases reflect the department's primary emphasis on literary figures, movements and themes, and thus they share a common core of upper-division literature electives. The Culture and Commerce emphasis has as its goal functional language competency to enable students to live and work in a German-speaking environment. A key feature of this track is a work/study experience abroad. 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 graduate 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:.............16-27
German 1-23 [or the equivalent]..............0-15
German 20, 21, 22.........................12

Depth Subject Matter:.....................44

General Program

German 101A, 101B, 103.............12
German 120.........................4

Three courses chosen from upper division literature offerings taught in German...........12
Four additional upper division courses selected from 104-109 and 121-128, upon the explicit advance approval of the undergraduate major adviser.............16

The above category may be satisfied in part by other major courses in Comparative Literature, in another national literature, or from German literature in translation offerings [111-119, 140-142] upon consultation with, and advance approval of, the undergraduate major adviser.

German Culture and Commerce Emphasis

German 103, 104, 109A, 109B.............16
German 118E or 120..........................12
German 143, 192...............................12
Three elective courses from at least two of the following subjects..................12
History 144A, 144B, Political Science 123, 137
Recommended: International Relations, German 101A, 101B

German Area Studies Emphasis

German 101A, 101B, 103..........................12
German 120........................................4
Two courses chosen from upper division literature courses that are taught in German
History 144A or 144B...........................8
Four elective courses in accordance with the student's interest chosen from at least two of the following three areas after consultation with and approval of the adviser:.......16
Humanities: History 143, Philosophy 170, 175.
Social Sciences: Geography 123, Political Science 117, 137.
Special consideration is given to such courses in Comparative Literature as the 164 series, where pan-European movements influential upon German literature are at issue.

Total Units for the Major:.........................60-71

Minor Program Requirements:

The Department offers a German Language and Literature minor. In addition, individualized minor programs may be designed upon consultation with the undergraduate adviser.

Students are particularly encouraged to consider a minor that combines a coherent group of courses to emphasize area studies in German (i.e., German literature, the arts, history, political science, as well as literature). The purpose of the minor is to provide students with the opportunity to augment their training in other fields by acquiring proficiency in the German language and exposure to German literature and culture.

UNITS

German Language and/or Literature:...........20-24

Choose courses numbered from German 101A through 109B and literature courses that are taught in German.............20-24

Major Adviser, E. Krimmer

Honors and Honors Program. The honors program comprises two quarters of study under course 194HA–194HB, which will include a research paper. See also the University and College requirements.

Teaching Credential Subject Representative. C. Arnett; see the Teaching Credential/M.A. Program on page 102.

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 in conjunction 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 Adviser.

Graduate Adviser, J. Fisher

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 Courses

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. Prerequisite: course 1. Continuation of course 1 in areas of grammar and basic language skills.—I, II, (II, III)

2. Elementary German (5)

Discussion—5 hours; laboratory—1 hour. Prerequisite: course 3. Course 6 may be taken concurrently with course 20. Designed to develop intermediate language skills with special emphasis on communicative and grammatical accuracy.—II, Chair

3. Intermediate German (4)

Discussion/discussion—3 hours; extensive writing. Prerequisite: course 3; may be taken concurrently with course 6. Review of grammatical principles by means of written exercises; expanding of vocabulary through readings of modern texts. Not open for credit to students who have completed course 4. [Former course 4.1—II, II, (I, II]

21. Intermediate German (4)

Lecture/discussion—3 hours; extensive writing. Prerequisite: course 20. Review of grammatical principles by means of written exercises; expanding of vocabulary through readings of modern texts.—I, II, (II, III)

22. Intermediate German (4)

Lecture/discussion—3 hours; extensive writing. Prerequisite: course 21. Review of grammatical principles by means of written exercises; expanding of vocabulary through readings of modern texts.—II, III, (III)

40. Great German Short Stories (in English)(4)

Lecture/discussion—3 hours; extensive writing. Major German short stories from Goethe to the end of the eighteenth century to Thomas Mann at the beginning of the twentieth century. Offered in alternate years. GE Credit: ArtHum, Div, Wrt.—III. Bernd

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 art-work" concept and the later Nibelungen cycle. May not be counted toward major in German. GE Credit: ArtHum, Wrt.—I, III, (II)

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 written projects treating topics such as communist-capitalist tension in German literature; masculine “versus” feminine identities; reification of consciousness; disintegration and reconstitution of language reflecting cultural transformation; exercising post-holocaust national guilt and individual frustration—Germany’s new European “mission.”—II, III
Lecture/discussion—3 hours; laboratory—1 hour.

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—II. (II.) Bernd

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—II. (II.) Bernd

103. Writing Skills in German (4)
Lecture—3 hours; writing-intensive. Prerequisite: course 22. Practice in different kinds of writing, such as abstracts, correspondence, lecture summaries, analysis of or response to short literary texts.

104. Translation (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 22. Exercises in German-to-English, English-to-German translation using texts from the areas of current interest to students. Not open for credit to students who have completed course 104A. Offered in alternate years.

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.—II.

109A. Business German (4)
Lecture/discussion—3 hours; laboratory—1 hour. Prerequisite: course 22 or consent of instructor. Specialized language course using business-oriented information and publications as the basis for discussions, roleplay, reports, compositions and translations. Offered in alternate years. (II.)

109B. Advanced Business German (4)
Lecture/discussion—3 hours; laboratory/discussion—1 hour. Prerequisite: course 22 or consent of instructor. Specialized advanced language course providing in-depth study of major business topics with the help of authentic texts and videos. Offered in alternate years. (II.)

112. Topics in German Literature (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: upper division standing or consent of instructor. Investigation of significant themes and issues within their European context. Knowledge of German is not required. May be repeated once for credit. Offered in alternate years. GE credit: ArtHum, Wrt.—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 and readings in English; reading the text in the original is encouraged. (Same course as Humanities 113) Offered in alternate years. GE credit: ArtHum, Div, Wrt.—II, III. (II.)

115. German Literature Since 1945 (4)
Lecture—3 hours; extensive writing. Knowledge of German not required. Major writers of the post-war generation of Austria, Switzerland and Germany: novelists, such as Bill, Grass, Johnson, 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 areas. GE credit: ArtHum.—I. (I.) Bernd

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 considerations of innovations in literature, music, graphic arts, architecture, philosophy and psychology, heralding European modernism. Offered in alternate years. GE credit: ArtHum, Wrt.—I. (I.) Finney

118B. Weimar Culture: Defeat, the Roaring Twenties, the Rise of Nazism (4)
Lecture—1 hour; discussion—2 hours; extensive writing. 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 Weimer Republic of 1919-1933. Offered in alternate years. GE credit: ArtHum, Wrt.—III.

118C. Germany Under the Third Reich (4)
Lecture/discussion—3 hours; term paper. Prerequisite: background in European history. course 118B recommended. No knowledge of German required. Interdisciplinary study of German society and culture during the Third Reich (1933-45); readings in History, Art, Literature, music, architecture, film and philosophy; study of Fascist culture in literature, film, architecture, and the graphic arts; focus on everyday life in Hitler’s Germany. GE credit: ArtHum, Wrt.—I. McConnell

118E. Contemporary German Culture (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 22. The political, economic, social and cultural scene of Germany today. Offered in alternate years. GE credit: ArtHum, Wrt.—II.

119. From German Fiction to German Film (4)
Lecture—3 hours; discussion—1 hour; term paper. Examines 100 years of film adaptations of major German prose works, and how they bring to the screen the positive and negative effects achieved by such transferences. GE credit: ArtHum, Wrt.—II. (II.)

121. The Medieval Period in German Literature (4)
Discussion—3 hours; extensive writing. Prerequisite: course 22. Major developments in German arts, philosophical thought, social institutions, and political history. GE credit: ArtHum.—II. (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 influence in literature of the social, as well as religious, scenes. Offered in alternate years. GE credit: ArtHum, Wrt.—I. Bernd

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 time. Offered in alternate years. GE credit: ArtHum.—I. Bernd

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 once for credit when topic differs. Offered in alternate years. GE credit: ArtHum.—II. (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 representations of various prose styles and cultural currents. Offered in alternate years. GE credit: ArtHum.—III. Finney

126. Modern German Literature (4)
Discussion—3 hours; extensive writing. Prerequisite: course 22. Selections from significant works of contemporary writers, such as Hesse, Mann, Kafka, Rilke, Brecht, Grass. May be repeated once for credit with consent of adviser. GE credit: ArtHum.—II. (II.)

127. Major Writers in German (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 22. Examination of representative works by a major writer, set in the broader cultural context of the relevant period or movement. May be repeated once for credit when topic differs. Offered in alternate years. GE credit: ArtHum.—I. III.

129. Postwar Women Writers (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 22. Major writers in both Germanies, Austria, and Switzerland since 1945. Topics may include the concept of a feminist aesthetics, East vs. West German writers, and the status of minority women writers in Germany (Jewish, Turkish-German, Afro-German). GE credit: ArtHum, Div.—I. (I.) Finney

131. German Lyric Poetry (4)
Lecture—3 hours; term paper. Prerequisite: course 22. Study of the genre of lyric poetry from the late Middle Ages through Renaissance, Baroque, Classical, Romantic, and Modern periods in correlation with other literary forms and the social climate of each period. Offered in alternate years. GE credit: ArtHum.—I. Bernd

132. The German Novelle (4)
Lecture—3 hours; term paper. Prerequisite: course 22. Inquiry into the art of the “Novelle” through analysis of the materials and formal devices of representative authors from Goethe to Kafka. Offered in alternate years. GE credit: ArtHum.—I. Bernd

133. The German Drama (4)
Lecture—3 hours; term paper. Prerequisite: course 22. Readings in the works of Germany’s leading dramatists from the eighteenth century to the present day: such as Lessing, G. Büchner, Hauptmann, Brecht. Offered in alternate years. GE credit: ArtHum.—III. Bernd

134. Topics in German Intellectual History (4)
Lecture—discussion—3 hours; term paper. Prerequisite: course 21. Topics in German intellectual history with materials from a number of periods, genres, and disciplines. May be repeated twice for credit when topic differs. Offered in alternate years. GE credit: ArtHum.—I. (I, III.)

141. The Holocaust and its Literary Representation (4)
Lecture—2 hours; discussion—1 hour; term paper. Knowledge of German not required. Aesthetic representation and metaphorical transformation of the holocaust in its human and historical perspectives. Offered in alternate years. GE credit: ArtHum, Wrt.—II.

142. New German Cinema (4)
Lecture/discussion—3 hours. Germain film-makers of the 1960s-1980s such as Fassbinder, Herzog, Syberberg, Brückner, Schlondorf, Kluge, Wenders. Knowledge of German not required. May be repeated for credit with consent of instructor. (Same course as German 142) GE credit: ArtHum, Wrt.—I. (I.) Fisher

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,
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—II. Bernd

192. Field Work in German (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 students proficiency in the German language. May be repeated twice 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 one quarter of upper division 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.)

197. Tutoring in German (1-4)
Tutorial—3-12 hours. Prerequisite: consent of Ger- man Program Director. Tutoring in undergraduate courses including leadership in small voluntary dis- cussion groups affiliated with department courses. May be repeated up to eight units of credit. (P/NP grading only.)

198. Directed Group Study (1-5)
Directed Study, First Year in Germany—4 hours; second year—2 hours; third year—1 hour. Prerequisite: course 22. Examples of German literature from the High Middle Ages to the present that encounter with the other [people of color, different beliefs and cultures, and inner-German minorities]. Offered in alternate years. GE credit: ArtHum—II. Arnett

202. Middle High German (4)
Lecture/discussion—3 hours; term paper or discuss- ion—1 hour. Prerequisite: course 22. Examples of German literature from the High Middle Ages to the present that encounter with the other [people of color, different beliefs and cultures, and inner-German minorities]. Offered in alternate years. GE credit: ArtHum Div.—II. Arnett

208. Multiculturalism in German Literature (4)
Lecture/discussion—3 hours; term paper or discus- sion—1 hour. Prerequisite: course 22. Examples of German literature from the High Middle Ages to the present that encounter with the other [people of color, different beliefs and cultures, and inner-German minorities]. Offered in alternate years. GE credit: ArtHum—II. McConnell

211. Concepts in Literary Theory (4)
Seminar—3 hours; written reports. Advanced course in concepts of literary theory and criticism. Discus- sion of the emergence of theoretical concepts and their impact on the understanding and appreciation of literary works. Discussion in German and English, reading in German. —II. (II.) Bernd

212. Contemporary Approaches to Literary Theory (4)
Seminar—3 hours; term paper. Study of contempo- rary theoretical approaches such as structuralism, deconstruction, feminism, Marxism, Frankfurt School, and reception theory in conjunction with the works of major authors. —III. (III.) Finney

239. Narrative and Narrative Theory (4)
Seminar—3 hours; term paper. Studies, in a theoreti- cal and literary hold, major elements of 19th- and 20-century narrative, such as techniques of framing, refraction, and montage; narrative per- spective, mimesis, and self-consciousness. Focuses on paradigmatic prose texts and side a spectrum of critical approaches. Offered in alternate years. —I. Finney

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.) Bernd

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. —II. (II.) Bernd

242. The German Novelle (4)
Seminar—3 hours; term paper. The major German Novellisten, with particular emphasis on the flower- ing of this genre in the nineteenth century. May be repeated for credit with consent of instructor. —II. (II.) Bernd

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.) Bernd

244. Gender and Comedy (4)
Seminar—3 hours; term paper. Studies of genre and gender in German-language comedy by male and female writers from the 18th century to the present. Authors treated include Lessing, Kleist, Buchner, Einher-Eichenbach, Hauptmann, Hoffmann, Frisch, Langner, and Jelinek. Offered in alternate years. —III. Finney

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.) Bernd

253. Goethe (4)
Seminar—3 hours; term paper. Study of the origins of Goethe's thought in German Pietism, and his prin- cipal artistic, autobiographical, scientific, and philo- sophical works. —I. (I.) Bernd

254. Schiller (4)
Seminar—3 hours; term paper. A critical analysis of Schiller's major works and his impact on the Intellec- tual climate in Germany in the late eighteenth and early nineteenth centuries. —II. (II.) Finney

255. Aesthetics in the Age of Goethe (4)
Seminar—3 hours; term paper. Prerequisite: gradu- ate 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 individ- uality of aesthetic experience. —II. (II.) Bernd

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 hemorrhagic problems in mod- ern German, French, and Anglo-American Kleist crit- ics. —III. (III.) Bernd

258. The Novels of Thomas Mann (4)
Seminar—3 hours; term paper. Reading of selected novels with emphasis on aesthetic techniques, origi- nality, ethical and political views, and influence on the contemporary literary scene in Germany. —II. (II.) Finney

259. Studies in Kafka (4)
Seminar—3 hours; term paper. Study of Kafka's narra- tive techniques with special emphasis on the shorter works on the existential development from its roots in Expressionism. —II. (II.) Finney

260. The Poetry of Rilke (4)
Seminar—3 hours; term paper. Study of the princi- pal motifs, myths, images, and problems in the poetry of Rainer Maria Rilke. —I. (I.) Finney

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 con- cepts. —III. (III.) Finney

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 devel- opments in psychology, the visual arts, philosophy, and music. Authors treated include Hauptmann, Holz and Schlaf, Schnitzler, T. Mann, Wedekind, Musil, Hofmannsthall. Offered in alternate years. —II. (II.) Finney

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 six- teenth century. May be repeated for credit with con- sent of instructor. —I. (I.) Finney

289. German Literature of the Baroque (4)
Seminar—3 hours; term paper. "The "Elegantioideal" and the varying methods used to portray it in seven- teenth-century German literature. May be repeated for credit with consent of instructor. —I. (I.) Finney

290. The Enlightenment in German Literature (4)
Seminar—3 hours; term paper. Revolt against the concept of the "Elegantioideal" and evolution of a new literature based on reason and wit. May be repeated for credit with consent of instructor. —I. (I.) Finney

291. Sentimentality and Sturm und Drang in German Literature (4)
Seminar—3 hours; written reports. Reaction to over- emphasis on Reason; theories of Hamann and Herder and works of poets such as Lenz, Leisewitz, the early Goethe and Schiller. May be repeated for credit with consent of instructor. —III. (III.) Bernd

293. The Classical Age of German Literature (4)
Seminar—3 hours; term paper. Inquiry into the aes- thetic and humanistic qualities of Germany's greatest literary epoch. May be repeated for credit with con- sent of instructor. —II. (II.) Bernd

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 classical aesthetics. May be repeated for credit with consent of instructor. —I. (I.) Finney

295. Poetic Realism in German Literature (4)
Seminar—3 hours; term paper. Outstanding figures in German literature between 1840 and 1890. Important phases in their developments will be treated. May be repeated for credit with consent of instructor. —I. (I.) Bernd
Global and International Studies

(Office of the Vice Provost for International Affairs)

The interdisciplinary minor in Global and International Studies will enable students not only to learn about global and international issues at UC Davis, but also to gain firsthand academic experience abroad. The minor is also designed to give recognition for upper division coursework while studying abroad. However, the minor can also be completed with approved coursework taken at UC Davis.

Students will be expected to work closely with an advisor in developing an intellectually coherent program of study. Each proposal must be approved by the Faculty Director of the Education Abroad Center.

The minor is sponsored by the Humanities Program.

For information, contact the Faculty Director of the Education Abroad Center and see http://eac.ucdavis.edu/students/degreerequirements/minor_gis/index.html.

Minor Program Requirements:

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
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 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 EAP or another approved study abroad program, or (2) completion of 12 units of coursework taken in UC Davis accredited international internships, 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.

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..................3-4
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 Social Sciences.

Suggested course clusters for the Social Science Emphasis:
(1) Country or region-specific courses in the Social Sciences: Western Europe; Russian and East/Central Europe; Asia and the Pacific, Latin 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: 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 EAP or another approved study abroad program, or (2) completion of 12 units of coursework taken in UC Davis accredited international internships, 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.

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 171.

Health Informatics

(A Graduate Group)

Formally 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 2700, Sacramento, CA 95817
(916) 734-8710; ucdinformatics@ucdavis.edu

Faculty
Aaron Bair, M.D., Assistant Clinical Professor (Emergency Medicine)
Matt Bishop, Ph.D., Professor (Computer Science)
Jo Anne Bookman, MS Librarian (Health Sciences Library)
Robert Cardiff, M.D., Ph.D., Professor (Pathology and Laboratory Medicine)
James Case, M.S., D.V.M., Ph.D., Professor (California Animal Health & Food Safety Laboratory System)
Anthony Cheung, Ph.D. Professor and Vice Chair (Pathology and Laboratory Medicine)
Mary Christopher, D.V.M., Ph.D., Professor (Pathology, Microbiology and Immunology)
Tom Engblom, M.D., Associate Professor (Anesthesiology and Pain Medicine)
Jose Galvez, M.D., Assistant Adjunct Professor (Comparative Medicine)
Michael Gertz, Ph.D., Associate Professor (Computer Science)
Glenna Gaboury, D.V.M., M.P.V.M., M.S., Assistant Adjunct Professor (Health Informatics)
Fred Gorin, M.D., Ph.D., Professor (Neurology)
Bernd Hamman, Ph.D., Professor (Computer Science)
Donald Hilty, M.D., Associate Professor, Director of Telepsychiatry (Psychiatry)
Michael Hogarth, M.D., Associate Professor (Internal Medicine)
Christine Hotz, D.V.M., M.S., Assistant Adjunct Professor (Health Informatics)
Janet Ikiv, B.V.Sc., Ph.D., Professor (Surgical and Radiological Sciences)
Anthony Jerant, M.D., Associate Professor (Family and Community Medicine)
Patrice Koehl, Ph.D., Associate Professor (Computer Science)
Bertram Ludaescher, Ph.D., Associate Professor (Computer Science)
Cecil Lynch, M.D., M.S., Assistant Adjunct Professor (Health Informatics)
Kwan-Liu Ma, Ph.D., Professor (Computer Science)
Wasyl Maliy, Ph.D., Director (Bioinformatics Core - NIH NCMI Center of Excellence in Nutritional Genomics)
Thomas Nesbitt, M.D., M.P.H., Professor (Family and Community Medicine)

See Health Informatics, on page 171.
Graduate Advisors. The Group currently offers an M.S. degree in Health Informatics. The program is aimed at health care professionals who hold advanced degrees, including, but not limited to, M.D., D.O., D.V.M., M.P.H., and RN with Bachelor’s degree. The course of study provides research-oriented training that spans the use of computer systems in medical care delivery, including methods for computer application, data acquisition, storage, and retrieval, the development, use and implementation of the electronic medical record, management of clinical data, and the related medical decision support systems. A research project and thesis are mandatory degree requirements.

Preparation. The Group encourages applications from health professionals who have had experience in the manipulation of clinical information. Basic qualifications include an advanced degree in a health-related field or the equivalent in work experience. Background in a programming language is required. Applicants with extensive computer background but little knowledge of clinical information would need to gain considerable practical experience in dealing with clinical information to be competitive applicants for the program.

Graduate Advisors: M. Hogarth (Internal Medicine), C. Hetz (Health Informatics), R. Walters (Computer Science)

Courses in Medical Informatics (MDI)

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 Turner, Hogarth

207. Decision Support System (4)
Lecture/discussion—2 hours; laboratory—2 hours; independent study—2 hours. Prerequisite: consent of instructor. Decision support system for medical application. Knowledge and computer representation, review of existing decision support system.—II, III, IV Hetz, Christopher

208. Electronic Medical Data (4)
Lecture/discussion—2 hours; laboratory—4 hours. Prerequisite: consent of instructor. Electronic resources for medical practice, review of existing resources and development of materials.—II, III Lynch

209. Data Acquisition in Medicine and Veterinary Medicine (4)
Lecture/discussion—2 hours; laboratory/discussion—6 hours. Prerequisite: basic proficiency in computer operation. Overview of the nature of medical/veterinary data, methods for capturing and storing data in electronic formats. Data validation, retrieval considerations.—I, II Galvez, Holtz

210. Introduction to Medical 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, HIT, Security, and HIPPA.—I, II Galvez, Holtz

211. 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 strategies and clinical applications, project management, risk management and legal issues; reimbursement and contracting; human resources and program sustainability.—I, II, III Gallant, III, IV, V Holtz

215. Beginning and Intermediate Programming in M (MUMPS) (3)
Online lecture—10 hours. Project-oriented approach to fundamentals of programming in ANSI Standard M (MUMPS) language. Basic syntax, Hierarchical file structure; arrays and string subscripts, indirection and extrinsic functions. (S/U grading only)—I, II, III, IV, V, VI, VII, VIII, IX, X Galvez

289A-L Special Topics in Medical Informatics (1-5)

290. Seminar in Medical Informatics (1)
Seminar—2 hours. Discussion of current graduate research and topics in Medical Informatics. Oral presentations of individual study. Limited enrollment. (S/U grading only)—I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV, XVI, XVII, XVIII, XIX, XX, XXI Galvez

299. Research in Medical Informatics (1-12)
(S/U grading only) Galvez

Hebrew

See Religious Studies, on page 434.

Hindi

See Middle East/South Asia Studies, on page 375.

History

[College of Letters and Science]

Daniel R. Brower, Ph.D., Chairperson of the Department

Department Office. 2216 Social Sciences and Humanities Building (530) 752-0776; http://history.ucdavis.edu

Faculty

David Biale, Ph.D., Professor

Robert Borgen, Ph.D., Professor

Beverly Bosser, Ph.D., Professor

Cynthia L. Brantley, Ph.D., Professor

Daniel R. Brower, Jr., Ph.D., Professor

Joan Cadden, Ph.D., Professor

Omnia El Shakry, Ph.D., Assistant Professor

William W. Hagen, Ph.D., Professor

A. Katie Harris, Ph.D., Assistant Professor

Thomas H. Holloway, Ph.D., Professor

Ari Kelman, Ph.D., Associate Professor

Kyu H. Kim, Ph.D., Associate Professor

Catherine J. Kudlick, Ph.D., Professor

Norma B. Landau, Ph.D., Professor

Victoria Langland, Assistant Professor

Benjamin Lawrence, Ph.D., Associate Professor

Susan L. Mann, Ph.D., Professor

Ted W. Margadant, Ph.D., Professor

Lisa Materson, Ph.D., Assistant Professor

Sally McKee, Ph.D., Associate Professor

Academic Senate Distinguished Teaching Award

Kathleen Stuart, Ph.D., Associate Professor

Alan S. Taylor, Ph.D., Professor

Baki Tezcan, Ph.D., Assistant Professor

Charles Walker, Ph.D., Associate Professor

Clarence E. Walker, Ph.D., Professor

Louis S. Warren, Ph.D., Professor

Emeriti Faculty

Arnold J. Bauer, Ph.D., Professor Emeritus

William M. Bowsky, Ph.D., Professor Emeritus

David Brody, Ph.D., Professor Emeritus

Daniel H. Calhou, Ph.D., Professor Emeritus

Robert O. Crummey, Ph.D., Professor Emeritus

Manfred F. Fleischer, Ph.D., Professor Emeritus

David L. Jacobson, Ph.D., Professor Emeritus

Kwang-Ching Liu, Ph.D., Professor Emeritus

Barbara Metcalfe, Ph.D., Professor Emeritus

Rollie E. Poppino, Ph.D., Professor Emeritus

Ruth E. Rosen, Ph.D., Professor Emerita

Academic Senate Distinguished Teaching Award

Morton Rothstein, Ph.D., Professor Emeritus

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

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-based education in the history of several geographic areas. Plan II encourages interrelated study, 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:

Preparatory Subject Matter

(Plan I or II) ........................................................................................................ 20

Five lower division courses, including at least two from each of two of the following fields ............................................................................................................. 20

(a) Western Civilization: History 3, 4A, 4B, 4C, 10

(b) Asian Civilization: History 8, 9A, 9B

(c) United States and Latin America: History

17A, 17B, 72A, 72B, 85, 86

(d) Africa: History 15

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer. 2007-2008 offering in parentheses

General Education (GE) credit: Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Social-Cultural Diversity, Wnt=Writing Experience
Minor Program Requirements:
The minor in History consists of five upper division courses chosen so that at least three courses are in one field and at least one course is in another field. The two fields shall be chosen from among those defined in the catalog for the major. However, students may also, in consultation with and with the authorization of a faculty adviser, define other thematic fields.

Units

History

At least 20 units of upper division history courses

Examples

- Pre-Law (British and American Political and Constitutional Development); The Twentieth Century; The History of Ideas in Society.
- Some as major advisers.
- Honors and Honors Program. A student becomes eligible for graduation with honors by meeting the minimum GPA (usually 3.500) and course requirements established by the College of Letters and Science. To qualify for high or highest honors, students must also complete the History Department honors program with a GPA of 3.000 or above and write a thesis that meets the criteria for high honors 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, interviews, and faculty recommendations. Students admitted to the program must complete the History 104A, 104B, 104C sequence of honor courses, which requires the completion of a senior honors thesis. Students who anticipate seeking admission to the honors program are urged to complete at least one History 102 (undergraduate seminar) before the end of their junior year. Interested students are urged to consult with faculty in their field early in their junior year. Students may follow either Plan I or Plan II above, and may substitute History 104B and 104C for any courses in their program other than History 102.
- Students who anticipate pursuing graduate work in history or a teaching credential, and who do not wish to opt for the research emphasis embodied in the honors program, are encouraged to select Plan II of the major.
- Study Abroad and the History Major. The department strongly encourages interested students to pursue their studies abroad. While there are no specific required courses or prerequisites, students are urged to take at least one history course that touches upon the geographic area where they plan to study abroad before departing. To receive a history degree from UC Davis, students must complete at least 18 upper division units in the history major at UC Davis (which can also include History 101, 102, 103). 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 of the student’s Study Abroad Program, or (c) the student presents copies of the course work, syllabus, and writing assignments to the department’s liaison person with the EAP office for approval.
- Note: students who wish to receive credit for courses taken abroad under programs other than EAP may petition the Undergraduate Program Committee to do so.
- Teaching Credential Subject Representative. See the Teaching Credential/M.A. Program on page 102.

Waiver Program for Single-Subject Teaching Credential in History. The Department of History is currently working with the School of Education to develop a program of study to satisfy the California Teaching Commission’s Subject Matter Competency requirement for the single subject credential in history/social science. For more information, contact Nancy McIntyre at the Area 3 History and Cultures Project, 175 Kerr Hall.

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 writing to the Graduate Adviser, Department of History.

Graduate Advisers. See the department’s Web site 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, 171A, 171B, 174A, 174B, 174C, 175A, 175B, 176A, 176B, 177A, 177B, 180A, 180B, 183A, 183B. The upper division courses may be used only with the consent of the instructor; see also under University requirements.

Courses in History (HIS)

Lower Division Courses

3. Cities: A Survey of Western Civilization

4A. History of Western Civilization
- Lecture—3 hours; discussion—1 hour. Growth of western civilization from late antiquity to the Renaissance. GE credit: ArtHum, Wrt.—I. (I.)

4B. History of Western Civilization
- Lecture—3 hours; discussion—1 hour. Development of western civilization from the Renaissance to the Eighteenth Century. GE credit: ArtHum, Wrt.—II. (II.)

4C. History of Western Civilization
- Lecture—3 hours; discussion—1 hour. Development of Western Civilization from the Eighteenth Century to the present. GE credit: ArtHum, Wrt.—I. (I.)

6. Introduction to the Middle East
- 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 and culture, politics and society. Offered in alternate years. GE credit: ArtHum or SocSci, Div. Wrt.—I. (I.) El Shakry, Teczan

7A. History of Latin America to 1700 (4)
- Lecture—3 hours; discussion—1 hour. Introduction to the history of Spanish and Portuguese America 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, and labor systems. GE credit: ArtHum or SocSci, Div. Wrt.—I. (I.) Resendez

7B. History of Latin America, 1700-1900 (4)
- Lecture—3 hours; discussion—1 hour. Latin America from colony to republic. The nature of Iberian colonialism, the causes for independence, the creation of nation states, the difficulties in consolidating these nations, and the rise of liberalism and export economies in the nineteenth century. GE credit: ArtHum or SocSci, Div. Wrt.—II. (II.) Walker

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 relations, neo-liberal restructuring. GE credit: ArtHum or SocSci, Div. Wrt.—III. (III.) Holloway

8. History of Indian Civilization (4)
- Lecture—3 hours; discussion—1 hour; written reports. Survey of Indian civilization 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 interaction and change. GE credit: ArtHum, Div. —I, II, III. (III.)

9A. History of East Asian Civilization (4)
Lecture—3 hours; discussion—1 hour. Surveys traditional Chinese civilization and its modern transformation. Emphasis is on thought and religion, political and social life, art and literature. Perspectives on contemporary China are provided. GE credit: ArtHum, Div. Wrt.—II, III, (II, III).

9B. History of East Asian Civilization (4)
Lecture—3 hours; discussion—1 hour. Surveys traditional Japanese civilization and its modern transformation. Emphasis is on thought and religion, political and social life, art and literature. Perspectives on contemporary Japan are provided. GE credit: ArtHum, Div. Wrt.—I. (I)

10A. World History to 1350 (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 1350, with particular attention to long-term trends and to periodic crises that reshaped the links of culture and nature on a global scale. Offered in alternate years. GE credit: ArtHum or SocSci, Div. Wrt.—II. (II, III.)

10B. World History, c. 1350-1850 (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 the emergence of the modern nation-state; the rise of the world market; the development of the modern church; the rise of the nation-states; and the process of globalization. GE credit: ArtHum, Wrt.—I. (I)

10C. World History to 1914 (4)
Lecture—3 hours; discussion—1 hour. Major topics in world history from 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 process of globalization. GE credit: ArtHum, Wrt.—III. (III.)

15. Introduction to African History (4)
Lecture—3 hours; discussion—1 hour. Examination of the long-range historical context as background to current-day realities in Africa. Includes the early development of African civilizations, the slave trade and its abolition, 20th century colonization, and African states in the 20th century. GE credit: ArtHum, Div. Wrt.—I. (I)

17A. History of the United States (4)
Lecture—3 hours; discussion—1 hour. The experience of the American people from the Colonial Era to the Civil War. GE credit: ArtHum, Div. Wrt.—I, II, III. (II, III)

17B. History of the United States (4)
Lecture—3 hours; discussion—1 hour. The experience 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, Div. Wrt.—II, III, (II, III)

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 until the late nineteenth century. Emphasizes changing roles and the family in the twentieth century. GE credit: ArtHum, Div. Wrt.—I. (I)

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 America, emphasizing female reformers and revolutionaries, working class women, consumerism, the role of media, the “feminine mystique,” changes in family life and the emergent women’s movement. GE credit: ArtHum, Div. Wrt.—II, (II)
121A. Medieval History (4)
Lecture/discussion and panel presentations—3 hours. The history of Europe from "the fall of the Roman Empire" to the eighth century. GE credit: ArtHum, Wrt.—I. (II.) Cadden

121B. Medieval History (4)
Lecture/discussion and panel presentations—3 hours. European history from Charlemagne to the twelfth century. GE credit: ArtHum, Wrt.—II. (III.) Cadden

121C. Medieval History (4)
Lecture/discussion and panel presentations—3 hours. European history from the Crusades to the Renaissance. GE credit: ArtHum, Wrt.—III. (IV.) Cadden

122. Selected Themes in Medieval History (4)
Lecture—3 hours; term paper. Each offering will focus on a single major theme, such as medieval agrarian history, feudalism, the family, medieval Italy, or the Crusades. Readings include original sources in English translation and modern works. May be repeated for credit. GE credit: ArtHum. Wrt.—I. (II.) Cadden

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 Italy, early modern Italy, Ancient Regime France, family and sexuality, and material culture and daily life. May be repeated for credit. GE credit: ArtHum, Wrt.—II. (III.) Harkness

130A. Christianity and Culture in Europe: 50-1450 (4)
Lecture—3 hours; written report or research paper. A history of the 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, Div, Wrt.—I. (II.) Harkness

130B. Christianity and Culture in Europe: 1450-1600 (4)
Lecture—3 hours; written report or research paper. A history of the Lutheran, Zwinglian-Calvinist, Reformed, 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, Div, Wrt.—II. (III.) Harkness

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 reconstruction 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.

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.—Stuart

131B. European History During the Renaissance and Reformation (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 Italian and Northern Renaissance, on the Protestant Reformation, and the Catholic Counter Reformation. GE credit: ArtHum, Wrt.—II. (III.) Stuart

131C. The Old Regime: Absolution, Enlightenment and Revolution in Europe (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 toleration in the French Revolution and the collapse of the old regime. GE credit: ArtHum, Wrt.—II. (III.) 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 processes of criminalization. GE credit: SocSci, Div, Wrt.—II. (III.) Stuart

133. The Age of Ideas (4)
Lecture—3 hours; written reports. The Enlightenment and its background in the seventeenth century. GE credit: ArtHum

134A. The Age of Revolution (4)
Lecture—3 hours; written reports. Ideas and institutions during the French Revolution and the Napoleon era. GE credit: ArtHum.—II. (III.) Margadant

135A. History of Science to the 18th Century (4)
Lecture/discussion—3 hours; term paper. Prerequisite: upper division standing. Survey of the historical 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.

136. Scientific Revolution (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 135A or 135B recommended. History of science in Western Europe (1400-1750). Investigates the changing definitions of science in the age of Copernicus, Vesalius, Harvey, Galileo and Newton. Considers the evolution of new ideas about nature, experiment, observation, and scientific theory. GE credit: ArtHum, Wrt.—II. (III.) Harkness

137A. Russian History: The Rise of the First Empire, 1500-1881 (4)
Lecture—3 hours; term paper. Prerequisite: courses 4B and 4C recommended. History of the fall of the Russian Empire and of the Revolution of 1917. Not open for credit to students who have completed former course 137B. GE credit: ArtHum, Wrt.—I. (II.) Brower

138B. Russian History: The Russian Revolution, 1880-1917 (4)
Lecture—3 hours; term paper. Prerequisite: courses 4B and 4C recommended. History of the fall of the Russian Empire and of the Revolution of 1917. Not open for credit to students who have completed former course 137B. GE credit: ArtHum, Wrt.—II. (III.) Brower

139C. Russian History: The Rise and Fall of the Soviet Union, 1917 to the Present (4)
Lecture—3 hours; term paper. Prerequisite: courses 4B and 4C recommended. The emergence of the Soviet Union as a socialist system and a Great Power; the decline and collapse of the Soviet Union and the formation of independent nations states in its place. Not open for credit to students who have completed former course 137C. GE credit: ArtHum, Wrt.—III. (IV.) Brower

139A. Medieval and Renaissance Medicine (4)
Laboratory/discussion—3 hours; term paper. The history of medicine, circa 1000-1700. Revival of ancient medicine; role of the universities; development of anatomy, chemistry and natural history; ideas about the body; cultural understanding of disease; hospital and the public health system. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt.—Cadden

139B. Medicine, Society, and Culture in Modern Europe (4)
Lecture—2 hours; discussion—1 hour; term paper. History of European medicine, 18th to 20th centuries, by examining the development of knowledge in epidemiology and anatomy; function of this knowledge, how it changed with technological breakthroughs and professionalization; role of medicine in attitudes toward gender, women, race, disease. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt.—III. (IV.) Kudlick

140. The Rise of Capitalism in Europe (4)
Lecture—3 hours; term paper. Prerequisite: course 4B or 4C. Comparative study of the 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. Integration of social, political, cultural, and economic history. Offered in alternate years. GE credit: ArtHum, Div, Wrt.—III. (IV.) Hagen

141. France Since 1815 (4)
Lecture—3 hours; term paper. GE credit: ArtHum, Wrt.—II. (III.) Margadant

142A. History of the Holocaust (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Topics include comparative genocide, medieval and modern antisemitism, modern German history, the rise of Nazism in Europe before the Nazi period, and the fate of the Jewish communities and other persecuted groups in Europe from 1933-1945. Offered in alternate years. GE credit: ArtHum, Div, Wrt.—I. (II.) Biale

142B. The Memory of the Holocaust (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. Examination of the literary, philosophical, and artistic responses to the Holocaust of the European Jews. Exploration of how memory is constructed, by whom and for what purposes. Offered in alternate years. GE credit: ArtHum, Div, Wrt.—I. (II.) Hagen

144A. History of Germany, 1450 to 1789 (4)
Lecture—3 hours; extensive writing. Survey of early modern Germany, 1450 to 1789; covering the theological 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. — III. (IV.) Stuart

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, industrialization; the World Wars, National Socialism, and the Holocaust; east and west Germany in the Cold War; the reunification scene. (Not open for credit to students who have completed former course 144.) GE credit: ArtHum, Div, Wrt.—II. (III.) Hagen

145. War and Revolution in Europe, 1789-1918 (4)
Lecture—3 hours; term paper. Survey of revolutionary movements, international relations, and war in Europe from the French Revolution to World War I. GE credit: ArtHum, Wrt.—II. (III.) Margadant

146A. Europe in the Twentieth Century (4)
Lecture—3 hours; term paper. Survey of the history of Europe from 1919 to 1939. GE credit: ArtHum, Wrt.—II. (III.) von Henneberg
1468. Europe in the Twentieth Century (4)
Lecture—3 hours; term paper. Survey of the history of Europe since 1939. GE credit: ArtHum, Wrt.—III. (III.) von Henneberg
147A. European Intellectual History, 1800-1870 (4)
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 one 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, Wrt.—I. (I.) Londau
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 nation, examining the transformation of landed to class society, oligarchy to democracy and bureaucracy, Bentham to Bloomsbury, empire to commonwealth. GE credit: ArtHum, Div, Wrt.—Landau
159. Women and Gender in Latin American History (4)
Lecture—3 hours; extensive writing. Prerequisite: one course either on Latin America or in women’s history in another world area. Roles 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, Div, Wrt.—III. (III.) Rivas
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 Spanish influence, its social and economic relations between Spain and America in the course of colonization. Offered in alternate years. GE credit: ArtHum, Div, Wrt.—(III.) Bauer
161A. History of Colonial Spanish America (4)
Lecture/discussion—3 hours; term paper. Pre-Columbian civilizations of Middle America and the Andean region (mainly Aztec and Inca); the impact of European conquest and colonization; the formation of a hybrid culture. CE credit: ArtHum, Div, Wrt.—I. (I.) Bauer
161B. Latin American History (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, Div, Wrt.—III. (III.) Walker
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, Div, Wrt.—III. (III.) C. Walker
163A. History of Brazil (4)
Lecture—3 hours; written reports. The history of colonial and imperial Brazil from 1500 to 1889. Offered in alternate years. GE credit: ArtHum, Div, Wrt.—III. (III.) Deyle
163B. History of Brazil (4)
Lecture—3 hours; written reports. The history of the Brazilian republic from 1889 to the present. Offered in alternate years. GE credit: ArtHum, Wrt.—III. (III.) Deyle
164. History of Chile (4)
Lecture—3 hours; term paper. Prerequisite: course 161A, 161B, 165, or 168 recommended. Emphasis on the history of Chilean political economy from 1930 to the present. Various strategies of development (modernization, Marxism, Neo-Liberalism); the rise of mass politics; the course of foreign relations; and the richness of Chilean literature. Offered in alternate years. GE credit: ArtHum. —III. Bauer
165. Latin American Social Revolutions (4)
Lecture—3 hours; written reports. Major social upheavals since 1900 in selected Latin American nations; similarities and differences in cause, course, and consequence. GE credit: ArtHum. —II. (II.) Bauer
166A. History of Mexico to 1848 (4)
Lecture/discussion—3 hours; written and/or oral reports. History of Mexico from 1808 to the present. Offered in alternate years. GE credit: ArtHum. —I. (I.) Resendez
166B. History of Mexico Since 1848 (4)
Lecture/discussion—3 hours; written and/or oral reports. History of Mexico from 1848 to the present. Offered in alternate years. GE credit: ArtHum. —I. (I.) Resendez
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. Offered in alternate years. GE credit: ArtHum, Wrt.—I. Walker, Resendez
168. History of Inter-American Relations (4)
Lecture—3 hours; term paper. Diplomatic history of Latin America since independence, Latin American relations, relations with the United States, participation in international organizations, and communism in Latin America. GE credit: ArtHum. —III. (III.) Deyle
169A. Mexican-American History (4)
Lecture/discussion—3 hours; written and/or oral reports. Economic, social, religious, cultural and political development of the Spanish-speaking population of the Southwestern United States from about 1800 to 1910. GE credit: ArtHum, Div, Wrt.—II. (II.) 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, Div, Wrt.—I. (I.) Smolenski, Taylor
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: ArtHum, Div, Wrt.—Smolenski, Taylor, Smolenski
170B. The American Revolution (4)
Lecture—3 hours; term paper. Analysis of the Revolutionary epoch 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: ArtHum, Div, Wrt.—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: ArtHum. —III. (III.) Deyle
171A. Jacksonian America (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. The political and social history of the United States from the end of the War of 1812 to the Compromise of 1850. How the Industrial Revolution transformed American life, and led the nation towards war. GE credit: ArtHum, Div, Wrt.—II. (II.) Deyle
171B. Civil War and Reconstruction (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 1850 to the end of Reconstruction in 1876. Causes of the war, the war itself, and the problems of reconstruction after the war. GE credit: ArtHum, Div, Wrt.—III. (III.) Deyle

Quarter Offered: I=Fall; II=Winter; III=Spring; IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Social-Cultural Diversity; Wrt—Writing Experience
171B. The Civil War in American Film (1)
Discussion—1 hour; film viewing. Prerequisite: course 17A or the equivalent. May be repeated once for credit when topics differ. Offered in alternate years. GE credit: ArtHum, Wrt.—III.

171D. Selected Themes in 19th Century American History (1)
Discussion—1 hour; 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 1890s, and southern history. May be repeated once for credit when topics differ. Offered in alternate years. GE credit: ArtHum, Wrt.—III.

172. American Environmental History (4)
Lecture—3 hours; term paper. Prerequisite: course 17A or 728 recommended. An introduction to the wide range of immigration 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 in alternate years. GE credit: ArtHum, Div., Wrt.—III.

174A. The Gilded Age and Progressive Era: United States, 1876-1917 (4)
Lecture—3 hours; term paper. Prerequisite: course 17B or 728 recommended. An examination of changing relations between people and nature in the area of the 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: ArtHum, Wrt.—III. Warren

173. Becoming an American: Immigration and American Culture (4)
Lecture—3 hours; term paper. Prerequisite: course 17A or 728 recommended. An introduction to the wide range of immigration 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 in alternate years. GE credit: ArtHum, Div., Wrt.—III.

174D. Emergence of Modern America: Discussion (1)
Discussion—1 hour; short papers. Prerequisite: course 17A or 728 recommended. Intensive discussion of topics and readings for course 174A. (P/NP grading only.)—I, II, III. (I.) Boyle

174AD. Emergence of Modern America: Discussion (1)
Discussion—1 hour; short papers. Prerequisite: course 17A or 728 recommended. Intensive discussion of topics and readings for course 174A. (P/NP grading only.)—I, II, III. (I.) Boyle

174B. War, Prosperity, and Depression: United States, 1917-1945 (4)
Lecture—3 hours; term paper. Prerequisite: course 17A, 17B, or 178 recommended. America's emergence as a world power, the business culture 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: ArtHum, Wrt.—I.

177A. History of Black People and American Race Relations (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 17A or 17B. History of black people in the United States from the African background to Recon- struction. GE credit: ArtHum, Div., Wrt.—I. C. Walker

177B. History of Black People and American Race Relations (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 17A or 17B. History of black people in the United States from the African background to Recon- struction. GE credit: ArtHum, Div., Wrt.—C. Walker

177A. Race in America, 1492-1865 (4)
Lecture—4 hours. Prerequisite: course 17A or 17B or 17A or 17B. Racial formation during 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: ArtHum, Div., Wrt.—II. Walker

177B. Race in America 1865-present (4)
Lecture/discussion—4 hours. Prerequisite: course 17A or 17B or 17A or 17B or 17A or 17B. Racial formation in the Post Civil War United States from 1860 to the present. Offered in alternate years. GE credit: ArtHum, Div., Wrt.—II. Walker

180A. Middle Eastern History: The Rise of Islam, 600-1000 (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. California history from the pre-colonial period to the present with particular focus on the history of California's Indians, political economy of the Spanish and Mexican periods, Gold Rush effects, industrialization, Hollywood, water politics, World War II, Proposition 13, or globalization. Offered in alternate years. GE credit: ArtHum, Div.—II. Warren

180B. Middle Eastern History: The Rise of Islam, 600-1000 (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 role of the imperial presidency. Not open for credit to students who have completed course 180A or 180C. GE credit: ArtHum, Wrt.—III. (III.) Rauchw, Olmedo

181. Religion in American History From 1890 (4)
Lecture—3 hours; term paper. Prerequisite: course 17A. American religious history from colonization through the Gilded Age. Topics include religious diversity in America; Native American religions; Protestant evangelicalism; gender and religion; religion and immigration; African American religion; religion in the Civil War, and religion's response to modernization. Offered in alternate years. GE credit: ArtHum, Wrt.—III. Smoleski

183A. The Frontier Experience: Trans-Mississippi West (4)
Lecture—3 hours; written and/or oral reports. The fur trade, western exploration and transportation, the Oregon Country, the Greater Southwest and the Mexican War, the Mormons, mining discovery, and the West during the Civil War. GE credit: ArtHum, Div., Wrt.—I. Taylor

183B. The Frontier Experience: Trans-Mississippi West (4)
Lecture—3 hours; written and/or oral reports. Spread of the mining kingdom, the range cattle industry, Indian-military affairs, settlement of the Great Plains and Rocky Mountain Regions and political organization of the West. GE credit: ArtHum, Div., Wrt.—II. 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, marriage, sexual violence, prostitution, inter-racial relationships, heterosexuality and homosexuality, the feminist, gay, and lesbian liberation movements, AIDS, commercialization of sexuality. Offered in alternate years. GE credit: ArtHum, Div., Wrt.—I. Materson

185A. History of Science in America (4)
Lecture—3 hours; research paper. Survey of the European background. Study of American scientific institutions, ideas, personalities, creative processes in science, and of relationships between technology and science from colonial times to present. GE credit: ArtHum, Wrt.

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, Wrt.

189. California History (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing. California history from the pre-colonial period to the present. GE credit: ArtHum, Div.—II. Warren

190A. Middle Eastern History: The Rise of Islam, 600-1000 (4)
Lecture—3 hours; extensive writing. Prerequisite: course 6 recommended. Middle Eastern history from the rise of the Islamic to the disintegration of the Abbasid Caliphate; the formative period of a civilization. Politics and religion, conquest and conversion, art and science, Christians, Jews and Muslims, gender
and sexuality, orthodoxy and heterodoxy. Offered in alternate years. GE credit: Arthum or SocSci, Div. Wrt.—II. Tezcan

190B. Middle Eastern History II: The Age of the Crusades, 1000-1400
Lecture—3 hours; extensive writing. Prerequisite: course 6 recommended. Middle Eastern history during the Crusades and Mongol 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.—I. Tezcan

190C. Middle Eastern History III: The Ottomans, 1400-1730 (4)
Lecture—3 hours; extensive writing. Prerequisite: course 6 recommended. Middle Eastern history from the foundation of the Ottoman Empire on the borderlands of Byzantine Anatolia through its expansion into Europe, Asia, and Africa, creating a new cultural synthesis including the Arab, Greek, Islamic, Mongol, Persian, Slavic, and Turkish traditions. Offered in alternate years. GE credit: Arthum or SocSci, Div. Wrt.—II. Tezcan

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 Div. Wrt.—I, II. (I) Bosler

191B. High Imperial China (4)
Lecture—3 hours; term paper. Political disunion and the influx of Buddhism; reunification under the great dynasties of T’ang, Sung, and Ming with analysis of society, culture, and thought. GE credit: Arthum Div. Wrt.—II. (II) Bosler

191C. Late Imperial China (4)
Lecture—2 hours; discussion—1 hour; two long papers. Prerequisite: course 9A or upper 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 and novels portraying elite ethos as well as popular culture. Offered in alternate years. GE credit: Arthum, Div. Wrt.—I. II. Mann

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. Div. Wrt.—I. II. (I) Bosler

191E. The Chinese Revolution (4)
Lecture—2 hours; discussion—1 hour; extensive writing. Prerequisite: upper division standing. Analysis of China’s cultural and political transformation from Confucian empire into Communist state. Emphasis on emergence and triumph of peasant revolutionary strategy (to 1949), with some attention to its implications for post-revolutionary culture and politics. GE credit: Arthum. Div. Wrt.—II. (II) Price

191F. The 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. Offered in alternate years. GE credit: Arthum. Div. Wrt.—III. (III) Mann

192. Internship in History (1-12)
Prerequisite: enrollment dependent on availability of internship positions, with priority to History majors. Supervised internship as historian, archivist, curator, or in another history-related capacity, in an approved organization or institution. (P/NP grading only.)

193A. History of the Modern Middle East, 1750-2014 (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: Orientalism, Orientalism, Arab intellectual renaissance, Islamic reform, state formation, role of subaltern groups. Offered in alternate years. GE credit: Arthum or SocSci, Div. Wrt.—II. (II) Metcalf

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 legacy 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.—III. El Shaky

194A. Aristocratic and Feudal Japan (4)
Lecture—3 hours, term paper and/or discussion. Survey of the cultural, social, economic, and political aspects of Japanese history from the seventeenth through the nineteenth centuries emphasizing the development of those patterns of thought and political organization with which Japan met the challenges of the nineteenth-century Western expansionism. GE credit: Arthum. Div. Wrt.—I. (I) Kim

194B. Early Modern Japan (4)
Lecture—3 hours; term paper and/or discussion. Survey of the cultural, social, economic, and political aspects of Japanese history in the twelfth century emphasizing labor and social movements, militarism and the Pacific war, and the emergence of Japan as a major economic power. GE credit: Arthum. Div. Wrt.—II. (II) Kim

194C. Modern Japan (4)
Lecture—3 hours; term paper and/or discussion. Survey of the cultural, social, economic, and political aspects of Japanese history in the twentieth century emphasizing labor and social movements, militarism and the Pacific war, and the emergence of Japan as a major economic power. GE credit: Arthum. Div. Wrt.—III. (III) Kim

194D. Business and Labor in Modern Japan (4)
Lecture—3 hours; term paper or papers. Survey of labor and management relations in Japan from the mid-eighteenth century to the present. Offered in alternate years. GE credit: Arthum. Wrt.—I. (I) Kim

194E. Education and Technology in Modern Japan (4)
Lecture—3 hours; term papers. Survey of education and technology in Japan from the mid-eighteenth century to the present. Offered in alternate years. GE credit: Arthum. Wrt.—II. (II) Kim

195A. History of Modern Korea (4)
Lecture—3 hours; laboratory/discussion—1 hour. Prerequisite: upper division standing. History of Modern Korea, from Yi dynasty period to 1900s. Political and socioeconomic changes in 19th century modernizing Korea and the Japanese occupation; postwar economic growth and effects of the Cold War. Offered in alternate years. GE credit: Arthum. Wrt.—I. (I) Kim

196A. Medieval India (4)
Lecture—3 hours; discussion—1 hour; written reports. Survey of history of India in the millennium preceding arrival of British in the eighteenth century, focusing on interaction of the civilizations of Hinduism and Islam and changing nature of the state. GE credit: Arthum. Div. Wrt.—I. (I) Metcalf

196B. Modern India (4)
Lecture—3 hours; discussion—1 hour; written reports. Survey of cultural, social, economic, and political aspects of South Asian history from critical of the British in the eighteenth century to formation of new independent states—India, Bangladesh, and Pakistan—in the twentieth century. GE credit: SocSci, Div. Wrt.—I. Metcalf

197. Tutoring in History (2)
Discussion—1 hour; laboratory—3 hours. Prerequisite: enrolled as a History major with senior standing and consent of department chairperson. Tutoring of students in lower division courses. Weekly meeting with instructors in charge of courses. Written reports on methods and materials required. May be repeated once for credit. No final examination. (P/NP grading only)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor; upper division standing. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Graduate Courses
201A-L, N, P-Q, S-T, X. Sources and General Literature of History (4)
Seminar—3 hours; term paper. Prerequisite: consent on instructor. Designed primarily for students preparing for higher degrees in history. (A) Medieval and Early Modern Medieval; (C) Renaissance and Reformations; (D) Early Modern Europe; (E) Europe since 1815; (F) China to 1880; (G) China since 1880; (H) Britain; (I) Latin America since 1810; (K) American History to 1787; (L) United States, 1787-1896; (M) United States since 1896; (N) Modern Japan; (P) African Historiography; (Q) Cross-Cultural Women’s History; (S) History of Science and Medicine; (T) Jewish History; (X) World History. May be repeated for credit when different subject area is studied.

201A-L. 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. Bossler, Haltunen, Hagen

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. (Deferred grading only, pending completion of sequence.)—II. III. (I, II, III)

204. Historiography (4)
Seminar—3 hours; term paper. Major issues in the philosophy and methodology of history. —I, (I)

211. 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 once for credit.

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) Bauer
Minor Program Requirements:
The interdisciplinary minor in 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 minor is sponsored by the Program in Science and Technology Studies.

UNITs

History and Philosophy of Science 24

Five courses from those listed below. One course must be from each of three areas: a) history; b) philosophy; and c) science and technology studies.

a) History 102, 135A, 135B, 136, 139A, 139B, 185A, 185B, 188A, 188B.
c) Science and Technology Studies 20, 130A, 130B, 131, 150, 180.

Minor Adviser. P. Carroll in 2272 Social Sciences and Humanities Building (530) 752-5388

Honors Challenge

Lolla Nelson-Adkins, Program Manager
Program Office, 167 Kerr Hall (530) 752-2335; http://www.honors.ucdavis.edu

The Program of Study

The Davis Honors Challenge (DHC) is a program for highly motivated students interested in enhancing their education through special courses, closer contact with faculty, and dynamic interaction with academic peers. Interested students apply in the spring quarter for places the following year. First- and second-year students participating in the DHC take two honors courses and one problem oriented interdisciplinary seminar per academic year. Second-year students have the option to substitute an honors contract for an honors course. Third-year students are required to complete two honors contracts and one upper division honors seminar. Fourth-year students participate in a year-long team project. All students who successfully complete the program receive transcript notation for each year of participation.

Lower division departmental honors courses, special DHC sections of regular courses, DHC seminars, and special studies opportunities constitute the course offerings of the Davis Honors Challenge. A complete list of these courses, with course registration numbers, is made available to admitted students through the Davis Honors Challenge office.

Lower division seminars are offered each year during winter and spring quarters. The seminars are designed to foster critical thinking and analytical interpretation, improve oral and written communication skills, enhance research skills, provide experience with group dynamics and collaborative exploration of problems. Enrollment in each seminar is limited to 20 students. Updated program information is available at our Web site.

Students not admitted to the program may not register for Davis Honors Challenge sections, seminars, or special study opportunities.

Courses in Davis Honors Challenge (HNR)

Lower Division Courses

90X. Honors Discussion Section (1)

Discussion—1 unit. Offered 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.
Human Anatomy

See Courses in Cell Biology and Human Anatomy (CHA), on page 354.

Human and Community Development

[College of Agricultural and Environmental Sciences]
Beth A. Ober, Ph.D., Chairperson of the Department
Michael P. Smith, Ph.D., Associate Chairperson of the Department
Community Studies and Development, Human Development and Family Studies, and International Agricultural Development

Department Advising Office. 1303 Hart Hall (530) 752-2244, 752-1805; http://hsd.ucdavis.edu

Faculty—Community Studies and Development
Ted Bradshaw, Ph.D., Professor
Stephen B. Brush, Ph.D., Professor
Luis E. Guarnizo, Ph.D., Associate Professor
Frank Hirtz, Ph.D., Associate Professor
Martin F. Kenney, Ph.D., Professor
William Lacy, Ph.D., Professor
Janet Mamsen, Ph.D., Professor
Michael P. Smith, Ph.D., Professor
Miriam J. Wells, Ph.D., Professor

Emeriti Faculty
Isao Fujimoto, M.A., Lecturer SOE Emeritus
Alvin D. Sokolow, Ph.D., Extension Specialist Emeritus
Orville E. Thompson, Ph.D., Professor Emeritus
Joan Wright, Ph.D., Extension Specialist Emeritus

Affiliated Faculty
David Campbell, Ph.D., Associate Extension Specialist
Jim Gregishop, Ph.D., Extension Specialist
Laurie Lippin, Ph.D., Lecturer
Bernadette Tarallo, Ph.D., Lecturer
Paul Marcatte, Ph.D., Lecturer
Robert Wiener, Ph.D., Lecturer

Faculty—Human Development and Family Studies
Brenda K. Bryant, Ph.D., Professor
Zhe Chen, Ph.D., Professor
Katherine Conger, Ph.D., Assistant Professor
Rand Conger, Ph.D., Professor
Xiaoqia Ge, Ph.D., Professor
Lawrence V. Harper, Ph.D., Professor
Rosemarie Kraft, Ph.D., Lecturer SOE
Katherine Maysn, Ph.D., Assistant Professor
Lisa Miller, Ph.D., Assistant Professor
Adrienne Nishina, Ph.D., Assistant Professor
Beth A. Ober, Ph.D., Professor

Emeriti Faculty
Keith Barton, Ph.D., Professor Emeritus
Emmy E. Werner, Ph.D., Professor Emeritus

Affiliated Faculty
Julie Law, Ph.D., Child Development Demonstration Lecturer
Cindy Linkhares, Child Development Demonstration Lecturer
Ann Matergeorge, Ph.D., Assistant Adjunct Professor
Lenna Ontai-Grzebik, Ph.D., Assistant Extension Specialist
Richard Ponzi, Ph.D., Extension Specialist

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses
General Education (GE) credit: ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Social-Cultural Diversity; Wrt=Writing Experience
Human Development

(Out of Agricultural and Environmental Sciences)

Faculty. See Department of Human and Community Development, on page 302.

The Major Program
Human development explores the developmental processes in humans throughout the life cycle. Biological, cognitive, and personality/social-cultural aspects of development are studied.

The Programs. Human development majors complete a group of preparatory courses in anthropology, general biology, genetics, history, philosophy, psychology, and statistics. Upper division students can design their programs in consultation with a faculty member to emphasize a particular interest. For instance, students can study the social and biological aspects of human development while emphasizing child or adult development.

Internships and Career Alternatives. At least one practicum course is required. A second practicum or supervised internship 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 2.500. All of the following courses must be taken for a letter grade.

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<thead>
<tr>
<th>Course</th>
<th>Units</th>
<th>Description</th>
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<tbody>
<tr>
<td>Psychology 10 or 13 or Psychology 41</td>
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<td>Sociology 46A or 468</td>
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<td>One course from Anthropology 1, 2 or 15</td>
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<td>One course from Biological Sciences 1A, 10,</td>
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<td>101, Microbiology 10, Molar Biology 10 or</td>
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<tr>
<td>Neurobiology, Physiology and Behavior 10, 12</td>
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B.S. Major Requirements:

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<tr>
<th>Units</th>
<th>Description</th>
<th>Notes</th>
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<tr>
<td>39-47</td>
<td>Preparatory Subject Matter</td>
<td>May be completed prior to degree.</td>
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<tr>
<td>50-55</td>
<td>Depth Subject Matter</td>
<td>Must be completed during the major.</td>
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<tr>
<td>12</td>
<td>Total Units for the Degree</td>
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Courses in Human Development (HDE)

Questions pertaining to the following courses should be directed to the instructor or to the Department of Human and Community Development, Advising office in 1303 Hart Hall (530) 752-2244.

Lower Division Courses

12. Human Sexuality (3)

Lecture—3 hours. Vocabulary, structure and 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 and maintaining intimacy; sexual dysfunctions; communication; enhancing sexual interaction; cultural differences in attitudes towards sexuality. GE credit: Div. I, II, III, IV Staff

13. Parenting (4)

Lecture/discussion—4 hours. Provides the basis for understanding the nature of the parenting process. Consideration of aspects of parenting that begin before conception and develop throughout the life cycle of the child and parent. GE credit: SocSci. —Bryant

92. Internship (1-6)

Internship—3-18 hours. Prerequisite: field work experience or at least one course, 100A, 100B, 140, 140L required to the fieldwork assignment; consent of instructor. Supervised internship, off and on campus, in community and institutional settings. (P/NP grading only.)

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 Courses

100A. Infancy and Early Childhood (4)

Lecture—4 hours. Prerequisite: Psychology 1 or 15, Biological Sciences 1A or 10. Analysis of the biological, social, and cultural influences in the psychological growth and development of children, prenatal through age six. —I, II, III, IV Staff. Harper, Chen

100B. Middle Childhood and Adolescence (4)

Lecture—4 hours; three brief observations of school-age children. Prerequisite: course 100A or the equivalent introductory biology. Analysis of the interplay of biological and social-cognitive factors in emotional, cognitive and social development from middle childhood through adolescence. —I, II, III, IV Staff

100C. Adulthood and Aging (4)

Lecture—4 hours; term paper. Prerequisite: Psychology 1 or 15. Development during early, middle, and late adulthood; biological, cognitive, and psycho-social aspects of adult development. Emphasis on normative patterns of development which characterize "successful aging." —I, III, Miller, Ober

101. Cognitive Development (4)

Lecture—3 hours; term paper. Prerequisite: course 100A or 100B or Psychology 140. Pass 1 restricted to Human Development or Psychology majors. Theories, methods, 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, perception, abstract thought, and social and physical and social world and language. (Same course as Psychology 141.) GE credit: Wrt.—I, II, III, IV Staff. Chen, Goodman, Lagattuta, Rivera

102. Social and Personality Development (4)

Lecture—3 hours; term paper. Prerequisite: course 100A or 100B or Psychology 140. Pass 1 open to Human Development or Psychology majors. Social and personality development in children, infancy through adolescence. Topics include the development of personality, achievement motivation, self-understanding, sexuality, social roles, and antisocial behavior. Emphasis on the interface between biolog...
103. Cross-Cultural Study of Children (4)
Lecture—4 hours. Prerequisite: course 100A or consent of instructor. Cross-cultural studies of children in developing countries and among minority groups in the U.S. GE credit: Div. III.

110. Contemporary American Family (4)
Lecture—4 hours. Prerequisite: introductory psychology. Factors currently influencing American families including changing economic conditions, changing sex roles, divorce, and parenthood, theories and research on family interaction.—II, III. K. Conger

117. Longevity (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing or consent of instructor. Nature, origin, terms, and limits of longevity with particular reference to humans; emphasis on implications of findings from non-human model systems including natural history, ecology and evolution of the life span; description of basic demographic techniques including life table methods. (Same course as Entomology 117.) GE credit: Sci/Eng, Writ.—I. Carey

120. Research Methods in Human Development (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 100A or 100B, and Statistics 13 or Education 114 or Psychology 41 or Sociology 46A and 46B. Topics include scientific view of human development, origins of scientific inquiry; research strategies; preparation for conducting research; descriptive statistics and statistical inference (hypothesis testing); statistical analysis and understanding results. Major emphasis on experimentation, collecting data and analyzing results.—I, II, III. Masyn, Nishina

121. Psychological Assessment (4)
Lecture—4 hours. Prerequisite: courses 100A-100B, elementary statistics and methodology related to the process of psychological assessment with children.—I. Nishina

130. Emotionally Disturbed Children (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100A or 100B or consent of instructor. Discussion of psychosis, neurosis, behavior disorders, and learning difficulties in children.—I, II, III. Bryant, Mastergeorge

131. Individual and Group Differences in Cognition (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100B or consent of instructor. Neurodevelopmental substrates and educational implications for individuals and differences within in cognition which impact learning disabilities, memory, intelligence, genius and creativity. Group differences in cognition as well as individual case studies will be discussed.—I, II, III. Bryant, Thompson

140. Communication and Interaction with Young Children (2)
Lecture—2 hours. Prerequisite: courses 30, 100A, and 140L (concurrent enrollment recommended). Theory and practice in the area of effective interaction with young children. Humanistic, child-centered approaches; awareness of goals, beliefs, and values as these affect interactions. To enroll, students must sign up for a consultation with the Child and Family Studies Center.—I, II, III. (I, II, III.) Thompson

140L. Laboratory in Early Childhood (3-6)
Discussion—3 hours; laboratory—6-15 hours. Prerequisite: course 140 may be taken concurrently. Application of theories of learning and development to interaction with children six months to five years at Early Childhood Laboratory. Applied skills in communication, discipline and curriculum. May be repeated for credit a total of 12 units. (P/NP grading only.)—I, II, III. (I, II, III.) Thompson

141. Field Studies with Children and Adolescents (4-6)
Discussion—2 hours; field study—6-12 hours. Prerequisite: course 100B or equivalent and consent of instructor. Study of children's effective, cognitive and social development within the context of family school environments, hospitals and foster group homes. May be repeated for credit for a total of 12 units following consent of instructor.—I, II, III. Kraft, Ponzo

142. Field Studies with Exceptional Children (4-6)
Discussion—2 hours; field study—6-12 hours. Prerequisite: course 100C or 160 may be taken concurrently. Field study with children who are identified as developmentally disabled, emotionally disturbed, or intellectually gifted. May be repeated for credit for a total of 12 units following consultation with and consent of instructor.—I. Bryant

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. To apply theory and research on adult development and aging, to work with older adults in a variety of settings, and to develop skills relevant to that application. Students will also develop a small research project.—I. Ober

160. Social Aspects of Aging (4)
Lecture—4 hours. Prerequisite: course 100C or Psychology 115. How the social context affects adult development. Focus is on intergenerational demography, social policy, culture, and adaptation. Oral histories as class projects. Offered in alternate years. GE credit: Div. C.

162. Issues in Aging (3)
Lecture—2 hours; lecture/discussion—1 hour. Prerequisite: course 100C or 160. Research and policy issues concerning the elderly and aging in contemporary society. Offered in alternate years.

163. Cognitive Neuropsychology in Adulthood and Aging (4)
Lecture/discussion—4 hours. Prerequisite: Psychology 1; course 100C recommended. Theories, methods, and findings concerning the relationship between cognitive processes and brain functioning. Readings, lectures, and in-class discussions cover research on normal younger and older adults, neuropsychological case studies, and selected patient groups (e.g., amnesia, schizophrenia, Alzheimer’s disease). Ober

180. Aging and Health (3)
Lecture—3 hours. Prerequisite: upper division standing; course 100C recommended. Changing nature and determinants of health and illness in the older population, including normal aging changes, chronic health problems, and disease prevention. Systems of formal and informal care for the elderly. One field trip required.—I. Ober

190C. Introductory Research Conference (1)
Discussion—1 hour. Prerequisite: involvement in ongoing research. Instructors lead discussions with undergraduate students who involve themselves in a research project. Research papers are reviewed and aspects of project proposals developed out of class are presented and evaluated. May be repeated for credit. (P/NP grading only.)—I, II, III. (I, II, III.)

190C. Directed Group Study (1-5)
(P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only.)

Graduate Courses

200A. Early Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: graduate standing; basic biology or physiology; one upper division course in psychology or a related field; one upper division course in developmental psychology (may be taken concurrently). Theory and research on the biological, social, cognitive, and cultural aspects of development from conception to the age of five years.—I. Chen, Harper

200B. Middle Childhood and Adolescence (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: graduate standing; basic biology or physiology, and at least two upper division or graduate-level courses in psychology or related fields. Theory and research on biological, cognitive, social, and cultural influences on behavioral development from age five years until late adolescence.—II. Bryant, Ge

200C. Development in Adulthood (4)
Lecture/discussion—4 hours. Prerequisite: courses 200A and 200B. Theory and research focusing on social, personality, cognitive, and biological development from early to late adulthood. Emphasis is on theory development and continuity and change.—III. Ober, Miller

201. Social-Emotional Development in Infancy (4)
Lecture/discussion—4 hours. Prerequisite: course 200A. Analysis of theory, methods, and research on social-emotional development of infants. Emphasizes the development of primary and secondary emotions, and the development of attachment. Other possible topics include infant temperament, sex differences, compliance, and self-regulation. Offered in alternate years.

203. Adolescent Behavioral and Emotional Development (4)
Lecture/discussion—4 hours. Prerequisite: course 200B. Analysis of recent theoretical developments, and major findings on adolescent behavioral and emotional development, including contextual and genetic influences on adolescence, pubertal transitions, and social-familial contexts and processes. Emphasis on multi-level mechanisms underlying adolescent behavioral and emotional development. Offered in alternate years. Ge

210. Theories of Behavioral Development (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: graduate standing in behavioral sciences. Consideration of enduring issues in theories of behavioral development; analysis of adequacy of major theoretical schools (e.g., social learning, Piagetian) as scientific theories. Offered in alternate years. Harper

211. Physiological Correlates of Behavioral Development (3)
Seminar—3 hours. Prerequisite: consent of instructor. An overview of mechanisms of organismic development and the implications of developmental biology for the analysis of behavioral ontogeny, considering parallels between processes of organismic development and behavioral development in children and intra-human mammals.—I. Harper

212. Adaptation and Aging (3)
Lecture/discussion—3 hours. Prerequisite: course 200C. Interdisciplinary perspective on the ways biological, psychological, and sociocultural factors affect aging and adaptation in late life. Focus is on the ways in which stress, coping, and social support affect health and the functioning which contribute to optimal aging. Offered in alternate years.—II

213. Cross-Cultural Study of Children (3)
Lecture—2 hours; discussion—1 hour; field project or paper. Prerequisite: graduate standing in Human Development, Education, Anthropology, Psychology or Sociology. Current theory and research concerned with comparative child development. Introduction into the major issues and methods of cross-cultural research (e.g., biological, cognitive, and social development of children in different cultures and subcultures in U.S.A.). Offered in alternate years.

217. Development of Cortical and Perceptual Laterality (3)
Seminar—3 hours. Prerequisite: graduate standing in child or human development or consent of instructor. Current theory and research regarding the development of human cortical and perceptual lateralization—emphasizing the relationship of this development to thinking and behavior. Offered in alternate years. Kraft

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer. 2007-2008 offering in parentheses.
220. Research Methods in Human Growth and Development (4)
Lecture—2 hours; discussion—2 hours. Prerequisite: level 13 or the equivalent and at least two upper division courses in Human Biology or Developmental Psychology. Overview of qualitative and quantitative approaches to empirical studies in the social sciences, with a focus on theory and research methods in biological growth and cognitive and social/emotional development from prenatal period to death. —II. (I.) Masyn

221. Psychological Assessment of Children (4)
Lecture—2 hours; discussion—2 hours. Prerequisite: course 121 or consent of instructor. Study of children’s behavior through examination, analysis and evaluation of psychological tests, cognitive, affective and social development. Problems in assessment of exceptional children considered. Assignments focus on preparation of a comprehensive report on one child.

222. Applied Research and Program Evaluation (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing and consent of instructor. Focuses on the design and conduct of applied research and evaluation studies, especially with regard to programs serving children and their families. Offered in alternate years. —III. Brauman

231. Issues in Cognitive and Linguistic Development (3)
Seminar—3 hours. Prerequisite: consent of instructor. Study and evaluation of key issues in the theoretical and empirical literature on cognitive and linguistic development —III. Kraft

232. Cognition and Aging (3)
Lecture/discussion—3 hours. Prerequisite: course 200C. The manner in which cognitive processes are affected by aging as well as an understanding of the changes in the central nervous system occurring with aging. Offered in alternate years. Ober

234. Children’s Learning and Thinking (3)
Seminar—3 hours. Prerequisite: course 200A or Psychology 212 recommended. Analysis of theories, research methods, and major findings of children’s higher order cognition, including origins of knowledge, development of problem solving skills, reasoning strategies, and scientific concepts, with an emphasis on the underlying mechanisms involved in children’s thinking and learning processes. Offered in alternate years. —III. Chen

237. Parent-Child Interaction (3)
Seminar—3 hours. Prerequisite: consent of instructor; upper division course in the family recommended. Current theory and research. Emphasis on parental behavior in other animals and other cultures, child-rearing practices, the child’s perception of parents, the differential influence of each parent on the child’s psychological well-being, sex-role development, and moral development. Offered in alternate years.

238. The Context of Individual Development (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing in Human Development, Child Development, Education, Psychology, Anthropology, Sociology, or consent of instructor. Analysis of human development within the context of daily life. Contextualizing theories and methods of developmental psychology will be distinguished from contextual theories and methods. Developmental psychological models will be distinguished from child psychology models. Offered in alternate years. Bryant

242. Adolescent Health Behavior: Theory and Programs (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing in child or human development, or consent of instructor; course 200B recommended. Theoretical conceptions relating to adolescent behaviors that have an impact on health (e.g., use of tobacco, alcohol and other drugs; sexual behavior; accident prevention). Development and evaluation of programs that aim to influence adolescents’ behaviors or attitudes in these areas. Offered in alternate years.

290. Seminar (3)
Seminar—3 hours. Discussion and evaluation of theories, research, and issues in human development. Different topics each quarter. —I, II, III. (I, II, III.)

290C. Research (1-4)
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. (I, II.) R. Conger, Kraft

292. Graduate Internship (1-12)
Internship—336 hours. Prerequisite: consent of instructor and satisfactory completion of placement requirements for graduate study and evaluation of key issues in the theoretical and empirical literature on cognitive and linguistic development —III. Kraft

298. Group Study (1-5)
299. Research (1-12)
(S/U grading only)

Professional Course

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.)

Human Development (A Graduate Group)

Human Development (A Graduate Group)
Lawrence V. Harper, Ph.D., Group Chairperson
Group Office. 1337 Hart Hall
(Please fill out the corresponding office information)
http://humandevelopment.ucdavis.edu

Faculty

Thomas F. Anders, M.D., Professor (Psychiatry)
Karen A. Bryant, Ph.D., Professor (Human and Community Development)
Zhe Chen, Ph.D., Professor (Human and Community Development)
Katherine J. Conger, Ph.D., Assistant Professor (Human and Community Development)
Rand Conger, Ph.D., Professor (Human and Community Development)
Kathryn G. Dewey, Ph.D., Professor (Nutrition)
Emilio Ferrer, Ph.D., Assistant Professor (Psychology)
Xiaojia Ge, Ph.D., Professor (Human and Community Development)
Beth Goodlin-Jones, Ph.D., Assistant Adjunct Professor (Psychiatry)
Gail Goodman, Ph.D., Professor (Psychology)
Rangy Hagerman, M.D., Director (M.I.N.D. Institute)
Robin L. Hansen, M.D., Associate Professor (Pediatrics)
Lawrence V. Harper, Ph.D., Professor (Human and Community Development)
Emily S. Harris, M.D., Assistant Professor (Psychiatry)
David Hesel, Ph.D., Assistant Professor (Psychiatry)
Sudh Joseph, Ph.D., Professor (Anthropology, Women and Gender Studies)
Penelope Knapp, M.D., Professor (Psychiatry)
Rosemarie H. Kraft, Ph.D., Lecturer (Sociology)
Seymour Levine, Ph.D., Adjunct Professor (Psychiatry)
Katherine Masyn, Ph.D., Assistant Professor (Human and Community Development)
Lissa Miller, Ph.D., Assistant Professor (Human and Community Development)
Thomas L. Morrison, Ph.D., Professor (Psychiatry)
Adrienne Nishina, Ph.D., Assistant Professor (Human and Community Development)
Beth A. Ober, Ph.D., Professor (Human and Community Development)
Susan Rivera, Ph.D., Assistant Professor (Psychology)
Richard W. Robbins, Ph.D., Assistant Professor (Psychology)
Jonathan H. Sandoval, Ph.D., Professor (Education)
Phillip Shaver, Ph.D., Professor (Psychology)
Ross A. Thompson, Ph.D., Professor (Psychology)
Susan Timmer, Ph.D., Clinical Specialist (Pediatrics)
Anthony Urquiza, Ph.D., (Pediatrics)
Kagawa will be Gregor, and will be involved in research with (Education)
Miriam J. Wells, Ph.D., Professor (Human and Community Development)
John Werner, Ph.D., Professor (Ophthalmology, Neurobiology, Physiological Psychology)
Keith Widaman, Ph.D., Professor (Psychology)

Affiliated Faculty

Kristin Alexander, Ph.D., (Human and Community Development)
Joanne Deocampo, Ph.D., Academic Administrator (Human and Community Development)
Ann Driscoll, Ph.D., Research (Human and Community Development)
Ann Mastergeorge, Ph.D., Assistant Adjunct Professor (Human and Community Development)
Lenna Ontai-Grzebik, Ph.D., Assistant Extension Specialist (Human and Community Development)

Graduate Study. The interdisciplinary and interdepartmental Graduate Group in Human Development offers a program of study leading to the Ph.D. degree. The program provides an in-depth 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 conduct research, and to be actively involved in public service in human behavioral development.

Applicants seeking consideration for admissions and fellowships must submit all materials by January 1.

Graduate Adviser. Contact the Group office.

Humanities

(Subjects of Letters and Science)

Georges Van Den Abbeele, Ph.D., Program Director
Program Office. 176 Voorhis
(Please fill out the corresponding office information)
http://humanities.ucdavis.edu

Committee in Charge

Moradewun Adejumobi, Ph.D. (African American and African Studies)
Joan Cadden, Ph.D. (Comparative Literature)
JoAnn Cannan, Ph.D. (French and Italian)
Caroly Thomas de la Peña, Ph.D. (American Studies)
Frances Dolan, Ph.D. (English)
Gayatri Gopinath, Ph.D. (Women and Gender Studies)
Ines Hernandez-Avila, Ph.D. (Native American Studies)
Caren Kaplan, Ph.D. (Cultural Studies)
Dean MacCannell, Ph.D. (Environmental Design)
Pablo Ortiz, D.M.A. (Music)
Brenda Schildgen, Ph.D. (Comparative Literature)
Academic Federation Excellence in Teaching Award
Blake Stimson, Ph.D. (Art History)
Georges Van Den Abbeele, Ph.D. (French and Italian, Humanities)
Louis S. Warren, Ph.D. (History)
Aram Yengoyan, Ph.D. (Anthropology)
The Program of Study

The Humanities program offers courses in the Humanities proper and also sponsors the minor in Global and International Studies. Courses in the Humanities proper are interdisciplinary in scope and aim to develop critical thinking and writing skills (most courses fulfill partial or complete GE requirements) in three areas: major authors and texts, major periods, major themes in world culture.

Courses in Humanities (HUM)

Lower Division Courses

1. Humanities Forum (2)
Lecture—2 hours. Reading and discussion of a single work representing a particular culture, historical period, or genre and significant for its ongoing cultural impact in the humanities, sciences, social sciences, technology, and popular arenas. Attention to provocative implications for contemporary society. May be repeated one time for credit if topic differs. GE credit with concurrent enrollment in HUM 1D.—I, II, Ill, (I, II, III).

1D. 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 once for credit if topic differs. GE credit with concurrent enrollment in course 1: ArtHum, Wrt.

2. Medicine and Humanities (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: completion of Subject A requirement. Evolution of the “medical arts” into the “sciences of medicine.” The culture of medicine in the context of society, medical ethics. GE credit: ArtHum, or SocSci, Div, Wrt.

3. Medicine and Humanities (2)
Lecture/discussion—3 hours; extensive writing. Prerequisite: completion of Subject A requirement. Evolution of the “medical arts” into the “sciences of medicine.” The culture of medicine in the context of society, medical ethics. GE credit: ArtHum, or SocSci, Div, Wrt.

3D. 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 once for credit if topic differs. GE credit with concurrent enrollment in course 1: ArtHum, Wrt.

3. Medicine and Humanities (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: completion of Subject A requirement. Evolution of the “medical arts” into the “sciences of medicine.” The culture of medicine in the context of society, medical ethics. GE credit: ArtHum, or SocSci, Div, Wrt.

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.—I. Schiesari.

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 with concurrent enrollment in course 4: ArtHum, Wrt.—I. Schiesari

5. Representation of the Law in Literature and Film (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: completion of Subject A requirement. The relationships among literature, film, and the law, from Greek tragedy to popular American fiction and films. Common law and literature portraying human experience. GE credit: ArtHum or SocSci, Wrt.

6. Wagner and Star Wars (4)
Lecture/discussion—3 hours; extensive writing. Wagner’s Ring and Lucas’ Star Wars, as examples of 19th and 20th centuries approaches to the arts and their relationship with the society. GE credit: ArtHum or SocSci, Wrt.—Ortiz

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. Contemporary 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 or SocSci, Wrt.

8. Introduction to Perspectives on Narrative (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: completion of Subject A requirement. Interdisciplinary approach to the use of story across time, culture, and discipline. How the telling and retelling of particular stories reflects the values, concerns, and assumptions of their original audiences and genres. GE credit: ArtHum or SocSci, Wrt.

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 with concurrent enrollment in course 9D: ArtHum, Wrt.—Martin

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.—Martin

10. Shakespeare in Performance (4)
Lecture/discussion—4 hours. Reading, viewing, and discussion of one or two Shakespeare plays with focus on the relationship between text and performance (on stage and on film); analysis of the relationship between presentation of Shakespeare and cultural world view, meaning, and aesthetics. GE credit: ArtHum, Wrt.—Dolan

11. History of the Book (4)
Lecture/discussion—3 hours; extensive writing. The invention and impact of printing systems on culture, including the invention of the printing press, the introduction of the codex, illustrations, the book-buying client, and the history of censorship and book burning and their connection to the technology of the word. Offered in alternate years. GE credit: ArtHum or SocSci, Wrt.

12. Witches: Myth and Historical Reality (4)
Lecture—3 hours; extensive writing. This course examines the historical construction of the witch. The four areas covered: 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 fairies/elves. GE Credit: ArtHum, Wrt.—II. Ill. Krimmer

13. 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 groups. Language ideology affecting linguistic groups, including bilinguals and non-native speakers of English. Offered in alternate years. GE credit: ArtHum, Div, Wrt.—II. Ill. Wurt.

40. Introduction to Computing in the Humanities (4)
Lecture—3 hours; laboratory—3 hours. Survey of current approaches to use of computers in such fields as language, art, music, and drama. Laboratory in text creation and analysis.—Raddy

50. 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, welfare state) around which individuals, communities and institutions define themselves in American society, by applying principles of narrative theory to the narratives where those issues are embedded. GE credit: ArtHum or SocSci, Wrt.

92. Internship (1-12)
Internship—3-36 hours. Internships in fields where students can practice their skills. May be repeated one time for credit. GE credit: ArtHum, Wrt.

14. Marx, Nietzsche, Freud (4)
Lecture/discussion—3 hours; term paper. Study of major texts of these thinkers 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 credit: ArtHum, Wrt.—Finney

145. The Literature of Deviance: Mann, Hesse, Kafka (4)
Lecture—3 hours, term paper. Close study of selected prose works of Mann, Hesse, and Kafka as representative of modernism’s fascination with social, sexual, and psychological alienation. Attention to the nuanced portrayal of deviance through formal innovations in fiction. Offered in alternate years.

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.

192. Internship (1-12)
Internship—3-36 hours. Internships in fields where students can practice their skills. May be repeated one time for credit. GE credit: ArtHum, Wrt.

198. Directed Group Study (1-4)
Prerequisite: consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-4)
Prerequisite: consent of instructor. (P/NP grading only.)

Graduate Courses

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. —II, Ill, (II, Ill, III). Graded pass/fail.

292. Graduate Internship (1-15)
Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: consent of instructor required. Individuals designed supervised internship, off campus, 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)
(S/U grading only.)

299. Individual Research (1-4)
Individual research in the humanities resulting in a formal written research report. (S/U grading only.)

Professional Course

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. (S/U grading only.)

Hydrologic Sciences

(A Graduate Group)

Mark Grismer, Ph.D., Chairperson of the Group

Hydrologic Sciences Group Office.

113 Veihmeyer Hall or 1152 Plant

Mark Grismer, Ph.D., Chairperson of the Group

Hydrologic Sciences Group Office.

113 Veihmeyer Hall or 1152 Plant

http://lawr.ucdavis.edu/graduate_hyd.htm

http://lawr.ucdavis.edu/hsgg/index.htm

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http://lawr.ucdavis.edu/graduate_hyd.htm

http://lawr.ucdavis.edu/hsgg/index.htm

Graduate Office.
Faculty

William Casey, Ph.D., Professor (Chemistry)
Randy Dahlgren, Ph.D., Professor (Land, Air, and Water Resources)
Jeanie Darby, Ph.D., Professor
(Civil and Environmental Engineering)
Harrison Dunning, II.R., Professor (School of Law)
Graham Foster, Ph.D., Professor (Land, and Air, and Water Resources)
Timothy Ginn, Ph.D., Professor (Civil and Environmental Engineering)
Mark Grismer, Ph.D., Professor
(Land, and Air, and Water Resources)
David Hinton, Professor
(Brigham Young University)
Cracker Nuclear Laboratory
Jan Hopmans, Ph.D., Professor
(Land, Air, and Water Resources)
Willie Harvath, Ph.D., Professor
(Land, and Air, and Water Resources)
Alan Jackman, Ph.D., Professor
(Chemical Engineering and Materials Science)
Michael Johnson, Ph.D., Director (Aquatic Ecosystem Analysis Laboratory)
Lester Kayvash, Ph.D., Professor
(Civil and Environmental Engineering)
Bruce Kutter, Ph.D., Professor
(Civil and Environmental Engineering)
Bruce Larock, Ph.D., Professor
(Civil and Environmental Engineering)
Jay Lund, Ph.D., Professor
(Civil and Environmental Engineering)
Miguel Marino, Ph.D., Professor
(Land, and Air, and Water Resources)
Jeffrey Mount (Geology)
Alexandra Novotny, Ph.D., Professor
(Land, Air, and Water Resources)
Gregory Pasternack, Ph.D., Associate Professor (Land, Air, and Water Resources)
Kyaw Tha Paw U, Ph.D., Professor
(Land, Air, and Water Resources)
Carlos Puente, Ph.D., Professor
(Environmental Science and Policy)
Eliska Rejkmanova, Ph.D., Professor
(Environmental Science and Policy)
Paul Sabatier, Ph.D., Professor
(Environmental Science and Policy)
Geoffrey Schladow, Ph.D., Professor
(Civil and Environmental Engineering)
Kate Scow, Ph.D., Professor
(Land, Air, and Water Resources)
Susan Ustin, Ph.D., Professor
(Land, Air, and Water Resources)
Wesley Wallender, Ph.D., Professor
(Land, Air, and Water Resources)
Bryan Weare, Ph.D., Professor
(Land, Air, and Water Resources)
Tom Young, Associate Professor
(Civil and Environmental Engineering)

Emeriti Faculty

Charles Goldman, Ph.D., Professor Emeritus
Theodore Hisao, Ph.D., Professor Emeritus
Dennis Rolston, Ph.D., Professor Emeritus
Roger Shaw, Ph.D., Professor Emeritus
Marilyn Shelton, Ph.D., Professor Emeritus
Kenneth Tanji, Sc.D., Professor Emeritus
Stephen Whitaker, Ph.D., Professor Emeritus

Affiliated Faculty

David Goldhamer, Ph.D., Irrigation Specialist
(Land, Air, and Water Resources)
Stephen Hall, Ph.D., Water Relations Specialist
(Land, Air, and Water Resources)
Blaine Hanson, Ph.D., Irrigation Specialist
(Land, Air, and Water Resources)
Thomas Haverstick, Ph.D., Cooperative Extension Specialist
(Land, Air, and Water Resources)
Terry Prichard, M.S., Water Management Specialist
(Land, Air, and Water Resources)

Lawrence Schwankl, Ph.D., Irrigation Specialist
Richard Snyder, Ph.D., Biometeorologist Specialist
Kathleen Tate, Extension Rangeland Specialist
(Agronomy and Range Science)

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 Chemistry. 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 on earth. Because of water's ubiquity and importance to physical, chemical and biological processes, hydrologic sciences involve the geologic, atmospheric and oceanic sciences, as well as engineering and other applied physical sciences. Basic to the program are core courses in fluid dynamics, hydrodynamic phenomena, hydrobiology, hydrogeochemistry, hydrologic techniques, and hydrologic policy. Students can pursue specializations in hydrogeochemistry, surface hydrology, subsurface hydrology, irrigation 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 have completed or be completing an undergraduate degree in environmental or physical sciences, mathematics, or engineering. Undergraduates, especially those in engineering, must complete one year of vector calculus, linear algebra and differential 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 individual program of study. Students not only pursue the direction of a group of faculty members with similar interests but also pursue their own interests. Course work in addition to the above is typically taken in the most appropriate disciplines.

Graduate Adviser. Mark E. Grismer (Land, Air, and Water Resources)

Courses in Hydrologic Sciences (HYD)

Graduate Courses

200. Survey of Hydrologic Sciences (1)
Seminar—1 hour; term paper. Prerequisite: open to students in the Hydrologic Sciences program. Seminar course exposes students to the diversity of sciences involved 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, II, III (II, III) Grismer

205. Continuum Mechanics of Natural Systems (4)
Lecture/discussion—4 hours. Prerequisite: Mathematics 210 and 222, Physics 98. Continuum mechanics of static and dynamic air, water, and earth and biological systems using hydraulic, heat and electrical conduction, diffusion, dispersion, stress, deformation, velocity gradient, stretch and spin tensors. (Same course as Biological Systems Engineering 205.) – I. Wallender

210. Vadose Zone Transport Processes and Modeling (3)
Lecture/discussion—3 hours. Prerequisite: Soil Science 107, Mathematics 226, programming language, or consent of instructor. Principles and modeling of vadose flow and chemical transport in the vadose zone, with specific applications to soils. Topics 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. – (III) Hoppman

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 programming techniques to water resource planning, analysis, design, and management. Water allocation, capacity expansion, and reservoir operation. Con-junctive use of surface water and groundwater. Water quality management. Irrigation planning and optimization models. (Same as Biological Systems Engineering 243.) – I. (II) Marino

252. Hillslope Geomorphology and Sediment Budgets (4)
Lecture—3 hours, fieldwork—3 hours. Prerequisite: course 141 or Geology 55 or Civil and Environmental Engineering 142 or consent of instructor. Exploration of theoretical and empirical foundations of sediment production on hillslopes using computer models and field data. Emphasis on understanding of how watersheds evolve naturally and with human impacts. 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 Environmental Engineering 42 or consent of instructor. Survey of the processes and landforms associated with sediment deposition in the coastal zone. Application of geomorphic principles to coastal management issues. Offered in alternate years. – III. Pasternack

264. Modeling of Hydrologic Processes (3)
Lecture—3 hours. Prerequisite: course 141 or the equivalent and Statistics 102 or the equivalent. Techniques used to model the spatio-temporal structure of rainfall and runoff are introduced. Procedures studied include those based on stochastic point processes, chaos theory, fractal geometry, and fractional noises. Offered in alternate years. – (III) Puente

269. Numerical Modeling of Groundwater Systems (3)
Lecture—3 hours. Prerequisite: course 145A or Civil Engineering 144 and course 145B, Mathematics 228. Finite difference and finite element techniques in modeling groundwater flow and transport. Fundamentals of constructing and calibrating models with hands-on applications. Methods and limitations of numerical solution of transport equations. Model interpretation and ethics. – (III) Fogg

273. Introduction to Geostatistics (3)
Lecture—3 hours. Prerequisite: Statistics 130A and 130B, or the equivalent. Statistical treatment of spatial data with emphasis on hydrologic problems. Topics include theory of random functions, variogram analysis, kriging, co-kriging, indicator geostatistics, and stochastic simulation of spatial variability. Demonstration and use of interactive geostatistical software is aided. Offered every other year. – I. (III) Fogg

275. Analysis of Spatial Processes (3)
Lecture—3 hours. Prerequisite: Statistics 102 or the equivalent; course 273 or Statistics 273A recommended. Characterization of homogeneous random fields; extremes and spectral parameters; geometry of excursions, local averaging, scale of fluctuation, non-Gaussian and irregular random fields; geostatistical applications. Offered in alternate years. – (III) Puente

286. Selected Topics in Environmental Remote Sensing (3)
Discussion—2 hours, lecture—1 hour; project. Prerequisite: Environmental and Resource Sciences 186 or the equivalent; Environmental and Resource Sciences 186L recommended. In depth investigation of advanced topics in remote sensing applications, measurements, and theory. Not offered every year. – Ustin

290. Seminar in Hydrologic Science (1)
Seminar—1 hour. Prerequisite: graduate standing in Hydrologic Science, consent of instructor. Seminars and critical review of problems,
Hydrology

(College of Agricultural and Environmental Sciences)

Faculty. See under Department of Land, Air, and Water Resources, on page 320, Hydrology Section.

The Major Program

Hydrology is the study of the occurrence, distribution, circulation, and behavior of water and waterborne materials in the environment of Earth. It includes practical measurement and technical analysis of water phenomena underground, on the Earth’s surface, and in its atmosphere. Contemporary hydrologic problems costing society $10-100 billion per year include environmental restoration, sustainability of groundwater and surface water resources, water pollution, and natural disasters such as floods, droughts, landslides, avalanches, and landslides. The management of these problems demands hydrologic scientists with the comprehensive, interdisciplinary education embodied in this program. Beyond its societal utility, hydrology can be an exciting 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 background across the basic sciences of physics, mathematics, 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 training. 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 are usually many above the available supply of trained hydrologists. Students commonly obtain internships and jobs with state and federal agencies, private consulting firms, environmental interest groups, irrigation districts, and utility companies. 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 Laboratory). State and local agency employers include California’s Department of Water Resources, Conservation, Fish and Game, and Toxic Substances as well as the Water Resources Control Board and Regional Water Quality Control Boards. To obtain higher levels of responsibility and salary, hydrologists often seek advanced degrees, and the hydrology major is designed to provide students with a highly competitive education to get into graduate school.

B.S. Major Requirements:

Written/Oral Expression.................................................. 0-8

Course work in each of the following areas is required to complete the Bachelor of Science degree in Hydrology.

Preparatory Subject Matter................................. 67

1. Biological Sciences 1A, 1C ................................. 10
2. Chemistry 2A, 2B, 2C ................................. 15
3. Physics 9A, 9B ............................................. 8
5. Geology 50, 50L ............................................. 5
6. Hydrologic Science 10 ............................................. 3
7. Engineering 6 or the equivalent ............................. 4

Total Units for the Degree ................................. 180


Minor Program Requirements:

The Hydrology Section of the Department of Land, Air, and Water Resources offers the minor in Hydrology for environmental or natural science students who have an interest in water/ environmental issues. The interested student should have completed preparatory course work in calculus (Mathematics 16B), chemistry (Chemistry 2A; Chemistry 2B recommended), physics (Physics 5A), and biology (Biological Sciences 1A). Course work in the minor provides foundational 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.

Total Units (Div) .................................................. 19-24

Hydrology .................................................. 19-24

1. Engineering 103 and Hydrologic Science 141; or Environmental and Resource Sciences 100 and 100L ..................... 8-10
2. Hydrologic Science 144 and Soil Science 107 ............................. 15
3. Environmental and Resource Sciences 136 or Hydrologic Science 134 ............................. 3-6

Graduate Study. See Hydrologic Sciences (A Graduate Group), on page 306.

Courses in Hydrologic Science (HYD)

Questions pertaining to the following courses should be directed to the instructor or to the Resource Sciences Teaching Center in 113 Vealmeier Hall or in 1152 Plant and Environmental Sciences Building, (530) 752-1669.

Lower Division Courses

10. Water and Power and 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 of water quantity and quality. Roles of science and policy in solving water problems. (Same course as Science and Society 10.) GE credit: SciEng, SocSci, Wrt. — III. (III.) Fogg

47. Watershed Processes and Water Quality in the Tahoe Basin (2)

Lecture/laboratory—21 hours; fieldwork—9 hours; discussion—3 hours. Term paper: Prerequisite: basic knowledge of environmental, soil, or hydrologic sciences. Course involves 3 days of instruction in Tahoe City. Watershed processes, runoff water quality management, and restoration in the Lake Tahoe Basin. Soils, precipitation-runoff, revegetation and adaptive management related to erosion control, effective solutions, and development of restoration strategies. Students develop and initiate field restoration. (Same course as Environmental and Resource Sciences 47.)—Grismer

92. Hydrologic Science Internship (1-12)

Internship—3-36 hours. Prerequisite: lower division student, consent of instructor. Work experience off and on campus in Hydrologic Science. Internship supervised by a member of the faculty. (P/NP grading only.)

98. Directed Group Study (1-5)

Prerequisite: consent of instructor. (P/NP grading only.)

Upper Division Courses

103N. 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 balances to solve a range of practical problems. (Same course as Biological Systems Engineering 103.)—I. Wallenda

110. Irrigation Principles and Practices (3)

Lecture—2 hours; laboratory—3 hours. Prerequisite: Physics 5A; Soil Science 100 recommended. General course for agricultural and engineering students dealing with soil and plant aspects of irrigation and drainage. Soil-water movement and storage, plant responses to irrigation regimes, water use by crops; procedures for determining frequency and depth of irrigation, drainage. Not open for credit to students who have completed Water Science 110. — III. (III.) Schawanki, Grattan, Goldhammer

115. Irrigation and Drainage Systems (4)

Lecture—4 hours. Prerequisite: Engineering 103A or course 103. Engineering and scientific principles applied to the design of surface, sprinkler and micro irrigation systems and drainage systems within economic, biological, and environmental constraints. Interaction between irrigation and drainage will be emphasized. Not open for credit to students who have completed Water Science 145. (Same course as Biological Systems Engineering 145.)—II. (II.) Wallender, Grismer, Hills

129. Biology of Running Waters (3)

Lecture—2 hours; discussion—1 hour. Prerequisite: introductory course in biology and junior standing. The study of lotic aquatic animals and plants in relation to their environment; various factors affecting the distribution of freshwater fishes and animals is emphasized in a manner particularly suitable for students of freshwater ecology, soil and water science,
and renewable natural resources. Not open for credit to students who have completed Water Science 122L.—I. (I.) Fogg

147. Runoff, Erosion and Water Quality Management in the Tahoe Basin (3) Lecture/laboratory—30 hours; fieldwork—15 hours; discussion—10 hours; term paper. Prerequisite: Physics 78 or 98, Mathematics 16b 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 hillside and riparian restoration concepts, modeling and applications from physical science perspectives including precipitation-runoff relationships and transport, and detention ponds. (Same course as Biological Systems Engineering 147.)—Grimmer

150. Water Law (3) Lecture—3 hours. Prerequisite: Environmental and Resource Sciences 101 or 121 or consent of instruc- tor. Principles and issues of California Water Law. Types of water rights, groundwater rights and man- agement, and protection of instream uses. Water projects, role of federal government and federal/ state relations. Basic water quality acts, endangered species act, water transfers and current water issues.—II.

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 contamination in the field. Equipment such as data loggers, water and sediment samplers, pressure transducers, weather stations, surveying equipment, and flow meters will be used.—II. (II.) Pasternack

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 biol- ogy and/or ecology courses recommended. Ecosys- tem and landscape modeling with emphasis on hydrology and salinete transport. Spatial analysis of environmental risk analysis including ecological risk assessment, natural resource management. Spatial database structures, scripting, data models, and error analysis in GIS. (Same course as Applied Bio- logical Systems Technology 182.) Offered in alter- nate years.—I. (I.) Pasternack

192. Hydrologic Science Internship (1-12) Internship—3-40 hours. Prerequisite: completion of 84 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.)

198. Directed Group Study (1-5) (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5) Prerequisite: senior standing. (P/NP grading only)

Immunology (A Graduate Group)

Hilary Benton, Ph.D., Chairperson of the Group

Group Office. 1321 Haring Hall (530) 752-8531

Immunology (A Graduate Group)
Independent Study Program

Information. Chairperson, Committee on Courses of Instruction, c/o Academic Senate Office (530) 752-7593.

The Independent Study Program provides an opportunity for upper division students to design and pursue a full quarter (12-15 units) of study in an area of special interest. A program qualifying as Independent Study will consist of one or more courses numbered 190-199 set. 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 (obtainable 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

(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 committee members. 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
Program Office, 150 Mrak Hall (530) 752-4491

Student Proposal. An Individual Major should submit a proposal to the Dean at least four quarters prior to starting the major. The proposal must be submitted to the Committee on Undergraduate Student Petitions prior to taking 120 units. It is important for the student to make arrangements to speak with a counselor in the college 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:

Preparatory Subject Matter....... (variable)

Lower division courses basic to the program or needed to satisfy prerequisites for upper division requirements.

Breadth/General Education............... 18-24

Satisfaction of General Education requirement.

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 Degree............. 180

Principal Adviser (selected by student). A faculty member in a section or program in the College of Biological Sciences.

College of Letters and Science
Program Office, 200 Social Sciences and Humanities Building (Dean's office)  http://www.lsc.ucdavis.edu/students

Committee in Charge
JoAnn Cannon, Ph.D., Chairperson (French, Italian, and Russian)
Yuri Druzhnikov, Ph.D. (Russian) Gail S. Goodman, Ph.D. (Psychology)
Jeanette Natalz, Ph.D. (Molecular and Cellular Biology) G. Thomas Sallee, Ph.D. (Mathematics)
Raymond Waddington, Ph.D. (English)

Student Proposal. A student who wishes to propose an individual major must submit the proposal to the Faculty Committee on Individual Majors in the College of Letters and Science prior to taking 120 units. The proposal must be submitted by the end of the fourth week of the quarter. This proposal will consist of: (1) an essay, identifying the specific educational objectives cannot be met by existing major.

G. Thomas Sallee, Ph.D.

Preparatory Subject Matter........... (variable)

Lower division courses basic to the program or needed to satisfy prerequisites for upper division requirements.

Breadth/General Education............ 18-24

Satisfaction of General Education requirement.

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 Degree............. 180

Master Adviser. Thomas Gordon, Ph.D. (Plant Pathology)

College of Biological Sciences
Program Office, 202 Life Sciences (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 taking 120 units. It is important for the student to make arrangements to speak with a counselor in the college 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:

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 sections in the College of Biological Sciences;
(b) additional requirements as determined by the Committee on Undergraduate Student Petitions. See the Dean's Office 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 degree requirements........ (variable)

Total Units for the Degree............. 180

Principal Adviser (selected by student). A faculty member in a section or program in the College of Biological Sciences.

College of Environmental Sciences
Program Office, 200 Social Sciences and Humanities Building (Dean's office)  http://www.ces.ucdavis.edu/students

Committee in Charge
JoAnn Cannon, Ph.D., Chairperson (French, Italian, and Russian) Gail S. Goodman, Ph.D. (Psychology)
Jeanette Natalz, Ph.D. (Molecular and Cellular Biology) G. Thomas Sallee, Ph.D. (Mathematics)
Raymond Waddington, Ph.D. (English)

Student Proposal. A student who wishes to propose an individual major must submit the proposal to the Faculty Committee on Individual Majors in the College of Letters and Science prior to taking 120 units. The proposal must be submitted by the end of the fourth week of the quarter. This proposal will consist of: (1) a essay, identifying the specific educational objectives cannot be met by existing major.

G. Thomas Sallee, Ph.D.
A.B. and B.S. Major Requirements:

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 units must include:
- (a) interrelated and complementary courses from two or more departments which provide a unified pattern and focus;
- (b) at least 30 units from Letters and Science teaching departments or programs;
- (c) no more than 10 units in courses numbered 194H, 198, and 199;
- (d) for the A.B. degree, a maximum of 80 units toward the major; for the B.S. degree, a maximum of 110 units toward the major.

Total Units for Degree (180)

Major Advisers (selected by student):
Principally, a faculty member in a teaching department or program in the College of Letters and Science in major field of emphasis. Secondary Adviser: a faculty member from secondary area of interest.

Honors Program.
By the fourth week of the last quarter of the junior year, students potentially eligible for high or highest honors at graduation (see College section), may petition the Individual Majors Committee for tentative acceptance into an honors program.

Final admission will depend upon the Committee’s approval of a senior thesis prospectus that has been agreed upon by the student and faculty adviser. The prospectus must be presented to the Committee by the end of the fourth full week of instruction of the first quarter of the senior year. Graduation with high or highest honors will be conditional upon both the maintenance of the required grade point average and the completion of the senior thesis project. Students who anticipate doing a senior honors thesis should allow up to 3 units of independent study in the program during each of two quarters in the senior year as course options.

Integrated Pest Management (A Graduate Group)

Howard Ferris, Ph.D., Chairperson of the Group

Graduate Adviser: Jay Rosenheim (Entomology)

Courses in Integrated Pest Management (IPM)

Graduate Courses

201. Concepts and Systems of Plant Protection and Pest Management (4)
   Lecture—2 hours; discussion—1 hour; laboratory—2 hours. Prerequisite: Agricultural Systems and Environment 120, Entomology 110, Plant Pathology 120, Plant Biology 120 (may be taken concurrently), Nematology 100; Plant Biology 117 or Evolution and Ecology 101 recommended. Ecological perspectives of agricultural systems, the role of pests and pest management in these systems, and the monitoring and modeling of the systems. Offered in alternate years. —(I, II)

202A-202B. Diagnosis of Plant Pest Problems and the Control of Causal Agents (4-4)
   Discussion—1 hour; fieldwork—9 hours. Prerequisite: Entomology 110, Plant Pathology 120, Plant Biology 120, Nematology 100 (may be taken concurrently). Problems and assessment of losses caused by in-sects, pathogens, weeds, nematodes, and other pests. Methods of determining infestation levels and establishing economic thresholds, and control of these pests with emphasis on integration of available management practices into programs. —II, III—Rosenheim

290. Seminar (1-2)
   (S/U grading only.)

298. Group Study (1-5)
   (S/U grading only.)

299. Research (1-12)
   (S/U grading only.)

Integrated Studies Honors Program

James F. Shackelford, Ph.D., Program Director
Program Office, 162 Everson Hall
(530) 752-9760;
http://integratedstudies.ucdavis.edu

Committee in Charge

John Boe, Ph.D., Lecturer (English)
Rabin Hill, B.F.A., Associate Professor (Art and Art History)
Naomi Janowitz, Ph.D., Professor (Religious Studies)
Alessa Johns, Ph.D., Associate Professor (English)
Peter Lindert, Ph.D., Professor (Economics)
Winder McConnell, Ph.D., Professor (German and Russian)
Jay Mechling, Ph.D., Professor (American Studies)
Terence Murphy, Ph.D., Professor (Plant Biology)
Hearnie Pardee, M.F.A., Assistant Professor (Art and Art History)

Affiliated Faculty

Evan Fletcher, Ph.D., Lecturer (Center for Neuroscience)
Martina Newell-McGloin, D.Sc., Lecturer (UC Systemwide Biotechnology Research and Education)
Marco Molinaro, Ph.D., Lecturer (Center for Biophotonics)

The Program of Study

The Integrated Studies Honors Program is an invitation-only, first-year, residential honors program. Established in 1969, the program aims to help high-achieving students integrate knowledge gained from their study of the humanities, natural sciences, and social sciences and expand their learning experiences through interdisciplinary and multidisciplinary courses. Enrollment is limited to 25 students per class, and program membership is limited to the top 3% of the entering class.

Students enroll in three Integrated Studies Honors Program courses per semester during the year. Students not admitted to the Program may not register for Integrated Studies Honors Program courses or seminars.

Courses in Integrated Studies (1ST)

Lower Division Courses

8. Colloquium (1)
   Discussion—1 hour. Lectures, films, and readings on the interrelation between the arts and sciences. May be repeated for credit. (P/NP grading only)—I, II, III.

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 offered. Limited enrollment. May be repeated for credit. GE credit: SciEng, Wrt.—II, III—Rosenheim

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: ArtsHum, Wrt.—II, III—Rosenheim

8C. Special Topics in the Social Sciences (4)
   Lecture—3 hours; discussion—1 hour. Group study of a special topic in social sciences. Course varies with topic offered. Limited enrollment. May be repeated for credit. GE credit: SocSci, Wrt.—II, III—Rosenheim

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—Rosenheim

Upper Division Courses

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) Not offered every year.

194HA. 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 junior honors thesis under the direction of a faculty adviser. May be repeated one time for credit. (Deferred grading only, pending completion of sequence.)—II, III—Rosenheim

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 junior honors thesis under the direction of a faculty adviser. May be repeated one time for credit. (Deferred grading only, pending completion of sequence.)—II, III—Rosenheim

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)—II, III—Rosenheim

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum, SciEng, SocSci, Div, Wrt
International Agricultural Development

[College of Agricultural and Environmental Sciences] International Agricultural Development is an interdisciplinary major in the Human and Community Development department.

Faculty. Includes members from various departments across colleges.

The Major Program

The goal of international agricultural development is to improve food production, nutrition, marketing, and health in less technically advanced countries. Students in this major are trained in technical areas of agriculture that can be applied to the problems of world hunger and health.

The Program. Principle subjects of study within the major are Agricultural Production, Economic Development, Environmental Issues, Nutrition, Rural Communities, and Trade and Commodity Development. Courses are in social sciences, humanities, and economic environments in which agriculture operates in countries outside the United States.

Career Alternatives. The study of international agricultural development prepares a student for a variety of careers. Some students choose service careers through the Peace Corps. Others seek employment in international trade, while others choose to work for a governmental or private agency in a foreign nation. Religious groups and organizations also employ university-trained individuals for agricultural work in conjunction with missions and other types of human service work overseas. The major is also preparation for further graduate work in agricultural development.

B.S. Major Requirements:

UNITS

English Composition Requirement .......................... 0-8
See College requirement.

International Agricultural Development Abroad .................................................. 0-20
A maximum of five courses abroad, selected with approval of an adviser, may be applied toward the 12 upper division courses in the major.

Preparatory Subject Matter ................................ 47
Choose 47 units from either the Social Science or Natural Science core in consultation with an adviser.

Social Science core:
- Agricultural and Resource Economics 15; Agricultural Management and Rangeland Resources 1; Animal Science 41 and 41L; Agricultural Management and Rangeland Resources 2; Chemistry 10; Community and Regional Development 1 or 17; Economics 1A and 18; Environmental Horticulture 150; Environmental Science and Policy 126, 161, 175 and International Agricultural Development 195A or 195B; Food Science and Technology 171; Plant Biology 151; Plant Pathology 151; Plant Sciences 1; Rangeland Resources 101 and 105; Plant Pathology 152 or Animal Genetics 107; Textiles and Clothing 174; Textiles and Clothing 162, 163; and Textiles and Clothing 174.

Natural Science core:
- Animal Science 41 and 41L; Agricultural Management and Rangeland Resources 2; Biological Sciences 1A and 1B or 1A and 1C; Chemistry 2A and 2B; Chemistry 8A and 8B or Physics 1A and 1B; Economics 1A or Agricultural and Resource Economics 15; International Agricultural Development 10; Mathematics 16A and 16B; Nutrition 10 or 20; Soil Science 10 or 100; Statistics 13 or Sociology 468.

Depth Subject Matter ........................................ 36-37
Agricultural and Resource Economics 147 or Agricultural Management and Rangeland Resources 101 or Geography 161; Economics 115A; International Agricultural Development 142 or 160; International Agricultural Development 103 and 104; International Agricultural Development 170; International Agricultural Development 170; Agricultural Management and Rangeland Resources 110A or 110B or 135 or Plant Biology 142; Political Science 123 or 124 or Sociology 145A; Textiles and Clothing 174.

Foreign Language Requirement ................................ 0-15
Students must complete 15-unit level in one language or pass the foreign language proficiency examination. A score of 5, 4, or 3 on a foreign language College Board Advanced Placement Examination (except Latin) or a score of 550 on the College Board SAT II language will also satisfy this requirement.

Internship Requirement ........................................ 4-8
Students must complete at least 4 units of internship and may use up to 8 units toward major requirements. Internships may be chosen in consultation with an adviser.

Internship requirement waived for students enrolled in the UC Education Abroad Program.

Areas of Specialization ........................................ 30-35
Agricultural Production Option:

Additional 14-15 units of restricted electives in consultation with an adviser.

Economics Development Option:
- Agricultural and Resource Economics 100A and 100B, Economics 115A; Agricultural and Resource Economics 120, 130, 140, 175 and International Agricultural Development 195A or 195B.

Environmental Issues Option:
- Environmental Science and Policy 100 or 110, 160, 171 and Plant Biology 151; Agricultural and Resource Economics 147, Agricultural Management and Rangeland Resources 101, Environmental Horticulture 150, Environmental Science and Policy 126, 161, 175 and International Agricultural Development 195A or 195B.

Rural Communities Option:
- Community and Regional Development 140, 151, 151L, 152, 153; Community and Regional Development 164 or 172 or 173 or 174; International Agricultural Development 195A or 195B; additional restricted electives chosen in consultation with an adviser.

Trade and Development in Agricultural Commodity Options:

Total Units for the Degree .................................. 180

Specialization Advisers
A listing of faculty in the various areas of specialization and with interests in International Agricultural Development is available from the Major Adviser.

Major Adviser. S.B. Brush (Human and Community Development)

Minor Program Requirements:

International Agricultural Development ............................................... 22
- International Agricultural Development 10 and Agricultural and Resource Economics 115A.

Agricultural Management and Rangeland Resources 101 and 110A or 110B; International Agricultural Development 103, 104, 195A or 195B, Agricultural and Resource Economics 115A, Sociology 145A.

Minor Adviser. S.B. Brush in 1331 Hart Hall.

Graduate Study. A program of study and research leading to the M.S. degree is available in International Agricultural Development. Detailed information regarding graduate study may be obtained by writing to the Coordinator of Graduate Recruitment (I.A.D.), Graduate Studies, UC Davis.


Courses in International Agricultural Development (IAD)

Questions pertaining to the following courses should be directed to the instructor or to the Department of Human and Community Development, Advising Center in 1303 Hart Hall (530) 752-2244.

Lower Division Courses

10. Introduction to International Agricultural Development (4)
Lecture—3 hours; discussion—1 hour. Theories, practices and institutions related to agricultural development; the interaction of changing social, cultural and economic organization through successive stages of economic development; impact of new agricultural technology on underdeveloped regions. GE credit: SocSci, Div. III; II-III.

92. Internship (1-12)
Internship—3-36 hours. Prerequisite: consent of instructor. Supervised internship, off and on campus, in community and institutional settings. (P/NP grading only.)

Upper Division Courses

103. Social Change and Agricultural Development (4)

Commodities Options:
104. Gender and Environment in the Developing World (4)
Lecture—4 hours; discussion—1 hour. Prerequisite: course 10 recommended. Examines how environmental problems in the countries of Africa, Asia, and Latin America affect men and women differently and the impact of development programs on the environment in rural and urban areas.—III. (III.) Monsen
142. Equipment and Technology for Small Farms (2)
Lecture—1 hour, laboratory—3 hours. Types and characteristics of agricultural equipment and technologies appropriate for small commercial farming. Adjustment and calibration of equipment. Selection of and budgeting for equipment. (Same course as Applied Biological Systems Technology 142.)

160. Agroforestry: Global and Local Perspectives (3)
Lecture/discussion—3 hours. Prerequisite: Plant Sciences 2 or Biological Sciences 1C, Plant Biology 142 or a general ecology course (Environmental Science and Policy 100). Traditional and evolving use of trees in agricultural ecosystems; their multiple roles in environmental stabilization and production of food, fuel, fiber, and socioeconomic barriers to the adoption and implementation of agroforestry practices. (Same course as Plant Sciences 160.) Offered in alternate years.—I. (I.) Gradziel

162. Field Course in Tropical Ecology and Sustainable Development (8)
Lecture—20 hours; discussion—10 hours; fieldwork—30 hours. Prerequisite: consent of the instructor; Biological Sciences 1C required; course 10 or Biological Sciences 1A or 1B recommended; limited enrollment, acceptance based on academic merit, personal experience, and academic discipline in order to provide a multidisciplinary atmosphere. Course in Panama. Tropical Ecology of various ecosystems; Agricultural systems in Panama; Sustainable agriculture—uniting ecology and agriculture in Panama, language and culture of Panama, trips to Barro Colorado Island (BCI) and ecotourism field trip. GE credit: SciEng, Div. Writ. (Same course as Plant Sciences 162.)—IV. (IV.) Kraft

170. Program Development for International Agriculture (4)
Lecture/course—4 hours. Prerequisite: course 10. Principles of leadership and management for international agricultural development. Organizations and organizational behavior, and the implications of planning and administering organizations involved in the global development effort.—II. (II.) Marcolte

190. Proseminar in International Agricultural Development (1)
Seminar and discussion of current topics in international agricultural development by visiting lecturers, staff and students. May be repeated for credit. (P/NP grading only.)

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: consent of instructor. Supervised internship, off and on campus, in community and institutional settings. (P/NP grading only.)

195A. Field Study in Agricultural Development—California (3)
Lecture—2 hours total; seminar—8 hours total; fieldwork—four 2-day visits. 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. Study of farm commodities, institutions and experiences related to agricultural development problems. International influence on U.S. agriculture. (P/NP grading only.)—III. (III.) Marcolte

195B. Field Study in Agricultural Development—Mexico (3)
Lecture—2 hours total; seminar—8 hours total; fieldwork—Baja trip to Mexico. 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. Study of farm commodities, institutions and experiences related to agricultural development problems. International influence on U.S. agriculture. (P/NP grading only.)—III. (III.) Marcolte

Graduate Courses

200N. Philosophy and Practice of Agricultural Development (5)
Lecture/discussion—5 hours; term paper. Introduction to key elements of philosophy and practice of agricultural development in less developed countries. Introduction to the major paradigms of development, the historical context within which these paradigms have operated, and the various development techniques and initiatives that have emerged from agricultural production to institutional capacity building and management. Not open for credit to students who have completed former course 202.—I. (I.) Marcotte

201. The Economics of Small Farms and Farming Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Agricultural and Resource Economics 100A. Economic perspective on small farm development. Establishes a basis for predicting farmers' responses to changes in the economic environment, and for proposing government policies to increase small farm production and improve farmer and national welfare.—II. (II.) Vlast

202N. Analysis and Determinants of Farming Systems (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Plant Sciences 150 or the equivalent. The unifying concepts of cropping systems in temperate and tropical climatic zones; agroecosystems stability, diversity and sustainability; management strategies, resource use efficiency and their interactions; the role of animals, their impact on energy use efficiency, nutrient cycling, and providing food and power. Not open for credit to students who have completed former course 200.—III. (III.) Van Kessel, Pittroff

203N. Project Planning and Evaluation (4)
Discussion—1 hour; workshop—3 hours. Prerequisite: courses 200N (or former course 202), 201N, 202N (or former course 200). Interdisciplinary setting for application of student skills and specialization to a "real world" development project. Focus on team-building and effective interdisciplinary problem-solving as the objective of producing a project document and presentation within a specified deadline. Not open for credit to students who have completed former course 203.—III. (III.) Brown, Gepts, Piedrahita

217. Conservation and Sustainable Development in Third World Nations (4)
Lecture/discussion—3 hours; fieldwork—2 hours. Prerequisite: at least one course from two of these three groups: 1) Environmental Science and Policy 160, 161, 168A, 168B; 2) Environmental Science and Policy 101, 133, International Agricultural Development 103, Geography 142; 3) Anthropology 126, 131, Geography 141; Sociology 144, 145A, 145B. Examination of the patterns of resource ownership, control and management in agricultural lands, extractive zones (fisheries, forests) and wildlands, with emphases on conservation and sustainability. Comparison of industrial democracies and poorer nations. (Same course as Ecology 217.) Offered in alternate years.—Orlove

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.—III. (III.) Momsen

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.)—III. Brown, Van Horn

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 once for credit.

292. Graduate Internship (1-12)
Internship—3-36 hours. Prerequisite: participation in H. Humphrey Fellow Program or consent of instructor. Individually designed supervised internship, off or on campus, in community, business or institutional setting. Developed with advice of faculty mentor and Humphrey Coordinator. (S/U grading only.)

298. Directed Group Study (1-5)
Directed study—1-5 hours. Prerequisite: consent of instructor. May be repeated for credit. (S/U grading only.)—I, II, III, (I, II, III)

Professional Course

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)

International Agricultural Development (A Graduate Group)

Patrick H. Brown, Chairperson of the Group
Group Office, 1220 PES (530) 752-5242, http://iad.ucdavis.edu

Faculty

Lindsay Allen, Ph.D., Professor (Nutrition)
Michael Barbour, Ph.D., Professor (Plant Sciences)
Diane M. Barrett, Ph.D., Specialist in Cooperative Extension (Food Science and Technology)
Stephen Boucher, Ph.D., Assistant Professor (Agricultural and Resource Economics)
David Boyd, Ph.D., Associate Professor (Anthropology)
Ted Bradshaw, Ph.D., Associate Professor (Human and Community Development)
Kenneth H. Brown, Ph.D., Professor (Nutrition)
Patrick H. Brown, Ph.D., Professor (Plant Sciences)
Stephen B. Brush, Ph.D., Professor (Human and Community Development)
Marita Cantwell, Ph.D., Lecturer (Plant Sciences Extension)
Tim E. Carpenter, Ph.D., Professor (Medicine and Epidemiology)
Colin A. Carter, Ph.D., Professor (Agricultural and Resource Economics)
Douglas Conklin, Ph.D., Associate Professor (Human and Animal Science)
Patricia A. Conrad, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Montague W. Denten, Ph.D., Professor (Plant Sciences)
Johannes J. DeVries, Ph.D., Lecturer (Civil and Environmental Engineering)
Kathleen G. Dewey, Ph.D., Professor (Nutrition)
Serge I. Doroshov, Ph.D., Professor (Animal Science)
James Fadel, Ph.D., Professor (Animal Science)
Howard Ferris, Ph.D., Professor (Nematology)
Graduate Study

The Graduate Group in International Commercial Law offers a program of study and research leading to the M.A. degree through a Summer only program. Students are required to take 36 quarter units of study over three, four, or five summers. Thirty of the units must be UC Davis courses. Six units must be completed in another country with the approval of the Director of the ICL program. The classes are taught in an intensive format during 20 hours per week or four hours per day in the morning, two hours in the afternoon. Students complete four core courses, starting with the Orientation to U.S.A. Law and followed by three specialized core courses in international commercial law. Elective courses then provide in-depth study in focused topics such as private international law, conflicts of laws, intellectual property, business associations, antitrust, tax, securities and the like. Students also complete a research paper.

Preparation

Foreign applicants must present satisfactory evidence of the completion of legal academic training at an accredited educational institution. Domestic applicants must have completed at least six years of resident study at accredited colleges and law schools and must hold a professional degree from a law school approved by the American Bar Association.

Graduate Advisors. Beth Greenwood (International Programs, School of Law), Dan Simmons (School of Law)

Courses in International Commercial Law (ICL)

ICL courses are taught in an intensive format during the summer quarter. For more information, contact the International Law Programs, School of Law, UC Davis, 4055 Q Street, Suite 210, Sacramento, CA 95817; (530) 752-1521; http://www.law.ucdavis.edu/ipl/ipl3.html

Quarter Offered: I, II, Winter, III, Spring.

General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Social-Cultural Diversity, Wrt=Writing Experience

International Commercial Law (A Graduate Group)

Alpert, Fischer, Ph.D., Associate Professor
(Plant Sciences)

Theodore C. Foin, Ph.D., Professor
(Plant Sciences)

Shih-Gung, Ph.D., Professor
(Plant Sciences)

Paul L. Gerps, Ph.D., Professor
(Plant Pathology)

Robert Gilbertson, Ph.D., Professor
(Plant Pathology)

Barbara G. Goldman, Ph.D., Lecturer
(Education, Human and Community Development)

Thomas Gradziel, Ph.D., Associate Professor
(Plant Sciences)

Richard D. Green, Ph.D., Professor
(Agricultural and Resource Economics)

James I. Grieshop, Ph.D., Specialist in Cooperative Environmental Engineering

Mark A. Matthews, Ph.D., Professor
(Agricultural and Resource Economics)

Silas S. O. Hung, 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)

Desmond A. Jolly, Ph.D., Lecturer
(Agricultural and Resource Economics)

Suad Joseph, Ph.D., Professor
(Anthropology, Women and Gender Studies)

Lucia Kaiser, Ph.D., Associate Specialist in Cooperative Extension (Nutrition)

Emilio A. Laca, Ph.D., Assistant Professor
(Plant Sciences)

W. Thomas Lanini, Ph.D., Lecturer (Plant Sciences)

Jay Lund, Ph.D., Professor
(Civil and Environmental Engineering)

E. Dean MacCannell, Ph.D., Professor
(Environmental Design)

Paul Marcotte, Ph.D., Lecturer
(Human and Community Development)

Miguel A. Martinez, Ph.D., Professor
(Plant, Air, and Water Resources)

Philip E. Martin, Ph.D., Professor
(Agricultural and Resource Economics)

Mark A. Matthews, Ph.D., Professor
(Viticulture and Enology)

Gale McGarrah, Ph.D., Lecturer (Plant Sciences)

Jeffrey P. Mitchell, Ph.D., Lecturer (Plant Sciences)

Janet D. Nomsen, Ph.D., Professor
(Human and Community Development)

Donald Nevin, Ph.D., Professor (Plant Sciences)

Benjamin Orlove, Ph.D., Professor
(Environmental Science and Policy)

Paul H. Pietro, Ph.D., Professor
(Biological and Agricultural Engineering)

Wolfgang Pittroff, Ph.D., Assistant Professor
(Animal Science)

Dan Potter, Ph.D., Assistant Professor (Plant Sciences)

D. William Rains, Ph.D., Professor Emeritus
(Plant Sciences)

Michael R. Reid, Ph.D., Professor (Plant Sciences)

Eliska Rejmankova, Ph.D., Professor
(Environmental Science and Policy)

Panels C. Ronald, Ph.D., Associate Professor
(Plant Pathology)

Scott Rozelle, Ph.D., Associate Professor
(Agricultural and Resource Economics)

Robert D. Sainz, Ph.D., Associate Professor
(Animal Science)

Richard Sexton, Ph.D., Professor
(Agricultural and Resource Economics)

Michael J. Singler, Ph.D., Professor
(Land, Air, and Water Resources)

R. Paul Singh, Ph.D., Professor
(Biological and Agricultural Engineering)

Johan Six, Ph.D., Assistant Professor (Plant Sciences)

Michael P. Smith, Ph.D., Professor
(Human and Community Development)

Alvin D. Sokolow, Ph.D., Specialist in Cooperative Extension (Human and Community Development)

Randal Sutherst, Ph.D., Professor
(Land, Air, and Water Resources)

Daniel A. Sumner, Ph.D., Professor
(Agricultural and Resource Economics)

J. Edward Taylor, Ph.D., Professor Emeritus
(Plant Sciences)

Larry R. Teuber, Ph.D., Professor (Plant Sciences)

Orville E. Thompson, Ph.D., Professor Emeritus
(Civil and Environmental Engineering)

Cory Tredler, Ph.D., Assistant Professor
(School of Education)

Mark Van Horn, M.Sc., Lecturer (Plant Sciences)

Chi van Kees, Ph.D., Professor (Plant Sciences)

Ronald E. Voss, Ph.D., Lecturer Emeritus
(Plant Sciences Extension)

Stephen Vosti, Ph.D., Assistant Adjunct Professor
(Agricultural and Resource Economics)

Karen Watson-Gegeo, Ph.D., Professor
(School of Education)

Steven Weinbaum, Ph.D., Professor (Plant Sciences)

Miriam J. Wells, Ph.D., Professor
(Human and Community Development)

Diane L. Wolf, Ph.D., Associate Professor
(Sociology)

Lin Wu, Ph.D., Professor Emeritus (Plant Sciences)

Aram A. Yengoyan, Ph.D., Professor (Anthropology)

Talhah Yilmaz, Ph.D., Professor
(Pathology, Microbiology, and Immunology)

Frank G. Zalom, Professor
(Agricultural and Resource Economics)

Minh Ha Zhang, Ph.D., Associate Adjunct Professor
(Land, Air, and Water Resources)

Rui Hong, Ph.D., Professor
(Animal Science)

Richard A. Zinn, Ph.D., Professor (Animal Science)

Graduate Study. The International Agricultural Development M.S. degree program prepares students for careers in global agricultural and rural development, especially of developing and less-industrialized regions. This is an interdisciplinary program designed to provide students with knowledge and skills that will enable them to implement, facilitate, and manage programs that enhance agricultural development, resource management, and rural life.

Students are prepared to accomplish biological and technological improvement in agricultural and natural systems to facilitate social innovation. Training in International Agricultural Development includes both breadth and depth components. Breadth components are required of all M.S. students, aim to establish an understanding of the issues in international development as it relates to agriculture and the environment. These include the history and philosophy of development, leadership and management techniques, fundamentals of crop and livestock farming systems, and agricultural economics. Students acquire depth in their own area of specialization within the agricultural and social sciences. The areas are agricultural and rural development, agricultural engineering, agronomy, animal science, anthropology, aquaculture, avian science, community development, ecology, economics, entomology, environmental degradation and environmental toxicoology, food science, gender, geography, horticulture, nutrition, plant pathology, plant biology, plant protection and pest management, political science, pathology, preventive veterinary medicine, range science, sociology, soil science, sustainable agriculture, vegetable crops, viticulture, and water science. Practical and on-site experience with development issues is encouraged and facilitated by the group’s approximately 80 faculty members, who possess a wide range of experience in international development.

Graduate Adviser. Contact the Group office.

International Commercial Law (A Graduate Group)

Daniel L. Simmons, J.D., Chairperson of the Group
Beth Greenwood, J.D., Director, International Programs, UC Davis School of Law

Group Office. International Law Programs, School of Law & UC Davis Extension, 1333 Research Park Drive, Davis, CA 95616; (530) 757-8569; http://www.law.ucdavis.edu/internprogram/ MCLG.html

Faculty

Courses are taught by School of Law faculty from the UC Davis and other University of California campuses, the Graduate School of Management, Departments of Economics and Agricultural and Resource Economics. Additionally, outstanding practitioners from private practice and government—lawyers, economists, bankers, businessmen—have acted as adjunct faculty to provide an applied perspective through lectures, simulations and case studies.

Graduate Study

The Graduate Group in International Commercial Law offers a program of study and research leading to the M.A. degree through a Summer only program. Students are required to take 36 quarter units of study over three, four, or five summers. Thirty of the units must be UC Davis courses. Six units must be completed in another country with the approval of the Director of the ICL program. The classes are taught in an intensive format during 20 hours per week or four hours per day in the morning, two hours in the afternoon. Students complete four core courses, starting with the Orientation to U.S.A. Law and followed by three specialized core courses in international commercial law. Elective courses then provide in-depth study in focused topics such as private international law, conflicts of laws, intellectual property, business associations, antitrust, tax, securities and the like. Students also complete a research paper.

Preparation

Foreign applicants must present satisfactory evidence of the completion of legal academic training at an accredited educational institution. Domestic applicants must have completed at least six years of resident study at accredited colleges and law schools and must hold a professional degree from a law school approved by the American Bar Association.

Graduate Advisors. Beth Greenwood (International Programs, School of Law), Dan Simmons (School of Law)

Courses in International Commercial Law (ICL)

ICL courses are taught in an intensive format during the summer quarter. For more information, contact the International Law Programs at (530) 757-8569 or e-mail at lawinfo@unoxmas.ucdavis.edu.
249. Comparative Law (1)  Lecture/discussion—10 hours. Prerequisite: course 201, law school education or the equivalent. A comparative study of the development of schools of legal thought, chiefly Common law systems and Civil law 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. Offered in alternate years. —Johnson

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 planning and investment. Includes substantive and procedural provisions of the World Trade Organization (WTO) and the North American Free Trade Agreement (NAFTA). Offered every three years. —Smith

251. United States Litigation Issues (1)  Lecture/discussion—10 hours. Prerequisite: course 201, law school education or the equivalent. Preven- tion and resolution of disputes in international commerce. Emphasis on preparing for a trial in the United States. Includes the regulation of pre-trial motions, jury selection, opening statements, rules of evidence, closing arguments, and the selection of appropriate strategies. Offered in alternate years. —Smith

252. Antitrust (1)  Lecture/discussion—10 hours. Prerequisite: course 201, law school education or the equivalent. Histori- cal and institutional background of antitrust law in the United States. The statutory framework including price fixing, limits an distribution, monopolization, and reporting requirements. Offered in alternate years. —Johnson

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. Invest- ment strategies for U.S. markets. Taxation of finan- cial investments, international currency regulation, and assessing rates of return on international invest- ments. Offered every three years. —Simmons

274. Intellectual Property (2)  Lecture/discussion—20 hours. Prerequisite: course 201, law school education or the equivalent. An intensive study of intellectual property law. Areas covered include copyright, trademark and patent law and unfair competition. Offered in alternate years. —Kurtz

290. American Legal System Research Seminar (1)  Seminar—5 hours. Prerequisite: course 201, law school education or the equivalent. The American legal system and its structure. Legal research methodolo- gies and presentation with attention to analysis, syn- thesis, organization, and editing techniques common to legal writing. (S/U grading only.)—Simmons

291c. International Commercial Law Seminar (4)  Seminar—20 hours. Prerequisite: course 201, law school education or the equivalent. Advanced sem- inar on a current Commercial Law. Offered at the University of Cologne in Cologne, Germany for two weeks each summer. The topic will change each year.

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

[College of Letters and Science]

Rudolph M. Siever, Ph.D., Program Director

Program Office: 1270 Social Sciences and Humanities Building (530) 752-3063

Committee in Charge

Paul Bergin, Ph.D. (Economics)
Cynthia L. Brantley, Ph.D. (History)
Daniel Yuichi Kono, Ph.D. (Political Science)
Zeev Mazon, Ph.D. (Political Science)
Gabriella Montinola, Ph.D. (Political Science)
Peter Schillerman, Ph.D.

(geology, Education Abroad Program)

Deborah Swenson, Ph.D. (Political Science)

The Major Program

Problems of security, development, ethnic conflict, human rights, health, and the environment are increasingly confronted 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 of a second modern language (at least 3.000 for courses taken at college). All courses must be taken for a letter grade.

Choose one from the following courses in one modern language. 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 courses taken at college). All courses must be taken for a letter grade.

<table>
<thead>
<tr>
<th>Preparatory Subject Matter</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Economics 1A or Anthropology 2</td>
<td>4</td>
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<tr>
<td>Economics 1B or Anthropology 2</td>
<td>4</td>
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<tr>
<td>History 4C or 10C</td>
<td>4</td>
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<tr>
<td>International Relations 1 or Political Science</td>
<td>4</td>
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<tr>
<td>Statistics 13 or Sociology 468</td>
<td>4</td>
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<tr>
<td>Anthropology 2</td>
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<td>Environmental Science and Policy 10</td>
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<td>Environmental Science and Policy 30</td>
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<td>International Agricultural Development 10</td>
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<td>Science and Society 2</td>
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<td>Sociology 4</td>
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<td>Sociology 5</td>
<td>4</td>
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<tr>
<td>Anthropology 2</td>
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Note: Economics 1A, Mathematics 46A, and 16B are prerequisites for some courses. Anthropology 2 may be used only once in satisfaction of lower division major requirements.

Foreign language requirements: 0-30

One of the following series in a single language, or certified fluency at the highest level required below:

| Chinese 1, 2, 3, 4, 5 | 30 |
| Chinese 1, 2, 3, 4, 5, 6 | 30 |
| Chinese 1, 2, 3, 4, 5, 6, 7 | 30 |
| Chinese 1CN, 2CN, 3CN | 15 |
| Chinese 1BL, 2BL, 3BL | 15 |
| French 1, 2, 3, 21 | 22 |
| German 1, 2, 3, 4, 5 | 23 |
| Hebrew 1, 2, 3, 21, 22, 23 | 30 |
| Italian 1, 2, 3, 4, 5 | 21 |
| Italian 1, 2, 3, 4, 5, 6 | 21 |
| Japanese 1, 2, 3, 4, 5, 6 | 30 |
| Japanese 1A, 2, 3, 4, 5 | 30 |
| Russian 1, 2, 3, 4, 5 | 23 |
| Spanish 1, 2, 3, 21, 22 | 25 |
| Spanish 31, 32 | 33 |
| Note: The language curricula are subject to change; please check with an advisor for the major. A language not listed above may be substituted with prior approval of the International Relations Program Committee. |

Depth Subject Matter: 36-48

Tracks I, II, and III: Twelve upper division courses

Track IV: Nine upper division courses

Choose one track below:

Track I: World Trade and Development

An interdisciplinary program focusing on economic relations of international and developing countries. For Advanced Industrialized Focus:

Economics 100, 101; 160A/160B, Political Science 123 | 20 |

One course selected from Group B | 8 |

Four courses to fulfill Area Studies Requirement: 16

For Developing Countries Focus:

Economics 115A-115B, 162 | 12 |

Political Science 123, 124 | 8 |

One course selected from Group B | 8 |

Two courses selected from Group B | 8 |

Group C courses: 15 |

Four courses to fulfill Area Studies Requirement: 16

Group D courses: (Advanced Industrialized Countries):

Agricultural and Resource Economics 138, Anthropology 127, Community and Regional Development 118, 141, Economics 102, 110B, 116, International Relations 104, Political Science 130, 140, Sociology 138, 139, 141, 183

Group E courses: 10 |

Four courses to fulfill Area Studies Requirement: 16

Track II: Peace and Security

Focuses on political and security relationships, among states and non-state actors, examining questions of war, peace, alliances, and diplomacy.

Economics 162 | 4 |

Political Science 123, 130, 132 | 12 |

Three additional courses from at least two departments selected from Anthropology 123BN, Comparative Literature 157, Economics 116, 122, History 145, 146A, 146B, Philosophy 118, Physics 137, Political Science 112, 124, 126, 131, 140, 145, Sociology 100, 118, 157, Women’s Studies 102 | 12 |

Four courses to fulfill Area Studies Requirement: 16

Track III: Global Environment, Health, and Natural Resources

Familiarizes students with new sources of global interdependence such as biodiversity, natural resource conflicts, population growth, and world health.

Note: Some courses shown below have additional prerequisites.

Economics 164 | 4 |

Anthropology 101 | 4 |

Political Science 123 | 4 |

Environmental Science and Policy 161 or Political Science 122 | 4 |


Select two from one of the following groups | 9-12 |

Atmospheric and marine environments: Atmospheric Science 116, 149, Environmental and Resource Sciences 121, 131, Geology 116, International Relations 131


Health and human populations: Anthropology 102, Environmental Science and Policy 121, 126, Environmental Toxicology 101, International Infectious Diseases 141, Nutrition 111AV, 111B, 118, Sociology 170, Epidemiology and Preventive Medicine 198 and 199

Quarter Offered: I Fall, II Winter, III Spring, IV Summer. 2007-2008 offering in parentheses

may be taken with the director's prior approval.

Four courses to fulfill Area Studies
Requirement ........................................ 16

Track IV: Peoples and Nationalities
Examines social and cultural foundations of nation-
development and international relations.
Select one course from Anthropology 123AN, Sociology
and Anthropology: 118, 116, 181 ............ 4
Select one course from Anthropology 130A, 102 ........................................ 4
Select one course each from the following four groups ........................................ 12
The Mixing of Peoples: Anthropology
123BN, 130BN; Community and Regional
Development 176; International Relations
104; Political Science 144
Women: Anthropology 126B; Human
Development 103; Sociology 145B;
Women's Studies 102, 192
Religion: Anthropology 124; Philosophy
105; Religious Studies 170; Sociology 146
Development and its Impact on Social
Cleavages: Anthropology 122B, 126A,
126B; Political Science 124, 178;
Sociology 145B
Four courses to fulfill Area Studies
Requirement ........................................ 16
Education/Internship Abroad for a minimum of one quarter

Area Studies Requirement
Four courses: Courses must incorporate at least two of three groups (History, Social Analysis,
Culture and Literature); 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 if course offerings within
the region of choice are insufficient. Tracks I, II and III students who choose to take advantage of an Education Abroad experience must 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
History: History 113, 115A, 115B, 115C,
115D
Social Analysis: African American and
African Studies 107C, 110, 111, 116,
Anthropology 140A, 140B, 142, Political
Science 134, 149, Women's Studies 184
Culture and Literature: African American and
African Studies 157, 162, Art History 150,
Comparative Literature 147, 166, Dramatic
Art 155A, French 124
Culture and Literature: African American and
African Studies 157, 162, Art History 150,
Comparative Literature 147, 166, Dramatic
Art 155A, French 124

East and South Asia
History: History 191E, 191F, 194C, 194D,
194E, 195B, 1968
Social Analysis: African American and
African Studies 107C, Anthropology
143A, 143B, 147, 148A, 148B, 148C,
149B, Economics 171, Political Science
148A, 148B, 148C, Sociology 147, 188
Culture and Literature: Anthropology 145,
Art History 163C, 163P; Chinese 101, 104,
105, 110, Dramatic Art 154, East Asian
Studies 113, Japanese 103, 104, 106,
107, 101, 131, 123, 155, 136

Latin America
History: 162, 163B, 164, 165, 166B,
167, 168
Social Analysis: African American and
African Studies 107A, 180, Anthropology
144, 146, Chicano/a Studies 130, Native
American Studies 120, 133, Political
Science 112
Culture and Literature: African American and
African Studies 163, Art History 151,
Comparative Literature 152, 165, Dramatic
Art 155A, Spanish 149, 151N, 153, 154,
155, 156, 167, 172

Russian and East/Central Europe
History: History 138B, 138C, 143
Social Analysis: Political Science 144
Culture and Literature: Russian 123, 129,
130, 131, 132, 143, 151

Western Europe
History: History 140, 141, 142A, 144B,
145, 146A, 146B, 147B, 147C, 151D
Social Analysis: African American and
African Studies 107C, Political Science
137, 147, 161
Culture and Literature: Film Studies 176A,
176B, French 107, 108, 120, 121, 133,
German 115, 118B, 118C, 118E, 120,
126, 141, 142, 143, 168, 185, Italian
108, 120A, 120B, Spanish 137N, 138N,
139, 140N, 141, 142, 148, 157, 170

Total units for the major ............... 59-102

Major Adviser, R. M. Siverson

Courses in International Relations (IRE)

Lower Division Courses
1. Global Interdependence (4)
Lecture—3 hours; discussion—1 hour. Development of
the concept of global interdependence along its
political, economic, demographic, cultural, techno-
logical, and environmental dimensions. Focus on
the ways societies and states interact. Course
provides the foundation for upper division multidisciplinary
work in international relations. —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 Courses
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.)
131. Ocean Politics (4)
Lecture—3 hours; term paper. Prerequisite: course 1
or Political Science 3; Political Science 123 recom-
mented. The political, economic, security and envi-
ronmental aspects of the world's oceans. Focus on
the international dimensions of ocean economic
resources, and on the means—both cooperative and
conflictual—by which these resources have been,
and are likely to be, managed.
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.
192. International Relations Internship
(1-12)
Internship—3-36 hours (to be arranged). Prerequi-
site: upper division standing and consent of instruc-
tor. Work experience in international relations, with
term paper summarizing the practical experience of
the student. (P/NP grading only)
194HA-194HB. Special Study for Honors
Students (4-4)
Seminar—2 hours; term paper. Prerequisite: open
to majors of senior standing who qualify for
honors program. Directed reading, research, and
writing on topics selected by students and instructor
culminating in preparation of a senior honors thesis
under direction of a faculty adviser. (Deferred
grading only, pending completion of sequence.)—I, II. (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)

Internship

See Internship Program, below; and UC Davis Washington Center, on
page 467.

Internship Program

Subhash H. Riksbud, Ph.D., Director
Jeanne B. Shelby, Associate Director
The Internship and Career Center 2nd and 3rd
Floors, South Hall
(530) 752-2855, Buehler Alumni and Visitors Center
(530) 752-2286

Program Areas
Linda R. Hughes, Program Manager
(Agricultural and Environmental Sciences, Engi-
neering and Physical Sciences, Graduate Student
and Postdoctoral Career Services, Health and
Biological Sciences and Liberal Arts and Busi-
ness)

Internship Experience

The Internship and Career Center facilitates a cam-
puswide 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 internship experience. Questions per-
taining to academic credit and Transcript Notation
may be directed to The Internship and Career Cen-
ter.

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.
522 Sproul Hall
(530) 752-1219, http://italian.ucdavis.edu

Faculty
JaAnn Cannon, Ph.D., Professor
Dennis J. Dutchie, Ph.D., Professor
Gustavo Fossarini, M.A., Senior Lecturer
Margherita Heyer-Caput, Ph.D., Associate Professor
Juliana Schiesari, Ph.D., Professor
(Italian, Comparative Literature)

Affiliated Faculty
Antonella Bassi, 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 Italian language and culture.

The Program

The Italian program is small and geared to the individual needs of the student. The use of Italian is stressed on all levels and a knowledge of the language is required for literature courses that are taught only in Italian. The Italian program actively participates in the Education Abroad Program, the Short Term Program Abroad, the International Internships Program, and the Summer Session in Italy. (Rome) all of which offer opportunities for travel and study in Italy.

Career Alternatives

Specific career opportunities for those students who have a background in foreign languages are abundant. In addition to the Foreign Service, jobs are available in business and education, both overseas and in the U.S. For example, those wishing to live (for brief or longer periods of time) and work in Italy have a choice of cities: Milan for business, Rome for international concerns in agriculture and nutrition in the F.A.O. and Florence for retail commerce and the arts, just to name a few. In the U.S., foreign-owned companies or American companies with interests in the foreign market need qualified people who are also fluent in a foreign language.

A.B. Major Requirements:

Preparatory Subject Matter ....................... 0-24
Italian 1, 2, 3, 4, 5, and 9 (or the equivalent).................. 0-24

Depth Subject Matter ............................... 36
Italian 101 and 105………………………….. 8
Upper division courses in Literature, taught in the language ……………………. 28
Must include at least one course from two of the following literary periods:
(a) Early Italy
(b) Renaissance and Baroque
(c) Eighteenth through Twentieth Centuries
Upper division General Education courses in Italian may fulfill this requirement with approval of the major adviser.
A total of 8 units in literature may be replaced by Italian 107 (highly recommended) or by courses in related fields such as history, art history, music, comparative literature, English, critical theory, classics, and linguistics.
Note: All upper division courses are to be chosen in consultation with the major adviser.

Total Units for the Major ............................... 36-60

Recommended

One year or one quarter of study abroad with the Education Abroad Program or college Latin or a Romance Language.

Major Adviser, M. Heyer-Caput

Minor Program Requirements:

UNITS
Italian ....................................................... 20
Italian 101 and 105………………………….. 8
Three upper division courses in literature chosen in consultation with major adviser— 12
One course chosen from the following three areas:
(a) Early Italian Literature
(b) Renaissance and/or Baroque
(c) Eighteenth through Twentieth Centuries
One of the above courses may be replaced by course 107 or by a course of literature in translation offered by the Italian Program.

Honors and Honors Program

The honors program comprises two quarters of study under course 194H (3 units) and course 195H (3 units), which will include a research paper and a comprehensive examination. See also Academic Information, on pages 61-62 in this catalog.

Education Abroad Program

Applicable courses taken on EAP are accepted for credit in the major or the minor programs.

Teaching Credential Subject Representative

See Major Adviser above; see the Teaching Credential/M.A. Program on page 102.

Prerequisite Credit

Credit will not normally be given for a course if it is a prerequisite of a course already successfully completed. Exceptions can be made only by the Program Director.

Short Term Language and Culture Program

The Italian program offers an exciting study abroad program of Italian language and culture at the University for Foreigners in Perugia. The spring quarter program is directed and taught in part by a faculty member of the University of California at good standing at UC Davis are eligible to apply. There is no language requirement to participate. Language and culture instruction is offered at all levels, and students are able to earn up to 20 units of credit. The courses may be used for credit towards the Italian major or minor. For information, contact the director of the Italian program or the Education Abroad Center.

Courses in Italian (ITA)

Lower Division Courses

Students seeking high school language preparation as a prerequisite must take a placement test.

1. Elementary Italian (5)
Discussion—5 hours; laboratory—1 hour. Introduction to Italian grammar and development of all language skills in a cultural context with special emphasis on communication. Students who have successfully completed Italian 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.—I, II, III (II, III)

15. Elementary Italian (5)
Discussion/labatory—5 hours. Introduction to Italian grammar and development of all language skills in a cultural context with special emphasis on communication. This course is taught abroad. Not open for credit to students who have completed course 1—III.

2. Elementary Italian (5)
Discussion—5 hours; laboratory—1 hour. Prerequisite: course 1. Continuation of course 1 in areas of grammar and basic language skills—II, III (II, III)

25. Elementary Italian (5)
Discussion/labatory—5 hours. Prerequisite: course 1. Preparation to read, understand, and discuss modern Italian.—I, II, III (I, II, III)

3. Elementary Italian (5)
Lecture/discussion—5 hours. Prerequisite: course 2. Continuation of grammar sequence and practice of all language skills through cultural texts.—I, II, III (I, II, III)

35. Elementary Italian (5)
Lecture/discussion—5 hours. Prerequisite: course 2. Completion of grammar sequence and continuing practice of all language skills through cultural texts. This course is taught abroad. Not open for credit to students who have completed course 3.—III.

4. Intermediate Italian (4)
Lecture/discussion—3 hours; laboratory—3 hours. Prerequisite: course 3. Review of grammar and syntax through written exercises and short prose works. Intended to develop the linguistic foundations of students who have completed the first year language classes.—I, II, III (I, II, III)

45. Intermediate Italian (3)
Lecture/discussion—3 hours. Prerequisite: course 3 or the equivalent. Review of grammar and syntax through written exercises and readings of short prose works. Intended to develop the linguistic foundations of students who have completed the first year language classes. This course is taught abroad. Not open for credit to students who have completed course 4—III.

5. Intermediate Italian (4)
Lecture/discussion—3 hours; laboratory—3 hours. Prerequisite: course 4. Preparation to read, understand, and discuss texts written in Italian. Transition between course 4 and 10. This course is taught abroad. Not open for credit to students who have completed course 5—III.

8A. Italian Conversation (3)
Discussion—3 hours. Prerequisite: course 3 or the equivalent. Course designed to offer practice in speaking Italian. May be repeated once for credit. (P/NP grading only)—I, III (I, 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 8. (P/NP grading only)—I, III (I, III)

89. Italian Conversation (3)
Discussion—3 hours. Prerequisite: course 8A. Course designed to offer practice in speaking Italian. (P/NP grading only)—II, III (II, III)

88B. Italian Conversation (3)
Discussion—3 hours. Prerequisite: course 8A. 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)—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 journalistic writings. Introduction to contemporary Italian literature and culture. Strengthening the student's command of the Italian language.—I, II, III (I, II, III) Cannon

95. Reading Italian (3)
Lecture/discussion—3 hours. Prerequisite: course 5. Reading and discussion of modern Italian prose, including selections from creative, scientific and journalistic 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—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 history. Film will be studied as an artistic medium and as a form of mass communication. GE credit: ArtHum, Wrt.—II. (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 Italian language or culture (such as Italian culture seen through film, Italian feminism, literature or politics) through seminars, discussions, written 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)
Upper Division Courses

101. Advanced Conversation, Composition, and Grammar (4)
Lecture—3 hours; weekly essays. Prerequisite: course 9 or consent of instructor. —I. (I.) Heyer-Caput, Cannon

101S. Advanced Conversation, Composition, and Grammar (4)
Lecture—3 hours; extensive writing. Prerequisite: course 9 or consent of instructor. Practice in exposition in writing in Italian, with emphasis on advanced grammar, organization, and vocabulary building. Course will be taught in Italian. Not open for credit to students who have completed course 101. —III.

104. Italian Translation and Style (4)
Lecture/discussion—3 hours; two research papers; term paper. Prerequisite: course 101 or consent of instructor. Practice in translation from English to Italian 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. —III. (III.) Cannon

104S. 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. —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 principal authors, works, and movements of the Medieval, Renaissance, and Early Modern periods in Italy. GE credit: ArtHum—II. (II.) Schiesari

105S. 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.—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. —III. (III.) Foscarini

107S. Survey of Italian Culture and Institutions (4)
Lecture/discussion—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. Course is taught abroad. Not open for credit to students who have completed course 107. GE credit: ArtHum. —III.

108. Contemporary Issues in Italian Culture and Society (4)
Lecture—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, Div, Wrt.—I. (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. Course is taught abroad. Not open for credit to students who have completed course 108. GE credit: ArtHum. —III. (III.) Heyer-Caput

112. 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, Cavalcanti, Petrarch, the Sicilian School, the Sweet New Style Poets, and other authors. Offered in alternate years. GE credit: ArtHum. —I. (I.) Dutschke

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 Divine 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—III. (III.) Dutschke

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—III. (III.) Dutschke

115A. Studies in the Cinquecento (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. 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, Aretilio, Castiglione, and Tasso. Offered in alternate years. GE credit: ArtHum. —III. (III.) 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 Micheangelo and Tasso leading to Marino, with an excur- sus on Galilei’s role in the formation of a modern literary standard. GE credit: ArtHum—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. 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, Gaspardini, Franco, and Isabella di Morra. Offered in alternate years. GE credit: ArtHum—I. (I.) Schiesari

115D. Early Modern Italian Lyric (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- velli and the logic of power, Baroque dramatists in the service of counter-reformation Italy, Goldoni’s comedies and bourgeois social consciousness. Offered in alternate years. GE credit: ArtHum. —III. (III.) Schiesari

118. Italian Literature of the Eighteenth Century (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 9 or consent of instructor. Development of modern Italian literature. Emphasis on the work of Goldoni, Bettinelli, Baretti, Panini, Alfieri and Vico. GE credit: ArtHum. —III. (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 Stendhal and Verismo. GE credit: ArtHum. —II. (II.) Heyer-Caput

120. 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, Maravita, Favese, and Vitori. GE credit: ArtHum.—III. (III.) Cannon, Heyer-Caput

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.—I. (I.) Cannon, Heyer-Caput

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 traditions and the problem of women’s self-representation. Authors studied may include Petrarch, Tasso, Casanova, Alfieri, Zvevok, Sibilla Almerano and Primo Levi. Offered in alternate years. GE credit: ArtHum. —III. (III.) Heyer-Caput, 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, Miche- langelo, and Tasso. GE credit: ArtHum.—II. (II.) Dutschke

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. Critical analysis of texts from the Italian Renaissan- ce. Primary concern focuses on issues such as “the dignity of Man;” education and gender politics; “high” and “low” culture and its relation to literary practices. GE credit: ArtHum, Div, Wrt.—II. (II.) Dutschke

141. Culture, Gender and the Italian Renaissance (4)
Lecture—1.5 hours; discussion—1.5 hours; term paper. Prerequisite: any course from the GE Literature preparation List. Reading of Dante Alighieri’s Divine Comedy, through the otherworldly realms of Inferno, Purgatory, and Paradise. GE credit: ArtHum, Wrt.—I, II, III. (I, II, III.) Dutschke

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 4. C. Analysis of major works of Italian narrative fiction from unification of Italy to present. Students will learn to use representative methods and concepts to guide literary scholar- ship. Consideration of works within European social and cultural context. Offered in alternate years. GE credit: ArtHum, Wrt.—III. (III.) Cannon

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 topic differs. GE credit: Wrt.—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, and the image of America, etc. May be repeated for credit when topic differs. GE credit: Wrt.—I, II, III. (I, II, III.)
Jewish Studies

(College of Letters and Science)
David Biale, Ph.D., Program Director
Program Office, 2216 Social Sciences and Humanities Building
http://jewishstudies.ucdavis.edu

Committee in Charge
Carlee Arnett, Ph.D. (German)
David Biale, Ph.D. (History)
Alisa Braun, Ph.D. (Jewish Studies)
Naomi Janowitz, Ph.D. (Religious Studies)
Lisa Markson, Ph.D. (History)
Diane Wolf, Ph.D. (Sociology)

The Program of Study
The Program in Jewish Studies offers students the opportunity to explore Jewish history, 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 will 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.

The Program in Jewish Studies will be of special interest to students in History, Religious Studies, Comparative Literature and Sociology as well as other fields in the Humanities and Social Sciences.

Minor Program Requirements:

Jewish Studies................................................ 20

One course from Jewish Studies 10 or Religious Studies 23......................... 4

Upper division courses selected from the following list, with at least one course in each category:

(a) Religion: English 171A; Religious Studies 122, 124, 125
(b) Representations, Languages, and Identity: Comparative Literature 147; English 179; French 108; German 141; Hebrew 100A, 100B, 100C; Jewish Studies 101, 110, 111, 112, 120, 121, Russian 159; Sociology, 174
(c) Histories: History 112A, 112B, 113, 142A, 142B

Advising: Jewish Studies Program office
(530) 752-1640 or 754-7007

Courses in Jewish Studies (JST)

Lower Division Course
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: SocSci, Div, Writ.

Upper Division Courses
101. Topics in Jewish Thought (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 10 or Religious Studies 23 or consent of instructor. Selected themes in Jewish thought are examined with a focus on one specific historical period, such as modern Jewish thought. May be repeated for credit when topic differs.
GE credit: ArtHum, Div, Writ. —II. (II.)

Land, Air, and Water Resources

(College of Agricultural and Environmental Sciences)
Jan W. Hopmans, Ph.D., Chairperson of the Department
James H. Richards, Ph.D., Vice Chairperson, Soils and Biogeochemistry
Terrence R. Nathan, Ph.D., Vice Chairperson, Atmospheric Science
Department Office: 1110 Plant and Environmental Sciences Building (530) 752-1406
http://lawr.ucdavis.edu

Faculty—Soils and Biogeochemistry
Office: 1110 Plant and Environmental Sciences Building (530) 752-1406
Caroline S. Bledsoe, Ph.D., Professor (Soil Science)
Randy A. Dahlgren, Ph.D., Professor (Soil Biogeochemistry)
William R. Horath, Ph.D., Professor (Soil Biogeochemistry)
Louise Jackson, Ph.D. Professor and Extension Specialist (Soil Science)
Alexandra Navrotsky, Ph.D., Professor  
Chemical Engineering and Materials Science

James H. Roberts, Ph.D., Professor  
Plant Nutrition

Kate M. Scow, Ph.D., Professor  
Soil Science

Wendy K. Silk, Ph.D., Professor  
Hydrologic Science

Michael J. Singh, Ph.D., Professor  
Soil Science  
Randal J. Southard, Ph.D., Professor  
Soil Genesis/Morphology

Emeriti Faculty
Conrad J. Bahre, Ph.D., Professor Emeritus  
Francis E. Broadbent, Ph.D., Professor Emeritus  
Richard G. Burau, Ph.D., Professor Emeritus  
Emanuel Epstein, Ph.D., Professor Emeritus  
André E. Lauchli, Ph.D., Professor Emeritus  
Roland D. Meyer, Ph.D., Specialist in Cooperative Extension Emeritus  
H. Michael Reiterman, Ph.D., Professor Emeritus  
Victor V. Rendig, Ph.D., Professor Emeritus  
Dennis R. Rolston, Ph.D., Professor Emeritus  
Harry O. Walker, Ed.D., Senior Lecturer Emeritus  
Robert J. Zasoski, Ph.D., Professor Emeritus

Affiliated Faculty
A. Toby O’Geen, Ph.D., Assistant Specialist in Cooperative Extension
G. Stuart Perrygrove, Ph.D., Specialist in Cooperative Extension

Faculty—Atmospheric Science
Office: 141 Hoagland Hall, 1110 Plant and Environmental Sciences, Ph.D., Associate Professor  
Tropospheric Chemistry
Shihua Chen, Ph.D., Assistant Professor  
Regional Scale Meteorologist
Ian Faloona, Ph.D., Assistant Professor  
Atmospheric Science
Robert G. Flocchini, Ph.D., Professor  
Environmental and Resource Sciences
Richard D. Grotjahn, Ph.D., Professor  
Atmospheric Science
Terrence R. Nathan, Ph.D., Professor  
Atmospheric Chemistry
Kyaw Thaw Pa U, Ph.D., Professor  
Atmospheric Science
Ruth Reck, Ph.D., Professor  
Atmospheric Science
Bryan C. Wheat, Ph.D., Professor  
Atmospheric Science

Emeriti Faculty
Thomas A. Cahill, Ph.D., Professor Emeritus  
John J. Carroll III, Ph.D., Professor Emeritus  
Roger H. Shaw, Ph.D., Professor Emeritus  
Marilyn L. Shelton, Ph.D., Professor Emeritus  
Su-Tzei Soong, Ph.D., Professor Emeritus

Affiliated Faculty
Richard L. Snyder, Ph.D., Lecturer  
Atmospheric Science and Specialist in Cooperative Extension

Faculty—Hydrology
Office: 141 Hoagland Hall, 1110 Plant and Environmental Sciences  
Graham E. Fogg, Ph.D., Professor  
Hydrogeology
Mark E. Grismer, Ph.D., Professor  
Hydrologic Science, Biological and Agricultural Engineering
Peter J. Hernes, Ph.D., Assistant Professor  
Hydrologic Science  
Ian W. Hopmans, Ph.D., Professor  
Vadose Zone Hydrology
Doug Mackay, Ph.D., Adjunct Professor  
Hydrologic Science  
Miguel A. Marito, Ph.D., Professor  
Hydrologic Science, Civil and Environmental Engineering
Gregory B. Pasternack, Ph.D., Associate Professor  
Water and Riparian Hydrology
Carlos E. Puente, Ph.D., Professor  
Hydrology
Susan Ustin, Ph.D., Professor  
Environmental and Resource Sciences  
Jennifer J. Wallander, Ph.D., Professor  
Hydrologic Science, Biological and Agricultural Engineering
Minghua Zhang, Ph.D., Adjunct Professor  
Hydrologic Science

Emeriti Faculty
James W. Biggar, Ph.D., Professor Emeritus  
Robert H. Burgy, M.S., Professor Emeritus  
Donald W. Grimes, Ph.D., Associate Professor Emeritus  
Delbert W. Henderson, Ph.D., Professor Emeritus  
Theodore C. Hisao, Ph.D., Professor Emeritus  
Allen W. Knight, Ph.D., Professor Emeritus  
Donald R. Nielsen, Ph.D., Professor Emeritus  
William O. Pruitt, Jr., Ph.D., Lecturer Emeritus  
Frank E. Robinson, Ph.D., Lecturer Emeritus  
Verne H. Scott, Ph.D., Professor Emeritus  
Kenneth K. Tanji, Sc.D., Professor Emeritus

Affiliated Faculty
David A. Goldhammer, Ph.D., Lecturer  
Hydrologic Science and Specialist in Cooperative Extension
Stephen Grattan, Ph.D., Lecturer  
Hydrologic Science and Specialist in Cooperative Extension
Blaine R. Hanson, Ph.D., Lecturer  
Hydrologic Science and Specialist in Cooperative Extension
Thomas Harter, Ph.D., Specialist in Cooperative Extension
Terry L. Prichard, M.S., Lecturer  
Hydrologic Science and Specialist in Cooperative Extension
Lawrence J. Schwank, Ph.D., Lecturer  
Hydrologic Science and Specialist in Cooperative Extension

Land, Air, and Water Resources is a multidisciplinary department with faculty who specialize in atmospheric, plant, environmental, resource, soil, and water sciences, hydrology, and water engineering. Teaching and research focus on both agricultural and environmental sciences. The faculty contribute to numerous undergraduate and graduate programs in the College of Letters and Science, Engineering, and Agricultural and Environmental Sciences.

Major Programs. Undergraduates in the department major in Atmospheric Science, Environmental and Resource Sciences, Hydrology, and Soil and Water Science; see http://lawr.ucdavis.edu/academic_programs.htm.

Advising Center is located in 1152 Plant and Environmental Sciences Building (530) 752-1669.

Graduate Study. Graduate work offered in the area of resource sciences is Atmospheric Science, Hydrologic Sciences, and Soils and Biogeochemistry. Detailed information can be obtained from graduate advisers for these areas, from the Graduate Announcements, and at http://lawr.ucdavis.edu/academic_programs.htm.

Courses. See courses listed under Atmospheric Science, Hydrologic Sciences, Hydrology, Environmental and Resource Sciences, and Soil Science. See also the Web sites listed above.

Landscape Architecture

(Office of Agricultural and Environmental Sciences)
Heath Schenker, MA, Chairperson, Landscape Architecture Program

Department Office. 142 Walker Hall (530) 752-3907, http://lada.ucdavis.edu

Faculty
Mark Francis, M.L.A., Professor  
Steven E. Greve, Assistant Professor  
Dean MacCannell, Ph.D., Professor  
E. Byran McCully, B.S.L.A., Lecturer  
Edward S. McNiel, M.L.A., Lecturer  
Patsy Eubanks Owens, M.L.A., Associate Professor  
Heath Schenker, M.A., Associate Professor  
Jeff Lux, Ph.D., Assistant Professor  
Eric Larsen, Ph.D., Assistant Research Scientist  
Lorence Ok, Ph.D., Cooperative Extension Specialist

Emeriti Faculty
Robert L. Thayer, Jr., M.A., Professor Emeritus
Nigel J.R. Allan, Ph.D., Professor Emeritus

The Major Program
Landscape architecture is the 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 it. They are capable of solving physical problems and are able to visualize or "think in" terms of spaces and three-dimensional concepts. The program is fully accredited by the American Society of Landscape Architects, which is the only organization professionally sanctioned to grant landscape architectural accreditations in the United States. The program was last reviewed in 2006.

The Program. The curriculum balances creativity and visual and spatial skills with technological expertise and a thorough background in physical, natural, and social sciences. Students develop proficiency at problem solving relating to design of parks, urban open spaces, energy-efficient neighborhood, land reclamation projects, and landscape planning for wilderness and scenic regions, coastal and riparian environments, and other sensitive land areas. 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 and selection by the faculty. Contact the Landscape Architecture Advising Office for further information, 201 Walker Hall (530) 754-8628.

Career Alternatives. Graduates may find jobs in private landscape architectural firms or public agencies 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Composition Requirement</td>
<td>8</td>
</tr>
<tr>
<td>Preparatory Subject Matter</td>
<td>61-70</td>
</tr>
<tr>
<td>Environmental Horticulture</td>
<td>4</td>
</tr>
<tr>
<td>One course from Mathematics 16A; Statistics 13; Computer Science 10</td>
<td>3-4</td>
</tr>
<tr>
<td>One course from Chemistry 2A, 10; Physics 1A, 10; Geology 1; or Soil Science 10</td>
<td>3-5</td>
</tr>
<tr>
<td>One course from Landscape Architecture 2, Geography 2, or 10</td>
<td>3-4</td>
</tr>
<tr>
<td>Two courses from Anthropology 2, 3, 20, Economics 1A, 1B, Psychology 1, Political Science 1, 2, 3, 4, 5, 7, Sociology 1, 2, 3, 4, 5, or 25</td>
<td>8-10</td>
</tr>
<tr>
<td>Two courses from Art 9, 10, 11, 12, 13, 14, Design 125, any course from History, Music, Dramatic Art, Philosophy, Art History, language or literature</td>
<td>8-10</td>
</tr>
</tbody>
</table>

Landscape Architecture 190 (three quarters) | 3-2 |

Breadth/General Education | 0-34 |

See General Education requirement.

Depth Subject Matter | 44-47 |

Landscape Architecture 160, 161, 170, 193A, 193B | 20 |
Four studios from Landscape Architecture 180, 180/181 or 191 | 17-20 |
Landscape Architecture 120 or equivalent | 4 |
Landscape Architecture 190 (three quarters) | 3 |
Internship (Landscape Architecture 192) recommended. | 4 |

Restricted Electives | 32 |
Psychology 153 | 4 |
Courses in Landscape Architecture (LDA)

Lower Division Courses

1. Landscape Meaning (4)
Lecture—3 hours; discussion—1 hour. Overview of the meaning of landscapes as manifested in designed and natural landscapes, everyday and sacred environments, parks, plazas, community gardens and found spaces. Introduction to the profession of landscape architecture and methods used to design plan and manage landscapes. Not open for credit to students who have taken course 40. GE credit: ArtHum or SocSci, Wrt.—I. (I.)

2. Place, Culture and Community (4)
Lecture—4 hours. Introduction to the relationship of social and spatial arrangements. Basic social-sciences concepts of status, role, kinship, ritual, myth, alienation, etc., introduced through site-specific case studies of both historical and contemporary communities. GE credit: SocSci, Wrt.—III. (III.) MacCannell

21. Landscape Drafting and Visualization (4)
Studio—8 hours; two all-day field trips. Prerequisite: course 23. Free-hand drawing recommended. Development of idea expression through graphic media and the use of drawing techniques for visual representation, including plan, section, and axonometric drawing. Includes an introduction to computerized drafting and drafting. —I. (I.)

Studio—8 hours; two all-day field trips. Prerequisite: course 30. Architectural communication explored through the computer. Includes computer-aided drafting, drawing, rendering, desktop publishing, and photorealistic simulation. —II, III, IV, III. (III.)

30. History of Landscape Architecture (4)
Lecture—3 hours; discussion—1 hour. Introduction to the history of landscape architecture, emphasizing landscape design as a product of cultural, political, social, and environmental factors. Topics include the history of community design and environmental planning. Not open for credit to students who have taken course 140. GE credit: ArtHum, Wrt.—II. (II.) Schenker, McNiel

50. Site Ecology (4)
Lecture—2 hours; laboratory—2 hours. Prerequisite: Biological Sciences 1A 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 expected to field exercises in local ecosystems. Not open for credit to students who have taken course 153. GE credit: SciEng.—III. (III.) Greco

60. Technology I: Grading and Drainage (4)
Studio—8 hours. Prerequisite: courses 21 and 23 or consent of instructor. Priority given to Landscape Architecture majors. Topographic and grading problems in landscape engineering: drainage plans, grading plans, specification, sections and profiles and cut and fill calculations. Not open for credit to students who have taken course 122.—I. (I.) McCulley

70. Basic Landscape Design Studio (4)
Studio—8 hours; field trips. Prerequisite: courses 1, 21, 30 or consent of instructor. Priority given to Landscape Architecture majors. Introduction to basic aesthetic, functional, social, and environmental considerations in landscape design. Provides a broad foundation in landscape design methodologies and skills necessary to create environmentally and socially responsible landscape designs. Not open for credit to students who have taken course 111.—II. (II.)

Upper Division Courses

120. Advanced Computer Applications (4)
Studio—8 hours; two all-day field trips. Prerequisite: course 23; open to majors in Landscape Architecture only. Studio work using computer-aided design, geographic information systems, and other advanced computer programs.—III. McNiel

160. Technology 2: Construction Materials and Detailing (4)
Studio—8 hours. Prerequisite: courses 21, 23, and 60. Priority given to Landscape Architecture majors. Introduction to materials and methods in landscape construction, including properties of common construction materials (stone, concrete and wood), detailing, preparation of cost estimates and specifications, design of drainage systems, fountains and roof decks. Not open for credit to students who have taken course 133.—I. (I.) McCulley

161. Professional Practice and Construction Documents (4)
Studio—8 hours. Prerequisite: courses 21, 23, 60 and 160. Legal and professional aspects of landscape architecture, including the development of construction documents (drawings and specifications), proposal writing, fee calculations, project management, cost estimation, and insurance.—II. (II.) McCulley

168. Maintaining Landscapes and Life (3)
Lecture—3 hours. Prerequisite: introductory course in cultural geography, cultural anthropology or landscape theory. Course provides knowledge of mountain landscapes, explains why different mountain societies exploit and reject resources available, examines myths about mountain landscapes that influence individual and collective behavior of residents and visitors. Examples from Himalayas, Andes, Alps, and Rockies. GE credit: ArtHum or SocSci, Wrt.—II. (II.) MacCannell

170. Field Studio in Landscape Architecture (3)
Lecture—2 hours; workshop—4 hours. Prerequisite: courses 1, 21, 23, 30, 50, 60 and 70 or consent of instructor. Field study and problem solving experience for juniors in the landscape architecture major. Analysis of complex landscape design and planning problems. Two all-day, weekend field trips required.—I. (III.)

180A. Special Topics in Landscape Architecture: Public Open Space (2)
Lecture—2 hours. Prerequisite: upper division standing. Intensive study of public open 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.—II. (III.)

180B. 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.—II. (III.)

180N. Special Topics in Landscape Architecture: Planting Design (2)
Lecture—2 hours. Prerequisite: upper division standing and Environmental Horticulture 6. Develop an understanding of the sense and functional importance of plants in the landscape. Visualization and change of designed environment. Offered in alternate years. Not open for credit to students who have taken course 185.—MacCannell

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 minors. Introduction to environmental art. Encouragement of critical thinking about the intersection of art, landscape and environmental issues. Offered in alternate years.—Schlenker

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 master planning vs. participatory planning and design approaches. Offered in alternate years.
and design of planted landscapes. Development of planting plans. Offered in alternate years. Not open for credit to students who have taken course 152.

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: Historic Preservation (2)
Lecture—2 hours. Prerequisite: upper division standing. Roots and present focus of historic preservation movement; current philosophies and laws governing preservation, restoration, and revitalization as they affect landscape architects. Offered in alternate years. —McKee

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. —MacCannell

181C. Art of the Environment Design and Planning Studio (3)
Studio—6 hours; one field trip required. Prerequisite: course 170; course 180C 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. —Schneck

181E. Landscape Ecology and Design Planning Studio (3)
Studio—6 hours. Prerequisite: courses 21, 23, 50, 60, and 170, 180F concurrently. 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 trip required. Offered in alternate years. —McCiel

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 liveable and sustainable cities, towns, villages, rural, and natural landscapes. Testing of models by creating plans for new communities, and for urban infill, restoration or redevelopment projects. Field trip required. Offered in alternate years. —Greco

182A. International Landscape Design and Planning Studio (3)
Studio—6 hours; one field trip required. Prerequisite: course 170; course 180H 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. —Owens

181K. Social Factors in Landscape Architecture Design and Planning Studio (2)
Studio—6 hours; one field trip required. Prerequisite: course 170 and Psychology 144; course 180K concurrently. Priority given to Landscape Architecture majors. Application of design theory and methods to real-world projects associated with course 180K. Offered in alternate years. —Owens

181L. Public Open Space 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. —Francis

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. —Francis

181N. Planting Design and Planning Studio (3)
Studio—6 hours; one field trip required. Prerequisite: course 170 and Environmental Horticulture 6; course 180N concurrently. Priority given to Landscape Architecture majors. Application of design theory and methods to real-world projects associated with course 180N. Offered in alternate years.

181O. Current Issues Design and Planning Studio (3)
Studio—6 hours; one field trip required. Prerequisite: course 170; course 180O concurrently. Priority given to Landscape Architecture majors. Application of design theory and methods to real-world projects associated with course 180O. Offered in alternate years.

185. Concepts and Methods in Geographic Information Systems (4)
Lecture/laboratory—8 hours. Prerequisite: Applied Biological System Technology 180 or Agricultural Management and Rangeland Resources 180 or course 50 or consent of instructor. Major concepts and methods in representation and analysis of data in geographic information systems (GIS). Methods to create spatial data sets from analog and digital data sources such as aerial photography and maps; data structures, data management, database design, geographic referencing, geostatistics, surface models, analysis, and visualization of spatial data. (Same course as Applied Biological System Technology 185.) —Greco

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

191. Workshop in Landscape Architecture (2-12)
Seminar—1 hour; workshop—3 hours. Prerequisite: courses 1, 70, and 170 or consent of instructor. Priority given 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

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. Project 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. Tutoring in Landscape Architecture courses. (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 Courses

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, urban design and planning. Normative theories of design are reviewed along with the social and environmental sciences. Offered in alternate years. —Francis

202. Methods in Design and Landscape Research (4)
Seminar—4 hours; field trip required. Prerequisite: graduate standing in Landscape Architecture, Ecology, Geography or Community Development or consent of instructor. Explores many of the research and advanced design and planning methods employed in landscape architecture. Exercises provide the student with a vehicle for designing independent landscape research and creative activities. Lectures provide an historical overview of research methodology. Offered in alternate years. —Owens

204. Case Studies in Landscape Design and Research (4)
Seminar—4 hours; field trip required. Prerequisite: graduate standing in Landscape Architecture, Ecology, Geography or Community Development or consent of instructor. Explores many of the research and advanced design and planning methods employed in landscape architecture. Exercises provide the student with a vehicle for designing independent landscape research and creative activities. Lectures provide an historical overview of research methodology. Offered in alternate years. —Owens

210. Advanced Landscape Architecture Studio (4)
Laboratory—8 hours. Prerequisite: course 113 or the equivalent; graduate standing or consent of instructor. Exposes students to real-world, designed-environment situations where creative activity and/or basic research is the primary product. May be repeated for credit for a total of 12 units. Offered in alternate years. —I, II, III

220. Public Space and Culture (3)
Seminar—3 hours. Prerequisite: course 182 or the equivalent; graduate standing or consent of instructor. Explores the public environment of cities including 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. —Francis

230. Landscape and Memory (4)
Seminar—4 hours; term paper. Prerequisite: graduate standing or consent of instructor. Theories of memory from other fields (critical theory, psychoanalysis, history) applied to landscape design, espe-
Landscape Restoration

(College of Agricutural and Environmental Sciences)

This minor is of particular interest to students majoring in Wildlife, Fish, and Conservation Biology, Environmental Biology and Management, Environmental and Resource Sciences, Landscape Architecture, Biological Sciences, Evolution and Ecology and Plant Biology. Biological Sciences 1C is a prerequisite to some courses in the minor. The minor is sponsored by the Department of Plant Sciences.

Landscape Restoration......................... 19-25

Select one of Environmental Horticulture 144/ Environmental and Resource Sciences 144/ Plant Biology 144, Environmental Science and Policy 153, Evolution and Ecology 121, Evolution and Ecology 117/Plant Biology 117, Plant Biology 102, 147 ............... 4-5

Select one of Environmental Horticulture 100, 130, 133, Plant Biology 119, 176 ........................................ 3-4

Soil Science 10 or 100 ............................ 3-5

Environmental Horticulture 160 and 160L ................................................... 4

Select one of Plant Sciences 130, Environmental Horticulture 150, Environmental Science and Policy 155, Landscape Architecture 180F, 180H, 180I, 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 171.

Latin American and Hemispheric Studies

(College of Letters and Science)

The minor in Latin American and Hemispheric Studies offers students the opportunity to explore connections 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 additional upper division courses from a designated list of courses that focus primarily on Latin American and/or Hemispheric issues). Students are strongly encouraged to develop proficiency in Spanish, either through course work (such as completion of Spanish 24 or 33), or through life experience.

Minor Program Requirements

Units

Latin American and Hemispheric Studies ........................................... 24

Basic Courses ...................................................................................... 4

One course from History 7A, 7B, 7C ........................................... 4

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, 163, Anthropology 130C, 146; Art History 151; Chicana/o Studies 130; Comparative Literature 151, 152, 165; Native American Studies 120, 125, 133, 181A, 181B, 181C, 184; History 160, 162, 163A, 163B, 164, 165, 166A, 166B, 167, 168, 169A, 169B; Spanish 117, 149, 153, 154, 155, 156, 157, 158, 159, 170, 171, 172, 174, 176

Minor Adviser. T. Holloway in 5211 Social Sciences and Humanities Building (530) 752-3046

Law, School of

Rex K. Perschbacher, J.D., Dean

Kevin Johnson, J.D., Associate Dean (Academic Affairs and Research)

Hollis L. Kulwin, J.D., Assistant Dean (Student Affairs)

Mary A. Grivna, B.A., Assistant Dean (Administration)

George S. Grossman, LL.B., M.S.L.S., Director (Law Library)

Dean's Office. 1011 Martin Luther King, Jr. Hall (530) 752-0243; http://www.law.ucdavis.edu

Faculty

Michelle Alexander, J.D., Acting Professor

Diane M. Amann, J.D., Acting Professor

Antonia E. Bernhard, J.D., Lecturer

Andrea K. Bjorklund, J.D., Acting Professor

Alan E. Brownstein, J.D., Professor

Jennifer M. Chacón, J.D., Acting Professor

Anupam Chander, J.D., Professor

Joel C. Dobris, I.B., Professor

Holly G. Doremus, J.D., Professor

Christopher S. Eldemerdash, J.D., Acting Professor

Floyd F. Feeney, I.B., Professor

Arturo Gándara, J.D., Professor

Joan Gerbasi, M.D., Assistant Clinical Professor

(School of Medicine)

George S. Grossman, LL.B., M.S.L.S., Professor

Robert W. Hillman, J.D., Professor

Bill Ong Hing, J.D., Professor

Edward J. Imwinkelried, J.D., Professor

Elizabeth E. Joch, J.D., Acting Professor

Margaret Z. Johns, J.D., Senior Lecturer

Kevin R. Johnson, J.D., Professor

Thomas W. Joo, J.D., Professor

Lea St. Knight, J.D., Lecturer

Hollis L. Kulwin, J.D., Lecturer

Lea St. Kurtz, J.D., Professor

Evelyn A. Lewis, J.D., Professor

Carlton Larson, J.D., Acting Professor

Albert C. Lin, J.D., Acting Professor

Robert Merges, J.D., LLM, J.D., Professor

Robert Mikos, J.D., Acting Professor

Millard Murphy, J.D., Lecturer

John B. Oakley, J.D., Professor

Angela I. Onwuchichi-Willig, J.D., Acting Professor

Amagda Perez, J.D., Lecturer

Rex R. Perschbacher, J.D., Professor

John W. Poulos, J.D., Professor

Lisa R. Pruitt, J.D., Acting Professor

Cruz Reynoso, I.B., Lecturer

Ben A. Rich, J.D., Ph.D., Professor

Charles L. Scott, M.D., Professor (School of Medicine)

Daniel L. Simmons, J.D., Professor

James F. Smith, J.D., Senior Lecturer

Madhavi Sunder, J.D., Professor

Jerrod Tannenbaum, J.D., Professor (School of Veterinary Medicine)

Martha S. West, J.D., Professor

Carter C. White, J.D., Lecturer

Tobias B. Wolff, J.D., Acting Professor

Bruce A. Wolk, J.D., Professor

Quarter Offered: I=Fall; II=Winter; III=Spring; IV=Summer; 2007/2008 offering in parentheses

General Education (GE) credit: ArHum=Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Social-Cultural Diversity, Wrt=Writing Experience
Emeriti Faculty

John D. Ayer, J.D., LL.M., Professor Emeritus
Edward L. Barrett, Jr., J.D., Professor Emeritus
Florindo Bartosic, J.S.D., LL.M., Professor Emeritus
Carol S. Bruch, J.D., Professor Emeritus
Harrison C. Dunning, LL.B., Professor Emeritus
Daniel Wm. Fessler, J.D., S.J.D., Professor Emeritus
Gary L. Gorn, Ph.D., Professor Emeritus
James E. Hogan, LL.B., Professor Emeritus
Raymond I. Parnas, J.D., LL.M., S.J.D., Professor Emeritus
Edward Rabin, LL.B., Professor Emeritus
Martindale D. Schwartz, J.D., LL.M., Professor Emeritus
Richard C. Wydyk, LL.B., Professor Emeritus

Courses of Instruction. The following courses for students enrolled in the School of Law are set up for the semester-system basis only. Instruction dates can be found at the end of the School of Law chapter of this catalog. For current schedule of classes, contact the School of Law.

Courses in Law (LAW)

Professional Curriculum

First Year Courses

200. Introduction to Law (1)
Discussion—1 hour. Introduction to basic concepts of the law, the historical roots of common law and equity, the precedent system in its practical operation, the modes of reasoning used by courts and attorneys, and the fundamentals 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' legal system. Important current legal issues, developments and trends. Required for LL.M. students who have not attended a U.S. law school. Fall semester only. (S/U grading only.)

201. Property (4)
Discussion—5 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 public and private land use control.

202. Contracts (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 and division of powers in the 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 individual liability for the major criminal offenses.

207. Legal Research (1)
Discussion/laboratory—1 hour. Research related issues in the practice of law, including the use of sources of law and secondary authority, computer-assisted legal research, writing research memorandum, and basic citation forms. Class discussion follows results of research assignments.

208. Legal Writing (2)
Lecture—2 hours. Instruction in the form and substance of writing. A variety of law-related documents will be discussed and drafted. An experience in oral advocacy will be included. Graded on the basis of the writing and advocacy assignments. No final examination.

Second and Third Year Courses

(a) General/Topical Survey Courses: 273, 285C, 287T
(c) Constitutional Law: 216A, 218, 240, 288A
(e) Estate Planning: 214, 223, 221
(g) Family Law: 225, 242, 272, 435
(l) Legal Theories and Ethics: 237, 250, 258, 259, 284, 286C, 286D
(m) Medical and Mental Health Law: 212, 241, 266A, 266B, 268, 286C
(n) Procedure and Jurisdiction: 242, 246, 283
(r) Clinical Programs: Extensives: 425, 430, 445, 455, 460, 470
(s) Clinical Programs - In-House Clinicals: 420, 435, 440, 480
(t) Individual and Group Study: 411, 418B, 418, 419, 419, 495, 499

209A. Patent Law (3)
Discussion—3 hours. Prerequisite: course 274 or consent of instructor. This course covers all essential aspects of patent law: patentable subject matter, novelty, utility, nonobviousness, enablement, prosecution, infringement, and remedies.

210. Criminal Justice Administration Seminar (2)
Seminar—2 hours. This course compiles U.S. criminal procedure with that of other countries, particularly the differing roles of the prosecutor, defense counsel, and the judge. Limited enrollment.

210A. Privatization of Criminal Justice Seminar (2)
Seminar—2 hours. Prerequisite: Prior social theory or criminal procedure knowledge not required; completion of course 227A strongly recommended. Analyzes the legal, historical, and sociological aspects of the growing private sector provision of criminal justice services traditionally assumed by government, including prisons, policing, and adjudication. Limited enrollment.

211. Negotiation (2)
Discussion—2 hours. Theoretical and empirical approaches to negotiation for the purposes of making deals and resolving legal disputes. Limited enrollment.

212. Law and the Mental Health System (3)
Discussion—3 hours. Mental illness, the regulation of mental health professions and the therapeutic relationship, mental health professionals as expert witnesses, and deprivation of liberty and property based upon mental disorder. With the prior written approval of the instructor, the advanced legal writing requirement may be satisfied by the research paper required for this course.

213A. Transnational Criminal Law (3)
Discussion—3 hours. Prerequisite: course 205, course 206. Will examine the laws responses to a particular aspect of globalization, transnational crime. The course will explore the phenomenon of transnationality and how it affects the power of nation-states, acting alone or together, to prosecute certain crimes.

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-skiping transfer tax.

215. Business Associations (4)
Discussion—4 hours. Legal rules and concepts applicable to business associations, both public and closely held. Corporate theory, 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. This course provides a broad survey of the legal rules and concepts applicable to business associations, both public and closely held. Principal attention is given the corporate form of organization, although partnerships are also treated briefly. Topics surveyed include the planning of business transactions, the process of incorporation, the financing of corporations, and role of managers and shareholders, the federal securities laws, and social responsibility.

216A. Law and Religion (2)

217. Telecommunications Law (3)
Discussion—3 hours. Economic and administrative regulation of telephone, 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 anti-trust law and state public utility regulation.

218. Constitutional Law II (4)
Discussion—4 hours. This course principally covers the First Amendment and the Equal Protection Clause.

219. Evidence (4)
Discussion—4 hours. Covers rules regarding the admissibility of testimonial and documentary proof 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.
220. Federal Income Taxation (4)
Discussion—4 hours. Introduction to basic principles of federal income taxation. Topics include the identification of income subject to taxation, gains and losses from property transactions, deductions from income, the timing of income and deductions (tax accounting), and the identity of persons subject to tax on particular items of income.

220S. Special Session Federal Income Taxation (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.

221. Trusts, Wills and Decedent’s Estates (3)
Discussion—3 hours. The law of decedent’s estates, wills and trusts. Topics include testamentary succession; family protection and limits on the power of testamentary disposition; execution, revocation and revival of wills; wills substitution; and testamentary trusts. Area of law subject to family law as well as real property law. Legal issues of particular relevance to the Latino community will be considered.

221A. Seminar in Administrative Law (2)
Seminar—2 hours. Prerequisite(s): One environmental course, or instructor consent. Area of law subject to family law as well as real property law. Legal issues of particular relevance to the Latino community will be considered.

222. Critical Race Theory Seminar (3)
Discussion—3 hours. Race relations and racial discrimination in America through the perspectives of proponents of the Critical Race Theory movement (“CRT”), a collection of legal scholars who challenge both conservative and liberal political orthodoxies.

222A. Latinos and Latinas and the Law (2)
Seminar—2 hours. Seminar analyzes some of the legal issues of particular relevance to the Latino community, including the history of immigration, immigration at the border, immigration status, the treatment of undocumented workers, and the debate over the path to citizenship for illegal immigrants.

223. Estate Planning Seminar (2)
Seminar—2 hours. Prerequisite: course 212. Overview and introduction to legal principles affecting animals and their use.

225. Marital Property (2)
Discussion—2 hours. The California community property system, including the rights of marital and domestic partners, and the ongoing relations between the parties and the court, and the end of the relationship by death or divorce.

226. Disability Rights (2)
Discussion—2 hours. The Americans with Disabilities Act (A.D.A.), as it applies to employment, higher education, public accommodations, and government services and programs. Emphasis on the statutory definition of disability, entities subject to the A.D.A., the “otherwise qualified” requirement, forms of discrimination, reasonable accommodation, and defenses.

227A. Criminal Procedure (3)
Discussion—3 hours. Federal constitutional limits on government conduct in criminal procedure and the investigation of crime. Topics include Fourth Amendment limits on search, seizure, and arrest; the Fifth Amendment privilege against self-incrimination; and the Sixth Amendment rights to counsel and to confront witnesses.

228. Business Planning and Drafting (3)
Discussion—3 hours. Prerequisite: course 215 instructor consent; course 220 or instructor consent. Acquaints students with a range of transactions frequently encountered by lawyers representing business clients and individual of moderate or large wealth, emphasizing the tax aspects of such transactions. Limited enrollment.

229. Scientific Evidence (3)
Discussion—3 hours. Prerequisite: course 219. In addition to teaching the scientific evidence law governing the administration of scientific testimony, this course considers trial advocacy in presenting and attacking such testimony. Each student is required to both make an oral and written opinion and to prepare a research paper dealing with a particular forensic technique. Limited enrollment.

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 and the Law (2)
Discussion—2 hours. Legal and social regulation of sexual orientation, including the legal subordination of lesbians and gay men and the ongoing struggles to end that subordination. Sexual orientation issues in criminal, employment, constitutional, and family law. Seminar in which students may meet the Advanced Writing Requirement at the discretion of the professor.

232. Real Estate Finance (2)
Discussion—2 hours. An examination of the problems involved in the negotiation and development of real estate, and of lender remedies and debtor protections in the event of debtor default. The practical application of California real estate law.

233. Refugee Law Seminar (2)
Seminar—2 hours. Prerequisite: course 292 recommended. Focus on the law concerning the admission of refugees into the United States. Detailed study of the Refugee Act of 1980, which is the major piece of legislation dealing with refugee admission, the international law that fueled the passage of the Act, and the various regulations promulgated by the Attorney General implementing the law. Examination of the implementation of the Refugee Act and examination of some criticisms of the immigration bureaucracy’s implementation of the law. Some topical issues of refugee law, such as gender-based persecution, persecution based on the exercise of reproductive rights, and the persecution of lesbians and gay men. The advanced legal writing requirement may be satisfied at the discretion of the instructor. Limited enrollment.

235A. Seminar in Administrative Law (2)
Seminar—2 hours. Prerequisite(s): One environmental course, or instructor consent. Seminar analyzes some of the legal issues of particular relevance to the Latino community, including immigration at the border, immigration status, the treatment of undocumented workers, and the debate over the path to citizenship for illegal immigrants.

235B. Administrative Law & Policy Seminar (3)
Seminar—3 hours. Covers in-depth coverage of one or more topical issues in administrative law and policy, such as the relationship between public participation and administrative action. Seminar in which students may meet the Advanced Writing Requirement at the discretion of the professor.

236. Securities Regulation I (2)
Discussion—4 hours. Prerequisite: course 215 or consent of instructor. Legal and rules applicable to business, public and closely held. Corporate form of organization, partnership and other associations. Forms. Include the planning of business transactions, the process of incorporation, securities regulations of corporations, and role of management and shareholders, the federal securities laws, and social responsibility.

236B. Securities Regulation II (2)
Discussion—2 hours. Prerequisite: course 215 or consent of instructor. Study of the role of the SEC and the NASD in regulating the securities markets. Topics covered include regulation of securities markets and securities profession-
choice of applicable law. Addresses problems that international lawyers encounter in a wide variety of settings.

243. 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 both as a means for providing funds for creditors, and as a device for maximizing asset value.

245. White Collar Crime (3)
Discussion—3 hours. The law of conspiracy, mail and wire fraud, RICO, money laundering and other business and environmental crimes and associated defenses.

245B. Death Penalty Seminar (2)
Seminar—2 hours. Offers overview of the constitutional law governing the death penalty in the United States. Limited enrollment.

246. Federal Jurisdiction (3)
Discussion—3 hours. Prerequisite: course 205. A study of subject-matter jurisdiction of federal courts.

247. Taxation of Partnerships and LLCs (2)
Discussion—2 hours. Prerequisite: course 220. The federal income tax relationship of business entities whose owners are taxed on the income, deductions and losses of the entity on a pass-through basis.

247B. Corporate Tax (4)
Discussion/laboratory—4 hours; discussion. Federal income tax relationship between corporations and federal income tax relationship between corporations’ owners. Transfer of funds into a corporation on formation and the retransfer of money and property from the corporation to shareholders. Taxable and non-taxable corporate restructuring in the form of sales, mergers, acquisitions, and divisions of corpora-
dons. Subchapter S corporations.

248. Public International Law (4)
Discussion—4 hours. Prerequisite: course 205. Intro-
ductive course covers basic international law con-
cepts 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-
flicts created by the Internet. Examine European efforts at harmonizing the approach to jurisdiction rules such as those at the Hague. Limited enrollment. GE Credit: Wrt.

248B. International Human Rights (3)
Discussion—3 hours. Prerequisite course 205. This course examines laws, theories, and institutions relat-
ing to international human rights.

248F. Labor and Global Economy Seminar (2)
Law, labor studies, and the social sciences to examine the problem of whether and how core labor stan-
dards are developed in the global economy, and to assess the application of the standards in current or pro-
posed national, international, and private sector settings.

248T. Is International Law Democratic? (2)
Seminar—2 hours. We will examine the interna-
tional-law-making legal process, theories of democ-
acy, and the relationship of international and national tribunals. Limited enrollment.

249. Comparative Law (3)
Discussion—3 hours. The uses of comparative method, principal differences between common law and civil law and civil law, the relation of legal reasoning that prevail in these two great legal cultures. Topics include the evolution of the civil law, the phenome-
on 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 the analysis of selected areas of substantive law. Knowledge of a foreign language 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, discussion centered around the main differences between common law and civil law and the different styles of legal thinking. Topics to be covered will be the evolution of the civil law and the ideas of conflict of law, 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. This is a seminar about theories of constitutional adjudication. Limited enrollment.

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.

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 bound-
aries.

253. Products Liability (3)
Discussion—3 hours. Civil action for harm to the consumer resulting from defective products. Includes manufacturing defects, warning defects and design cor-
derations. Subchapter S corporations.

254. Housing Law (2)
Discussion—2 hours. This survey course covers legal and policy issues related to developing, protecting and preserving affordable, safe and accessible housing and sustainable 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 the treatment of the highly compensated, limitations on contributions and 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 regulation, 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.

257A. Legislative Intent Seminar (2)
Seminar—2 hours. Theories and principles of statu-
tory and constitutional interpretation. Original intent vs. living constitution; permissible kinds of evidence for determining legislative intent; canons of construc-
tion; extent to which initiatives should be interpreted similarly to legislative enactments.

257B. Statutory Interpretation (2)
Seminar—2 hours. This course addresses the pro-
cess of statutory interpretation, commercial and pub-
ic interest, and construction of public instruments. The course covers legal and political science theo-
tries, and the practicalities of the legislative process, which bear on interpretation of statutes and regula-
tions.

258. Professional Responsibility (2)
Discussion—2 hours. The American Bar Associa-
tion’s Model Rules of Professional Conduct and the Code of Judicial Conduct and 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 law-
ers’ ethical duties and responsibilities to clients, the courts, third parties, and the legal system.

259. Feminist Legal Theory (3)
Discussion—3 hours. Women’s legal history and feminist theory, including liberal, radical, antirealistic, and postmodern feminism. Consider relationship between theory and practice by looking at number of issues that arise when the law intersects with women’s lives: pornography, prostitution, rape, sexual harassment, divorce.

260. Employment Discrimination (3)
Discussion—3 hours. Examination of federal law prohibiting employment discrimination based upon race, color, religion, sex, national origin, age, and sexual orientation.

261. Judicial Process Seminar (2)
Seminar—2 hours. Prerequisite: must be taken before or concurrently with the judicial externship (offered fall only). Required for all full-time judicial externs and recommended for part-time judicial externs. Examines a variety of issues concerning the judicial process. The judge’s role in the legal pro-
cess, the administration of justice, ethical issues, decision making, bias, and critical examination of the strengths and weaknesses in our current judicial system.

262. Antitrust (3)
Discussion—3 hours. Study of the federal antitrust laws including price fixing, limits on distribution, tying arrangements, monopolization, and mergers.

262S. Special Session Antitrust (1)
Discussion—1 hour. A study of the federal antitrust laws including price fixing, limits on distribution, tying arrangements, monopolization and mergers.

263A. Trial Practice (3)
Discussion—2 hours; laboratory—1 hour. Prerequi-
tive: course 219 (may be taken concurrently). Intro-
duction to the preparation of cases for trial, featuring lectures, videotapes, demonstrations, assigned readings and forensic drills. Limited enrollment. (S/U grading only.)

264. Water Law (3)
Discussion—3 hours. Property rights in surface waters, including riparianism, prior appropriation and federal reserved rights; water administration institutions, including the federal reclamation program; the law of interstate waters and property rights in ground water. Emphasis on California water law and policy.

264A. Ocean and Coastal Law (2)
Discussion—2 hours. An introduction to the coastal and ocean environment.

265. Natural Resources Law Seminar (2)
Seminar—2 hours. Prerequisite: course 256 or course 285 useful but not required. In-depth cover-
age of a specific topic in natural resources law. The topic varies from year to year. Limited enrollment.

266. Law of E-Commerce (3)
Discussion—3 hours. The legal issues that are emerging as crucial to the conduct of business in cyberspace. Discussion of the evolution and current administrations of the Internet and the World Wide Web. Brief foray into early claims that cyberspace should not be regulated at all and examination of how cyberspace is in fact regulated. A variety of issues relevant to business engaged in e-commerce, General Education (GE) credit: ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Social-Cultural Diversity; Wrt=Writing Experience.
including jurisdiction, the domain name system, electronic contracting and signatures, intellectual property, pre-dispute and post-dispute procedures. Recent state and federal legislation dealing specifically with e-commerce, state law and secondary materials. Understanding of how to approach cyberspace issues.

267. Civil Rights Law
Discussion—4 hours. Civil remedies for civil rights violations under the primary United States civil rights statute. Specifically, covers actions for constitutional or statutory violations. Use of the Talmud and on the commentaries and decisions that are derived from it. Jewish law is of interest to American law school students because it is the past history and the mediation is a common practice in American law school. This system is based primarily on the Talmud and on the commentaries and decisions that are derived from it. Jewish law is of interest to American law school students because it is the past history and the mediation is a common practice in American law school. Specific techniques of analysis that are part of the core curriculum in a good business school are studied. Purpose is to give you background necessary for understanding clients and for understanding other business-related law courses.

269A. Basic Finance
Discussion—3 hours. Students with a non-law basic finance course must have instructor’s permission. Basic techniques of analysis that are part of the core curriculum in a good business school are studied. Purpose is to give you background necessary for understanding clients and for understanding other business-related law courses.

269C. Corporate Finance
Discussion—3 hours. How corporations raise money, i.e., stocks and bonds, IPOs, how deals are structured (or restructured, under Chapter 11 of the Bankruptcy Code). Intended for those who intend to practice in a firm where clients raise money in securities markets or invest in deals.

270. International Business Transactions (2)
Discussion—2 hours. Select legal problems arising from international business transactions. Topics include the international sales contract, letters of credit, transfers of technology, regulation of bribery, repatriation of profits, and national efforts to control international transactions.

271. Nonprofit Organizations (4)
Discussion—4 hours. Prerequisite: course 215 or consent of instructor. The legal rules and concepts applicable to nonprofit organizations. Limited enrollment.

271A. Nonprofit Organizations: State and Local Governance Issues (2)
Discussion—2 hours. Prerequisite: course 215 (may be taken concurrently) or consent of 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, state and local laws impacting tax-exempt entities or charitable trust formation, operation and governance, dissolution, fiduciary obligations of trustees and officers and directors, management and investment obligations vis-a-vis trust assets, cy pres, 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. Limited enrollment.

271B. Nonprofit Organizations: Tax Exemptions and Taxation Focus (2)
Discussion—2 hours. Prerequisite: course 215 or consent of instructor; course 220 recommended. Conceptual basis and substantive law criteria for the federal and state income tax exemption of nonprofit organizations and those particular circumstances and activities which will result in income tax or financial sanctions and disqualifications for exempt status, the nondistribution constraint, the incurrence and private benefit concepts, limitations on campaign activities, permissible lobbying expenditures, the unrelated business income tax, the deductibility of charitable contributions, charitable remainder unitrusts and annuities, private nonoperating foundations, and charitable trusts. Useful for those who intend to practice in the field of tax-related nonprofit law.

272. Family Law (2)
Discussion—3 hours. Emphasizes the legal, social, and emotional aspects of relationships within the family. How has the law constructed “families”? What are the common law, statutory, and constitutional principles that affect the formation and dissolution of families?

272B. Elder Law (2)
Discussion—2 hours. The legal practice and policy relating to aging individuals and an older society. Examination of the roots of legal ethics and the role of the lawyer as professional problem solver and advisor, and the uses of law in relationships between people over life’s course. The traditional divisions of tort, contract and property and examination of issues such as age discrimination in employment, eligibility for public benefits, long-term care, housing options of the elderly, health care and end of life planning, and related legal issues. Limited enrollment.

273. Advanced Torts (3)
Discussion—3 hours. The course is designed to build on the first year torts course. Defamation, privacy, misrepresentation, misuse of legal procedure, and business torts. Nuisance and related environmental torts. The intersection between statutory remedies and common law torts.

274. Intellectual Property (3)
Discussion—3 hours. Broad survey of the field of intellectual property, including federal and state trade mark, unfair competition, copyright, and patents.

274A. International Intellectual Property (2)
Discussion—2 hours. Prerequisite: course 274 or 296 or 209A or consent of instructor. International aspects of copyright, patents, and trademarks, including a look at basic international instruments such as the Paris Convention, the Berne Convention, and Trade Related Aspects of Intellectual Property Rights (TRIPS) of the World Trade Organization. Topics include approaches to patent protection for pharmaceutica products and agricultural products in developing nations, and copyright protection in a digital world.

274AS. Summer Session Intellectual Property (2)
Discussion—2 hours. This course provides a broad survey of the field of intellectual property. Areas covered include trademarks, patents, trade secrets, idea protection, unfair competition, and copyright.

274C. Intellectual Property in Cyberspace Seminar (2)
Seminar—2 hours. Prerequisite: course 274. The recent expansion of IP laws emerging to meet the growth of Internet and digital technologies and the recent increase in the number of Internet users to enhance human abilities to access, copy, store, manipulate, and transmit vast amounts of information.

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 (IPR). Required paper satisfies advanced writing requirement.

276. Juvenile Justice Seminar (2)
Seminar—2 hours. Legal and philosophical bases of a separate juvenile justice process for crimes committed by minors; police investigation, apprehension, and diversion; probation intake and detention; juvenile court hearing and disposition; juvenile corrections. The role of counsel at each phase of the process is examined.

277. Native American Law (2)
Seminar—2 hours. Legal relations between Native American tribes and the federal and state government. Topics include the basic jurisdictional conflicts which dominate the law and specific areas such as land rights, hunting and fishing rights, water rights, domestic relations law, and environmental protection. Religious freedom, repatriation, issues regarding terminated and non-recognized tribes are also addressed.

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 cross-examination, depositions. 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 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 Seminar (2)
Seminar—2 hours. How to write a variety of legal documents in plain English. Writing exercises and outside readings will be assigned weekly. Each student completes an individual writing project in lieu of final examination. The writing project will satisfy the 3 credits of advanced legal writing requirements. Limited enrollment. (S/U grading only.)
281. Local Government Law (3)
Discussion—2 hours. Explores the structure of state and local government through the lens of the virtues and flaws of the ideas of Madison and DeToqueville, i.e., centralized federal government vs. decentralization.

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 electricity industry emphasized. The basic regulatory schemes for other energy sources 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, or regulated industries.

283. Remedies (3)
Discussion—3 hours. Survey of modern American civil remedies law in both private and public law contexts. The role of law and equitable remedies, equitable defenses, contempt power, injunctive relief, restitution, and money damages in torts and contracts.

284. Law and Economics (3)
Discussion—2 hours. Introduction to the economic and environmental regulation of the utility industries emphasized. The basic regulatory schemes for other energy sources 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, or regulated industries.

285. Environmental Law (3)
Discussion—4 hours. An introduction to federal and state environmental law, including coverage of historical development of environmental law, the role of courts, the legislature and the executive branch in the development and implementation of environmental policy, allocation of authority among different levels of government, the role of market forces in environmental decisions, the major regulatory strategies that have been applied to control environmental harm, and enforcement of environmental law. Major statutes considered include the National Environmental Policy Act, Endangered Species Act, Clean Air Act and Clean Water Act.

285A. Environmental Justice Law (2)
Discussion—2 hours. Introduction to the scope of current environmental justice work, who is affected by environmental hazards, what legal and political tools are available to address the problems, and the strategic issues confronting groups organizing for change. The role of law and equitable remediation in the environmental justice context.

285B. Environmental Practice (3)
Discussion—3 hours. Prerequisite: course 285 recommended. Examines underlying theory and practice in securing compliance with our major environmental laws.

285C. Agricultural Law and Policy (3)
Discussion—3 hours. An introduction to agricultural law, focusing on legal principles and issues at the forefront of contemporary debates about agriculture in society.

285T. Farmworkers and the Law (2)
Discussion—2 hours. Provides an overview of California and federal laws impacting farmworkers and how such laws have been applied to regulate working conditions in agriculture.

286. Public Health Law (2)
Seminar—2 hours. Public health law as the government’s power and responsibility to ensure the conditions for the population’s health. The use of this power and the individual’s interests in liberty and property.

286A. Typical Issues in Health Law (2)
Seminar—2 hours. The course focuses on four-six issues at the interface of law, medicine, biotechnology, and health policy that are currently the subject of major litigation, legislation, and/or contentious debate in the inclusion of biogenetics and public policy.

286B. Advanced Health Law Seminar (2)
Seminar—2 hours. Prerequisite: course 286A or consent of instructor. Specific seminar topics will be drawn from those covered in 286A. Reading and discussion of book on seminar topic and/or a set of selected readings. Students will select research project related to seminar topic and will facilitate the discussion of that topic. Written paper analyzing legal issues related to chosen research project.

286C. Bioethics Seminar (2)
Seminar—2 hours. Course examines the ethical and legal issues that arise from biomedical research and use of medical technologies. Limited enrollment. GE Credit: Wri.

286D. Legal Psychology Seminar (2)
Seminar—2 hours. Course examines the ethical and legal issues related to chosen research project. Written paper analyzing legal issues related to chosen research project.

286E. Bioethics Seminar (2)
Seminar—2 hours. Course examines the ethical and legal issues that arise from biomedical research and use of medical technologies. Limited enrollment. GE Credit: Wri.

286F. Legal Psychology Seminar (2)
Seminar—2 hours. Course examines the ethical and legal issues related to chosen research project. Written paper analyzing legal issues related to chosen research project.

287. Public Land Law (3)
Discussion—3 hours. Legal aspects of federal land management, including the history of public land law, authority over federal lands and specialized law dealing with particular natural resources and uses found on federal lands (minerals, timber, range, wildlife, recreation and preservation).

287A. Public Benefits 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 is shaped 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: course 218A. In-depth selected topics or problems in constitutional law and theory. Initial topics may include the regulation of hate speech, the interpretation of the Establishment Clause, or the development of Takings Clause doctrine.

288A. Comparative Constitutional Law Seminar (2)
Seminar—2 hours. Prerequisite: course 218A or 218B (may be taken concurrently). Explores in-depth selected topics or problems in constitutional law and theory. The current focus is on the interpretation and application of the principle of non-derogation clauses of the First Amendment. Limited enrollment.

288B. Comparative Constitutional Law Seminar (2)

289A. Biotechnology Law and Policy (2)
Seminar—2 hours. Coverage includes the regulation of biotechnology research, including restrictions on cloning and genetic 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 biogenengineered organisms or their products. Limited enrollment.

290. International Trade Dispute Seminar (2)
Seminar—2 hours. The economic, political, and legal theories underlying the establishment of NAFTA and WTO.

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.

292. Immigration Law and Procedure (3)
Discussion—3 hours. Surveys the history of U.S. immigration law and policy.

293. Public Interest Law Seminar (2)
Seminar—2 hours. This class will examine the issues and problems associated with providing legal services to persons and interests in American society that typically have been unable to afford or otherwise obtain representation from the private bar.

294. Law and Popular Culture (2)
Seminar—2 hours. This course examines works of popular culture, films, and legal texts. Each session will focus on a particular film and its cultural implications, particular problem or problems of law, law practice, legal ethics, traditional ethics, or public policy.—I (I).

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, authors and performers rights, trademarks as speech, and international aspects of trademark protection.

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 include trade copyright protection, the copyright owner’s rights, the term of protection, copyright ownership and transfer, infringement, and defenses to infringement.

296A. Advanced Copyright and Related Doctrines (2)
Discussion/laboratory—2 hours. Prerequisite: course 296 or 274 or consent of instructor. Intensive look at selected issues in copyright, including the fair use doctrine, the application of copyright principles in the context of the Internet and digital technology, and international aspects of copyright law. Examination of some doctrines related to copyright, as well as to entertainment law, including protection for fictional characters and titles, and the right of publicity.

296T. Right of Publicity and Related Doctrines (2)
Discussion—2 hours. Intensive look at the right of publicity, which, generally, involves the right of an individual, especially a celebrity, to control the commercial value and exploitation of his or her name, likeness or other indicia of identity.

297. Alternative Dispute Resolution (3)
Discussion—3 hours. Will introduce students to a wide variety of alternative dispute resolution processes, with an emphasis on negotiation, mediation and arbitration. Limited enrollment.

298. Sociology of the Legal Profession (2)
Seminar—2 hours. Comprehensive look at the organization, operation, and ideology of the legal profession. Limited enrollment.
Professional Courses

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 journal required, to be determined by instructor. Limited enrollment. (S/U grading only.)

409. Community Education Seminar (2) Seminar—2 hours. An introduction to the field of "school law," focusing on public education from kindergarten through high school. Topics range from constitutional law, first amendment and due process issues for both faculty and students, to federal and state law on special education. Equitable funding of public schools and labor relations under public sector state statutes.

410A. Moot Court (2) Discussion/laboratory—2 hours. Basic appellate practice and procedure. Beginning instruction in oral advocacy skills and an opportunity to practice these skills in front of a group of judges. Students compete in two rounds of oral arguments which, combined with the second semester of the program, determine the rankings for selecting participants in the annual Neu- miller Competition and other interschool competition teams and for membership on the Moot Court Board. Both courses 410A and 410B must be taken in order to qualify for most interschool competitions. Limited enrollment. (S/U grading only.)

410B. Appellate Advocacy (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.)

410C. Appellate Advocacy Seminar (2) Seminar—2 hours. Appellate advocacy before state and federal courts, including writs and appeals in civil and criminal matters. The role, structure, and practices of appeals in civil cases. Students will participate in projects. Required papers will satisfy the Advanced Legal Writing Requirement. Limited enrollment.

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.)

412. 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.)

412. Carr IntraScholar Trial Advocacy Competition (1) 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 present a mock trial presided over by judges and critiqued by experienced litigants. Limited enrollment. (S/U grading only.)

413. Interschool Competition (1-3) Prerequisite: consent of appropriate faculty adviser. Participation in interschool moot court and lawyer- ing skills competitions. Enrollment is limited to stu- dents actually representing the School in the interschool competitions. Competition must be autho- rized by the appropriate faculty. The faculty adviser may condition the award of academic credit for any particular competition on the performance of such additional work as may be reasonable to justify the credit. May satisfy advanced 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 semes- ter of service to the board, up to maximum of two. Credit awarded only after certification by Moot Court Board and approval of the faculty adviser to Moot Court Board. Limited enrollment. (S/U grading only.)

415. Trial Practice Honors Board (1) Members of the Trial Practice Honors Board adminis- ter the Frances Carr competition. Members are nom- inated by their individual Trial Practice I adjuncts. Students receive credit for their work on the Board, awarded upon approval of the faculty adviser. (S/U grading only.)

416. Law Review Writer (1-2) Writing of an editorial quality law review article under the editorial sponsorship of editors of the Law Review. Minimum of 40 hours contribution to the Review’s publication is also required. Credit may be obtained only upon achieving status as a member of the Law Review, which requires that the student have made substantial progress toward completing an editorial article. Credit is awarded only after certi- fication by the editor-in-chief of the Law Review and approval of the faculty advisers to the Law Review. One unit of credit is earned the first semester. Two units are earned the second semester upon complet- ing an editorial draft. One unit is earned second semester if only a Membership draft is completed. (S/U grading only.)

417. Law Review Editor (1-2) Editors must have completed an editorial article and must perform editorial duties requiring a sub- stantial 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 may receive four credits or two semesters of service as an editor. (In exceptional cases, students may petition to participate for one semester only and receive two credits.) (S/U grading only. Deferred grading pending only, pending completion of seminar.)

418. Environis Journal (1-2) Units will be distributed as follows: The editor in chief will receive two units of credit per semester, for a total of four units over the course of the academic year. The co-editors or executive editor will receive one unit per semester, for a total of two units each over the course of the academic year. The managing editors will be awarded one unit of credit per semester for a total of two units of the course of the academic year. (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 require- ment. 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 com- ments), or 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 require- ment. 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 com- ments), or 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. 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 require- ment. 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 com- ments), or 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.)

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440. Immigration Law Clinical (2 to 6 or 12) Clinical program. Students may represent clients in administrative proceedings in San Francisco. Minimum units for the course are 4 and maximum is 12. Each unit assumes four hours work per week, including participation in the seminar, conference, and case supervision. Students who have completed course 292 may take the clinic for a minimum of 2 units. Limited enrollment. (S/U grading only)

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 will be to familiarize students with the day-to-day aspects of legislative work, to give and take real legislative experience, as well as to provide an overview of the legislative process. (S/U grading only)

450. Environmental Law Externship (2-6) Clinical activity—2-6 hours. Prerequisite: course 285 or consent of instructor. Practical experience in environmental law. Students will work in an approved government, non-profit or private law office engaged in environmental law work for a minimum of 8 hours per week. Students must prepare a journal describing and reflecting upon their clinical experience, and meet periodically with the instructor.

455. Employment Relations Externship (2-6) Clinical activity. Prerequisite: course 251 or 260 (may be taken concurrently). Practical experience in employment law, including employment discrimination and public sector labor law. Work under the direct supervision of a government lawyer. Opportunity to participate in a range of work, with an emphasis on observation and participation in actual investigation, interviewing, drafting pleadings, and attendance at hearings. (S/U grading only)

460. Public Interest Law Clinical (2-6) Clinical activity. Prerequisite: prior or concurrent enrollment in course 293 (recommended). Students work with a public interest practitioner in a nonprofit organization. Journals and attendance at two group meetings are required. Clinical students must complete an evaluative final paper of approximately 8 pages. Hours completed in public interest setting may be applied toward the practicum requirement for the Public Interest Law Program. (S/U grading only)

465. Clinical Program in Administrative Law (2-6) Clinical activity—2-6 hours. Prerequisite: course 235 (may be taken concurrently) or consent of instructor. For students interested in a work experience in an administrative law setting. Students will work under the direct supervision of an administrative law judge, hearing officer, or government attorney. Placement assistance will be provided by the instructor. A goal of this clinical will be a breadth of experience in the areas of formal adjudication, informal adjudication, rulemaking, and judicial review. Students will be required to meet monthly as a group to share experiences and maintain observational journals. (S/U grading only)

470. Administration of Criminal Justice Externship (2-6 or 12) Clinical activity—12 hours. Prerequisite: Completion of, or concurrent enrollment, in courses 219 and 227; course 263A recommended. Gain 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 or U.S. Attorney’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)

480. Clinical Program in Prison Law (2-6) Clinical program. Provides practical experience in providing legal services to real clients who have various problems 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)

495. Instruction in Legal Research and Legal Writing Skills (1-2) Participants will assist in instructing legal research and writing for first-year students under the direction of the legal writing instructors. Approval of the research and writing instructors is required for enrollment. Participants may assist in the legal research program and once in the legal writing program. One unit will be given in the fall semester for legal research instruction and two units in the spring for legal writing instruction. (S/U grading only)

498. Group Study (1-4) Groups of students (not fewer than 4 or more than 10) with common interest in studying a stated legal problem may plan and conduct their own research and seminar program, subject to the following regulations: (1) the plan must extend over no less than two semesters; (2) the plan for the program and the list of members of the group must be submitted to the Dean’s office at least 4 weeks prior to opening of the semester in which the program is to begin; (3) a three-member faculty board will be appointed for each group proposed and will have authority to approve or disapprove the program and the amount of credit sought; (4) changes in the program or membership of the group must be approved by the faculty board and normally will be approved only prior to the semester involved; (5) group members must conduct a weekly seminar session to be arranged by them; (6) each member of the group must submit an individual paper or an approved alternative growing out of the seminar subject to the faculty board; (7) S/U grading only unless the entire group requests letter grades in advance.

499. Research Project (1-4) Students may receive credit for individual projects, subject to the following regulations: (1) the project may extend over more than two semesters; (2) each project will be supervised by the supervising faculty 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 individual programs during any semester; and (5) each student must submit an individual paper or approved alternative to the supervising faculty member. (Deferred grading only, pending completion of sequence.)

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 supervised by the supervising faculty 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 individual programs during any semester; and (5) each student must submit an individual paper or approved alternative to the supervising faculty member.

Linguistics

(College of Letters and Science)
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Julia Menard-Warwick, Ph.D., Assistant Professor
Alminda E. Ojeda, Ph.D., Professor
C. Orhan Orgun, Ph.D., Associate Professor
Vai Ramathan, Ph.D., Professor
Lenora A. Timm, Ph.D., Professor
Emeriti Faculty
Maria I. Manoliu, Ph.D., Professor Emerita
David L. Olmsted, Ph.D., Professor Emeritus
Benjamin E. Wallacker, Ph.D., Professor Emeritus
Mary Schleppegrell, Ph.D., Professor Emerita
Gwendolyn Schwabe, M.A., Senior Lecturer Emerita
Maximo Torreblanca, Ph.D., Professor Emeritus
Affiliated Faculty
Nina Donkers, Ph.D., Adjunct Professor
Janet Lane, M.A., Lecturer
Ellen Lange, M.A., Lecturer
John Samels, M.A., Lecturer
Kathleen Ward, Ph.D., Lecturer

The Major Program

Linguistics is the systematic study of human language. It focuses on theories of language structure, variation, and use, description of contemporary languages, and the examination of language change through time. Because of the pervasive influence of language in our everyday lives, work in linguistics interacts in important ways with fields carried out in many other fields, including psychology, anthropology, neuroscience, philosophy, computer science, sociology, literature, language teaching, communication, and education.

The Program. An introductory lower division course provides students with basic concepts and
some of the methods needed to analyze language in a systematic way. Upper division courses probe more deeply into specific aspects of language structure, language use, and the relationship of language to other realms of human activity.

Career Alternatives. Majors in linguistics find practical outlets for their linguistic training in a variety of fields: the publishing industry (language editing, copy editing, freelance work); the business world (language research, marketing); the government (language research, policy analysis); and the legal profession (language research, document analysis).

Minor Program Requirements:

Linguistics offers two minor programs:

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.

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 334 for more detailed information that may be obtained from the Graduate Adviser or from the Chairperson of the Linguistics Group.

Graduate Adviser. A.E. Ojeda

Courses in Linguistics (LIN)

Lower Division Courses

1. Introduction to Linguistics (4)
   Lecture—3 hours; discussion—1 hour. Introduction to the study of language; its nature, diversity, and structure. GE credit: ArtHum or SocSci, Wrt.—I, II, III. (I, II, III.)

2. Linguistics for language teachers (4)
   Lecture—4 hours. Introduction to basic linguistic concepts and models needed for the interpretation of literary texts. Topics include meaning in texts, textual meaning, linguistic variation in texts, sound systems and poetry.

3. 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. Intensive 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 strategies for effective participation in academic tasks. May be repeated once for credit with consent of instructor. (P/NP grading only.)

4. Introduction to Reading and Composition for 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 in writing organized, coherent, and grammatically correct paragraphs and short academic essays. (P/NP grading only.)—I. Lane

5. Advanced Reading and Composition for Non-Native Speakers (4)
   Lecture/discussion—4 hours. Prerequisite: admission by placement examination, by successful completion of course 22, 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 learn to develop fluency and critical thinking and will study grammar needed for academic writing. (P/NP grading only.)—I, II, III. (I, II, III.)

6. English Grammar (4)
   Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or 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 in alternate years.
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.] Not open for credit to students who have completed course 104. GE credit: ArtHum. —I. Ward

111. Introduction to Phonological Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 103A, 103B. Introduction to contemporary phonological theory with emphasis on autosegmental, metrical, and lexical theory. —III. Orgun

112. Phonetics (4)
Lecture—3 hours; term paper. Prerequisite: courses 103A, 103B. Detailed examination of articulatory and acoustic properties of sounds of English; traditional notions of regional dialects and standardization. Recommended. Explores the forms of American English; Indo-European languages and comparison with other world varieties of Spanish, within a historical framework. GE credit: Div, Wrt.

114. Semantics (4)
Lecture—3 hours; term paper. Prerequisite: courses 103A, 103B. Introduction to the linguistic study of the meanings of words and phrases. Survey of the mechanisms by which context affects the meanings of lexical items and determines the nature of their interpretive behavior. GE credit: Wrt.—I. Ojeda

150. Languages of the World (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 103A or Anthropology 4. Survey of the world’s languages, their geographical distribution and classification, both genetic and typological. Illustrative stand-alone and inflectional morphology, as well as the contribution of argument structure, quantification, and coordination to meaning. GE credit: Wrt.—I. Ojeda

151. Historical Linguistics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 103A, 103B. Description and methods of the historical study of language, including the comparative method and internal reconstruction; sound change, morphological change, syntactic change, semantic change. —II. Benware

152. Language Universals and Typology (4)
Lecture—3 hours; term paper. Prerequisite: courses 103A, 103B. Investigation into common features of all human languages and the classification of languages in terms of their structural features; theories of universal grammar; detailed discussion of non-Indo-European languages and comparison with English. GE credit: Wrt.—III. —II. Ward

160. American Voices (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 103A or Anthropology 4. Upper division standing recommended. Explores the forms of American English; traditional notions of regional dialects and increasingly important social dialects, reflecting age, class, gender, race, ethnicity, and sexual orientation. The influence of language attitudes on perception of dialect speakers; dialect in media, education, and literature. GE credit: SocSci, Div, Wrt.—III. Ward

163. Language, Gender, and Society (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 103A 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.—Ward

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 and teaching to issues concerning language and gender, race, class and the media. —Ramanathan

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 in 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: Div, Wrt.

171. Introduction to Psycholinguistics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or consent of instructor; courses 103A, 103B recommended. Introduction to psychological issues relating to the implementation of formal linguistic structure, and to the methods of data collection. GE credit: SocSci. —Corina

173. Language Development (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or consent of instructor; courses 103A, 103B recommended. Theory and research on children’s acquisition of their native language, including the sound system, grammatical systems, and basic semantic categories. GE credit: SocSci.

175. Biological Basis of Language (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or Anthropology 4. Survey of the field of neurolinguistics and techniques used to explore representation of language in the human brain. GE credit: SciEng.—I. Corina

200. Foundations of Linguistics II (4)
Lecture/discussion—3 hours; term paper. Prerequisite: graduate standing. Survey of fundamental issues raised by pre-generative linguists in the twentieth century, with emphasis on issues crucial to applications of linguistics. Not open for credit to students who have completed course 203A.

200B. Foundations of Linguistics II (4)
Lecture/discussion—3 hours; term paper. Prerequisite: graduate standing. Survey of fundamental issues raised by contemporary linguists. GE credit: Wrt.—I. —II. Ojeda

211. Advanced Phonological Theory and Analysis (4)
Lecture—3 hours; term paper. Prerequisite: course 111. Critical examination of current phonological theories. Offered in alternate years. —Orgun

212. Advanced Phonetics (4)
Lecture—3 hours; term paper. Prerequisite: course 111. Advanced study of the physical basis of speech articulation and acoustic phonetics. Offered in alternate years. —II. Ojeda

231. Advanced Syntactic Theory and Analysis (4)
Lecture—3 hours; term paper. Prerequisite: course 131. Critical examination of current syntactic theories. Offered in alternate years. —III. —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. Offered in alternate years. —III.

252. Romance Linguistics (4)
Lecture—3 hours; term paper. Prerequisite: course 152. Advanced study of the Romance languages from Proto-Romance to the modern era. Application and critical examination of methods of historical and comparative linguistics in particular areas of structural change in Romance. Offered in alternate years.—III.

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; sociolinguistic issues related to social and linguistic constraints in variation; issues and methods in the quantitative analysis of variation. Speech community, quantitative analytic methods, and the scope of sociolinguistic competence. —I. Bayley
263. Discourse Analysis: Text in Context (4) Lecture/discussion—3 hours; term paper. Prerequisite: graduate standing. Introduction to and application of leading theoretical approaches to the analysis of discourse. Approaches to the analysis of (spoken and written) text in context, tools for analyzing different types of texts (narrative, conversation, etc.). Theme/point, given/new, anaphora, discourse markers, and other lexical/grammatical features.—II.

264. Current Issues in Language and Gender (4) Seminar—3 hours, term paper; project. Prerequisite: graduate standing; prior coursework in Linguistics, Gender Studies, or Cultural Studies is desirable; no expectation of high proficiency. Exploration of the construction and performance of gender through language in cross-cultural perspective and in a variety of contexts: informal conversations, narratives, workplaces, schools, households, the mass media. Special topics may include: language acquisition; multilingualism; ecofeminism; queer theory. May be repeated for credit one time when topic differs. Offered in alternate years.—[I.] Menard-Warwick, Timm

265. Language, Performance, and Power (4) Seminar—3 hours, term paper. Exploration of the intersection between linguistic and social theories in the language-state relation and the performance of identity. Ideological sources of language differentiation; nation-building and linguistic difference. Political economy, social linguistic, and ethnographic approaches to understanding linguistic inequality. (Same course as Anthropology 265.) Offered in alternate years.—[II.] Smith

280. Theories of Second Language Acquisition (4) Lecture/discussion—3 hours; term paper. Prerequisite: course 300 or consent of instructor. Covers theoretical perspectives that direct or have directed research and language acquisition; explores the relationship between linguistics and language teaching and deals with the individual variables that influence second language learning.—[I.] Ramanathan

281. Research Methods in TESOL/SLD (4) Lecture—3 hours; term paper. Prerequisite: course 300 or consent of instructor. Designing and evaluating ESL curricula and proficiency assessment instruments in all areas of language acquisition (pronunciation, reading, listening, comprehension, etc.). Developing lesson plans, teaching and tutoring in selected language acquisition areas in the UCD ESOL Clinic. Evaluating (and adapting) published ESL materials.—II.

301. Materials of TESOL (4) Lecture—4 hours. Prerequisite: course 300 or consent of instructor. Review of recent research in second language acquisition and the teaching of English to speakers of other languages. Continued teaching and tutoring in the UCD ESOL clinic. Each student also designs and reports on a classroom project.—II. Smith

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 in the study of English as a second language. Intensive course in the use of English in a variety of contexts: informal conversations, narratives, workplaces, schools, households, the mass media. The readings can be in English. See the following courses are open to students throughout the campus. The readings can be in English. See departmental listing for the course description.

Linguistics (A Graduate Group)

Cecilia Colombi, Ph.D., Chairperson of the Group
Group Office. 108 Sproul Hall (530) 752-9933

Faculty
Moradewun Adejunmobi, Ph.D., Associate Professor (African American and African Studies)
Raul Aranovich, Ph.D., Assistant Professor (Linguistics)
Carlee Arnett, Ph.D., Assistant Professor (German) Wilbur A. Benware, Ph.D., Professor (Linguistics) Robert Blake, Ph.D., Professor (Spanish)
Travis Bradley, Ph.D., Assistant Professor (Spanish) Cecilia Colombo, Ph.D., Professor (Spanish)
David Corina, Ph.D., Professor (Linguistics)
Patrick Farrell, Ph.D., Professor (Linguistics)
Michael Glauberg, Ph.D., Associate Professor (Philosophy)
Janet S. Smith, Ph.D., Professor Emerita

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 UCD ESOL Clinic. Each student also designs and reports on a classroom project.—II. Smith

396. Teaching Assistant Training Practicum (1-4) Prerequisite: grade standing. May be repeated for credit. (S/U grading only.)—I, II, III.

Graduate Adviser. A.E. Ojeda (Linguistics)

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. Modern Chinese Literature (in English)
11. Great Books of China (in English)
50. Introduction to the Literature of China and Japan (in English)
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. Topics in Chinese Literature (in English)
110. Great Writers of China: Texts and Context (in English)

Classics
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
Great Books of Western Culture: The Modern Crisis
Major Books of the Contemporary World
Fairy Tales, Fables and Parables
Myths and Legends
Literature of Fantasy and the Supernatural
Utopias and their Transformations
The Short Story and Novella
Master Authors of World Literature
Introduction to Women Writers
Dramatic Literature
Introduction to Poetry
Man and the Natural World
Ethnic Minority Writers in World Literature
Literature of China and Japan
Literature of India and Southeast Asia
Writing Nature: 1750 to the Present
Literature of Japan
Literature of India and Southeast Asia
Literature of China and Japan
Introduction to the Literature of China and Japan

Italian
Studies in Italian Cinema
Survey of Italian Culture and Institutions
Contemporary Issues in Italian Culture and Society
Boccaccio, Petrarch and the Renaissance
Italian Literature in English Translation: Dante, Divine Comedy
Culture, Gender and the Italian Renaissance
Masterpieces of Modern Italian Narrative
Studies in Italian Cinema

Japanese
Masterworks of Japanese Literature (in English)
Introduction to Traditional Japanese Culture
Introduction to the Literature of China and Japan
Japanese Literature in Translation: The Early Period
Japanese Literature in Translation: The Middle Period
Japanese Literature in Translation: The Modern Period
Modern Japanese Literature: War and Revolution
Modern Japanese Literature: Hero and Anti-Hero
Japanese Culture through Films
Modern Japanese Autobiographies (in English)
Poetry of China and Japan

Native American Studies
Native American Literature (the novel and fiction)
Native American Literature (non-fiction works by Native authors)
Native American Literature (traditional and contemporary poetry)
Contemporary Indigenous Literature of Mexico
Special Topics in Native American Literary Studies

Russian
Survey of Nineteenth-Century Russian Literature
Survey of Twentieth-Century Russian Literature
Children’s Literature in Russia
Russian Fantasy
Nineteenth-Century Russian Prose
Twentieth-Century Russian Prose
The Russian Theater
Contemporary Russian Culture
Literature of Revolution
Nature and Culture in the Soviet Union
Dostoevsky
Tolstoy
Christ and literature
Russian Culture
Soviet Writers and Censorship
Russian Folklore
Representations of Sexuality in Russian Literature

Spanish
Latin-American Literature in Translation
Courses in Management (MGT/MGP)

Lower Division Courses

11A. Elementary Accounting (4) Lecture—3 hours; discussion—1 hour. Basic concepts of accounting, interpreting and using financial statements, understanding accounting principles.—I, II, III.

11B. Elementary Accounting (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A. Product costing; using accounting information for decision making, planning and performance evaluation.—III (III).

Upper Division Courses

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 the concepts, methods, and uses of accounting and financial reporting. Preparation of financial statements, including balance sheet and statements of income and cash flow, as well as their analysis by investors and managers.—II, III.

120. Managing and Using Information Technology (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A, Mathematics 168, 178, or 218, 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.—III, Bhargava.

140. Marketing for the Technology-Based Enterprise (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A, Mathematics 168, 178, or 218, Statistics 100, 102, 103, or 108. Marketing in technology industries such as software development and biotechnology research. Motivating and managing workers, organizing for innovation, and making decisions.—III, Hagerty.

150. Technology Management (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A, Mathematics 168, 178, or 218, 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.—III, Hagerty.

160. Starting New Business Ventures (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A, Mathematics 168, 178, or 218, 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, Castanias.

170. Managing Costs and Quality (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A, Mathematics 168, 178, or 218, 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, managing quality and time to create value, ethical issues in cost assignment, and differential costing for decision making.—I, Maher.

180. Supply Chain Planning and Management (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 11A, Mathematics 168, 178, or 218, 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 Courses—Core Courses

200A. Financial Accounting (3) Lecture—3 hours. Prerequisite: graduate student in the Graduate School of Management. Introduction to the concepts and techniques underlying the presentation of financial statements. Topics include understanding the accounting cycle, measurement and valuation problems associated with financial statement components, consideration of the usefulness of financial statements in the analysis of a corporation’s operations.—I (I), II (II), Rangan.

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 (II), L. Mahon.

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, social interaction, individual and group decision making, and team building.—I (I), Palmer.

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 change.—II (II), Bigelow, Swaminathan.

202A. Markets and the Firm (3) Lecture—3 hours. Prerequisite: graduate student in the Graduate School of Management. Examines the interaction of consumers, firms and government, and the effect this interaction has on the use of resources and firm profitability. Fundamental economic concepts such as marginal analysis, opportunity cost, pricing, and externalities are introduced and applied.—I (I), Clark.

202B. Business, Government, and the International Economy (3) Lecture—3 hours. Prerequisite: course 202A. Examines the influence of government and international factors on business operation, including distribution of income, business cycles, inflation and interest rates, the federal debt, monetary policy and international trade and finance.—II (II), Clark.

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 statistics and data analysis for managerial decision making. Descriptive statistics, principles of data collection, sampling, quality control, statistical inference. Application of data analytic methods to problems in marketing, finance, accounting, production, operations, and public policy.—II (II), Swaminathan.

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 in managerial research and contingency table analysis. Application of these methods to marketing, finance, accounting, production, operations, and public policy.—II (II), Tsai.

204. Marketing Management (3) Lecture—3 hours. Prerequisite: graduate student in the Graduate School of Management. Analysis of market opportunities, elements of market research, development of marketing strategies, market planning and implementations, and control systems. Con

summer and industrial markets, market segmentation, pricing strategies, distribution channels, promotion, and sales.—II (II), Hagerth.

205. Financial Theory and Policy (3) Lecture—3 hours. Prerequisite: graduate student in the Graduate School of Management. Corporate financial policy and investment management. Corporate capital budgeting, optimal capital structure, cost-of-capital determination, risk management. Develops basic valuation principles for investments with long-lived and risky cash-flows, and extends theory to derivative securities, asset portfolio, investment management and hedging.—III (III), Barber.

206. Decision Making and Management Science (3) Lecture—3 hours. Prerequisite: graduate student in the Graduate School of Management MBA program or consent of instructor. Develops decision-making and problem-solving skills in conjunction with a quantitative model-building approach. Emphasizes how structured modeling techniques, probability forecasts, simulations, and computer optimization models are used in the overall process of making decisions in an uncertain environment.—II (II), Topkis.

207. Management Information Systems (3) Lecture—3 hours. Prerequisite: graduate student or consent of instructor. Introduction to computer programming and data handling skills. Use of computer in organizations, emphasis on managerial aspects of computing. Standard and nonstandard uses of data files, centralization versus decentralization of computing, office automation, computer security.—II (II), Woodruff.

Elective Courses

Students must complete the Management core course requirement before enrolling in any of the following courses, or petition with consent of the instructor.

215. Business Law (3) Lecture—3 hours. Prerequisite: completion of Administration core requirements or petition with consent of instructor. Introduction to law and legal process in the United States. Sources of law, Structure and operation of courts, federal-state relationships, fundamentals of administrative law, fundamentals of business law.

216. Managing Professionals, Budgets, Controls and Ethics (3) Lecture—3 hours. Prerequisite: graduate standing. Performance measures, budgetary controls and ethical pressures which occur at middle management levels in service-type organizations. Addresses such issues as organization and communication, ethical decision making, and understanding and influencing political processes in organizational settings.—I (I), Swaminathan.

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 information, social psychological processes (including commitment), the construction of meaning, and ethics.—Palmer.

224. Managing People in Modern Organizations (3) Lecture/discussion—3 hours. Modern systems for managing people. Examination of the changing workforce and workplace, emphasizing high-technology and knowledge-intensive organizations. The impact of firms’ environment (competition, product market, regulations) on choices for managing people. The consequences of these choices for firms and managers.—II (II), Beckhy.
Managerial Economics

[College of Agricultural and Environmental Sciences]

The Major Program
The major in managerial economics (formerly agricultural and managerial economics) teaches students to apply economics and quantitative principles to problems in agricultural production, management, marketing, finance, trade, futures and options, environment and development.

The Program. Each student must specialize in at least one of three options: agricultural economics, which is focused on the production and marketing of foods and fibers; environmental and resource economics, which focuses on issues related to use of resources and environmental quality; or managerial economics, which focuses on topics related to evaluating, financing, and managing business activities.

Internships and Career Alternatives. Students in managerial economics have opportunities to gain additional experience and preparation through internships in a variety of private business and governmental agencies. Graduates qualify for supervisory and management training positions in farm and ranch production, food and agricultural processing, agricultural sales and service, banking, finance, commodity and stock brokerages in the private sector, and a variety of agency career positions in local, state, and federal government. Students who desire additional training are well qualified to enter graduate programs in agricultural and resource economics, economics, business administration, or law. For more information, see http://iicc.ucdavis.edu.

Major Economic Requirements. Students may enter the Pre-Managerial Economics major while completing the major preparatory requirements. Acceptance into the major does not guarantee automatic admission into the major. Before declaring a major in Managerial Economics, a student must complete the following courses with a combined grade point average (GPA) of at least 2.800. All of these courses must be taken for a letter grade. In determining admission to major status, the Department of Agricultural and Resource Economics counts only the first repeat of any major course.

Economics 1A and 1B ..........8 units
Statistics 13 .........4 units
Mathematics 16A or 16B or 21A and 21B ..........6-8 units
If a student has taken Agricultural and Resource Economics (ARE) 100A and/or Economics (ECN) 101 before applying for admission to our major, ARE 100A will take the place of ECN 1A and ECN 101 will take the place of ECN 1B for calculation of the student’s entrance GPA.

B.S. Major Requirements:

UNITS

English Composition Requirement ......4-12
At least 8 units from the following list:

English 3, University Writing Program 1, 18, 19, 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 104A, 104F

Statistics 13, 103 ..........8 units

Agricultural Management and Rangeland Resources 21, Computer Science Engineering 10, 15 or 30 ........3-4

Mathematics 1A-18B or 21A-21B ..........8-9

Social Science, Natural Science, Agricultural Science ................37-38

See major breadth requirement checklist in department Advising Office.

Preparatory Subject Matter ............72-75

Management 1A-118 ........8 units

Agricultural and Resource Economics 100A, which has prerequisites Economics 1A-1B and Mathematics 1A-115 or 21A-21B or 104A-104F

Economics 1A-1B ..........8 units

Mathematics 1A-161 16C or 21A-21B ........9 units

Statistics 13, 103 or 105 ........8 units

Social Science, Natural Science, Agricultural Science ................37-38

See major breadth requirement checklist in department Advising Office.

http://www.agecon.ucdavis.edu for a complete list of courses.

Breadth/General Education ..........6-24

Note: Approved General Education courses may be used to simultaneously satisfy Social, Natural, and Agricultural Science courses as defined in the Preparatory Subject Matter for the major and the campus General Education requirements.

Depth Subject Matter ............20

Students graduating with this major are required to attain at least a C average (2.000) in all upper division courses taken at the University in the depth subject matter.

Agricultural and Resource Economics 100A, 100B, 106, 155, 160, 165 ........16

Economics 101 ..........................4

Restricted Electives .............32

Choose at least one of the options below:

Agricultural Economics option

Choose at least 15 units from Agricultural and Resource Economics 120, 130, 132, 138, 139, 140, 145, 150, 156, the remaining 17 units from the aforementioned courses, Agricultural and Resource Economics 18, or upper division courses in Agricultural and Resource Economics and/or Economics.

Environmental and Resource Economics option

Agricultural and Resource Economics 175, 176 ......................8

Choose at least 18 units from Agricultural and Resource Economics 15, 145, 150, 156, 146, 150, 156, Economics 123, 125, 130, Environmental Science and Policy 168A, 168B, 178. Select the remaining 6 units from the aforementioned courses or upper division courses in Agricultural and Resource Economics and/or, Environmental Science and Policy 160, 161, 163, 165, 166, 167, 171, 172, 173, Environmental Toxicology 138

Managerial Economics option

Agricultural and Resource Economics 18 .........................4

Choose at least 12 units from Agricultural and Resource Economics 112, 118, 136, 157, 171A, 171B. Select the remaining 16 units from the aforementioned courses or from Agricultural and Resource Economics 115A, 120, 130, 132, 138, 139, 140, 143, 144, 145, 146, 150, 156, 175, 176, 194HA-194HB, Economics 115A, 121A, 121B, 151A, 151B, 100A, 100B, 105A, 105B.

Unrestricted Electives ..................41-44

Total Units for the Degree ..........180

Advising Center for the major is in 1176 Social Sciences and Humanities Building (530) 754-9536.

Major Adviser, Hoy F. Carman (Agricultural and Resource Economics)

Minor Program Requirements: Before declaring a minor in Managerial Economics, a student must complete the following courses with a combined grade point average (GPA) of at least 2.800. All of these courses must be taken for a letter grade. In determining admission to minor status, the Department of Agricultural and Resource Economics counts only the first repeat of any pre-major course.

Economics 1A and 1B ..........8 units

Mathematics 16A-16B or 21A-21B 6-8 units

Statistics 13 ..............................4 units

The Department of Agricultural and Resource Economics offers four minor emphases open to students majoring in other disciplines who wish to complement their study program with a minor in Managerial Economics. Each emphasis requires Agricultural and Resource Economics 100A, which has prerequisites Economics 1A-1B and Mathematics 1A-161. For some courses, Statistics 13 and/or 103 may be required. Variable-unit courses and lower division courses are not accepted for any emphasis.

UNITS

Managerial Economics ............18

General emphasis

Agricultural and Resource Economics 100A or the equivalent ..................4

Additional upper division courses in Agricultural and Resource Economics ..........14

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, 156, 146, 150, 156, Economics 123, 125, 130, 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

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer, 2007/2008 offering in parentheses

Maternal and Child Nutrition
(Graduate Studies, page 97, in this catalog)

Graduate Study. See Graduate Studies, on page 97, in this catalog.

Mathematical and Physical Sciences

The Division of Mathematical and Physical Sciences teaches students to use 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 Course

1. General Science: Science in the News (4)
   Lecture—3 hours; laboratory/discussion—1 hour. Prerequisite: lower division standing. Basic principles in science including numeracy, scale, energy, and time; the scientific method; good and bad science. Emphasis on science topics recently in the news. GE credit: SciEng.—Ill. Rustad

11A-11B. Mathematical and Physical Sciences Seminar (2-2)
   Lecture—2 hours. Prerequisite: mentorship for under-graduate research projects in the physical and mathematical sciences. Research and writing in the mathematical and physical sciences. Presentations by various science faculty members.—Ill. (Hl)

Mathematics

See Mathematics; and Applied Mathematics (A Graduate Group), on page 145.

Graduate Advisors. Kathryn G. Dewey, Ph.D., Professor (Nutrition); Jane Heinig, Ph.D., Academic Administrator (Nutrition)

Courses in Maternal and Child Nutrition. See courses under Nutrition, on page 398.

Mathematics

(Conference of Letters and Science)

E. O. Milton, Ph.D., Professor, Academic Senate Distinguished Teaching Award

Ben Morris, Ph.D., Associate Professor

Alexander I. Magilliner, Ph.D., Professor

Motoko Mulase, Ph.D., (Mathematics)

Robert H. Shumway, Ph.D. (Statistics)

The Program of Study

The Division of Mathematical and Physical Sciences teaches students to use 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.

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Mathematics

See Mathematics; and Applied Mathematics (A Graduate Group), on page 145.

Graduate Advisors. Kathryn G. Dewey, Ph.D., Professor (Nutrition); Jane Heinig, Ph.D., Academic Administrator (Nutrition)

Courses in Maternal and Child Nutrition. See courses under Nutrition, on page 398.
Applied Mathematics

B.S. Major Requirements:

Preparatory Subject Matter ............... 42-48

Mathematics 12 (or high school equivalent) .......... 0-3
Mathematics 21A, 21B, 21C, 21D, 22B ............... 19
Computer Science Engineering 30 or Engineering 6 ............ 4

Additional non-Mathematics courses chosen from natural sciences ........12

Depth Subject Matter ..................... 34-38

A. Entry Level (Optional) ............ 0-4
(Suggested choices: one course from Mathematics 108, 114, 115A, 141, 145)

B. Core .................................. 16

Mathematics 125A ....................... 8
Mathematics 135A ....................... 4
Mathematics 150A ....................... 4

C. Choose one Plan from the following two: (up to 4 of these 18 units may be approved upper division courses outside of the Department of Mathematics with extensive use of mathematics) ....... 18

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 .......... 6

Note: Students who wish to satisfy the single subject matter waiver for the teaching credential should see an adviser as early as possible.

Total Units for the Major .................. 77-84

Mathematics

Lawrence Marx, Ph.D., Lecturer

The Major Programs

Mathematics is the study of abstract structures, space, change, and the interrelations of these concepts. It is also 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 concrete mathematics of the lower division and the more abstract concepts taught in upper division courses. The core classes are intended to provide the basic mathematical techniques, whereas the enrichment choices allow students to further their mathematical knowledge and skills that feature their research or career interests. This individualized program can lead to graduate study in pure or applied mathematics, to 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 some other field.

Career Alternatives. A degree in mathematics provides entry to many careers in addition to teaching, or to other professional goals. It can also be used to pursue graduate study in a variety of fields, such as law, engineering, and economics.

A.B. Major Requirements:

Preparatory Subject Matter ............... 43-46

Mathematics 12 (or high school equivalent) .......... 0-3
Mathematics 21A, 21B, 21C, 21D, 22B ............... 19
Computer Science Engineering 30 or Engineering 6 ............ 4

Additional non-Mathematics courses chosen from natural sciences ........12

Depth Subject Matter ..................... 34-38

A. Entry Level (Optional) ............ 0-4
(Suggested choices: one course from Mathematics 108, 114, 115A, 141, 145)

B. Core .................................. 16

Mathematics 125A ....................... 8
Mathematics 135A ....................... 4
Mathematics 150A ....................... 4

C. Choose one Plan from the following two: (up to 4 of these 18 units may be approved upper division courses outside of the Department of Mathematics with extensive use of mathematics) ....... 18

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 .......... 6

Note: Students who wish to satisfy the single subject matter waiver for the teaching credential should see an adviser as early as possible.

Total Units for the Major .................. 77-84

B.S. Major Requirements:

Preparatory Subject Matter ............... 42-48

Mathematics 12 (or high school equivalent) .......... 0-3
Mathematics 21A, 21B, 21C, 21D, 22B ............... 19
Mathematics 25, 67 ............... 8
Computer Science Engineering 30 or Engineering 6 ............ 4

One approved upper division course from Physics 9A, 9B; Biological Sciences 1A-1B; Chemistry 2A-2B; Economics 1A-B; Statistics 32, 102; or other approved preparatory courses approved by your adviser .......... 7-10

Depth Subject Matter ..................... 48-52

A. Entry Level (Optional) ............ 0-4
(Suggested choices: one course from Mathematics 108, 114, 115A, 141, 145)

B. Core .................................. 32

Mathematics 135A ....................... 4
Mathematics 125AB ..................... 8
Mathematics 111 ....................... 4
Mathematics 128AB ..................... 8
Mathematics 185A ....................... 4

C. Enrichment Courses ................. 16


2. One approved upper division course outside the Department of Mathematics with extensive use of mathematics .......... 4

Total Units for the Major .................. 90-100

Mathematics

B.S. Major Requirements:

Preparatory Subject Matter ............... 34-38

Mathematics 12 (or high school equivalent) .......... 0-3
Mathematics 21A, 21B, 21C, 21D, 22B ............... 19
Mathematics 25, 67 ............... 8
Computer Science Engineering 30 or Engineering 6 ............ 4

One approved upper division course from Mathematics 111, 114, 115A, 116, 135B, 141, 145, 146, 147, 148, 150B, 150E, 150F, 185A ............ 4

Total Units for the Major .................. 90-100

Mathematical and Scientific Computation

B.S. Major Requirements:

Preparatory Subject Matter ............... 35-38

Mathematics 12 (or high school equivalent) .......... 0-3
Mathematics 21A, 21B, 21C, 21D, 22B ............... 19
Mathematics 25, 67 ............... 8
Computer Science Engineering 30, 40 ............ 4

Depth Subject Matter ..................... 48-52

A. Entry Level (Optional) ............ 0-4
(Suggested choices: one course from Mathematics 108, 114, 115A, 141, 145)

B. Core .................................. 28

Mathematics 150A ....................... 4
Mathematics 135A ....................... 4
Mathematics 125AB ..................... 8
Mathematics 128ABC .................... 12

C. Enrichment Courses ................. 12


2. One approved upper division course from Mathematics 111, 114, 115A, 116, 135B, 141, 145, 146, 147, 148, 150B, 150E, 150F, 185A ............ 4

D. Choose one Emphasis from the following two: (up to 4 of these 18 units may be approved upper division courses outside the Department of Mathematics with extensive use of mathematics) ....... 8

Computational and Mathematical Biology Emphasis

Mathematics 124 ....................... 4
One approved upper division course in Biology .......... 4

Computational and Mathematics Emphasis

Mathematics 168 ....................... 4
One approved upper division course involving extensive computation or theory of computation .......... 4

Total Units for the Major .................. 83-90

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 advisers, contact the Student Services office at studserv@math.ucsd.edu or our Web site.

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. For Mathematics 189 and 190 level courses, (1) a maximum of one unit may be counted in partial satisfaction of the depth subject matter requirements excluding Mathematics 194; (2) up to 3 units of Mathematics 194 may be counted in partial satisfaction of the depth subject matter requirements. No combination of (1) and (2) is allowed.
Statement of Objectives. As early as possible, but no later than the last quarter of the sophomore year or no later than the beginning of the first quarter of the junior year for transfer students, each prospective mathematics major, in consultation with an adviser, should file a formal program of study in one of the majors offered in mathematics. Forms to be used for this are available on our Web site or from the Department office. Failure to file a formal program could lead to a delay in graduation.

Information for Undergraduates. Assistance in planning undergraduate major program in mathematics is available on our Web site, as well as by consulting an adviser.

Mathematics Placement Requirement. Students who wish to enroll in Mathematics 12, 16A, 17A, 21A, 21AH, 36 and 67 must satisfy the mathematics placement requirement. See the Department of Mathematics Web page for details well in advance of enrolling. Students who do not satisfy the requirement will be administratively dropped from these courses. Dates and times for the Precalculus Diagnostic Exam, one of the ways to meet this requirement, are posted on the Learning Skills Center Web page. The Center also provides review materials, review workshops, and other recommended remedial math courses.

Beginning with the 2006-2007 academic year, the Mathematics Placement Requirement is waived when one of the following conditions is met: (a) Advanced Placement Mathematics AB exam score of 3, 4, or 5; (b) Advanced Placement Mathematics BC exam score of 3, 4, or 5; (c) SAT Math score of 700 and above.

Minor Program Requirements:

Mathematics................................. 20

Upper division units in mathematics (exclusive of Mathematics 12, 197C, 199, 200, 219)................................. 20

Teaching Credential Subject Representative. Ali Dad-del

Graduate Study. The Department offers programs of study and research leading to the M.A., M.A.T., and Ph.D. degrees in mathematics. Information regarding graduate study may be obtained by consulting our Web site, and by sending an e-mail to studentservices@math.ucdavis.edu.

Courses in Mathematics (MAT)

Lower Division Courses

B. Elementary Algebra (no credit)

Lecture—3 hours. Basic concepts of algebra, including polynomials, factoring, equations, graphs, and inequalities. Offered only if sufficient number of students enroll. Not open to Concurrent student enrollment. (P/NP grading only) (There is a fee of $45.1. I.)

C. Trigonometry (no credit)

Lecture—3 hours. Basic concepts of trigonometry, including trigonometric functions, identities, inverse functions, and applications. Offered only if sufficient number of students enroll. Not open to Concurrent student enrollment. (P/NP grading only) (There is a fee of $30.) I., II, III.

D. Intermediate Algebra (no credit)

Lecture—3 hours. Basic concepts of algebra, designed to prepare the student for college work in mathematics 16A or 21A. Functions, equations, graphs, logarithms, and systems of equations. Offered only if sufficient number of students enroll. Not open to Concurrent student enrollment. (P/NP grading only) (There is a fee of $15.) I., II, III.

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 motion and optimization. Not open for credit to students who have completed any of courses 16A, 16B, 16C, 17A, 17B, 17C, 21A, 21B, or 21C with a C or better.—I, II, III. (I, II, III.)

Note: Mathematics 16A, 16B, and 16C are intended for students who wish to enroll in Mathematics courses 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 a treatment of analysis), and are intended for biology students who do not wish to take more rigorous Mathematics courses.

16A. 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 motion and optimization. Not open for credit to students who have received credit for Mathematics 17B, 17C, 21A, 21B, or 21C. Only 2 units of credit to students who have completed course 17A. GE credit: SciEng.—I, II, III. (I, II, III.)

16B. 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, 21B, or 21C. Only 2 units of credit to students who have completed course 17B. GE credit: SciEng.—I, II, III. (I, II, III.)

16C. Short Calculus (3)

Lecture—3 hours. Prerequisite: course 16A, 16B, or 21B. Differential equations; partial derivatives; double integrals; applications; series. Not open for credit to students who have completed course 17C. GE credit: SciEng.—I, II, III. (I, II, III.)

17A. Calculus for Biology and Medicine (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: two years of high school algebra, plane geometry, plane trigonometry, and analytic 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 any of courses 16A, 21A, 21B, or 21C. Only 2 units of credit to students who have completed course 17A. GE credit: SciEng.—I, II, III. (I, II, III.)

Note: Mathematics 16A, 16B, and 16C are intended 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—1 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 16A, 21A, or 21C. Only 2 units of credit to students who have completed course 17A. GE credit: SciEng.—II, III.

17C. Calculus for Biology and Medicine (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 16B, 17B, or 21B. Multivariable 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.—II, III.

17A. 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. GE credit: SciEng. Offered irregularly.

17AL. 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 Scholars Program by instructor’s invitation only. (P/NP grading only) Not offered every year.—I.

21B. Calculus (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 21A or 21AH. Continuation of course 21A. Definition of definite integral, fundamental theorem of calculus, techniques of integration. Applications to area, volume, arc length, average of a function, improper integral, surface of revolution. Only 2 units of credit to students who have completed course 21B. GE credit: SciEng.—II, III. (II, III.)

21BH. Honors Calculus (4)

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. GE credit: SciEng.

21BL. Emerging Scholars Program Calculus Workshop (2)

Workshop—6 hours. Prerequisite: course 21A or 21AH; concurrent enrollment in 21B. Continuation of course 21A. Same course content as course 21B. Enrollment for students in the Emerging Scholars Program by instructor’s invitation only. (P/NP grading only) Not offered every year.—II.

21C. Calculus (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 16C, 17C, 21B, or 21BH. Continuation of course 21B. Sequences, series, tests for convergence, Taylor expansions. Vector algebra, vector calculus, scalar and vector fields. Partial derivatives, total differentials. Applications to maximum and minimum problems in two or more variables. Applications to physical systems. GE credit: SciEng.—I, II, III. (I, 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. GE credit: SciEng. Offered infrequently.

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) Not offered every year.—III.

21D. Vector Analysis (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: course 21C or 21CH. Continuation of course 21C. Infinite integrals over plane and solid regions in var-
Prerequisites: consent of instructor. (P/NP grading only.)

Upper Division Courses

108. Introduction to Abstract Mathematics (4)
Lecture/discussion—4 hours. Prerequisite: course 21B. A rigorous treatment of mathematical concepts with emphasis on developing the ability to understand abstract mathematical ideas and to write and present mathematical concepts, and to prove theorems. Designed to serve as preparation for the more rigorous upper division courses. —I, II, (II.)

111. History of Mathematics (4)
Lecture—3 hours. Prerequisite: eight units of upper division Math; one of the following courses: 25, 67, 108, 115A, 141, or 145. The history of mathematics from ancient times through the development of calculus. Mathematics from Arab, Hindu, Chinese, and other cultures. Selected topics from the history of modern mathematicians. —II, (II.)

114. Convex Geometry (4)
Lecture—3 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. —II.

115A. Number Theory (4)
Lecture/discussion—4 hours. Prerequisite: course 21B. Divisibility and related topics, diophantine equations, selected topics from the theory of prime numbers. Designed to serve as preparation for the more rigorous upper division courses. —I, II.

115B. Number Theory (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 67, 115A. Euler function, Mobius function, congruences, primitive roots, quadratic reciprocity law. Offered in alternate years. —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. —III.

118A. Partial Differential Equations: Elementary Methods (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 21D, 22B, 22A or 67. Derivation of partial differential equations, separation of variables; equilibrium solutions and Laplace’s equation; Fourier series; methods of characteristics for the one dimensional wave equation. Solution of nonhomogeneous equations. —I, (I.)

118B. Partial Differential Equations: Eigenfunction Expansions (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 118A. Sturm-Liouville Theory; self-adjoint operators; mixed boundary conditions; partial differential equations in two and three dimensions; Eigenvalue problems in circular domains, nonhomogeneous problems and the method of eigenfunction expansions; Poisson’s Equations. —II, (II.)

118C. 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; Fourier transforms; Green’s functions for time dependent problems; Laplace transform and solution of partial differential equations. —III, (III.)

119A. Ordinaty Differential Equations (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 21D, 22B, 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, Lyapunov’s method; limit cycles; Poincare Bendixon theory. —II, (II.)

119B. Ordinary Differential Equations (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 119A. Lorentz maps; center manifolds and normal forms; scalar and planar maps; phase space analysis for iterated maps; period-doubling bifurcation; Lyapunov exponents; chaos and symbolic dynamics; strange attractors; fractals. —III, (III.)

124. Mathematical Biology (4)
Lecture—3 hours; project. Prerequisite: courses 22A or 67; 22B. Methods of mathematical modeling of biological systems including difference equations, ordinary differential equations, stochastic and dynamic programming models. Computer simulation methods applied to biological systems. Applications to population growth, cell biology, physiology, evolutionary ecology and protein clustering. MATLAB programming required. Offered in alternate years. —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. —I, II, (II.)

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. —II, III, (III.)

128A. Numerical Analysis (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 Pascal, Fortran, or BASIC required. —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 Pascal, Fortran, or BASIC required. —I, (I.)

128C. Numerical Analysis in Differential 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 Pascal, Fortran, or BASIC required. —I, (I.)

129. Fourier Analysis (4)
Lecture—3 hours; extensive problem solving. Prerequisite: courses 21D; 22A or 67; 22B; 25 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 differential equations. —I, (I.)

133. Mathematical Finance (4)
Lecture—3 hours, extensive problem solving. Prerequisite: courses 67; 135A. Analysis and evaluation of deterministic and random cash flow streams, yield and pricing of basic financial instruments, interest rate theory, mean-variance portfolio theory, capital asset pricing models, utility functions and general principles. MATLAB programming required. Offered in alternate years. —III.

135A. Probability (4)
Lecture/discussion—4 hours. Prerequisite: course 125A. Probability space; discrete probability, combinatorial analysis; independence, conditional probability; random variables, discrete and continuous distributions, probability mass function, joint and marginal density functions; expectation, moments, variance, Chebyshev inequality; sums of random variables.
variables, random walk, large number law, central limit theorem. Not open for credit to students who have completed former course 131.—I, II, III.

135B. Stochastic Processes (4) Lecture—3 hours; extensive problem solving. 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 former course 132A.—II. (II, III.)

141. Euclidean Geometry (4) Lecture/discussion—4 hours. Prerequisite: courses 21B, 22A or 67. An axiomatic and analytic examination of Euclidean geometry from an advanced point of view. In particular, a discussion of its relation to other geometries. Designed to serve as preparation for the more rigorous upper division courses. —II. (II.)

145. Combinatorics (4) Lecture/discussion—4 hours. Prerequisite: course 21B. Combinatorial methods using basic graph theory, counting methods, generating functions, and recurrences. Course designed to serve as preparation for the more rigorous upper division courses.—III. (III.)

146. Algebraic Combinatorics (4) Lecture/discussion—4 hours. Prerequisite: courses 22A, or consent of instructor. Polya Theory, generating functions, current topics in algebraic combinatorics. Not open for credit to students who have completed former course 149A.—III. (III.)

147. Topology (4) Lecture—3 hours; extensive problem solving. Prerequisite: courses 67, 125A. Basic notions of point-set and combinatorial topology.—I, II, III.

148. Discrete Mathematics (4) Lecture/discussion—4 hours. Prerequisite: course 67, or consent of instructor. 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.—I, 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 (cayley theorems, etc.) developing these concepts. Precise thinking, proof writing, and the ability to deal with abstraction.—I, II, III.

150B. Modern Algebra (4) Lecture/discussion—4 hours. Prerequisite: course 150A. Concepts of rings, factorization, modules.—II, III.

150C. Modern Algebra (4) Lecture/discussion—4 hours. Prerequisite: course 150B. Group representations, fields, Galois theory.—II, III.


165. Mathematics and Computers (4) Lecture—3 hours; project. Prerequisite: Computer Science: Engineering 30 or equivalent; course 228 and one of the following courses: 25, 67, 108, 114, 115A, 114, 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; buffering; operating system contention; CPU, I/O, interactive operations. Not offered every year.

167. Applied Linear Algebra (4) Lecture—3 hours; extensive problem solving. Prerequisite: course 22A or 67. Linear algebra; linear equations, orthogonal projections, similarity transformations, quadratic forms, determinants, eigenvalues and eigenvectors. Applications to physics, engineering, economics, biology and statistics. —I, II, III. (I, II, III.)

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.—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 differ. Not offered every year.—I, II, III.

185A. Complex Analysis (4) Lecture—3 hours; extensive problem solving. Prerequisite: courses 67, 125A. Complex number system, analyticity and the Cauchy-Kiemann equations, elementary functions, complex integration, power and Laurent series expansions, residue theory.—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.—III.

189. Advanced Problem Solving (3) Lecture—3 hours. Prerequisite: courses 21D, 22A or 67, 25. Introduction to advanced problem solving techniques. Solve and present interesting and challenging problems of all areas of mathematics. Not offered every year.

192. Internship in Applied Mathematics (1-3) Internship; final report. Prerequisite: upper division standing; project approval by faculty sponsor prior to enrollment, students not enrolled in applied mathematics. May be repeated for credit for a total of 10 units. (P/NP grading only.)

194. Undergraduate Thesis (3) Prerequisite: consent of instructor. Independent research under faculty direction. A faculty member. Student will submit written report in thesis form. May be repeated with consent of Vice Chairperson. (P/NP grading only)—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 once 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) (P/NP grading only)

Graduate Courses


204. Applied Asymptotic Analysis (4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: graduate standing or consent of instructor. Scaling and non-dimensionalization. Asymptotic expansions. Regular and singular perturbation methods. Applications to algebraic and ordinary and partial differential equations in the sciences and engineering. Offered in alternate years.—I.

210A. Topics in Geometry (3) Lecture—3 hours. Prerequisite: bachelor’s degree in mathematics or consent of instructor. Topics in advanced geometry related to curriculum at all levels. Required for M.A.T. degree program for prospective teachers. May be repeated for credit with prior consent of instructor.—I.

210AL. Topics in Geometry: Discussion (1) Lecture/discussion—1 hour (to be arranged). Prerequisite: course 210A (concurrently); consent of instructor. Topics of special interest to teachers and candidates for M.A.T. degree program. May be repeated for credit. Offered irregularly.

210B. Topics in Algebra (3) Lecture—3 hours. Prerequisite: bachelor’s degree in mathematics or consent of instructor. Topics in advanced algebra related to curriculum at all levels. Required for M.A.T. degree program for prospective teachers. May be repeated for credit with prior consent of instructor.—II.

210BL. Topics in Algebra: Discussion (1) Lecture/discussion—1 hour (to be arranged). Prerequisite: course 210B (concurrently); consent of instructor. Topics of special interest to teachers and candidates for M.A.T. degree program. May be repeated for credit. Offered irregularly.

210C. Topics in Analysis (3) Lecture—3 hours. Prerequisite: bachelor’s degree in mathematics or consent of instructor. Topics in advanced analysis related to curriculum at all levels. Required for M.A.T. degree program for prospective teachers. May be repeated for credit with prior consent of instructor.—III.

210CL. Topics in Analysis: Discussion (1) Lecture/discussion—1 hour (to be arranged). Prerequisite: course 210C (concurrently); consent of instructor. Topics of special interest to teachers and candidates for M.A.T. degree program. May be repeated for credit. Offered irregularly.

215A-215B-215C. Topology (4-4-4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: graduate standing or consent of instructor. Fundamental group and covering space theory.
218A-218B. Partial Differential Equations (4-4)
Lecture—3 hours; term paper or discussion. Prerequisite: courses 22A, 127C. Initial and boundary value problems for elliptic, parabolic and hyperbolic partial differential equations; existence, uniqueness and regularity for linear and nonlinear equations; maximum principles, weak solutions, Holder and Sobolev spaces, and energy and variational equations. Offered in alternate years.—IIIII.

236A-236B. Stochastic Dynamics and Applications (4-4)

240A-240B-240C. Differential Geometry (4-4-4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 116 or consent of instructor. Manifolds. Differentiable structures. Vector fields and tangent spaces. Bundles, tensors, forms, Grassman algebras. DeRham cohomology. Riemannian geometry. Connections, curvature, geodesics, submanifolds. Curves and surfaces. Positive and negative curvature; Morse Theory; homogeneous spaces; Hodge theory; applications. Offered in alternate years.—IIIII.

245. Enumerative Combinatorics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 145, 150 or the equivalent, or consent of instructor. Introduction to modern combinatorics and its applications. Emphasis on enumerative aspects of combinatorial theory. Offered in alternate years.—IIIII.

250A-250B-250C. Algebra (4-4-4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: graduate standing in mathematics or consent of instructor. Group and rings. Syllow theorems, abelian groups, Jordan-Holder theorem. Rings, unique factorization. Algebraic and geometric aspects. Fields and vector spaces over fields. Field extensions. Commutative rings. Representation theory and its applications.—IIIII.

258A. Numerical Optimization (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: courses 127A, 167. Numerical methods for infinite dimensional optimization problems. Newton and quasi-Newton methods, linear and sequential quadratic programming, barrier methods; largescale optimization; theory of approximations; infinite and semi-infinite programming; applications to optimal control, stochastic optimization and distributed systems. Offered in alternate years.—IIIII.

258B. Variational Analysis (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 127A and 167 or consent of instructor. Foundations of optimization theory. The design of solution procedures for optimization problems. Modeling issues, and stability analysis. Offered in alternate years.—IIIII.

261A-261B. Lie Groups and Their Representations (4-4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 22A and 167 or the equivalent or consent of instructor. Computational methods for the solution of linear algebraic equations and matrix eigenvalue problems. Analysis of direct and iterative methods. Special methods for sparse matrices. Offered in alternate years.—IIIII.

265. Mathematical Quantum Mechanics (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 201 or consent of instructor. Mathematical foundations of quantum mechanics: the Hilbert space formalism, independence, laws of large numbers, characteristic functions, central limit theorems. Weak convergence in metric spaces, Brownian motion, invariance principle. Con-
supporting material, preparation and grading of examinations, and related topics. Required of departmental teaching assistants. May be repeated for credit. (S/U grading only)—I, II, III, IV. (I, II, III, IV.)

399. Individual Study (2-4)
Independent study—2-3 hours; discussion—1 hour. Individual study of some aspect of mathematics education or a focused work on a curriculum design project under supervision of a faculty member in mathematics. May be repeated once for credit. (S/U grading only)—I, II, III. (I, II, III.)

Medical Informatics
(A Graduate Group)

See Health Informatics (A Graduate Group), on page 293.

Medical Microbiology

See Medicine, School of, on page 345.

Medical Pharmacology and Toxicology

See Medicine, School of, on page 345.

Medical and Epidemiology (VME), on page 473.

Medicine

See Medicine, School of, on page 345; and Medicine and Epidemiology (VME), on page 473.

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Beverly Garcia-Williams, M.D., Asst Clinical Professor
Shawn Hayes, Ph.D., Asst Adjunct Professor (Internal Medicine)
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<td>David Shenton, M.D.</td>
<td>Professor</td>
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<td>Chris Shin, M.D.</td>
<td>Asst Clinical Professor</td>
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<td>Curtis Sheid, M.D.</td>
<td>Professor</td>
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<tr>
<td>Tony Simon, Ph.D.</td>
<td>Assoc Professor</td>
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<td>Amrik Singh, M.D.</td>
<td>Asst Clinical Professor</td>
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<td>Anne C. Smith, Ph.D.</td>
<td>Asst Adjunct Professor</td>
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<td>Lloyd Smith, Ph.D.</td>
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<td>Peter Sokolove, M.D.</td>
<td>Assoc Professor</td>
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<td>Jay Soltz, M.D.</td>
<td>Professor</td>
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<tr>
<td>Marjorie Solomon Friedman, Ph.D. MBA</td>
<td>Asst Clinical Professor (Psychiatry and Behavioral Sciences)</td>
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<td>Eiler Sommerhaug, M.D.</td>
<td>Asst Professor</td>
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<td>Espen Spanenberg, Ph.D.</td>
<td>Asst Professor</td>
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<td>Malathi Srinivasan, M.D.</td>
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<td>Charles Stebbins, Ph.D.</td>
<td>Professor</td>
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<td>Rebecca Sten-Wexler, M.D.</td>
<td>Asst Clinical Professor</td>
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<tr>
<td>Judith Stern, Ph.D.</td>
<td>Professor</td>
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<td>Robin Stern, Ph.D.</td>
<td>Clinical Professor</td>
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<td>Frazier Stevenson, M.D.</td>
<td>Assoc Professor</td>
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<td>Thomas Stevenson, M.D.</td>
<td>Professor (Surgery)</td>
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<td>Deborah Stewart, M.D.</td>
<td>Clinical Professor</td>
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<td>Anthony Stone, M.D.</td>
<td>Professor (Urology)</td>
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<td>E Bradley Strong, M.D.</td>
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<td>Dennis Styne, M.D.</td>
<td>Professor (Pediatrics)</td>
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<td>Nirupama Subramanian, M.D.</td>
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<td>Colleen Sweeney, Ph.D.</td>
<td>Asst Adjunct Professor</td>
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<td>Richard Sweet, M.D.</td>
<td>Professor</td>
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<td>Diane Swick, Ph.D.</td>
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<td>Arthur Swiwicki, M.D.</td>
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<td>Jonathan Sykes, M.D.</td>
<td>Professor (Otolaryngology)</td>
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<td>Michael Swirsky, M.D.</td>
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<td>Robert M Szabo, M.D.</td>
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Yoshikazu Takada, M.D. Ph.D., Professor (Otolaryngology)

Michael Tanaka, M.D., Assoc Clinical Professor (Internal Medicine)

Alice Tarantal, Ph.D., Professor (Pediatrics, Cell Biology and Developmental Biology)

Alice Tarantal, Ph.D., Professor (Cell Biology and Human Anatomy, Physics and Membrane Biology)

Timothy Tautz, M.D., Asst Clinical Professor (Anesthesiology and Pain Medicine)

Douglas Taylor, M.D., Asst Professor (Pediatrics, Otolaryngology and Pain Medicine)

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Suzanne Teuber, M.D., Assoc Professor (Obstetrics and Gynecology)

Barry Tharp, M.D., Professor (Neurology, Pediatrics)

R Steven Thrarrt, M.D., Professor (Internal Medicine, Anesthesiology and Pain Medicine)

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Charles Thrillik, Ph.D., Assoc Adjunct Professor (Optical and Visual Sciences)

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Kathrin Trappmann, M.D., Assoc Professor (Surgery)

Glenn Tse, M.D., Asst Professor (Surgery)

Alexander Tsadikov, Ph.D., Assoc Professor (Public Health Sciences)

Renee Tsolis, Ph.D., Asst Professor (Medical Microbiology and Immunology)

Richard Tucker, Ph.D., Professor (Cell Biology and Developmental Biology)

Judith Turgeon, Ph.D., Professor (Internal Medicine, Obstetrics and Gynecology)

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A Kimberly Ureyy, Ph.D., Assoc Professor (Neurology)

William Martin Ureyy, Ph.D., Asst Professor (Neurology)

Garth Uter, M.D., Asst Professor (Surgery)

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Ana Vazquez, Ph.D., Adjunct Professor (Radiation Oncology)

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E Elaine Waeljen, M.D., Asst Professor (Obstetrics and Gynecology)

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Stacey Wallace, M.D., Asst Professor (Internal Medicine and Rehabilitation)

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Michael Wright, Ph.D., Asst Professor (Pharmacology and Toxicology)

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Reen Wu, Ph.D., Prof. (Internal Medicine)

Heike Wulf, Ph.D., Asst Professor (Pharmacology and Toxicology)

Theodore Won, M.D., Professor (Internal Medicine)

Ping Xia, M.D. Ph.D., Assoc Professor (Obstetrics and Gynecology)

Ebenazet Yamoah, M.D., Professor (Otolaryngology)

Chunli Yang, Ph.D., Asst Professor (Pediatrics)

Xiaowei Yang, Ph.D., Asst Adjunct Professor (Public Health Sciences)
Admission Requirements and Professional Curriculum. Detailed information can be obtained from the School of Medicine. See also School of Medicine, on page 113, in this catalog.

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 [internships and residencies] and the practice of medicine. It offers a blend of basic science, training and clinical experience with opportunities for research. The first-year program is for three quarters, beginning in the fall. Basic science courses (anatomy, physiology, biochemistry, histology, endocrinology, neurosciences, immunology, genetics, reproduction, general pathophysiology) provide a firm foundation in normal structure and function needed for further study of pathology in the second year. These courses also provide abundant clinical correlation to help students appreciate the contribution of these sciences to the care of patients. During the first year, the student begins the three-year Doctoring series, begins in fall quarter and runs parallel to the basic science courses. Students are introduced to the art and science of communicating with patients, physical diagnosis, and clinical problem solving through a combination of longitudinal small group experiences and preceptorships. Didactic sessions and cases are designed to help students integrate the basic and clinical sciences, and appreciate the central role of psychosocial, cultural and ethical perspectives in patient care.

The second-year program is for four quarters, but with the Summer Quarter abbreviated to six weeks. The applied basic sciences (microbiology, pharmacology, and systemic pathology) are integrated with the study of the pathophysiological basis of disease (dermatology, oncology, hematology, endocrinology, orthopedics, cardiology, pulmonology, psychiatry, neurology, nutrition, gastroenterology). The Doctoring program continues with a combination of longitudinal small groups, didactic presentations, clinical rotations, clerkships, and preceptorships. Major themes of the program include intermediate-level instruction in patient evaluation and physical diagnosis, critical reasoning, biostatistics and epidemiology, human sexuality, geriatrics, and medical ethics, and critical review of the biomedical literature.

The third-year program includes six required clerkship rotations in the clinical specialties: eight weeks each of surgery, medicine, obstetrics/gynecology, pediatrics, ambulatory medicine (jointly administered by the Family Practice and Internal Medicine) and psychiatry. Students may elect to defer one of the required clerkships to the fourth year. The third-year program consists of longitudinal small groups led by faculty members who remain with their group throughout the year as the students rotate through the clerkships. Didactic learning experiences and preceptorships. Didactic sessions and cases are designed to help students integrate the basic and clinical sciences, and appreciate the central role of psychosocial, cultural and ethical perspectives in patient care.
Curriculum also provides 12 weeks of undesignated time.

To satisfy the M.D. degree program, the student must successfully complete the required course work, clerkships, and fourth year elective program. Students who enter the program with advanced training in one of the areas required for the program are permitted to substitute required courses with electives of equal credit. 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 three years. Examples include electives in medical economics, history of ethics and medicine, medical Spanish, 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., M.B.A., and M.P.H.). These programs offer a wide breadth of study areas and draw upon the considerable expertise of the entire campus faculty. In addition, the UC Berkeley School of Public Health offers a M.P.H. program in conjunction with the M.D. program. The School of Medicine’s department of Epidemiology and Preventive Medicine also offers a M.P.H. This program is restricted to professional students in the Schools of Veterinary Medicine and Medicine, 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 targeted to train physicians to meet, respond to and solve the broad diversity of problems relating to medicine with faculty in the School of Medicine. (S/U grading only)—I, II, III, IV (I, II, III, IV) Kumari

Medical Sciences (MDS)

Lower Division Course

99. Special Study in Medicine for Undergraduates (1-5)

Independent study—3-1.5 hours. Prerequisite: consent of instructor. Participate in research projects relating to medicine with faculty in the School of Medicine. (S/U grading only)—I, II, III, IV (I, II, III, IV) Kumari

Upper Division Course

192. Medical Education Internship for Advanced Undergraduates (1-12)

Internship—3-36 hours. Prerequisite: competency with lower-level skills. Elective school faculty. Evaluation 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) Kumari

Professional Courses

400. Application of Medical Principles (1)

Discussion—3 hours. Prerequisite: approval of the Committee on Student Progress. 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. (P/NP grading only)—I, II, III, IV (I, II, III, IV) Kumari

400B-400C. Application of Medical Principles (1-2)

Discussion—2-3 hours. Prerequisite: approval of the Committee on Student Progress. 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 Kumari

400D. Application of Medical Principles (1)

Discussion—1.5 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress. 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 Kumari

400F. Application of Medical Principles (1)

Discussion—1.5 hours. Prerequisite: second year medical student. 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. (P/NP grading only)—IV Kumari

400J. Application of Medical Principles (1)

Discussion—1.5 hours. Prerequisite: third year medical student. 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. (P/NP grading only)—IV Kumari

400K. Application of Medical Principles (1)

Discussion—1.5 hours. Prerequisite: third year medical student. 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. (P/NP grading only)—IV Kumari

General Education (GE) credit: ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Social-Cultural Diversity; Wrt=Writing Experience
401. Applications of Computers to Medical Practice (2) Lecture—2 hours. Prerequisite: enrollment in medical school. Proficiency in computer applications relative to practice of medicine, with emphasis on e-mail, literate searching, file transfer, and hospital information systems. Offered online, at home or in lab; time and place determined by student. (H/ P/F grading only.)—I, II, III, IV. (I, II, III, IV) Hunley

411A-411B-411C. Doctoring 1 (4-3.5-3) Discussion—2 to 3 hours; clinical activity—1 hour, lecture/discussion. Prerequisite: approval of committee on student progress. Small, case-based learning groups with training in patient communication and interviewing techniques, clinical identification and applications of social, psychological, cultural, bioethical, and basic science concepts to patient case scenarios, outpatient clinical experiences and didactic presentations. (Deferred grading only, pending completion of sequence. P/F grading only.)—I, II, III, IV. (II, III, IV) Jer- ent, Callahan

413. Doctoring (1-2) Fieldwork—1 to 2 hours, independent study—1 to 2 hours; internship—1 hour. Prerequisite: approval of School of Medicine Committee on Student Progress. Application of multidisciplinary basic, social and clinical science concepts to clinical cases in small group discussions. Evaluation of professional competencies, attitudes and skills needed in the practice of clinical medicine as well as in-depth, self-directed learning. (H/P/F grading only; deferred grading only, pending completion of sequence.)—II, III, IV. (II, III, IV) Jer- ent, Callahan

421A. Doctoring 2 (2) Discussion—2 hours; lecture/discussion—2 hours; internship—1 hour. Prerequisite: approval of School of Medicine Committee on Student Progress. Application of multidisciplinary basic, social and clinical science concepts to clinical cases in small group discussions. History and physical examination with M.D., D.D.S., D.M.D., O.D., N.D., Pharm.D., D.V.M., Ph.D., or D.N.S. in nursing, acceptance into Clinical Research Graduate Group K30 program. Exposure to various medical specialties, research methods, and ethical issues involved in conducting research. (P/F grading only.)—McCurdy, Romano

421B. Doctoring 2 (4.5) Discussion—2 hours; lecture/discussion—2 hours; internship—1 hour. Prerequisite: approval of School of Medicine Committee on Student Progress. Application of multidisciplinary basic, social and clinical science concepts to clinical cases in small group discussions. History and physical examination with M.D., D.D.S., D.M.D., O.D., N.D., Pharm.D., D.V.M., Ph.D., or D.N.S. in nursing, acceptance into Clinical Research Graduate Group K30 program. Exposure to various medical specialties, research methods, and ethical issues involved in conducting research. (P/F grading only.)—McCurdy, Romano

421C-421D. Doctoring 2 (3.5-2.5) Discussion—2 hours; lecture/discussion—2 hours; internship—1 hour. Prerequisite: approval of the School of Medicine Committee on Student Progress. Application of multidisciplinary basic, social and clinical science concepts to clinical cases in small group discussions. Evaluation of professional competencies, attitudes and skills needed in the practice of clinical medicine. (Deferred grading only, pending completion of sequence. P/F grading only.)—I. Stevenson

430. Applications of Medical Principles (1) Discussion—2 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress. 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. (H/P/F grading only.)—I, II, III, IV. Stevenson

430A. Doctoring 3 (2) Discussion—3 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress. 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. (IV) Wilke, 430B-430C-430D. Doctoring 3 (2-2.5-2) Discussion—2 hours. Prerequisite: approval of School of Medicine Committee on Student Progress. Application of multidisciplinary basic, social and clinical science concepts to clinical cases in small group discussions. 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. Wilkes

440A-440B-440C. Doctoring 4 Teaching Fellowship (9) Discussion—1.5 hours; seminar—0.5 hours. Prerequisite: courses 430A, B, C, and D; consent of instructor; 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. (IV) Stevensen

440D. Doctoring 4 Teaching Fellowship (3) Discussion—1.5 hours; seminar—0.5 hours. Prerequisite: courses 430A, B, C, and D; consent of instructor; 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.)—II, III, IV. Wilkes

462. Introduction to Clinical Epidemiology and Study Design (3) Lecture—2 hours; discussion—1 hour. Prerequisite: completed M.D., D.D.S., D.M.D., O.D., N.D., Pharm.D., D.V.M., Ph.D., or D.N.S. in nursing, acceptance into Clinical Research Graduate Group K30 program. Anatomy and physiology of conducting clinical epidemiologic research. Familiarity with three basic study designs (cross-sectional, case-control, and cohort). Principles of measurements in clinical epidemiological studies. Frequency and analyzing data, and ethical issues involved in conducting research. (P/F grading only.)—McCurdy, Romano

464CR. Methods in Clinical Research (4) Lecture—3 hours; discussion—1.5 hours; laboratory/discussion—1.5 hours. Prerequisite: completed M.D., D.D.S., D.M.D., O.D., N.D., Pharm.D., D.V.M., Ph.D., or D.N.S. in nursing, acceptance into Clinical Research Graduate Group K30 program. Overview of major approaches to clinical research, including health services research techniques, informatics, using the GCRC, and preclinical methodologies available to enhance clinical projects. Overview of the clinical research support infrastructure available at UC Davis. Range of methodologies that can be applied to clinical research and multidisciplinary perspective about clinical research. (P/F grading only.)—Lloyd, Kravitz, Berglund

465CR. Responsible Conduct of Research (4) Lecture—3 hours, laboratory—12 hours. Prerequisite: completed M.D., D.D.S., D.M.D., O.D., N.D., Pharm.D., D.V.M., Ph.D., or D.N.S. in nursing, acceptance into Clinical Research Graduate Group K30 program. Overview of the major approaches to clinical research, including health services research techniques, clinical 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, correlation, and linear association. Microcomputer applications of statistical procedures in population medicine. (P/F grading only.)—Wun

466CR. Introduction to Medical Statistics (4) Lecture—36 hours; laboratory—12 hours. Prerequisite: approved M.D., D.D.S., D.M.D., O.D., N.D., Pharm.D., D.V.M., Ph.D., or D.N.S. in nursing, acceptance into Clinical Research Graduate Group K30 program. Biomedical applications of statistical methods. (Directed research in methodology 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, correlation, and linear association. Microcomputer applications of statistical procedures in population medicine. (P/F grading only.)—Wegelin

468CR. Insights in Clinical Research (1) Lecture—1 hour. Prerequisite: medical student in good standing. Seminars on research presented by Medical School faculty; overview of pertinent issues, including medical ethics, human subjects protocols, case control methods, etc. (P/F grading only.)—III. (III) Kumari

468CR. Introduction to Clinical Research (3) Lecture—3 hours; independent study. Prerequisite: completed M.D., D.D.S., D.M.D., O.D., N.D., Pharm.D., D.V.M., Ph.D., or D.N.S. in nursing, acceptance into Clinical Research Graduate Group K30 program. Introduction to clinical research and overview of major clinical research topics. Overview of basic clinical skills needed to accomplish CRGG mentored research project. (P/F grading only.)—Meyers

466CR. Strategies for Grant Writing (2) Discussion—2 hours; lecture—1 hour. Prerequisite: completed M.D., D.D.S., D.M.D., O.D., N.D., Pharm.D., D.V.M., Ph.D., or D.N.S. in nursing, acceptance into Clinical Research Graduate Group K30 program. Practical strategies and survival skills to create successful grant proposals in the NIH style and format. Preparing and submission, identifying and accessing research resources, understanding how to generate a peer-reviewed grant, and knowledge of the peer review process. (P/F grading only.)—II. (II) Paik

481. Insights into Clinical Specialties (1) Lecture/discussion—1 hour. Prerequisite: medical student in good standing. Exposure to various medical specialties, their responsibilities, and the needs in which medical students can prepare for and improve their candidacy for such programs. (P/F grading only.)—II. (II) Kumari

482. Lecture Series in Reproductive Health (1) Lecture—1 hour. Psychosocial and public health aspects of providing quality reproductive health care and application in student-run clinics and in 3rd year clerkships. May be repeated twice for credit. (P/F grading only.)—I, II, III, Kumari
487. History and Ethics of Medicine (1)
Lecture—1.25 hours. Introduction to ethical problems of patient care in both modern and historical contexts. Historical topics in medicine and medical ethics. (P/F grading only.)—I, II, III, IV.

489. Directed Studies (9)
Independent study—40 hours weekly. Prerequisite: individual directed studies in extended preparation for USMLE Part I, and/or as required by Promotion Board. Independent studies to review material from years I and II in the curriculum in preparation for taking USMLE Part I in the fall, and for remediation course work directed by the Promotion Board. Students are expected to spend 8 to 12 hours per day on their studies. Faculty consultation and tutoring available on individual basis. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

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, ethnicity and medicine, gender and medicine, history of medicine, health manpower, and medical education. A prepared paper on the selected topic will be required. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

499. Research in Medical Education and Curriculum Development (4)
Independent study—1-36 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, (I, II, III, IV)

Departmental Courses:

Anesthesiology and Pain Medicine (ANE)

Upper Division Course

192. Internship in Anesthesiology (1-6)
Internship—3-18 hours; final report. Prerequisite: upper division standing; approval of project prior to period of internship by preceptor. Supervised work experience in anesthesiology and related fields. (P/NP grading only.)—I, II, III, IV, (I, II, III, IV)

Professional Courses

460. Anesthesiology Clinical Clerkship (3-18)
Full time clinical activity (3 full days per unit). Prerequisite: medical student. In-depth exposure to anesthesiology through informal lectures and mentoring by anesthesiologists. Emphasis on understanding and applying anesthetic principles in managing administration of general, regional, and specialized areas. (H/P/F grading only.)—I, II, III, IV.

462. Anesthesiology (3)
Clinical activity—full time. Prerequisite: medical student (graduate, second and third year students). Exposure to anesthesiology through combination of informal lectures and mentoring by anesthesiologists. Anesthetic procedures, pharmacology, and all of the issues, pediatrics, rehabilitation, etc. Daily clinics, rounds, and lectures. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

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, and palliative care. Pain management, pain assessment, pain 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 discussions of primary papers from the literature. Offered in alternate years. —II. Hershey

230. Practical NMR Spectroscopy and Imaging (1)
Lecture—2 hours. Prerequisite: Chemistry 107A-107B, Physics 1A-5A-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, II

231. Biological Nuclear Magnetic Resonance (3)
Lecture—3 hours. Prerequisite: Molecular and Cellular Biology 221A or the equivalent or consent of instructor. Principles and applications of magnetic resonance in biomolecules. Fundamental concepts and the biophysical basis for magnetic resonance applications in areas of tissue characterization/imaging, metabolic regulation, and gene expression. (Same course as Biophysics 231.)—III (III)

291. Seminar in Genetic Approaches to Pathogenesis of Human Disease (1)
Seminar—1 hour. Prerequisite: student in Genetics Graduate Program 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.

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)

Graduate Courses

209. Prostaglandins/Leukotrienes and Related Lipids (2)

214. Molecular Medicine (1)
Discussion—1 hour. Prerequisite: course in molecular genetics, molecular and cellular biology, biochemistry or the equivalent. Series of lectures on current topics of molecular genetics related to medicine. Material stresses concepts derived from genetic research which have some potential clinical relevance. (Same course as course 414.) (S/U grading only.)—II. Seldin

217. Molecular Genetics of Fungi (3)
Lecture—3 hours. Prerequisite: grading standard 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 discussions of primary papers from the literature. Offered in alternate years. —II. Hershey

230. Practical NMR Spectroscopy and Imaging (1)
Lecture—2 hours. Prerequisite: Chemistry 107A-107B, Physics 1A-5A-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, II

231. Biological Nuclear Magnetic Resonance (3)
Lecture—3 hours. Prerequisite: Molecular and Cellular Biology 221A or the equivalent or consent of instructor. Principles and applications of magnetic resonance in biomolecules. Fundamental concepts and the biophysical basis for magnetic resonance applications in areas of tissue characterization/imaging, metabolic regulation, and gene expression. (Same course as Biophysics 231.)—III

291. Seminar in Genetic Approaches to Pathogenesis of Human Disease (1)
Seminar—1 hour. Prerequisite: student in Genetics Graduate Program 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.

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 Courses

410A. Molecular and Cell Biology (3.5)
Lecture—4 hours. Prerequisite: approval by Committee on Student Evaluation and Promotion. Basic biochemistry of proteins and nucleic acids, molecular genetics, regulation of gene expression, biomembranes and structural proteins. Applications to clinical relevant systems, particularly cystic fibrosis, synaptic conductance, muscular dystrophy, and oncogenes and cell proliferation control. (P/F grading only.)—I. Yoss

410B. Cell Biology and Metabolism (3)
Lecture—4 hours. Prerequisite: approval of the Committee on Student Progress. Introduction to the transport of small molecules and ions across membranes followed by study of energy metabolism and biosynthetic processes in humans. Membrane receptors are considered as they regulate to basic metabolic processes. Correlations to human disease. (P/F grading only.)—II. Jue, Troy

414. Molecular Medicine (1)
Discussion—1 hour. Prerequisite: course in molecular genetics, molecular and cellular biology, biochemistry or the equivalent. Series of lectures on current topics of molecular genetics related to medicine. Material stresses concepts derived from genetic research which have some potential clinical relevance. (Same course as course 214.) (H/P/F grading only.)—II. Seldin
418. Mammalian Endocrinology and Homeostasis (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: approval of Committee on Student Progress. Physiological and biochemical properties of the mammalian endocrine system: the cellular and systemic level. Principles that regulate homeostasis, especially in organ-organ interrelationships, metabolites and minerals. Reproductive endocrinology. [Same course as General Physiology 418] (H/P/F grading only.)—III. W. Wodicka

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 291.) (H/P/F grading only.)—I, II, III, IV.

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. (H/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 Courses

101. Human Gross Anatomy (4)
Lecture—4 hours. Prerequisite: Biological Sciences 1B; concurrent enrollment in course 101L strongly recommended. A detailed study of the gross anatomical structure of the human body, with emphasis on function and clinical relevance to students entering health care professions. GE credit: SciEng—I, II, III

101L. Human Gross Anatomy (3)
Laboratory—4 hours; lecture/discussion—3 hours. Prerequisite: course 101 (may be taken concurrently). A detailed study of prospected human cadavers in small group format with extensive hands-on experience. GE credit: concurrent enrollment in course 101: Wrt—I, II, III

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.)

198. Directed Group Study (1-5)
Discussion—1 hour; laboratory—6-9 hours. Prerequisite: consent of instructor. Directed reading, discussion, and/or laboratory experience on selected topics. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Graduate Courses

200. Gross Anatomy—Graduate Courses (9)
Lecture—6 hours; laboratory—12 hours. Prerequisite: approval by committee on student evaluation and promotion. Integrated presentation of developmental, gross, and radiological anatomy. Four students assigned to cadaver and dissect entire body. Embryology and radiology are correlated with the dissections. Embryology is covered from implantation to birth. I. (I) Tucker

202. Human Microscopic Anatomy (5)
Lecture—3 hours; laboratory—6 hours. Examines the normal microscopic structure of the basic units, tissues, and organs of the body. Lectures emphasize morphology and structure-function relationships. Accompanying laboratories involve analysis and identification of light microscopic and ultrastructural levels. II, II'. Primakoff

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. (III) Kumari

290. Seminar (1)
Seminar—1 hour. Prerequisite: consent of instructor. (S/U grading only.)

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, IV.

292. Fertilization and Gamete Literature Critique (1)
Discussion—1 hour. Prerequisite: consent of instructor. Critical evaluation of current journal articles dealing with cell biology and biochemistry of gametes and fertilization. Selected papers will be presented and discussed in detail by students and faculty. May be repeated for credit. (S/U grading only.)—I, II, III, IV, Meizel

298. Advanced Group Study (1-5)
Prerequisite: consent of instructor.

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only)

Professional Courses

420. Integumentary System (2)
Lecture/discussion—4 hours. Prerequisite: approval of School of Medicine Committee on Student Progress. Cell biology, pathology, and physical diagnosis of the skin. Recognition of normal variations, and common or important dermatoses. Patient demonstrations of select conditions. (P/NP grading only.)—IV, Isseroff

460. Dermatology Clinical Clerkship (6)
Clinical activity (inpatient/outpatient service)—40 hours for four weeks. Prerequisite: completion of three years of medical school, or consent of instructor. Observation and participation in dermatology clinics/practice and participation in Ward Rounds and Dermatology Clinics at UCD Medical Center, Kaiser, and private practitioner offices. Limited enrollment—1, II, III, IV. (I, II, IV) Lynch

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 and participation in dermatological care and attendance at some conferences. (P/H/F grading only.)—I, II, III, IV, (I, II, III, IV) Huntley

495. Wound Healing: From Bench to Bedside (6)
Clinical activity—12 hours; laboratory—9 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, Rivkah

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. Assessed readings and/or clinical examination of selected patients. (H/P/F grading only.)
499. Research in Cutaneous Biology (1-12)
Laboratory—3-36 hours. Prerequisite: consent of instructor. Research in either laboratory or clinical, or ongoing projects within the department under supervision of faculty. (P/N/P grading only.)—I

Epidemiology and Preventive Medicine (EPP)

Lower Division Course

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/N/P grading only.)

Upper Division Courses

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; provides students with perspectives on preventive medicine in society.—III. (Ill.) Chen

160. General Health Education and Prevention (5)
Lecture—4 hours; discussion—1 hour. Topics include addiction, substance abuse/prevention, nutrition, stress management, physical fitness, body image, reproductive anatomy and physiology, contraceptive options, safer sex, sexual health, healthy relationships, and other general wellness/health promotion topics. Practice in peer counseling and outreach presentations to small and large groups. High risk behaviors. Practice in peer counseling skills and outreach presentations to small and large groups. (P/N/P grading only.)—I. (I.) Lake, Fergan

161. Campus Alcohol/Drug Abuse Prevention Program Peer Educator Training (4)
Lecture/discussion—3 hours; practice—1 hour. Prerequisite: course 160 (may be taken concurrently). Preparation for service in campus and community substance abuse prevention and educational intervention. Addiction and other physiological responses to alcohol and other drugs. Harm-reduction strategies for individuals and target populations. Risk high behaviors. Practice in peer counseling skills and outreach presentations to small and large groups. (P/N/P grading only.)—II, III. (II, III.) Lake

162. Health Advocates Peer Educator Training (4)
Lecture/discussion—3 hours; practice—1 hour. Prerequisite: course 160 (may be taken concurrently). Preparation for service in campus and community health promotion and risk reduction. Nutrition, stress management, physical fitness, body image and disordered eating, skin cancer prevention, and other general wellness/health promotion topics. (P/N/P grading only.)—III. (III.) Belden, Grun

163. Peer Counselors in Sexuality Training (4)
Lecture/discussion—3 hours; practice—1 hour. Prerequisite: course 160 (may be taken concurrently). 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, and other general wellness/health promotion topics. (P/N/P grading only.)—III. (III.) Belden, Grun

164. Peer Counselors in Athletics Training (4)
Lecture/discussion—1 hour. Prerequisite: course 160 and 40 (may be taken concurrently). Preparation for internship in athletics as an athlete and health promotion peer. Peer health education in nutrition, body image, eating disorders, stress management, exercise and athletics training injury prevention, rehabilitation, and other physiological responses to alcohol/tobacco/performance enhancement and other drugs. Health risk issues unique to athletics. Practice in peer counseling and outreach presentations to small and large groups. May be repeated up to 5 units of credit. (P/N/P grading only.)—I

175W. Health Policy and Health Politics (4)
Seminar—3 hours; extensive writing or discussion—1 hour. Following the model of a Congressional sub-committee, identification of four salient health policy issues for study, research, and development of model policies to address them. (Same course as UC Davis Washington Center 175.) GE credit: SocSci, Wrt.—III. Wintemute

188. Economics of Preventive Medicine (3)
Lecture—2 hours; discussion—1 hour. Assessment of the benefits and costs of proposals to improve aggregate health of groups of people and the health of individuals. Issues include cigarette taxes, hazardous wastes, diet, exercise, and breast cancer screening, among others.—III. (III.) Leigh

190C. Research Conference in Community and International Health (1)
Discussion—1 hour. Prerequisite: consent of instructor. Weekly conference on research projects, progress, and techniques in Community and International Health. Critical discussion of recent journal articles. May be repeated for credit. (P/N/P grading only.)—I, II, III. lakes

192. Internship in Community Health Practice (1-12)
Internship—3-36 hours. Prerequisite: upper division and graduate students; consent of instructor. The student, through practice in a community health agency, learns to apply theory and concepts learned in the classroom. (P/N/P grading only.)

198. Study 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/N/P grading only.)

199. Research in Community and International Health (1-5)
Prerequisite: undergraduate standing; consent of instructor. Students 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. (P/N/P grading only.)

Graduate Courses

222. Social and Behavioral Aspects of Public Health (3)
Lecture/discussion—3 hours. Prerequisite: Statistics 102 and 106 or the equivalent, graduate standing, consent of instructor. Concepts and methods of social and behavioral sciences relevant to the identification and solution of public health problems. Topics include nutrition, physical activity, smoking, socioeconomic status, gender, race/ethnicity, stress, social support, social marketing, media advocacy and behavioral theories of change.—Il. Gibson

244. Introduction to Medical Statistics (4)
Lecture—6 hours; laboratory/discussion—3 hours. Introduction to statistical methods and software in clinical, laboratory, and population medicine. Graphical and numerical data, probability, binomial, Poisson, normal, t, F, and Chi-square distributions, elementary nonparametric methods, simple linear regression and correlation, life tables. One unit of credit for students who have completed Statistics 100 or Preventive Veterinary Medicine 402.—IV. (IV.) Beckett, Wegelin

245. Statistical Analysis of Laboratory Data (4)
Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: course 244 or equivalent; consent of Instructor. The analysis of data and design of experiments for laboratory data with an emphasis on gene expression analysis and other high throughput biological assay technologies. For students in the K30 training program in the School of Medicine. Additional class capacity will be available for students in other programs, but it is essential that the K30 students be accommodated first.—I, II, III, IV (I, II, III, IV)

255. Human Reproductive Epidemiology (3)
Lecture—3 hours. Prerequisite: Preventative Veterinary Medicine 405, 406, Physics 220, Physiology 222 or equivalents, or consent of instructor. Human reproductive effects and educational interventions, as well as other relevant issues. Emphasis on rationale for current law and policies. Exposure to macro- and micro-environmental exposures in community and occupational settings, epidemiologic study designs and analyses. Offered in alternate years.—I, II. (I, II.) Gold

262. Principles of Environmental Health Science (3)
Lecture—3 hours. Prerequisite: consent of instructor. 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, II, III. (I, II, III.) Breid

273. Health Services Administration (3)
Lecture—3 hours. Prerequisite: consent of instructor. Structure and function of public and private medical care. Topics include categories and trends in national medical spending, predictors of patient use, causes of death, managed care, Medicare, Medicaid, costs of technology, and medical care in other countries.—II. (II.) Leigh

290. Topics in Public Health (1)
Seminar—1 hour. Prerequisite: open to students in Master of Public Health program or consent of instructor. Seminar on key issues and current topics in public health. May be repeated for credit up to 3 times. (S/U grading only.)—I, II, III, IV, IV. (IV, IV, IV, IV.) Schenker, Leistlikow, McCurdy

295. International Health (1)
Lecture/discussion—1 hour. Prerequisite: graduate standing. Forum for learning health issues and health care systems in other countries. Topics include health care for refugees, the impact of political instability on health, the health care professional in international settings. Evening seminars begin in Fall quarter and continue through Spring quarter. Deferred grading only, pending completion of sequence. S/U grading only.—I, II, III, IV, IV, IV, IV, IV, IV. (IV, IV, IV, IV, IV, IV, IV, IV.) Schenker

297. Public Health Practicum (1-8)
Fieldwork—3-16 hours; term paper. Open to students in Master of Public Health. Practical fieldwork experience in public health. Placement site varies. May be repeated up to 8 units of credit. (Deferred grading only, pending completion of sequence. S/U grading only.)—I, II, III, IV, IV, IV, IV, IV, IV, IV. (IV, IV, IV, IV, IV, IV, IV, IV, IV, IV.) Schenker

299. Research in Community and International Health (1-12)
Prerequisite: graduate standing; consent of instructor. Students 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 for graduate students.)

299. Research in Community and International Health (1-12)
Prerequisite: graduate standing; consent of instructor. Students 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 for graduate students.)

Professional Courses

402. Introductory Medical Spanish (2)
Lecture—2 hours. Prerequisite: medical student or consent of instructor. The vocabulary needed to conduct basic history and physical examination in Spanish. (P/N/P grading only.)—I, II. (II.) Mezick

455. Multidisciplinary Clinical Preceptorship (4.5)
Clinical activity—full time (3 weeks). Prerequisite: second-year student in clinical training. Students will be introduced to basic principals of geriatric health care and provided with opportunities for clinical observation and experience in a variety of
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 settings and practice situations. Students participate in treatment at several clinic sites in Yolo County. Topics include primary care, environmental health, maternal and child health, rural health, and public health for the aged. (P/F grading only)—I, II, III, IV.

465. Community Health Preceptorship (3-18)
Clinical activity—full time (2-12 weeks). Prerequisite: fourth-year medical student. Students participate at the California Department of Health Services 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 and laboratory experience—full time (4 to 8 weeks). Prerequisite: fourth-year medical student and consent of instructor. Participate in activities of Occupational Health Unit. Major activity is involvement in an epidemiologic research project of the University. Also participate in Ambulatory Occupational and Environmental Medicine Clinic at UC Davis Medical Center. (H/P/F grading only)—I, II, III, IV.

470. Clinical Selective in Occupational and Environmental Medicine (3)
Clinical activity—full time. Prerequisite: fourth-year medical student and academic standing, with consent of instructor. Outpatient clinical experience in Occupational and Environmental Medicine at UC Davis and in local industries. Participants will gain experience in evaluating occupational and environmental conditions, use of medical literature resources, the worker’s compensation system, and toxicological principles. (H/P/F grading only)—I, II, III, IV.

471. Health Issues Confronting Asian Americans and Pacific Islanders (4)
Lecture/discussion—4 hours. Exploration of health issues confronting Asian Americans and Pacific Islanders. A forum for understanding health issues facing Asian Americans and Pacific Islanders. (H/P/F grading only)—II. (II.) Chen

480. Insights in Occupational and Environmental Health (1-3)
Clinical activity—3-9 hours. Prerequisite: first or second-year medical student in good academic standing; consent of instructor. Students will observe and participate in research and clinical activities in occupational and environmental medicine which include conferences, occupational and environmental medicine clinical activities and field visits. Students develop and present small individual research projects. (H/P/F grading only)—I, II, III, IV, (I, II, III, IV). McCurdy

498. Study in Community and International Health (1-6)
Prerequisite: medical student in good standing and consent of instructor. Study and experience for medical students in areas in community and international health. May be repeated for credit. (H/P/F grading only)—I, II, III, IV, (I, II, III, IV).

499. Research in Community and International Health (1-9)
Prerequisite: medical students with 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. (H/P/F grading only)

Family and Community Medicine (FAM)

Lower Division Course
92C. Primary Care Clinics (2)
Clinical activity—6-8 hours; seminar—2 hours; lecture—1-2 hours. Prerequisite: consent of instructor, enrollment at the UC Davis campus, upperdivision standing. Students must apply and interview with the Board of Clinics Tepati or Imani Clinic. Field experiences include division of students to health care delivery, patient histories, physical examinations, health promotion, disease prevention and diagnosis; treatment of episodic, acute, chronic illness; and follow-up. May be repeated for credit. (P/NP grading only)—I, II, III, IV, (I, II, III, IV) Solis, Smith

Upper Division Courses
92C. Primary Care Clinics (1-2)
Clinical activity—6-8 hours; seminar—2 hours; lecture—1-2 hours. Prerequisite: consent of instructor, enrollment at the UC Davis campus, upperdivision standing. Students must apply and interview with the Board of Clinics Tepati or Imani Clinic. Field experiences include division of students to health care delivery, patient histories and physical examinations, health promotions and disease prevention, diagnosis and treatment of episodic, acute and chronic illness, basic laboratory testing and appropriate referral and follow-up. May be repeated for credit. (P/NP grading only)—I, II, III, IV, (I, II, III, IV) Smith, Solis

195. Health Care to Underserved Populations (1)
Lecture—1 hour. Prerequisite: sociology, political science, or applied behavioral science background recommended, or registration in medical school. Discusses sociocultural perspectives of underserved populations in California impacting their health; roles of family/interdisciplinary relationships in making health care decisions; and clinician’s perspectives in treating people of cultures who are unfamiliar and/or uncomfortable with Western medicine. (P/N grading only)—I. (I.) Nubbe

Graduate Courses
The following courses are for students enrolled in the Family Nurse Practitioner/Physician Assistant (FNP/PA) program.
240A-240B-240C-240D-240E-240F. Clinical Preceptorship (1-13)
Clinical activity—9-36 hours. Prerequisite: enrollment in the Master’s Track of the FNP Certificate Program, and successful completion of each preceding 240A-F section. Diagnosis and treatment of patients of all ages in an ambulatory care setting, under the supervision of a qualified preceptor. May be repeated for credit. (P/NP grading only)—I, II, III, IV, (I, II, III, IV). DeAmicis

242A-242B. Clinical Role Seminar (1.5-1.5)
Seminar—1.5 hours. Prerequisite: course 240 concurrently and student in the Master’s Track of the FNP certificate program. Accompany course 240 and provides a small group forum for students to explore role development and clinical management issues based on nursing theories and research. (Deferred grading only, pending completion of sequence)—I, II, III, IV. (I, II, III, IV). DeAmicis, Fraser

252A. Professional Role Development (1.5)
Lecture/discussion—1.5 hours. Prerequisite: enrollment in the Master’s Track of the FNP Certificate Program. Provides opportunity to discover strategies for professional role development and to participate in a discussion of pertinent issues, theory, and research. (Deferred grading only, pending completion of sequence)—I, II, III, IV. (I, II, III, IV) Hass

252B. Nurse Practitioner as Leader (1.5)
Lecture/discussion—1.5 hours. Prerequisite: course 252A and concurrent enrollment in Master’s Track of the FNP Certificate Program. Study of advanced practice role of nurse practitioner. Overview of legal and regulatory issues, certification and malpractice liability issues. Includes critical analysis of theories, issues and research related to nurse practitioner role development and applied legislation through community involvement. (Deferred grading only, pending completion of sequence)—I, II, III, IV. (I, II, III, IV) Hass

264. Psychosocial Concepts and Issues in Primary Care (2)
Lecture/discussion—2 hours. Prerequisite: B.S. degree in nursing and enrollment in the Master’s Track of the FNP Certificate Program. Introduces the principles of effective communication in establishing the therapeutic working relationship. Provides an examination of relevant psychosocial concepts and issues related to primary care. Research and theory are emphasized. —I, II, III, IV. Hass

266A. Health Maintenance/Preventive Care (2)
Lecture—2 hours. Prerequisite: B.S. degree in nursing and enrollment in the Master’s Track of the FNP Certificate Program. Focuses on the health and wellness of individuals throughout the lifespan. Critical analyses of nursing interventions in health promotion and maintenance based on nursing and other theoretical frameworks and research data are emphasized. —I. (I.) DeAmicis

266B. Family Nursing Theory (1)
Lecture—1 hour. Prerequisite: enrollment in master’s track of the FNP Certificate Program or consent of instructor. Exploration of family theories as related to advanced primary care nursing practices. —I, II, III, IV. (I, II, III, IV) Stewart

266C. Family Nursing Interventions (2)
Lecture—2 hours. Prerequisite: course 266B and enrollment in the Master’s Track of the FNP Certificate Program. Course integrates family theoretical and therapeutic concepts to improve understanding of family assessment and intervention strategies for family problems in health and illness. —III. (III) Stewart

266D. Community Assessment and Intervention (1)
Lecture—1 hour. Prerequisite: enrollment in the Master’s Track of the FNP Certificate Program. The relationship between advanced primary care nursing practice and community is explored. Community assessment and intervention strategies appropriate for the family nurse practitioner are discussed. May be repeated twice for credit. —II. (II) Stewart

Professional Courses
The following courses are for students enrolled in the Family Nurse Practitioner/Physician Assistant (FNP/PA) program.

240A-240B-240C-240D-240E-240F. Clinical Preceptorship (1-13)
Clinical activity—9-36 hours. Prerequisite: enrollment in the Master’s Track of the FNP Certificate Program, and successful completion of each preceding 240A-F section. Diagnosis and treatment of patients of all ages in an ambulatory care setting, under the supervision of a qualified preceptor. May be repeated for credit. (P/N grading only)—II, III, IV. (II, III, IV) DeAmicis.
411. Selected Studies of Systems for Chronic Illness Care (3)
Clinical activity—4 hours. Prerequisite: consent of instructor. Interaction of systems affecting patients with chronic illness, particularly diabetes, participation in patient care, alternative techniques. May be repeated once for credit. (H/P/F grading only.)—I, II, III, IV.

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. Eight week primary care clerkship for third year medical students. Four week primary care experience with an additional four weeks in Internal Medicine clinics. (H/P/F grading only.)—I, II, III, IV. Morgan

434. Advanced Preceptorship in Family Medicine (3-12)
Clinical activity—40 hours. Prerequisite: completion of third-year primary care plus clerkship or consent of instructor. Preceptorships with primary care physicians in a variety of settings. Acquaints students with a variety of practice settings. May be repeated to up to 12 units of credit. (H/P/F grading only.)—I, II, III, IV. Morgan

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 clinics, adult day health centers, a diagnostic and research center, and case management specialists. Observa-
tion and participation in MMSE’s, patient-family con-
f erences, interdisciplinary team meetings, neuropsychiatric testing and home visits evaluation. (H/P/F grading only.)—I, II, III, IV. Xakellis

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 student contact or with assistance of the Family and Community Medicine Department.] Participate in clinical experience and report characteristics of the practice. May be repeated to up to 12 units of credit. (H/P/F grading only.)—I, II, III, IV. Morgan

469. Clerkship in Family Practice Residency (3-12)
Clinical activity—40 hours. Prerequisite: completion of third year of medical school or consent of instructor. Comprehensive primary medical care of patients in a family practice hospital or residency. Usually includes inpatient and outpatient experience. May be repeated to up to 12 units of credit. (H/P/F grading only.)—I, II, III, IV.

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 and primary care health delivery. Visits to and written analysis of report characteristics of the health care delivery system or consent of instructor. May be repeated to 9 units of credit. (H/P/F grading only.)—I, II, III, IV.

498. Directed Group Study (1-5)
Variable—3-15 hours. Explore in-depth various topics in primary care. Extensive contact with and oversight by instructor. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV. Morgan, Hirsch

499. Research (1-12)
Prerequisite: medical students with consent of instructor. Research in various aspects of the health care delivery system. (H/P/F grading only.)

Upper Division Courses

192. Internship in Human Physiology (1-12)
Internship—3-36 hours; final report. Prerequisite: upper division standing; approval of project prior to period of internship by preceptor. Supervised work experience in physiology and related fields. (P/N grading only.)

198. Special Study for Advanced Undergraduates (1-5)
Laboratory—3-15 hours; undergraduate research project. Prerequisite: senior standing in biology, chemistry, physics, psychology, or engineering. (P/N grading only.)

Graduate Courses

200. Human Physiology (6)
Lecture—48 hours total; discussion—12 hours total. Prerequisite: graduate standing and consent of instructor. General cellular and organ system physiology, including neural, cardiovascular, respiratory, gastrointestinal and urinary systems in the human. Lectures concurrent with course 400; research discussion and laboratory demonstration sessions, and examinations separate.—II. (II) Carlsen, O’Donnell

210A. Advanced Physiology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Physiology Ph.D. program, or consent of instructor. Advanced course in general principles of physiology, surveying homeostasis, cellular and selected topics, and neurophysiology. (Same course as Physiology 210A.)—I. (I) Cole, Payne

285. Peripheral Circulation (3)
Lecture—1 hour; discussion—2 hours. Prerequisite: Physiology 111A, 113; or course 200 and consent of instructor. Lectures and critical analysis of papers on peripheral vascular function, including: structure/function and pressure/flow relationships, interva-
tion, receptor pharmacology, endothelial and smooth muscle interactions, signal transduction, ion transport, permeability, paracrine mediators and disease mechanisms. Offered in alternate years.—(III) Gray, O’Donnell

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 Courses
Graduate Courses

214. Topics in Medical Ethics (1) Seminar—1 hour. The complex moral, legal, and ethical dilemmas that patients, families, and health care providers face in today’s clinical environment. May be repeated once for credit. (S/U grading only)—I. Kulkarni-Date

220D. Cardiovascular System (2.5) Lecture/discussion—5.5 hours. Prerequisite: Human Physiology 200. Emphasis on cardiovascular system, including the circulation of the blood, the structure and function of the heart, and the implications of cardiovascular disease. (P/F grading only)—II. Laslett

250. Medicine and the Law (3) Lecture/discussion—2 hours; project—2 hours. Legal and biotechnical principles and concepts in medicine. Topics include standard of care, informed consent, professional liability, and end-of-life issues. (S/U grading only)—II. Rich

Professional Courses

219. Introduction to Clinical Nutrition (2.5) Lecture—2 hours; lecture/discussion—2 hours. Prerequisite: approval of Committee on Student Progress. Basic principles of nutrition and dietetics. (P/F grading only)—III. Halsted

402A. Hematology (2) Lecture/discussion—3 hours, laboratory—2 hours. Prerequisite: consent of Committee on Student Progress. Principles of hematology. Normal hematopoiesis and basic disorders of blood cells, leukemia and lymphoma, transfusion therapy, immunoglobulin disorders, thrombosis and hemostasis, and abnormal blood cells and the interpretation of common laboratory tests. (P/F grading only)—Wisdom

420B. Gastrointestinal System (2.5) Lecture/discussion—6 hours. Prerequisite: approval of Committee on Student Progress. Basic physiological principles of digestive diseases with an emphasis on clinical concepts and judgments that can be developed. (P/F grading only)—II. Rosso

420C. Pulmonary and Critical Care Medicine (2.5) Laboratory/discussion—5.5 hours. Prerequisite: approval of Committee on Student Progress. Basic principles of physiology, mechanisms, and management of the major diseases of the pulmonary system. (P/F grading only)—II. Louie

420D. Cardiovascular System (2.5) Lecture/discussion—5.5 hours. Prerequisite: approval of the School of Medicine Committee on Student Progress. Principles of physiology, mechanisms, and management of the major diseases of the cardiovascular system. Included are ischemic, valvular, hypertensive, cardiomyopathic, pericardial, and electrical disorders. (P/F grading only)—II. Laslett

420E. Nephrology (2) Lecture—2 hours; discussion—2 hours; laboratory—2 hours. Prerequisite: approval of Student Progress Committee. Functional aspects of disorders of body water, electrolytes and acid/base balance, major categories and mechanisms of renal diseases, urinary tract infections. (P/F grading only)—II. Steverson

420F. Pathophysiology of the Endocrine System (2.5) Lecture/discussion—5.5 hours. Prerequisite: approval of the School of Medicine Committee on Student Progress. Open to medical students only. Students will develop an understanding of the functional aspects of hormone physiology, regulation, and action. Students will understand the endocrinology, pathophysiology, diagnosis, and management of the major diseases of the endocrine system. (P/F grading only)—I. Fitzgerald

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 UCDMC and at Kaiser Hopsitals. Time is spent in direct patient care situations under the guidance of faculty. Ongoing patient write-ups, rounds, conferences are required. (P/F grading only)—I, II, III, IV. Prescott

450. Medical and the Law (1-3) Legal and biotechnical principles and concepts in medicine. Topics include standard of care, informed consent, professional liability, and end-of-life issues. Not offered every year. (P/F grading only)—I, II, 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 research impacting treatment and prevention of cancer. Emphasis on epidemiology, biology, and pharmacology. (P/F grading only)—I, I, II, III, IV. Silva

462. Extremity in Medicine (1-21) Clinical activity—40 hours. Prerequisite: Medical Sciences 431; demonstrated ability to accept responsibility; consent of instructor. Students assume role of acting intern and will be primary physician on medical ward and general resident and staff. Responsibility for patients admitted to acting intern. Teams I–V take call every fifth night. Team VI students assume role of acting intern and will be primary physician on the medical hospitalist service under direct supervision of the hospitalist staff. Responsibility for patients admitted to acting intern in with-hospital daytime call. Emphasis on evidence-based medicine-based inpatient care. Limited enrollment. (P/F grading only)—I, II, III. IV. (I, II, III, IV). Silver

463. Acting Internship in Medicine Intensive Care Unit (MICU) (9) Clinical activity—full time. Prerequisite: completion of third year in medical school; consent of Director of MICU. At UCDMC, 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 one third of the time. Limited enrollment. (P/F grading only)—I, II, III. IV. (I, II, III, IV). Silver

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/research perspective. Principles of evidence-based medicine. (P/F grading only)—III. Kravitz, Amsterdam

480. Person Centered Assessment (1) Lecture—1 hour. Prerequisite: medical student. Person-centered assessment modalities and diagnostic approaches with regards to general 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, or other related aspects of clinical community health care.
461. Management of Coronary Artery Disease: Coronary Care Unit (3-18) Clinical activity—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. Current methods of clinical research involving certain aspects of diagnosis and treatment. Includes acute coronary care, hemodynamic monitoring, stress testing, cardiac catherization, and other patient correlations and the modern approach to therapy, both medical and surgical, based on pathophysiology. 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 Catherization, and Cardiac Surgery services. [H/P/F grading only]—I, II, III, IV (IL, II, III, IV Amsterdam

480. Insights in Clinical Nutrition (1-3) Clinical activity—3-9 hours. Prerequisite: medical student in good academic standing and approval by Division of Cardiology. Clerkship of 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.

498. Special Group Study: EKG Unit (1-12) Special study—2 weeks sessions. Prerequisite: medical students with advance approval by monthly attending faculty. Special group study in cardiovascular medicine for medical students in EKG unit. May include lectures, directed reading, and/or discussion groups. May be repeated for credit. Limited enrollment. [H/P/F grading only]—I, II, III, IV.

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].

Graduate Courses

220. Basic Science in Cardiology (1) Lecture—1 hour. Prerequisite: graduate or medical student status. Fundamentals underling cardiovascular medicine. Including hemodynamics, neural control of heart rate, ion transport, and some experimental design and statistics. Experts in each of these fields will give current information in their areas. Offered in alternate years. (S/U grading only) —Kaufman

299. Cardiology Research (2-3.5) Prerequisite: consent of instructor. Research or special studies. (S/U grading only) —Bonham, Longhurst

Professional Courses

401. Clinical Cardiology Clerkship: Kaiser (3-18) Clinical activity (4 weeks) —8:12 hours (hospital); 1-5 hours (clinical). Prerequisite: third- and fourth-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 CCU and elsewhere. The roles of ECC, PCG, and cardiac fluoroscopy, etc., in clinical cardiology will be evaluated. May be repeated for credit. Limited enrollment. [H/P/F grading only]—I, II, III, IV (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 clinical initial evaluation, ward rounds, and follow-up of patients with cardiologic disorders. Two outpatient clinics per week. May be repeated for credit. Limited enrollment. [H/P/F grading only]—I, II, III, IV.

499. Research in Nutrition (1-18) Prerequisite: medical student in good standing; consent of instructor. Participating in basic or nutrition research. Student may devise own project depending upon time commitments. —Hastie, Davis

Internal Medicine—Emergency Medicine (EMR)

Upper Division Course

192. Emergency Medicine Clinical Research Internship (4) Internship—8 hours; lecture/discussion—1 hour. Prerequisite: undergraduate student in good academic standing. Clinical research by assisting in identifying and enrolling patients for clinical studies in the Emergency Department. Basic principles of clinical research from directed readings and selected didactic lectures. [P/NP grading only]—I, II, III.

Professional Courses

401. Preceptorship in Emergency Medicine (1-4) Clinical activity—46 hours; lecture/discussion—8 hours. Prerequisite: satisfactory completion of Medical, Surgery, and Pediatric Clerkship. Student will see patients primarily in the Emergency Department of the "fast track" area of the Emergency Department. Exposure to patients with minor illnesses and injuries. Emphasis on wound management and treatment of orthopedic injuries. [Former course Internal Medicine 440.] [H/P/F grading only]—I, II, III, IV (I, II, III, IV) Lurain


460. Ambulatory Care Clerkship (1-12) Laboratory—full time (2-12 weeks). Prerequisite: consent of instructor. Elective where topics may be selected in either basic or clinical research areas of Emergency and/or Critical Care Medicine. The goals will be tailored to each individual student. Enrollment requires prior discussion and consent of instructor. [H/P/F grading only]
Internal Medicine—Endocrinology and Metabolism (ENM)

Upper Division Course
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 Course
299. Research (1-12)
Prerequisite: consent of instructor. Endocrinology research. (S/U grading only.)

Professional Courses

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.)

480. Insights in Endocrinology (1-3)
Clinical activity—3-9 hours, oral presentation. Prerequisite: student in good academic standing and consent of instructor. First- or second-year students observe 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 Course
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 Course
299. Research (1-12)
Research in gastroenterology. (S/U grading only.)—I. (I.) Loewy

Professional Courses

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 and to work as a general internist. Student spends time in General Medicine Clinic and on the General Medicine Consult Service. Consultation 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.)

May be repeated for credit. (Same course as Epidemiology 291.) (S/U grading only.)—I, II, III, IV. (I, II, III, IV.)

470. Health Care Ethics (3-9)
Discussion and conference—full time (2-6 weeks). Prerequisite: consent of instructor. Guided independent study of issues in biomedical ethics, with discussion of readings that are based on student interest and needs. Student participation in ethics rounds. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV.)

Loewy

480. Insights in General Medicine (1-3)
Clinical activity—one to nine 4-hour sessions; rounds—one to nine 2-4 hour sessions. Prerequisite: student in good academic standing and consent of instructor. Student will observe work-up, diagnostic evaluation and management of common general medicine problems in ambulatory and inpatient settings; be supervised by attending physician while attending General Medicine Clinic and/or Consult Rounds; and make brief presentations to consultant service. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV.)

Robbins

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 problems and methods. (H/P/F grading only.)—I. (I.) Loewy

499. General Medicine Research (1-18)
Discussion—3 hours; clinical research—8-40 hours. Prerequisite: consent of instructor. Student will be involved in a clinical research problem within the areas, interest and expertise of members of Division of General Internal Medicine. Alternatively, the research effort will be directed toward investigation of a clinical problem of general medical interest. May be repeated for credit. (H/P/F grading only.)

Internal Medicine—
Hematology-Oncology (Honors)

Upper Division Course
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 Courses

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 to be dictated by the interest and background of the students.

409. Research (1-12)
Prerequisite: consent of instructor. Laboratory investigation contributing to the dissertation for a graduate degree. (S/U grading only.)

Professional Courses

420. Oncology (1)
Lecture—9 hours; discussion—9 hours. Prerequisite: approval by School of Medicine Committee on Student Progress. Cancer epidemiology, cancer genetics, and cancer pharmacology; the pathophysiological principles of oncology as they relate to specific common cancers using both lectures and case discussions. (P/F grading only.)—IV. Wisdom, DeGregorio

460. Hematology-Oncology Acting Internship (6-18)
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 (6-18)
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 consultation 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 (6-18)
Clinical activity [inpatient/outpatient service]—full time (4 weeks). Prerequisite: fourth-year medical student in good academic standing. Outpatient rotations in related clinical services. Participation with members of the subspecialty service in the initial clinical evaluation, work-up, management and follow-up of patient with hematologic or oncologic disorders. May be repeated for credit. Limited enrollment. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV.)

490. Practicum in Care for the Terminally Ill (3-6)
Clinical activity—full time (2-4 weeks); three 4-hour seminars included. Prerequisite: fourth-year medical student and an interview with Program Medical Director. 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. Fulfills the Ambulatory Care requirement. (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—Infectious Diseases (ID1)

Upper Division Courses
141. Infectious Diseases of Humans (1)
Lecture—1 hour. Prerequisite: introductory knowledge in biology and chemistry recommended. Course integrates information on biological and molecular nature of the disease, modern diagnostics, treatment and prevention strategies, and the role of infectious diseases in contemporary society and throughout human history. (P/NP grading only.)—I. (I.) Danekar
Internal Medicine—Nephrology (NEP)
Upper Division Course
192. Internship in Nephrology (1-12)
Internship—3-36 hours; final report. Prerequisite: upper division standing; approval of project by preceptor prior to internship. Supervised work experience in nephrology. May be repeated for credit up to 12 units. (P/NP/grade only.)—I, II, III, IV, (I, II, III, IV)
Graduate Course
299. Research in Nephrology (1-12)
Prerequisite: consent of instructor. (S/U grading only.)

Professional Courses
460. Nephrology and Fluid Balance (3-6)
Clinical activity—full time. Prerequisite: completion of third year of medical school; consent of instructor. Active participation in all inpatient/outpatient clinical activities, attendance at specific lectures and conferences at UCD Medical Center covering the field of nephrology and fluid-electrolyte disorders. Limited enrollment. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

499. Research in Nephrology (3-18)
Prerequisite: individual arrangement and consent of instructor. Independent laboratory research on a specific problem related to biochemical or immunologic aspects of renal disease and/or uremic disorders in humans or animals. (H/P/F grading only.)—Kaysen

Internal Medicine—Pulmonary Medicine (PUL)
Upper Division Course
192. Internship in Pulmonary 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 pulmonary medicine. May be repeated for credit up to 12 units. (P/NP grading only.)

Graduate Course
299. Pulmonary Disease Research (1-12)
Laboratory. Prerequisite: by arrangement only. Pulmonary disease research activity with focus in inhaled toxicity, oxidants or lung biochemistry, and cell and molecular biology. (S/U grading only.)

Professional Courses
460. Pulmonary and Critical Care Medicine Clinical Clerkship (6-18)
Clinical activity—full time (4-12 weeks). Prerequisite: Medical Sciences 431. At UCD Medical Center participating and rounding with Pulmonary/Critical Care Medicine fellows and consultation staff. Also includes pulmonary function test interpretation, outpatient assignments in outpatient clinic and preparation and presentation of material at weekly conferences. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

462. Pulmonary Clinical Clerkship (3-12)
Clinical activity—full time (2-8 weeks). Prerequisite: completion of second year of medical school and/or consent of instructor. Participation at the Sacramento VA clinic with members of the subspecialty service in patient evaluation, workup, management, and follow-up of patients with pulmonary disorders. Includes experience in Pulmonary Function Laboratory, and pulmonary diagnostic procedures. Limited enrollment. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV)

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 in-patient pulmonary consultation rounds and medical intensive care rounds. Introduction to diagnosis and treatment of common pulmonary problems. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV, IV)
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 readings in rheumatology. (H/P/F grading only.)—I, II, III, IV (I, II, III, IV) Leek

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/or laboratory procedures. Students can gain experience in clinical medicine and clinical investigation. (H/P/F grading only.)

Medical Microbiology (MMI)

Lower Division Courses
10. Parasitic Disease in Humans (2)
Lecture—2 hours. Introduction to parasitic diseases in humans, including relationships between humans and parasites, symptoms, diagnosis, geographical distribution, treatment and prevention of parasitic disease. Not offered every year. —III. Thesis

115. Ecological Parasitology (3)
Lecture—3 hours. Parasitism as a life style is explored from the ecological point of view, illustrating the way parasites utilize biotic habitats and the influence climate, geography, behavior, cultural changes and alteration of habitat can have on the distribution and prevalence of parasites. —II. (II. Thesis

116. Parasitology for Wildlife Biologists (3)
Lecture—3 hours. Prerequisite: upper division standing or consent of instructor. Emphasis on the role infectious diseases play in wildlife dynamics. Lectures and demonstrations on techniques and methods for examining wild animals for evidence of infectious diseases, methods used in preserving and identifying parasites of wildlife, as well as what is known about their pathogenesis. —III. (III.) Thesis

130. 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 430.)—II. Pappagianis

188. Human Immunology (3)
Lecture—3 hours. Prerequisite: undergraduate level introductory biology course. Human immune system and mechanisms of immunity. Basic components and function of immune system. Molecular basis of immune response; basic cellular and molecular mechanisms. Interactions between cells of immune system producing immune responses; regulating molecules. —III. (III.) Torres

192. Internship in Medical Microbiology (1-12)
Internship—3.36 hours; final report. Prerequisite: upper division standing; approval of program prior to period of internship. Supervised work experience in medical microbiology and related fields. (P/NP grading only.)

194. Senior Honors Project in Medical Microbiology and Immunology (5)
Independent study—15 hours. Prerequisite: course 199 and consent of instructor. Project in research related to immunology of medically important viruses. Development of hypothesis-driven project, performance of experimental protocols and preparation of graphical representation of original data. Requires oral and written presentation of research results. May be repeated three times for credit with consent of instructor. (P/NP grading only.)—II, III, (I, II, III, IV) Torres

198. Group Study in Medical Microbiology (1-5)
Prerequisite: upper division standing and consent of instructor. Directed reading and discussion and/or laboratory investigation on selected topics. (P/N grading only.)

199. Research in Medical Microbiology (1-5)
Prerequisite: upper division standing and consent of instructor. Individual research. (P/N grading only.)

Graduate Courses
2000. Mechanisms for Microbial Interactions with Hosts (3)
Lecture/discussion—3 hours. Prerequisite: Microbiology 200A or consent of instructor. Study of microbial virulence and mechanisms involved in microbial interactions within a host environment. The following principles are basic to understanding these interactions: host recognition, invasion, competition and growth, and host defense. —II. (II. Beaman

208. Seminars in Microbiology and Immunology (1)
Seminar—1 hour. Research seminars on current topics in microbiology and immunology. May be repeated for credit if topic differs. (S/U grading only.)—I, II, III, (I, II, III) Dandekar, Luckhart

210. Physician Scientist Molecular Medicine Journal Club (1)
Lecture/discussion—1 hour. Research articles in current literature. Topics/articles to include a broad range of frontiers in biomedical literature. May be repeated for credit if topic differs. (S/U grading only.)—I. (I.) Beaman

215. Medical Parasitology (5)
Lecture—3 hours; laboratory—6 hours. Prerequisite: graduate student with consent of instructor. Epidemiological, pathogenesis, diagnostic methods and laboratory studies of protozoa, helminths and arthropods of medical importance. Offered in alternate years. (Same course as 415.)—I. Thesis

220. Current Concepts in Bacterial Ultrastructure (2)
Discussion—2 hours; student presentations; term paper. Prerequisite: Microbiology 105 or consent of instructor. Critical evaluation of current literature dealing with all aspects of bacterial ultrastructure. Discussion of selected and assigned reading and formal student presentations of assigned topics. —III. (III.) Beamman

280. Molecular Pathobiology for Diagnosis and Therapy of Human and Animal Diseases (3)
Lecture—3 hours. Prerequisite: graduate standing. Molecular pathobiology of phenotypes caused by human hereditary diseases and viruses. Emphasis on molecular diagnostics at cellular/tissue level, and therapy including vaccines and gene transfer using recombinant DNA technology. Not open for credit to students who have completed Internal Medicine: Infectious Diseases 280. Offered in alternate years. —II. (II.) Dandekar

298. Group Study in Medical Microbiology and Immunology (1-5)
Prerequisite: consent of instructor; open to graduate students. Directed reading and discussion and/or laboratory investigation on selected topics. (P/N grading only.)

299. Research (1-12)
Prerequisite: medical students with consent of instructor. Directed reading and discussion and/or laboratory investigation on selected topics. (H/P/F grading only.)

415. Medical Parasitology (5)
Lecture—3 hours; laboratory—6 hours. Prerequisite: medical student with consent of instructor. Approved for graduate degree credit. Epidemiological, pathogenesis, diagnostic methods and laboratory studies of protozoa, helminths and arthropods of medical importance. Offered in alternate years. (Same course as 215.) (H/P/F grading only.)—I. Thesis

420. Current Concepts in Bacterial Ultrastructure (2)
Discussion—2 hours, formal presentation or term paper. Prerequisite: medical students with consent of instructor. Evaluation of current status of bacterial ultrastructure with an emphasis on host-parasite interactions through discussions and assigned readings. (H/P/F grading only.)—IV. (IV.) Doebbert

422. Clinical Microbiology (3)
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.)—II. Pappagianis

480A. Medical Immunology (2)
Lecture—4 hours. Prerequisite: approval of Committee on Student Progress. Structure and function of the molecules, cells and tissues involved in immunity, and their interactions in health and disease. (P/F grading only.)—II. (II.) Beamman

480B. Pathogenic Microbiology (3.5)
Lecture—4 hours; laboratory—3 hours. Prerequisite: approval of the School of Medicine Committee on Student Progress. The biology of pathogenic microorganisms with emphasis on their role in human disease. May be repeated for credit. (P/F grading only.)—IV. Beamman

480C. Pathogenic Microbiology (2)
Lecture/laboratory—5 hours. Prerequisite: approval of the School of Medicine Committee on Student Progress. The biology of pathogenic microorganisms with emphasis on their role in human disease. (P/F grading only.)—IV. Beamman

497T. 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. (P/N grading only.)

499. Research (1-12)
Prerequisite: medical students with consent of instructor. (H/P/F grading only.)

Master of Public Health (MPH)

Graduate Course
210. Public Health Informatics (1)
Lecture—2 hours. Collection, verification, and utilization of data related to populations; infrastructure, functions, and tools used to generate public health knowledge supporting public health practices and policy development/dissemination. (S/U grading only.)—H. (H.) Hogarth, Doebbert

266. Applied Analytic Epidemiology (3)
Lecture—2 hours; laboratory—2 hours. Prerequisite: Preventive Veterinary Medicine 404 or consent of instructor. Principles and methods of epidemiologic data. Methods of analyzing stratified and matched data, logistic regression for cohort and case-control studies, Poisson regression, survival-time methods. (Same course as 266.)—I, II (I, II) Kass

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer, 2007/2008 offering in parentheses

General Education (GE) credit: Art/Hum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Social-Cultural Diversity; Wrt—Writing Experience
Medical Pharmacology and Toxicology (PHA)

Lower Division Courses

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 Courses

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.)

Graduate Courses

200A. Advanced General Pharmacology (3)
Lecture—3 hours. Prerequisite: upper division courses in biochemistry (101A&B) and mammalian physiology (111A&B and 112) or the equivalent (may be taken concurrently). Core course in human pharmacology designed for graduate and medical students. Principles in pharmacology, including pharmacokinetics and drug metabolism and the actions, uses and toxicity of the major classes of drugs. (P/NP grading only.)

200B. Advanced General Pharmacology (4)
Lecture—4 hours. Prerequisite: upper division courses in biochemistry (101A&B) and mammalian physiology (111A&B and 112) or the equivalent (may be taken concurrently). Core course in human pharmacology designed for graduate and medical students. The actions, uses and toxicity of the major classes of drugs. Continuation of course 200A. (II.)

206. Pharmacokinetics (2)

298. Group Study (1-5)
Prerequisite: consent of instructor. (S/U grading only.)

299. Research (1-12)
Prerequisite: consent of instructor. (P/NP grading only.)

Professional Courses

400A. Pharmacology (2)
Lecture—18 hours. Prerequisite: approval by School of Medicine Committee on Student Progress. 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.)—I. Fischer

400B. Pharmacology (1.5)
Lecture—22 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress. Principles in pharmacology, including autonomic pharmacology, endocrine pharmacology, general anesthesia, GI drugs, substance abuse and general toxicology. (Deferred grading only, pending completion of sequence. P/F grading only.)—I. Fischer

400C. Pharmacology (2.5)
Lecture—23 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress. Principles in pharmacology, including pharmacokinetics, drug metabolism and the actions, uses and toxicities of the major classes of drugs. (P/F grading only.)—II. Fischer

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 medicinal practice. (H/P/F grading only.)—II. (I.) Harkey

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)
Lecture/discussion—5 hours, lecture—4 hours. Prerequisite: approval of Committee on Student Progress. Pathophysiology underlying neurological disorders, including disorders of development, mus- cle, nerve, cerebral circulation, metabolism, myelin, cortical function, movement disorders, autonomic function and special senses. Anatomical basis of clinical testing, nervous system infection, neoplasia and trauma. (P/NP grading only.)—II.

450. Clinical Neurology Clerkship (6)
Clinical activity—full time (2-12 weeks). Prerequisite: consent of instructor. Critical elements of neurological clinical skills (history & exam) and basic and clinical neurological concepts expected for general residency preparation. Active, didactic, experiential and independent learning to encourage maturation of general neurological competencies. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV.)

451. Clinical Neurology Clerkship (3-6)
Clinical activity—full time (2-4 weeks). Prerequisite: consent of instructor. Extension of basic Neurology clerkship. Designed for students with special interest in medical disorders of nervous system. By arrange- ment with department, student may serve as an acting intern. Principles of neurological differential diagnosis and therapies emphasized. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV.)

453. Advanced Clinical Neurology (6)
Clinical activity—full time (3-12 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 arrange- ment with department, student may serve as an acting intern. Principles of neurological differential diagnosis and therapies emphasized. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV.)

454. Electroencephalography and Evoked Potentials (3-18)
Clinical activity—full time (2-12 weeks). Prerequisite: completion of four-week Neurology selective and consent of instructor. Principles of electroencephalographic diagnosis including techni- cal basis of electroencephalography and evoked
499. Research (1-12)
Laboratory—2-24 hours. Prerequisite: consent of instructor. Approved for graduate degree credit. Lab- oratory investigation on selected topics. (H/P/F grading only for graduate and medical students.)

Neurosurgery (NSU)

499. Neurosurgery Research (1-18)
Prerequisite: medical student with consent of instruc- tor. Student may participate in ongoing neurosurgi- cal projects or may pursue and design independent projects. (H/P/F grading only.)

Obstetrics and Gynecology (OBG)

Upper Division Courses

190. Seminar in Early Mammalian Development (1)
Seminar—1 hour; short paper. Prerequisite: Zoology 100 or the equivalent. Each student will present a paper from the recent scientific literature on various research topics in early mammalian development. Short paper will be required at the end of course.—I, II, III, IV.

192. Shifa Clinic/Student Volunteer (1)
Conference—2 hours; clinical activity—68 hours; discussion—1-2 hours. Supervised work experience in obstetrics and gynecology. May be repeated up to 3 times for credit. (P/NF grading only.)—I, II, III, IV.

198. Direct Observation Group Study (1-5)
Prerequisite: consent of instructor. (P/NF grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NF grading only.)

Graduate Courses

220. 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.

290. Current Topics in Research (1)
Seminar—1 hour. Prerequisite: graduate standing and consent of instructor. Selected topics in repro- ductive biology. (S/U grading only.)—I, II, III, IV.

291. Seminar in Early Mammalian Development (1)
Seminar—1 hour. Each student will be asked to present a paper from the recent scientific literature on various research topics in early mammalian development. Short paper will be required at the end of course.—I, II, III, IV.

298. Group Study (1-5)
Prerequisite: graduate standing; consent of instruc- tor.

299. Research (1-12)
Prerequisite: graduate standing; consent of instruc- tor. (S/U grading only.)

Professional Courses

420. Genetics and Reproduction (2)
Lecture—20 hours; conference—4 hours. Prerequi- site: Endocrinology. Introduction to medical genetics and the clinical consequences of genetic abnormali- ties. Aspects of reproduction including gametogene- sis, development of the conceptus, maternal adaptation to pregnancy, labor and delivery and menopause; and seminars ongoing. (H/P/F grading only.)—IV.

430. Obstetrics and Gynecology Clerkship (12)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress. Obstetrics, gynecologic and gynecologic oncology experience in the obstetric ward, operating room, clinical and wards at UCDMC and affiliated sites. Rounds, conferences, interactive student pre- sentations and seminars ongoing. (H/P/F grading only.)—I, II, III, IV.

450. Elective Clerkship (4-18)
Clinical activity—full time (3 days per unit). Prerequi- site: third- and fourth-year medical student; course 430 or the equivalent; consent of instructor. Active participation in inpatient and outpatient care. Attend- ance at specified conferences; student-faculty mem-
Clinical activity—full time (4-6 weeks). Prerequisite: third and fourth-year medical students who have completed course 430; consent of instructor. Student will participate in clinics each week. General Obstetrics, New and Return Obstetrics, Post-Partum, High-Risk Obstetrics, Pre-Operative Clinic, other specialty clinics as assigned. Student will conduct examinations, present patients to staff and will be able to discuss treatment regimens. Night call in Labor and Delivery Suite each third night. (H/P/F grading only.)—I, II, III, IV, I, II, III, IV.

498. Insights in Ophthalmology (1-3)
Clinical activity—4 to 6 months. Prerequisite: medical student who has completed Internal Medicine course 430 in third or fourth year; consent of instructor. Participation in selected topics. May be repeated for credit. (H/P/F grading only.)—I, II, III, IV, I, II, III, IV, I, II, III, IV. J. Brandt

499. Orthopaedics Research (1-12)
Clinical activity—3 to 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. Szabo

480. Insights in Ophthalmology (1-3)
Clinical activity—3 to 9 hours. Prerequisite: medical student(s) who have completed Internal Medicine course 430 in third or fourth year; consent of instructor. Participation in disciplines of neuro-ophthalmology, pediatric ophthalmology, diseases of the cornea and vitreous, and retinal diseases. Rotations at UCD Medical Center may be arranged in 4-week units of one service alone, or in combination, as arranged with instructors. (H/P/F grading only.)—I, II, III, IV, I, II, III, IV, Mannis, Keilner, J. Brandt

499. Orthopaedics Research (1-12)
Clinical activity—3 to 36 hours. Prerequisite: medical students with consent of instructor. Individual research on selected topics in orthopaedics, including basic and clinical research. (H/P/F grading only.)

Orthopaedic Surgery (OSU)
Lower Division Course
99. Special Studies for Undergraduates (1-4)
Prerequisite: lower division standing and consent of instructor. (P/NP grading only.)

Upper Division Course
199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: upper division standing; consent of instructor. (P/NP grading only.)

Professional Courses
421. The Musculoskeletal System (2.5)
Lecture/discussion—6 hours. Prerequisite: consent of Committee on Student Progress. Basic and clinical science of orthopaedic surgery and rheumatology. (P/NP grading only.)—I. Martin

482. Ambulatory and Emergency Room Orthopedics (3-6)
Clinical activity—full time (2-4 weeks). Prerequisite: fourth-year medical student in good academic standing; consent of instructor. Provides student with practice in the management of patients; an outpatient environment, including the emergency room. Skills include orthopaedic examinations, present patients to staff rotating 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; consent of instructor. Acquaints student with practice of future primary care physician in 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.

464. Acting Internship (6)
Clinical activity—full time (4 weeks). Prerequisite: fourth-year medical student in good academic standing; consent of instructor. Student will experience: Obstetrics and Gynecology, 2 weeks each; General Obstetrics, New and Return Obstetrics, Post-Partum, High-Risk Obstetrics, Pre-Operative Clinic, other specialty clinics as assigned. Student will conduct examinations, present patients to staff and will be able to discuss treatment regimens. Night call in Labor and Delivery Suite each third night. (H/P/F grading only.)—I, II, III, IV, I, II, III, IV.

480. Insights in Ophthalmology (1-3)
Clinical activity—3 to 9 hours. Prerequisite: medical student(s) who have completed Internal Medicine course 430 in third or fourth year; consent of instructor. Participation in disciplines of neuro-ophthalmology, pediatric ophthalmology, diseases of the cornea and vitreous, and retinal diseases. Rotations at UCD Medical Center may be arranged in 6-week units of one service alone, or in combination, as arranged with instructors. (H/P/F grading only.)—I, II, III, IV, Mannis, Keilner, J. Brandt

499. Orthopaedics Research (1-12)
Clinical activity—3 to 36 hours. Prerequisite: medical students with consent of instructor. Individual research on selected topics in orthopaedics, including basic and clinical research. (H/P/F grading only.)
ulty 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.—II, II, III, IV. Yamao

298. Group Study (1-5)
(S/U grading only)

299. Individual Study in Otolaryngology for Undergraduate Students (1-12)
Prerequisite: advanced graduate student with consent of instructor. (S/U grading only)

Professional Courses

401. Clinical Examinations in Otolaryngology (1)
Lecture—1 hour; laboratory—1 hour; practical—1 hour total. Prerequisite: second-year medical student with consent of instructor; open to graduate students. Approved for graduate degree credit. Obtaining the history, applied anatomy of the regions, and the art of the examination. Head mirror required.—I, II, III, IV. Enepekides

402. Otolaryngology in Family Practice (1)
Lecture—10 hours total. Prerequisite: fourth-year medical students and family practitioners with consent of instructor; open to graduate students. Approved for graduate degree credit. Planned as a first-year course for students—II. (I, II, III, IV) Enepekides

403. Basic Principles of Reconductive Surgery (1)
Lecture—four 2-hour sessions; laboratory—one 2-hour session (4 weeks). Prerequisite: third- or fourth-year medical student with consent of instructor. Formal instruction in the basic principles of reconstructive surgery, including wound healing, treatment of lacerations, skin and bone grafts, flaps, Z-plastics and revision of scars. Laboratory session utilizing animal tissues.—II. (I, II, III, IV) Donald

440. Otolaryngology Required Clerkship (3)
Clinical activity—full time (2 weeks). Prerequisite: consent by Committee on Student Evaluation and Promotion. To provide fundamental knowledge of otolaryngology 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 otolaryngology care.—I, II, III, IV. Enepekides

450. Fourth Year Otolaryngology Elective (6)
Clinical activity—35 hours; lecture—2 hours; film-viewing—0.25 hours; discussion—1 hour. Prerequisite: third- or fourth-year medical student; consent of instructor. Participation in Otolaryngology Clinic and attending weekly conference and evaluation of common Otolaryngology diseases. (H/P/F grading only)—II, III, IV. Enepekides

460. Clinical Otolaryngology Elective (3-18)
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)—II, III, IV. Enepekides

480. Insights in Otolaryngology (1-3)
Clinical activity—3 to 9 hours. Prerequisite: first- and second-year medical students in good academic standing; consent of instructor. Individualized activities (depending upon time available and previous exposure to Ear, Nose and Throat) including observing patient exams, ward rounds and attendance at lectures and grand rounds. (H/P/F grading only)—II, III, IV. Enepekides

490. Journal Seminar (1)
Lecture/discussion—10 hour 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 developments. (H/P/F grading only)—I, II, III, IV. Enepekides

498. Individual or Group Study (1-5)
Lecture/discussion—1 hour; 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)

499. 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)—Brodie

Pathology (PMD)

Upper Division Courses

192. Internship in Human Pathology (1-12)
Internship—3-26 hours; final project report. Prerequisite: upper division standing; consent of instructor. Prior to period of internship by preceptor. Supervised work experience in pathologic 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 Courses

210. Introduction to Human Pathology (4.5)
Lecture/discussion—8 hours; laboratory—4 hours (5 weeks). Prerequisite: graduate or upper division students with background in gross and microscopic anatomy, physiology and biochemistry. Lectures, laboratory and computer based learning. Introduces basic human disease processes. Stresses mastery of pathophysiology and vocabulary. Examining gross and microscopic tissue sections is taught. Course given second five weeks of spring and taken with fourth-year medical course 410A. (H/P/F grading only)—III. (I, II, III, IV) Enepekides

298. Group Study (1-5)
Prerequisite: consent of instructor. (S/U grading only)

Professional Courses

404. Forensic Pathology (2)
Laboratory—3-10 hours. Prerequisite: medical student or consent of instructor. Systematic study of current forensic cases with emphasis on differential diagnosis, prevention, and medical-legal procedures. Introduction to histopathologic diagnosis, ballistics, and toxicology. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Strong

405. Brain Cutting Conference (1-4)
Seminar—1-4 hours. Prerequisite: third- and fourth-year medical students or consent of instructor. Current specimens are sectioned, discussed, and clinical correlations proposed. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Ellis

407. Advanced Neuropathology (1-12)
Discussion and laboratory. Prerequisite: consent of instructor. Study of pathologic reaction in human central and peripheral nervous systems and skeletal muscle by microscopic, light and electron microscopic examination of current and archival material. Discussions of clinical correlations and current medical literature. Individualized experience in neuropathology.—(H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Ellis

410A. General Pathology (2)
Lecture—4 hours; laboratory/discussion—4 hours. Prerequisite: approval of Committee on Student Progress. Pathologic mechanisms of human disease. Gross organ and microscopic materials are utilized to illustrate morphology and concepts. (P/NP grading only)—III. (I, II) Gandour-Edwards, Jensen

497T. Tutoring in Pathology (1-5)
Prerequisite: consent of instructor. Group study in variety of advanced topics in pathology and related fields. (P/NP grading only)

498. Individual or Group Study (1-5)
Lecture/discussion—1 hour; 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)

499. 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)

410B. Systemic Pathology (1.5)
Lecture—8 hours; laboratory/discussion—12 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress. Concepts of general pathologic processes, i.e., cell death, inflammation and neoplasia in the context of specific organ systems and human diseases. (Deferred grading only, pending completion of sequence. P/F grading only)—IV. Gandour-Edwards, Jensen

410C. Systemic Pathology (2)
Lecture—1 hour; discussion—2 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress. Anatomic and clinical pathology of organ system human disease with an emphasis on integration with clinical medicine. Topics include hematopathology, gynecologic pathology, endocrine pathology, and musculoskeletal pathology. (Deferred grading only, pending completion of sequence. P/F grading only)—I. Gandour-Edwards, Jensen

410D. Systemic Pathology (2.5)
Lecture—1 hour; discussion—2 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress. Anatomic and clinical pathology of organ system human disease with an emphasis on integration with clinical medicine. Course content closely parallels concurrent clinical courses with integration of lectures and discussion sections. Topics include gastrointestinal pathology, hepatopathology, nutritional pathology. (Deferred grading only, pending completion of sequence. P/F grading only)—II. Gandour-Edwards, Jensen

410E. Systemic Pathology (1)
Lecture—1 hour; discussion—2 hours. Prerequisite: approval by the School of Medicine Committee on Student Progress. Anatomic and clinical pathology of organ system human disease with an emphasis on integration with clinical medicine. Course content closely parallels concurrent clinical courses with integration of lectures and discussion sections. Topics include gastrointestinal pathology, hepatopathology, nutritional pathology, pathology of the lower urinary tract. (P/F grading only)—III. Gandour-Edwards, Jensen

464. Anatomic Pathology (3-12)
Clinical activity—40 hours. Prerequisite: third- or fourth-year medical student or consent of instructor. Anatomic pathology with an emphasis in surgical pathology and application to clinical practice. Specimen grossing, frozen section techniques, microscopic sign-out and conferences. Exposure to autopsy, cytopathology, hematopathology, and clinical pathology. (H/P/F grading only)—I, II, III, IV. (I, II, III, IV) Ramanujam

465. Applied Clinical Laboratory Medicine (6-9)
Clinical activity—full time (4-6 weeks). Prerequisite: consent of instructor. Emphasis upon laboratory techniques, procedures, and interpretation of laboratory results. Students will be expected to participate fully and in all laboratory operations including bench techniques, laboratory management and quality control. (P/F grading only)—I, II, III, IV. (I, II, III, IV) Swenson

477. Tutoring in Pathology (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 have reached the required level of the required curriculum of the School of Medicine. (H/P/F grading only)

498. Advanced Group Study (1-5)
Prerequisite: medical student and consent of instructor. Group study in various advanced topics in general, special, experimental, or comparative pathology. (H/P/F grading only)

499. Research (1-18)
Prerequisite: medical student with consent of instructor. Research in experimental, comparative, and applied pathology. Limited enrollment. (H/P/F grading only)
199. Special Study in Pediatric Research (1-5)
Prerequisite: undergraduate student with consent of instructor based upon adequate preparation as determined by instructor. (P/NP grading only.)

Graduate Course

299. Pediatric Research (1-12)
Prerequisite: graduate students who are candidates for a degree in some area of biology or behavioral sciences; consent of instructor. (S/U grading only.)

Professional Courses

401. Preceptorship in Pediatrics (2)
Preceptorship—half time. Prerequisite: second-year medical student or first-year medical student with consent of instructor. Opportunity to observe and participate in primary medical care in a practicing pediatrician’s office. Participation in history-taking and physical examination will be at discretion of preceptor and dependent upon student’s experience. Evaluation by student. (H/P/F grading only.)—I, II, III, IV.

402. Clinical Experience in Private Practice (1-18)
Clinical activity—full time (2 to 12 weeks). Prerequisite: third- or fourth-year medical student; course 430; consent of preceptor and Chairperson. Opportunity to participate in practice of preceptor, performing such tasks as history-taking, physical examination, and patient management. (H/P/F grading only.)—I, II, III, IV.

430. Pediatric Clerkship (12)
Clinical activity—45 hours. Prerequisite: approval by School of Medicine Committee on Student Progress. Eight week clinical clerkship providing students with the opportunity to learn fundamentals of caring for the pediatric patient by participating in nursery, ambulatory, inpatient, and outpatient services at UCDMC and affiliated clinical sites. Rounds, conferences, student presentations ongoing. (H/P/F grading only.)—I, II, III, IV. Wold

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 Acting Intern functions in a manner similar to that of a pediatric intern. The Acting Intern takes admissions in 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. Connors

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 UCDMC. 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. Elective in Hematology/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 hematologic disorders in children. Laboratory experience and participation in clinical investigation may be arranged. 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. Elective in Pediatric Cardiology (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 cardiovascular disorders in children. Laboratory experience and participation in clinical investigation may be arranged. Limited enrollment. (H/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 and surgical high-risk newborn. Student 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. Supervised experience in a variety of pediatric subspecialty clinics. Limited enrollment. (H/P/F grading only.)—I, II, III, IV.

466. Elective in Pediatric Cardiology (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 cardiovascular disorders in children. Limited enrollment. (H/P/F grading only.)—I, II, III, IV.

467. Elective in Pulmonary Medicine (3-18)
Clinical activity—full time (2 to 12 weeks); daily rounds, two weekly half-day clinics. Prerequisite: pediatric clerkship. Inpatient and outpatient management of pediatric patients with pulmonary diseases. These will include but will not be limited to cystic fibrosis, asthma, and other chronic pulmonarv diseases as well as congenital abnormalities. (H/P/F grading only.)—I, II, III, IV. McDonald, Joad

468. 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, V.

469. Elective in Pediatric Infection 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 management 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, V.

470. Elective in Pediatric Neurology (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 neurological disorders. This course fulfills the fourth year neurology requirement. Limited enrollment. (H/P/F grading only.)—I, II, III, IV, V.

471. 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 gastrointestinal disorders in children. Limited enrollment. (H/P/F grading only.)—I, II, III, IV.

472. Clinical Rotation in Adolescent Medicine (6)
Clinical activity—39 hours; lecture—1 hour. Prerequisite: consent of instructor; fourth-year medical student. Under supervision, students will see patients in the UCD clinic and at a number of community-based sites. Emphasis on the socially-mediated problems that face adolescents, including substance abuse, STD’s, pregnancy, depression and suicide. One hour of lecture each week. (H/P/F grading only.)—I, II, III, IV.

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, V, VI.

478. 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, V, VI.

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, neurology, pulmonary diseases, and others) may be arranged 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 Courses

100. Research Approaches to Disability and Rehabilitation (2)
Lecture/discussion—2 hours. Discussion and evaluation of research approaches to medical rehabilitation, community integration, and quality of life for disabled persons, with a focus on the progressive disabilities associated with neuromuscular diseases. Intent is to encourage interest in professions that serve the disabled community and increase awareness of rehabilitation goals. (I. D. Devereaux

198. Directed Group Study (1-5)
Prerequisite: advanced standing and consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-15)
Prerequisite: advanced standing and consent of instructor. (P/NP grading only.)

Graduate Course

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only.)

Professional Courses

440. Rehabilitation Medicine Clerkship (3)
Clinical activity—full time (2 weeks). Prerequisite: third- or fourth-year medical student; approval by Committee on Student Evaluation and Promotion. Rehabilitation medicine and geriatrics relating to comprehensive care of the physically disabled and the physical medicine management of neurologic and musculoskeletal disorders. Physiological effects, indications and contraindications of the therapeutic modalities and their application to common musculoskeletal disorders. Limited enrollment. (H/P/F grading only.)—I, II, III, IV.

461. Rehabilitation Medicine Clinical Elective (5-18)
Clinical activity—full time. Prerequisite: completion of third year in Medical School; Internal Medicine 430, Surgery 430. Intended for non-UC medical students. Emphasis on evaluation of patients with neurological or orthopaedic problems requiring rehabilitative techniques for their management. Introduction to management of such patients. Fourth-year student may function as acting intern of Physical Medicine and Rehabilitation service. (H/P/F grading only.)—I, II, III, IV, V.

Kilmer

Wilkes

Dimand

Parish

Connors

McDonald

Gospe

Makker

Wienman

Goss
462. Rehabilitation Medicine Clinical Elective (3-12)
Clinical activity—full time. Prerequisite: Internal Medicine 430, Surgery 430; completion of third year in Medical School. Emphasis on evaluation of patients with neurological or orthopaedic problems requiring rehabilitative techniques for their management. Introduction to management of such patients. Physical Medicine and Rehabilitation at off-campus facility must be approved by Chairperson. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Klimes
498. Advanced Group Study (1-5)
Prerequisite: consent of instructor. Study and experience for medical students in any of a number of areas in 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.)

Plastic Surgery (PSU)

Professional Courses
460. Clinical Plastic Surgery Elective (1-18)
Clinical activity—full time (approximately 40 hours per week). Prerequisite: third or fourth-year medical student; consent of instructor. Total involvement in patient care involving surgical preoperative, operative, and postoperative care and follow-up. Developing and understanding reconstruction and aesthetic plastic surgery. Microvascular surgery included. Student rotation. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Stevenson

461. Dentistry for Future Physicians and Surgeons (6-8)
Discussions/semesters—3 hours; laboratory—2 hours; clinical activity—full time (4-6 weeks). Prerequisite: third or fourth-year medical students. General practitioners must recognize dental-related problems, have the ability to alleviate potential pain, and be able to refer problems to further definitive evaluation and treatment. Students will have basic knowledge of dentistry, recognize potential dental problems, provide emergency care, have knowledge of where to refer these problems. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Thaller

Psychiatry (PSY)

Upper Division Courses
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 Courses
298. Directed Group Study for Graduate Students (1-5)
Prerequisite: graduate standing and consent of instructor. (P/NP grading only)
299. Special Study for Graduate Students (1-12)
Prerequisite: graduate standing and consent of instructor. (S/U grading only)

Professional Courses
401. Medicine and the Mind: An Introduction to Psychiatry (2)
Lecture/discussion—2.5 hours. Prerequisite: consent of Committee on Educational Progress. Concepts and clinical applications of psychiatry through the life cycle. Biological, psychological, social, and spiritual factors influencing health and illness. (P/F grading only.)—I. (I) Servis
403. Fundamentals of Clinical Psychiatry (3)
Discussion—2 hours; lecture—3 hours. Prerequisite: approval of Committee on Student Progress. Psychiatric interviewing, Mental Status Exam and diagnosis.

Medicine, School of 369

414. Psychosomatic Medicine Service (3-6)
Clinical activity—weeks; discussion—8 hours. Prerequisite: Psychosomatic Medicine; consent of instructor for Medical Students only. A large university hospital service in which the student functions as a member of the team in evaluation, management and psychiatric consultation to medical service. Medical students must be experienced in clinical management, treatment of adult patients with psychiatric and substance abuse disorders; crisis management/intervention, evaluation/development of diagnosis and treatment plan; emphasis on outpatient psychopharmacology/brief psychotherapy; abortion, under close faculty supervision, as assigned by faculty/residents. May be repeated for credit two times. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Bourgeois, Ton

415. Substance Abuse: Diagnosis and Treatment (3)
Clinical activity—20 hours; independent study—15 weeks; lecture/discussion—5 hours. Prerequisite: medical student with consent of instructor. Two-week selective offering supervised contact with patients addicted to alcohol, opioids, cannabis, or psychostimulants. Sites: Travis Air Force Base and regional Methadone and Alcohol Treatment Programs. Pharmacological, psychosocial, “12-step” and behavioral treatments will be demonstrated. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV)

416. Child Psychiatry Clerkship (6-12)
Clinical activity—full time (4 to 8 weeks). Prerequisite: course 430 (Psychiatry Core Clerkship) 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)

417. Jail Psychiatric Clerkship (6-12)
Clinical activity—full time (4 to 8 weeks). Prerequisite: course 430 (Psychiatry Core Clerkship) and/or consent of course coordinator. Students gain experience in various aspects of jail operations, including 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)

418. Off-Campus Clinical Experience (6 or 12)
Clinical activity—full time (4 to 8 weeks). Prerequisite: fourth-year medical students; consent of instructor. Clinical or research elective in off-campus medical school or hospital setting. To be arranged with advance approval of instructor and individual in charge of off-campus setting. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV)

419. Group Psychotherapy (6)
Clinical Activity—32 hours; discussion—8 hours. Prerequisite: psychiatry clerkship or consent of instructor of record. Senior medical students will rotate through a community mental health clinic with an extensive group psychotherapy program. Students will have opportunity to see patients individually, but the main emphasis will be to participate in cutting edge group therapies. May be repeated two times for credit. For medical students only. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) L. Krimsky

420. Acting Internship in Psychiatry (6-12)
Clinical activity—full time (4 to 8 weeks). Prerequisite: course 430 (Psychiatry Core Clerkship) and/or consent of course coordinator. Acting intern position with close faculty supervision with emphasis on biologic 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 for 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 of indigent and uninsured patients as well as primary care for psychiatry patients. May be repeated for credit two times. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) McCarron, Onate, Tor

422. Readings in Psychiatry (1-3)
Readings/discussion—3.5 hours. Independent reading of a selected topic in psychiatry. Supervision and discussion with a psychiatry faculty member. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV)

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 the skills gained in their preclinical years; emphasis on diagnostic, therapeutic, and interpersonal skills. Areas of focus include patient management, interviewing skills, mental status exam, differential diagnosis, basic psychopharmacology, crisis assessment, intervention and case referrals. (H/P/F grading only)—I, II, III, IV. Cox

480. Insights in Psychiatry (1-3)
Clinical activity—3-9 weeks. Prerequisite: first or second-year medical student in 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) Cox

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.)

Radiation Oncology (RON)

Upper Division Courses
190. Molecular and Cellular Radiation Biology Seminar (1)
Lecture—1 hour. Topics in radiation biology and physics given by senior scientists. Focus on cellular response to ionizing radiation, radiation risk assessment, DNA damage and repair, and radiation dosimetry and imaging. May be repeated for credit when topic differs. (P/NP grading only.)—I, II, III, IV. (I, II, III, IV) V. Lajewskaya

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only)

Graduate Course
299. Independent Study and Research (1-12)
Clinical activity—full time (2-8 weeks). Prerequisite: enrollment with Biomedical Engineering Group for Ph.D. candidacy and consent of Group Advisor and Sponsor. Research under supervision of Radiation
Residence, nuclear medicine, and echocardiography of heart diseases. (H/P/F grading only.)—III. (III.) Bogren

498. Group Study in Diagnostic Radiology (1-12)
Prerequisite: consent of instructor. (H/P/F grading only)

499. Research in Diagnostic Radiology (1-12)
Prerequisite: consent of instructor. Approved for graduate degree credit. (H/P/F grading only for medical students.)

Radiology—Nuclear Medicine (RNU)
Upper Division Courses
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)

Graduate Course
299. Research: Special Study for Graduate Students (1-12)
Prerequisite: graduate standing and consent of instructor. (S/U grading only)

Professional Courses
430. Surgery Clerkship (12)
Clinical activity—full time. Prerequisite: approval by School of Medicine Committee on Student Progress. Eight week general surgery clerkship includes GI, Burn, Oncology, cardiothoracic, consult, transplant and trauma. Clerkship assignments are at UCDMC. Daily core material presentations and reading assignments. Student involvement includes work-up and care of surgical patients. (H/P/F grading only.)—I, II, III, IV. Owings

460A. Clinical Surgical Elective (6-18)
Clinical activity—full time. Prerequisite: fourth-year medical student or third-year medical student with completion of course 430. Rotation through Surgery Specialty Clinics: Vascular, GI, GU, Thoracic, Plast., Radiotherapy. Student works up one new and two return visit patients. Presents consult to on-site faculty. Weekly review with preceptor and course director. Reading assignments to add perspective for in-depth discussions. (H/P/F grading only.)—I, II, III, IV, (I, II, III, IV) Follite

461. Surgery Burn Unit Clerkship (6 or 9)
Clinical activity—full time (4 or 6 weeks). Prerequisite: fourth-year medical student, or third-year medical student with completion of course 430. Externship in the eight-bed Burn Unit, and the 80 bed Shriners Hospital for Children. Principles of critical care, fluid and electrolyte resuscitation and management of surgical wounds in both adults and children. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV) Bushberg, Vera

462. Surgery Trauma Service Clerkship (6 or 9)
Clinical activity—full time (4 or 6 weeks). Prerequisite: fourth-year medical student, or third-year medical student with completion of course 430. Student works as an extern on one of the two general surgery trauma teams, participating in resuscitation and management of critically injured patients. Team hours consist of 24 hours on, and 24 hours off. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV)

463. Surgery Intensive Care Unit (6 or 9)
Clinical activity—full time (4 or 6 weeks). Prerequisite: fourth-year medical student, or third-year medical student with completion of course 430. Student participates in direct supervision of critically ill surgical patients in a twelve-bed surgery ICU. Each student is closely supervised. Provides in-depth experience with management of critically ill patients. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV)

464. General Surgery Clerkship: Kaiser Hospital (6 or 9)
Clinical activity—full time (4 or 6 weeks). Prerequisite: fourth-year medical student, or third-year medical student with completion of course 430. Student participates with University residents on the teaching services at Kaiser Hospital. Opportunity to see larger number of practical, general surgical problems and participate in their care. (H/P/F grading only.)—I, II, III, IV. (I, II, III, IV)
467. Surgical Oncology (3-9)
Clinical activity—full time (2 to 6 weeks). Prerequisite: fourth-year medical student or third-year medical student with completion of course 430. Students actively participate in management of patients requiring surgery for cancer, endocrine disease and selected general surgical or orthopedic 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.

468. Cardiothoracic Surgery Clerkship (6-9)
Clinical activity—full time (4 to 6 weeks). Prerequisite: fourth-year medical student, or third-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 operations on the heart, lungs, mediastinum, and great vessels. Regularly scheduled teaching conferences are conducted. (H/P/F grading only)—I, II, III, IV.

469. Trauma Service: East Bay (6-9)
Clinical activity—full time. Prerequisite: fourth-year medical student or third-year medical student with completion of course 430 and Internal Medicine 430. Student works as an extern on the Trauma Service at Highland General Hospital (Oakland) participating in resuscitation and management of critically injured patients. Team hours consist of 24 hours on and 24 hours off. (H/P/F grading only)—I, II, III, IV.

470. General Surgery: East Bay (6-9)
Clinical activity—full time. Prerequisite: fourth-year medical student or third-year medical student with completion of course 430. Student will work as an extern on one of the two general surgery services and participate in the preoperative evaluation, intraoperative management, and postoperative care of surgical patients. (H/P/F grading only)—I, II, III, IV.

471. Gastrointestinal Surgery (3-9)
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 GI Surgery Service, working under the immediate supervision of the faculty and surgical house staff, involving the full spectrum of gastrointestinal diseases performed by the medical student. (H/P/F grading only)—I, II, III, IV.

472. Vascular Surgery (3-9)
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. Inclusive patient care responsibilities with appropriate supervision. (H/P/F grading only)—I, II, III, IV.

473. Surgical Intensive Care Unit-East Bay (6-9)
Clinical activity—full time. Prerequisite: fourth-year medical student or third-year medical student with completion of course 430 and Internal Medicine 430. Externship on surgical ICU service, clinical management of critically ill patients in the ICU procedures with appropriate supervision. An eight-lecture didactic series. (H/P/F grading only)—I, II, III, IV.

474. Breast Disease (6)
Clinical activity—full time (4 weeks). Prerequisite: third-year medical student, Medical Sciences 430. Students focus on aspects of benign and malignant breast disease working in the surgical oncology clinic, observing needle localization procedures, following patients of the O.R., working with radiologists in mammography, working in hematology/oncology clinics, and withpathologists reviewing histology. (H/P/F grading only)—I, II, III, IV.

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, General experience with acquired surgical diseases in children. (H/P/F grading only)—I, II, III, IV.

476. Medical 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.

477. Clinically Oriented Anatomy (3)
Clinical activity—40 hours. Prerequisite: completion of three years of medical school. Anatomy of selected regions of the body using cadaver dissections, prosections and interactive CD-ROMs. Anatomical relationships relevant to surgical surgical procedures. Surgical and interventional radiology procedures. (H/P/F grading only)—I, II, III, IV.

478. Surgical Preceptorship: Off Campus (6-18)
Clinical activity—full time. Prerequisite: fourth-year medical student and consent of instructor. Student participates in the preoperative, operative and postoperative care of surgical patients under the supervision of attending staff. (H/P/F grading only)—I, II, III, IV.

479. Insigths in Surgery (1-3)
Clinical activity—3 to 9 hours. Prerequisite: medical student in good academic standing and consent of instructor. Individualized activities, including ward rounds, subspecialty clinics and conferences, grand rounds, and observation of a variety of surgical procedures. (H/P/F grading only)—I, II, III, IV.

494H. 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, that would enable them to succeed during the internship and residency training. (H/P/F grading only)—I, II, III, IV.

498. Group Study (1-5)
Prerequisite: medical student; consent of instructor. Directed reading and discussion and/or laboratory investigation on selected topics. (H/P/F grading only)—I, II, III, IV.

499. Laboratory Research (1-12)
Laboratory—3-36 hours. Prerequisite: completion of second year of medical school; consent of instructor. Laboratory research on surgically related problems. Participation in projects to include the following: burns, nutrition, oncology, transplant and others. (H/P/F grading only)—I, II, III, IV.

199. Special Study for Advanced Undergraduate (1-5)
Prerequisite: consent of instructor. (NP grading only)—devere White

Professional Courses
400. Office Urology (1)
Clinical activity—4 hours in afternoons (6 weeks). Prerequisite: fourth-year medical student with consent of instructor. Introduction to ambulatory care of urologic patients including basic therapeutic and diagnostic procedures from case material referred to private clinic. Management of urinary tract infection will be emphasized. (H/P/F grading only)—I, II, III, IV,

460. Urology Clinical Clerkship (5-18)
Clinical activity—full time. Prerequisite: second-year medical student; physical diagnosis or the equivalent; consent of instructor. Clinical experience in diagnosis and treatment of urologic disease. Student will work closely with house staff, participate in conferences and surgery, and perform initial patient evaluation on new patients. May be repeated for credit. Limited enrollment. (H/P/F grading only)—I, II, III, IV.

468. Externship in Urology (5-18)
Clinical activity—full time. Prerequisite: fourth-year medical students with consent of instructor. Under supervision, student acting as intern will assume full inpation responsibility including admission history, physical examination, management of hospitalization, and participate in surgical procedures, outpatient clinic and learning diagnostic and therapeutic procedures. May be repeated for credit. (H/P/F grading only)—I, II, III, IV.

499. Research in Urology (1-12)
Research—3–36 hours. Prerequisite: medical or veterinary medical students with consent of instructor. Research in oncology, male infertility, urodynamics, nephrogenic bladder. Unique opportunity to apply recent technologies (nuclear medicine resonance, flow cytometry, recombinant DNA) in investigation, diagnosis and treatment of GU cancer, infectious disease, male infertility and development of genitouri nary bioprosthesis. (H/P/F grading only)—I, II, III, IV.

Medicine and Epidemiology
See Medicine and Epidemiology (VME), on page 473.

Medieval and Early Modern Studies
See Medicine and Epidemiology (VME), on page 473.

Medieval and Early Modern Studies

( College of Letters and Science
Claire Waters, Ph.D., Program Director
Program Office, 176 Voorhis Hall
(530) 752-2257; http://medieval.ucdavis.edu

Committee in Charge
Joan Cadden, Ph.D. (History)
Seeta Chaganti, Ph.D., (English)
Frances Dolan, Ph.D., (French)
Margaret W. Ferguson, Ph.D., (Spanish and Classics)
Noah Gunyn, Ph.D. (French and Italian)
Kate Harris, Ph.D. (History)
Adrienne Martin, Ph.D., (Spanish and Classics)
Winder McConnell, Ph.D., (German and Russian)
Sally McKee, Ph.D. (History)
Academic Senate Distinguished Teaching Award
Marianne Osborn, Ph.D., (English)
Academic Federation Excellence in Teaching Award
Kevin Roddy, Ph.D., (Medieval and Early Modern Studies), Academic Federation Excellence in Teaching Award
Brenda Schützner, Ph.D., (Comparative Literature), Academic Federation Excellence in Teaching Award
Kathleen Stewart, Ph.D., (History)
Lauren Trill, Ph.D., (Spanish and Classics)
Georges Van Den Abbeele, Ph.D., (French and Italian)
Claire Waters, Ph.D., (English)

General Education (GE) credit: Arts and Humanities, SciEng=Science and Engineering; SocSci=Social Sciences; Div=Social-Cultural Diversity; Wrt=Writing Experience

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007/2008 offering in parentheses
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, art, 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, 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 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 .................. 24
Medieval Studies 20A, 20B, 20C .......... 12
Three additional courses chosen from: Art 1B, 1C; Comparative Literature 2, 10A, 10B, 10C, 10D, 10E; English 46A, 46B, 47, 48; History 4A, 4B, Humanities 1*, 9; Philosophy 21, 22 .................. 12
Language proficiency is a desideratum.
Courses in Latin and other European languages are strongly recommended, particularly for students planning to pursue graduate studies in the medieval or early modern world.

Depth Subject Matter .................. 44
In consultation with the undergraduate adviser, students select a total of eleven courses from the following disciplines with at least three courses each from the Medieval and Early Modern periods:

Art History 178A, 178B, 178C, 179B, 190B, 190C
Classics 110
Comparative Literature 139, 164A, 164B, 164C, 166A, 180*

Dramatic Art 156A


French 115, 116, 117A, 118B, 141*


History and Philosophy of Science 130A


Medieval Studies 120A, 120B, 120D, 120E, 130A, 130B, 130C, 130D, 130E, 190

Music 121*, 124A, 124B

Philosophy 105, 132, 145, 190*

Political Science 115, 116, 118A

Religious Studies 100D, 110, 112, 113, 140*, 141

Spanish 130, 132N, 133N, 141N, 142*

Dramatic Art 156A

Total Units for the Major .................. 68

* Prior approval by Undergraduate Adviser necessary.

Major Adviser. K. Roddy

Minor Program Requirements: Medieval and Early Modern Studies ..... 24

The minor in Medieval and Early Modern Studies is a coherent program of interdisciplinary study. Medieval Studies units may be taken in one or more of the traditional fields of concentration, including art, history, literature, music, national languages, philosophy, political theory, and religious studies. Courses must be upper-division with at least two courses each from the Medieval and Early Modern periods. Students may also select a minor with a thematic emphasis.

Although there is no foreign language requirement for the minor, knowledge of Latin or a modern European language is recommended. The minor must be designed in consultation with the Undergraduate Adviser.

Minor Adviser. K. Roddy

Courses in Medieval Studies (MST)

Lower Division Courses

20A. Early Medieval Culture (4)

Lecture—3 hours; discussion—1 hour. Readings (in translation) in early medieval culture, such as the Codes of Justinian, the Confessions of Saint Augustine, The Consolations of Philosophy of Boethius, Beowulf, the Nibelungenlied and The Song of Roland. GE credit: ArtHum, Wrt.—II. [I] Roddy

20B. The Culture of the High Middle Ages (4)

Lecture—3 hours; discussion—1 hour. Readings (in translation) in the culture of the high Middle Ages, such as the Summa Theologica of Thomas Aquinas, The Chronicles of Froissart, The Canterbury Tales of Chaucer, and The Divine Comedy of Dante. GE credit: ArtHum, Wrt.—II [I] Roddy

20C. The Late Medieval and Early Modern Period (4)

Lecture—3 hours; discussion—1 hour. The great transformations that created the modern world: Constitutional Government, the Hundred Years’ War, the Black Death, and the Peasants’ Revolts, the Renaissance, Reformation and Counter-Reformation, and the Baroque. GE credit: ArtHum, Wrt.—II

98. Directed Group Study (1-5)

(P/NP grading only.)

99. Special Study for Undergraduates (1-5)

(P/NP grading only.)

Upper Division Courses

120A-E. The Medieval World (4)

Lecture—3 hours: discussion—1 hour; term paper. Course deals with selected themes from the Middle Ages: the Fall of Rome to the beginning of the Renaissance. Subjects will vary from year to year and cover such topics as (A) The Monastic Orders; (B) Origins of Universities; (D) Family and Society; (E) Chivalry. GE credit for 120A or 120D or 120E: ArtHum, Wrt.—II

121. Jewish/Christian/Islamic Relations 700-1400 (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing; one course from the 20 series recommended. An interdisciplinary approach to the relations among Islam, Judaism, and Christianity between 700-1400. Topics include politics, geography and travel, architecture and art, philosophy, science, theology, mysticism, and literature. Offered in alternate years. GE credit: ArtHum, Div, Wrt.

130A. Special Themes in Medieval Cultures (4)

Lecture—3 hours; discussion—1 hour. Each offering concentrates on an interdisciplinary aspect of medieval culture in the Middle East and Europe: the idea of the hero, mysticism, urban development. Extensive readings focused on medieval source material. May be repeated for credit. GE credit: ArtHum, Wrt.

130B. Special Themes in Renaissance Culture (4)

Lecture—3 hours; discussion—1 hour. Each theme illuminates an interdisciplinary aspect of Renaissance culture in the eastern and western hemispheres: exploration, medical pathology, daily life, baroque culture. Immersion in source material from 1500-1650. May be repeated for credit. GE credit: ArtHum, Wrt.

190. Senior Thesis (4)

Seminar—4 hours. Prerequisite: 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,—I, II, III. [I, II, III]

197. Tutoring in Medieval Studies (1-4)

Seminar—2 hours. Prerequisite: 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.)
102. General Bacteriology (4)
Lecture—4 hours. Prerequisite: Biological Sciences 1A and Chemistry 89 or 118. (May be taken concurrently.) Survey of the biology of bacteria and viruses, including bacterial structure, metabolism, physiology, genetics, and evolution; viral structure and replication; the role of bacteria in global element cycles; and the role of viruses in infectious disease. —I, II, III, I, III.

102L. General Bacteriology Laboratory (3)
Lecture/laboratory—7 hours. Prerequisite: course 102 (may be taken concurrently). Survey of the major subject matter of class through microbiological techniques as tools for the study of genetics and biochemistry. —I, II, III.

105. Bacterial Diversity (3)
Lecture—3 hours. Prerequisite: consent of instructor; courses 102 and 102L; Biological Sciences 102; Biological Sciences 103 recommended. Survey of the major groups of bacteria emphasizing diversity of energy metabolism, morphology and natural history. Not open for credit to students who completed course 105 in 2005 or earlier. —II. (III.) Parales, Wheels

105L. Bacterial Diversity Laboratory (3)
Laboratory—9 hours. Prerequisite: consent of instructor; courses 102 and 102L; course 105 (may be taken concurrently). Biological Sciences 103 recommended. Laboratory—nine hours (eight hours scheduled lab periods; one hour during open laboratory). Isolation and characterization of bacterial strains from various habitats. Includes methods for determination of evolutionary relationships among groups. Not open for credit to students who completed course 105 in 2005 or earlier. —II. (III.) Nelson, Parales

120. Microbial Ecology (3)
Lecture—3 hours. Prerequisite: course 105, Biological Sciences 102. Interactions between non-pathogenic microorganisms and their environment, emphasizing physiological and metabolic characteristics of various groups and their adaptation to modification of specific habitats. —III. (III.) Wheels

120L. Microbial Ecology Laboratory (2)
Laboratory—6 hours; one optional overnight weekend field trip. Prerequisite: course 120 (may be taken concurrently); consent of instructor. Study of prokaryotic microorganisms from certain habitats. One-half of laboratory work will consist of organized experiments on ecologically important microbial activities. For remaining one-half, research projects will be done on student selected specific habitats of microorganisms. Limited enrollment. Not offered every year.

140. Bacterial Physiology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101, 102, 103 (may be taken concurrently); course 102 recommended (may be taken concurrently). Fundamental aspects of bacterial growth and bacteriophage responses to environmental stresses. Topics will include carbon and nitrogen regulation, growth rate control, post-exponential growth, and motility and chemotaxis. Not open for credit to students who have completed course 130A. —I. (I.) Singer, Meeks

150. Bacterial Genetics (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101, 102, Biological Sciences 103 or course 140; course 102 recommended (may be taken concurrently). Molecular genetics of enterobacteria and their viruses. Isolation of mutants; genetic exchange and mapping; complementation; suppression; transposons; gene expression; and plasmids and bacteriophages. Examples illustrate applicability to molecular cloning of recombinant DNA, and to the study of bacterial pathogenesis. —II. Roth, Stewart

155L. Bacterial Physiology Lab (1)
Lecture/discussion—1 hour; laboratory—4 hours. Prerequisite: course 140 or 150, 102L, consent of instructor. Physiology and genetics of bacteria. Isolation and characterization of mutant strains. Mapping

Microbiology 373

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007/2008 offering in parentheses

General Education (GE) credit: ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Social-Cultural Diversity; Wrt—Writing Experience
of mutations by conjugation and transduction studies of control of enzyme synthesis by induction, repression, and catabolite repression. — Ill. 160. Bacterial Regulatory Mechanisms (3) Lecture—3 hours. Prerequisite: course 140 or 150 recommended. Fundamentals of bacterial regulatory mechanisms. Topics will include control of DNA, RNA, and protein synthesis, global regulatory mechanisms, recombination, DNA repair systems, and cell cycle control with emphasis on bacterial systems. Not open for credit to students who have taken course 130B. (Former course 130B.) Not offered every year.

162. General Virology (4) Lecture—4 hours. Prerequisite: Biological Sciences 1A, 102, integrated presentation of the nature of animal, bacterial, and plant viruses, including their structure, replication and genetics. — II. (Ill.) Manning. Falk

170. Yeast Molecular Genetics (3) Lecture—3 hours. Prerequisite: Biological Sciences 101 and 102; course 102 or 140 (may be taken concurrently) strongly recommended. Survey of the genetics, cell biology and technologies in yeasts and related lower eukaryotes. Topics include diversity of yeasts; cell structure; metabolism; cell cycle; genetic approaches and genomics; gene expression; yeasts as models to study higher eukaryotes; and contemporary techniques. — Ill. (III.) Shiozaki

190C. Undergraduate Research Conference (1) Discussion—1 hour. Prerequisite: upper division standing and consent of instructor, course 199 concurrently. Presentation and critical discussion of staff research activities designed for advanced undergraduate students. May be repeated for credit. (P/NP grading only.)—I, II, III. (I, II, III.)

192. Internship (1-12) Internship—3-36 hours. Technical and/or professional experience on or off campus. Supervised by a member of the Microbiology Section faculty. (P/NP grading only.)

194H. Microbiology Honors Research (2) Independent study—6 hours. Prerequisite: senior standing, eligibility for college honors; completion of six units of 199 in microbiology; consent of section. Continuation of an individual microbiological research project culminating in writing of a senior thesis under a faculty director. (P/NP grading only.)

197T. Tutoring in Microbiology (1-12) Prerequisite: upper division standing and consent of instructor. Assisting the instructor in one of the section’s regular courses by tutoring individual or small groups of students in a laboratory, in voluntary discussion groups, or other voluntary course activities. 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)

Graduate Courses

200A. Biology of Prokaryotes (3) Lecture—3 hours. Prerequisite: course 102 or the equivalent. Intended for first year graduate students in microbiology and closely related fields. Overview of prokaryotic biology, with emphasis on physiology, physiology, and diversity of bacteria. — I.

200B. Advanced Bacteriology (3) Lecture—3 hours. Prerequisite: course 200A. Intended for first year graduate students in microbiology and closely related fields. Advanced topics in physiology, physiology, and diversity of bacteria. Not offered every year. — II.

2011. Advanced Microbiology Laboratory Rotations (5) Laboratory—15 hours. Prerequisite: course 200A (may be taken concurrently). Two-week five-week assignments in microbiology research laboratories. Individual research projects with emphasis on methodological/professional experience and experimental design. May be repeated twice for credit. — I, II. (I, II)

210. Molecular Mechanisms in Microbial Pathogenesis (3) Lecture—2 hours. Prerequisite: course 105 or Virology 127 and course 102 or Virology 128 or the equivalent. Study of the molecular mechanisms involved in cytopathogenesis of higher eukaryotic organisms. Emphasis on the alteration or inhibition of cellular metabolism and function by bacteria and animal viruses. Not offered every year.

215. Reconstituting 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 techniques, choice of vectors, preparation of insert DNA, and selection procedures. — I. (I) Praviky

250. Biology of Yeasts (3) Lecture—2 hours. Discussion—2 hours. Prerequisite: Biological Sciences 102, course 102, 102L, course 215 recommended. Survey of the genetics, physiology, metabolism, regulatory mechanisms, structure, cell biology, ecology and diversity of yeasts and related organisms. Offered in alternate years. — II. (II) Bisson

260. Bacterial Genetic Regulatory Mechanisms (3) Lecture/discussion—3 hours. Prerequisite: general knowledge of nucleic acid biochemistry and bacterial genetics. Analysis at the molecular level of genetic regulation in selected bacterial systems. Specific systems discussed will include the following types of regulation: control of transcription initiation and termination; translational controls; RNA modification effects; autoregulation; control circuits in bacterial viruses; supercoiling. Not offered every year.

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, regulation, expression, replication and recombination, and effects on host cells and organisms. — (III.) Bruening

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 of protein–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 strains of protein–nucleic acid binding proteins. Emphasis on systems that represent paradigms in protein–nucleic acid interactions. Not offered every year.

274. Seminar in Genetic Recombination (1) Seminar—1 hour. Prerequisite: graduate standing; consent of instructor. Biochemical and genetic aspects of genetic recombination in prokaryotes and eukaryotes. Mechanisms of recombination and bio-chemical and genetic characteristics of recombination proteins. Proteins include DNA strand exchange; DNA helicases; and Holliday junction resolving proteins. May be repeated for credit. (S/U grading only.)—I, II, III. (I, II, III.) (I, II, III.)

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, II, III. (I, II, III.) (I, II, III.) H. Heyer

290C. Advanced Research Conference (1) Discussion/conference—1 hour. Prerequisite: graduate standing and/or 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. (I, II, III.)

291. Selected Topics in Microbiology (1) Seminar—1 hour. Prerequisite: graduate standing and consent of instructor. Current progress in microbiology and cellular and molecular biology. May be repeated for credit. (S/U grading only.)—I, II, III. (I, 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. (I, II, III.)

297. Seminar in Animal Virology (1) Seminar—1 hour. Prerequisite: consent of instructor. Discussion of current topics in animal virology. (Same course as Pathology, Microbiology, and Immunology 297A.) May be repeated for credit. (S/U grading only.)—I, II, III. (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 Course

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.)

Microbiology (A Graduate Group)

Linda F. Bisson, Ph.D., Chairperson of the Group

Group Office. 3143 Tupper Hall (Medical Microbiology and Immunology)

(530) 752-0262

Faculty

Stanley W. Arzt, Ph.D., Professor (Microbiology)

Enoch F. Baldwin, Ph.D., Assistant Professor (Molecular and Cellular Biology)

Peter A. Barry, Ph.D., Assistant Professor (Comparative Medicine)

Stephen W. Barthold, Ph.D., Professor (Pathology, Microbiology, and Immunology)

Nicole Baumgarth, Ph.D., Associate Professor (Center for Comparative Medicine)

Andrew Baumber, Ph.D., Professor (Medical Microbiology and Immunology)

Blaine L. Beamam, Ph.D., Professor (Medical Microbiology and Immunology)

Charles L. Bevins, Ph.D., Professor (Medical Microbiology and Immunology)

Linda F. Bisson, Ph.D., Professor (Viticulture and Enology)

Aaron Brau, Ph.D., Assistant Professor (Pathology, Microbiology, and Immunology)

George E. Bruening, Ph.D., Professor (Plant Pathology)

Sean M. Burgess, Ph.D., Assistant Professor (Molecular and Cellular Biology)

Barbara A. Byrne, Ph.D., Assistant Professor (Pathology, Microbiology, and Immunology)

Robert D. Cardwell, Ph.D., Professor (Medical Pathology)
Carol Cardona, Ph.D., Assistant Professor
(Veterinary Medicine)
R. Holland Cheng, Ph.D., Professor
(Molecular and Cellular Biology)
Anthony T. W. Cheung, Ph.D., Professor
(Medical Pathology)
Bruno B. Chomel, Ph.D., Professor
(Population Health and Reproduction)
Ronald Y. Chuang, Ph.D., Professor
(Medical Pharmacology and Toxicology)
Dean O. Cliver, Ph.D., Professor
(Population Health and Reproduction)
Patricia A. Conrad, Ph.D., Professor
(Pathology, Microbiology, and Immunology)
James S. Collor, Ph.D., Associate Professor
(Population Health and Reproduction)
Michael E. Dahmus, Ph.D., Professor
(Medical Microbiology and Immunology)
Satya Dandekar, Ph.D., Professor
(Microbiology)
Angela Gelli, Ph.D., Assistant Professor
(Pharmacology and Toxicology)
Laurel J. Gershwin, Ph.D., Professor
(Pathology, Microbiology, and Immunology)
M. Eric Gershwin, Ph.D., Professor (Rheumatology)
Ronald H. Hedin, Ph.D., Professor
(Medicine and Epidemiology)
John W. B. Hershey, Ph.D., Professor
(Biological Chemistry)
Wolfgang Heyer, Ph.D., Professor (Microbiology)
Michael J. Holland, Ph.D., Professor
(Biological Chemistry)
Neil Hunter, Ph.D., Assistant Professor
(Microbiology)
Michele M. Igo, Ph.D., Associate Professor
(Microbiology)
Kenneth B. Kaplan, Ph.D., Assistant Professor
(Molecular and Cellular Biology)
Stephen C. Kowalczykowski, Ph.D., Professor
(Microbiology)
Hsing-Jen Kung, Ph.D., Professor
(Biological Chemistry)
Rance B. LeFebvre, Ph.D., Professor
(Pathology, Microbiology, and Immunology)
Patrick S. C. Leung, Ph.D., Associate Adjunct Professor (Internal Medicine)
Su-Ju Lin, Ph.D., Assistant Professor (Microbiology)
Paul Luciw, Ph.D., Associate Professor
(Patent Medicine)
Shirley Luckhart, Ph.D., Associate Professor
(Medical Microbiology and Immunology)
Jaakko S. Manning, Ph.D., Professor (Microbiology)
Karen A. McDonald, Ph.D., Professor
(Chemical Engineering and Material Science)
John C. Meeks, Ph.D., Professor (Microbiology)
Christopher J. Miller, Ph.D., Associate Professor
(Pathology, Microbiology, and Immunology)
David A. Nilsen, Ph.D., Professor
(Viticulture and Enology)
Douglas C. Nelson, Ph.D., Professor (Microbiology)
Thomas W. North, Ph.D., Professor
(Center for Comparative Medicine)
Jodi Nunnari, Ph.D., Assistant Professor
(Molecular and Cellular Biology)
David M. Ogrydziak, Ph.D., Professor
(Food Science and Technology)
Bennie I. Osburn, Ph.D., Professor
(Pathology, Microbiology, and Immunology)
Demosthenes Pappageorgiou, Ph.D., Professor
(Medical Microbiology and Immunology)
Rebecca E. Parales, Ph.D., Assistant Professor
(Microbiology)
Niels C. Pedersen, Ph.D., Professor
(Medicine and Epidemiology)
Claire Pomery, Ph.D., Professor
(Medicine and Infectious Diseases)
Edmund R. Powers, Ph.D., Assistant Professor
(Molecular and Cellular Biology)
Martin L. Privalsky, Ph.D., Professor (Microbiology)
Kathryn Radke, Ph.D., Associate Professor
(Animal Sciences)
Gary H. Rhodes, Ph.D., Associate Adjunct Professor
(Pathology)
John R. Roth, Ph.D., Professor (Microbiology)
Dewey D. Y. Ryu, Ph.D., Professor
(Checmical Engineering and Material Science)
Michael A. Savageau, Ph.D., Professor
(Biomedical Engineering)
Jonathan Scholz, Ph.D., Professor
(Molecular and Cellular Biology)
Kate M. Scow, Ph.D., Associate Professor
(Land, Air, and Water Resources)
Irvin H. Segel, Ph.D., Professor
(Molecular and Cellular Biology)
Barbara L. Shacklett, Ph.D., Assistant Professor
(Medical Microbiology and Immunology)
Kazuhiro Shizaki, Ph.D., Assistant Professor (Microbiology)
Mitchell H. Singer, Ph.D., Associate Professor
(Microbiology)
Jay V. Solnick, Ph.D., Assistant Professor
(Internal Medicine)
Heinrich Stahlberg, Ph.D., Assistant Professor
(Molecular Cellular Biology)
Jeffrey L. Stott, Ph.D., Professor
(Pathology, Microbiology, and Immunology)
Michael Syvanen, Ph.D., Professor
(Medical Microbiology and Immunology)
Jose V. Torres, Ph.D., Assistant Professor
(Medical Microbiology and Immunology)
Reene Tsolis, Ph.D., Assistant Professor
(Medical Microbiology and Immunology)
Stefan Wurz, Ph.D., Professor
(Civil and Environmental Engineering)
Tahlan D. Yilmaz, Ph.D., Professor
(Pathology, Microbiology, and Immunology)
Glenn M. Young, Ph.D., Assistant Professor
(Food Science and Technology)
Affiliated Faculty
Marta L. Marthas, Ph.D., Assistant Adjunct Professor
(California Regional Primate Research Center)
Earl T. Sawai, Ph.D., Assistant Adjunct Professor
(Medical Microbiology and Immunology)
Ellen E. Sparger, Ph.D., Adjunct Professor (Medicine and Epidemiology)
Graduate Study. The Graduate Group in Microbiology offers study and research leading to the M.S. and Ph.D. degrees. Doctoral work is given to doctoral applicants. The group offers study in general microbiology, microbial physiology, microbial genetics, molecular mechanisms of microbial regulation, and molecular mechanisms of microbial pathogenesis, immunology, virology, and recombinant DNA technology. For information on the graduate study and undergraduate preparation for the program contact a graduate adviser or the Chairperson of the Group.
Graduate Advisers. P. Barry (Center for Comparative Medicine), L.F. Bisson (Viticulture and Enology), K. Radke (Animal Science), R.E. Parales (Microbiology), K. Shizaki (Microbiology), E.E. Sparger (Vet Med: Medicine)
Courses in Microbiology (MIB)
Graduate Courses
290C. Advanced Research Conference (1)
Discussion/conference—1 hour. Prerequisite: graduate standing and/or 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, IV.)
299. Research (1-2)
Research under the guidance of dissertation committee. (S/U grading only.)

Middle East/South Asia Studies

(College of Letters and Science)
The Program in Middle East/South Asia Studies takes an interdisciplinary approach to the study of this important world area. Participating faculty are drawn from a variety of departments and programs, including Anthropology, Asian American Studies, Comparative Literature, English, History, Religious Studies and Women and Gender Studies. The minor in Middle East/South Asia Studies offers students a unique opportunity to study exchanges, complementarities, and correspondences in the region in religion, family structures, gender relations, media, literature and film, history, anthropology, law, political economy, international relations, development, diasporas, urbanism, and other themes.

Minor Program Requirements:

UNITs

Middle East/South Asia Studies 100 ............................... 4
Choose one course from Anthropology 142, Comparative Literature 166, History 190A, 190B, 190C, 193A, 193B, Religious Studies 160, 162; Women’s Studies 178A, 178B, 178C .............................................. 4
Choose one course from Anthropology 145, History 102Q, 196A, 196B; Geography 126; Religious Studies 168, 170, Women’s Studies 178A, 178B, 178C, 178D .............................................. 4
Additional Electives from Core Course list (below) .............................................. 8-12
Core Course List: Anthropology 142, 145, Comparative Literature 166, History 102Q, 190A, 190B, 190C, 193A, 193B, 196A, 196B; Geography 126; Middle East and South Asian Studies 180, 192, 198, 199; Religious Studies 160, 162, 168, 170; Women’s Studies 178A, 178B, 178C, 178D
Note: With prior consultation with an adviser, students can petition the Program Committee in advance to accept other elective courses toward the minor program. Under no circumstances may more than one lower division course be offered in satisfaction of requirements for the minor program.
Note: With prior consultation with an adviser, students can petition the Program Committee to accept more than four units of Middle East and South Asian Studies 192, 198, and/or 199 towards the minor program.
Minor Adviser. Consult the Department of Anthropology in 330 Young Hall, (530) 752-0745 or 0746.

Courses in Arabic (ARB)

Lower Division Courses

2. Elementary Arabic 2 (5)
Lecture/discussion—5 hours. Prerequisite: course 1 or with instructor’s consent after student takes all components of the course 1 final exam. Continues introduction to basic Arabic from course 1 and 2. Intercultural and integrated presentation of listening, speaking, reading, and writing skills, including syntax. Focus on standard Arabic and limited use of spoken Egyptian and/or one colloquial dialect.—II. (Ilr) Sharlet

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 final exam for course 1 and 2. Continues introduction to basic Arabic from courses 1 and 2. Intercultural and integrated presentation of listening, reading, and writing skills, including syntax. Focus is on standard Arabic with limited use of spoken Egyptian and/or one other colloquial dialect.—II. (Ilr) Sharlet

21. Intermediate Arabic 21 (5)
Lecture/discussion—5 hours. Prerequisite: course 1, 2, or 3 or with consent of instructor after taking all parts of course 3 final exam. Builds on courses 1, 2, and 3. Intercultural and integrated presentation of listening, speaking, reading, and writing skills, including idiomatic expression. Focus is on standard Arabic with limited use of Egyptian and/or one other colloquial dialect.—I. (Il) Sharlet

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer, 2007-2008 offering in parentheses

General Education (GE) credit: Arhum=Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Social-Cultural Diversity; Writ=Writing Experience
22. Intermediate Arabic 22 (5)
Lecture/discussion—3 hours. Prerequisite: course 21 or with consent of instructor after taking all parts of course final 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. —II. (II) Sharlet

23. Intermediate Arabic 23 (5)
Lecture/discussion—3 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. —III. (III) Sharlet

Courses in Hindi (HIN)
Lower Division Courses
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. —I. (I)

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. —II. (II)

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. —III. (III)

Lecture/discussion—5 hours. Prerequisite: course 3. 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. —I. (I)

22. Intermediate Hindi/Urdu II (5)
Lecture/discussion—5 hours. Prerequisite: course 21. An intermediate level course for students who will continue to practice their skills in listening, speaking, reading and writing in Hindi and Urdu. —II. (II)

23. Intermediate Hindi/Urdu III (5)
Lecture/discussion—5 hours. Prerequisite: course 22. An intermediate level course for students who will continue to practice their skills in listening, speaking, reading and writing in Hindi and Urdu. —III. (III)

Courses in Middle East and South Asian Studies (MSA)
Upper Division Courses
100. Middle East and South Asia: Comparative Perspectives (4)
Lecture—3 hours; extensive writing. Comparative perspective on the Middle East and South Asia. Topics may include modernity, religious traditions, colonialism, subalternity and social movements, gender and sexuality, history and memory, science and development, ritual and performance, public culture, diasporas. May be repeated one time for credit. GE credit: ArtHum, Div, Wrt—I, II, III. (I, II, III)

107. Topics in Middle East and South Asian Studies (4)
Lecture—3 hours; extensive writing. Comparative perspective on the Middle East and South Asia. Topics may include modernity, religious traditions, colonialism, subalternity and social movements, gender and sexuality, history and memory, science and development, ritual and performance, public culture, diasporas. May be repeated one time for credit. GE credit: ArtHum, Div, Wrt—I, II, III. (I, II, III)

Military Science
[College of Letters and Science]
Reserve Officers’ Training Corps (ROTC), Army
Mark W. Connelly, Lt. Col., Chairperson of the Department, Professor of Military Science
Department Office. 125 Hickey Gymnasium (530) 752-5211

Faculty
Major Mark VarRosky, Associate Professor
Major Russell Meyer, Assistant Professor
Captain Jason D. Hioco, Assistant Professor

Program of Study
The Military Science Department offers hands-on training in management and leadership. The program stresses the following Army Values: loyalty, duty, respect, selfless-service, honor, integrity, and personal courage. The program also stresses leader- ship dimensions as taught in the classes. Also stressed are current events, national and interna- tional politics, military affairs, ethics training, and human relations with emphasis on eliminating racial and gender discrimination. Management and leader- ship are taught using the U.S. Army as a model. Military skills such as drill and ceremonies, 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 military obligation to the military and is open to all students. Students pur- suing 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 the Ranger Club (a club designed for adventure activities such as rappel- ling, white-water rafting, orienteering, and patrol- ling) and intramural sports teams.

Students who desire a commission in the U.S. Army participate in both the academic portion of the pro- gram and in the leadership laboratories and extra- curricular activities designed to enhance their leader- ship and technical skills. They wear uniforms to lead- ership laboratories and selected classes and become ROTC cadets. Students may be cadets in the lower division courses without incurring a military obliga- tion. Students participating in the upper division pre- commissioning program incur 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 atten- dance in lower division courses. Students are entitled 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 other requirements. Qualified veterans can enter the advanced course immediately because of their mili- tary service experience, upon approval by the Department Chairperson.

Two-Year Program
The two-year program is for students, including grad- uate students, who have not attended lower division Military Science classes. In lieu of lower division courses an applicant attending a six-week summer pro- gram, Leaders Training Course (LTC) 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 Dedication National Guard scholarships to students planning to attend or attending UC Davis. The U.S. Army ROTC scholarship pack- age pays tuition and educational fees. Also included in all scholarships is a flat rate of $900 per year for textbooks.

The Reserve Officers’ Training Corps four-year Active Duty merit scholarships are awarded to quali- fied high school seniors in a national competition each year. There are three cycles available for sub- mission of the four-year scholarship application. As high school seniors, students compete for the Regular Cycle scholarship by submitting their complete applic- ation. Interested applicants should apply at http://www.monroe.army.mil or contact UC Davis, Depart- ment of Military Science at (530) 752-7682. 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 leadership skills, including tactics, strategies, leadership, and techniques. Students engage in team building activities including off-the-grid exercises, off-road driving, 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 Warrior Forge, held at Fort Lewis, Washington.

Academic Credit
College of Agricultural and Environmental Sciences.

The Bachelor of Science degree in agricul- ture requires the completion of 180 units. Military Science courses are counted in the unit allowance 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 allowance for electives.

School of Veterinary Medicine, The number of Military Science units acceptable toward the Bachelor of Science degree in Veterinary Medicine is on 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.

Courses in Military Science (MSC)

Lower Division Courses

11. Roles and Organization of the U.S. Army (1)
Lecture—2 hours. Prerequisite: lower division standing. Constitutional and legal basis of the Army, organization and strategic roles in times of war and peace, and "total Army" concept. Impact of civil-military relations and Soviet military power on role of Army studied in context of current problems.—I. (I.)

12. Introduction to Military Leadership (2)
Lecture—2 hours. Prerequisite: lower division standing, and consent of instructor. Introduction to leadership roles in military organizations. Course surveys the duties and responsibilities of junior Army officers, the general environment in which they work, and leadership roles performed. Introduces military map reading skills.—(II.)

13. Introduction to Basic Military Operations (1)
Lecture—1 hour. Prerequisite: lower division standing. Basic military tactical theories and their application at the individual and squad level. Course introduces military tactical operations, and covers military first aid. Principles of war as introduced in course 11 are applied to offensive and defensive tactics.—II. (II.)

14A. Introduction to Military Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: lower division standing and consent of instructor; completion of all previous laboratories. Personal and organizational leadership skills introduced in leadership laboratory. Extensive supervised leadership experiences conducted in a military environment. Basic military skills necessary for leadership role are also covered. (P/NP grading only)—I. (I.)

14B. Introduction to Military Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: lower division standing and consent of instructor; completion of all previous laboratories. Development of leadership and military skills introduced in course 14A is continued with emphasis on the individual’s role in the squad, the basic organizational element of the Army. As students gain capabilities, supervisory controls are reduced. (P/NP grading only)—II. (II.)

14C. Introduction to Military Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: lower division standing and consent of instructor; completion of all previous laboratories. Students demonstrate skill levels required for promotion to non-commissioned officer level. Upper chain of command from company through individual levels emphasized. Interrelations of squad and platoon organizations is explored. (P/NP grading only)—III. (III.)

21. Military History (2)
Lecture—2 hours. Prerequisite: lower division standing; course 11 or consent of instructor. Survey of military history from 1900 to present, focusing on World War I, World War II, the Korean War, and the present. (P/NP grading only)—III. (III.)

22A. Intermediate Military Leadership and Operations I (2)
Lecture—2 hours. Prerequisite: lower division standing; course 12 or consent of instructor. Develops and exercises personal leadership skills in extensive supervised leadership laboratory. Intermediate level military skills necessary for leadership roles as junior non-commissioned officers are developed. Students perform in role of junior non-commissioned officers.—I. (I.)

22B. Intermediate Military Leadership and Operations II (2)
Lecture—2 hours. Prerequisite: lower division standing; course 22A or consent of instructor. Continuation of course 22A. Intermediate leadership skills identified in course 22A are studied in more depth, enabling each student to target weaknesses. Instruction is presented in intermediate defensive tactics at the squad level.—II. (II.)

24A. Individual Military Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: lower division standing; courses 14A, 14B, 14C and 21, or consent of instructor. Develops and exercises personal military leadership skills in extensive supervised leadership laboratories. Intermediate level military skills necessary for leadership roles as junior non-commissioned officers are developed. Students perform in role of junior non-commissioned officers. (P/NP grading only)—II. (II.)

24B. Individual Military Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: lower division standing; courses 14A, 14B, 14C and 21, or consent of instructor. Students are prepared for transition from junior leader to senior non-commissioned officer. Chain of command and hierarchical responsibilities and reporting requirements are demonstrated in a laboratory setting. (P/NP grading only)—II. (II.)

24C. Individual Military Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: lower division standing; courses 14A, 14B, 14C and 21, or consent of instructor. Students are prepared for transition from junior leader to senior non-commissioned officer. Chain of command and hierarchical responsibilities and reporting requirements are demonstrated in a laboratory setting. (P/NP grading only)—II. (II.)

Upper Division Courses

131. Advanced Military Leadership and Management (2)
Lecture—2 hours. Prerequisite: upper division standing; course 22A or consent of instructor. Course addresses different types of power and influence a military leader may use, reviews counseling techniques, and introduces basic management skills. Instruction provided on the various branches in which a commissioned officer may serve.—III. (III.)

132A. Advanced Military Operations (2)
Lecture—2 hours. Prerequisite: upper division standing; course 22B or consent of instructor. First phase of advanced military tactical operations. Advanced work on topographical maps, navigation, and orienteering techniques. Instruction is also provided on resource planning techniques and military intelligence.—II. (II.)

132B. Advanced Military Operations (2)
Lecture—2 hours. Prerequisite: upper division standing; course 22B or consent of instructor. Continuation of course 132A. Military tactical theories and their application in offense and defense are presented at the platoon and company level. Course covers in-depth analysis of the principles of war related to offensive and defensive operations.—II. (II.)

134A. Military Organizational Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: upper division standing; courses 24A-24B-24C or consent of instructor. Students develop personal and management skills by practical application of leadership of military organizations in a supervised leadership laboratory. Advanced level military skills presented. Students fulfill role of non-commissioned officers. (P/NP grading only)—II. (II.)

134B. Military Organizational Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: upper division standing; courses 24A-24B-24C or consent of instructor. As more complex material is presented in classroom, the laboratory environment becomes more challenging. Students assume senior non-commissioned officers in squad, platoon and company levels, given appropriate authority and responsibility. (P/NP grading only)—II. (II.)

134C. Military Organizational Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: upper division standing; courses 24A-24B-24C or consent of instructor. Students prepared for advanced summer training experience by establishing a plan, organize and conduct military operations in field environments; individual leadership potential is closely assessed in the laboratory environment. (P/NP grading only)—II. (II.)

141. U.S. Army Management Systems (2)
Lecture—2 hours. Prerequisite: upper division standing and course 131. Army decision making, personnel and equipment management. Includes command and staff functions, training, gathering, techniques for the conduct of meetings, and logistics management procedures at unit level.—III. (III.)

142. Military Law (2)
Lecture—2 hours. Prerequisite: upper division standing and course 141. Army and General Mili- tary Justice System, the Uniform Code of Military Justice, the Hague and Geneva Conventions, and customary law of war. Includes detailed study of selected procedures of military justice system.—II. (II.)

143. Military Ethics and Professionalism (2)
Lecture—2 hours. Prerequisite: upper division standing and course 142. Profession of arms, its characteristics, uniqueness, roles, and responsibilities. Discussion topics include the professional soldier’s responsibilities to the Army and the Nation, and the need for ethical conduct. Case studies are used to develop ethical decision making skills.—II. (II.)

144A. Military Training Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: upper division standing; courses 134A, 134B, 134C, and 141. Develops and exercises the leadership skills necessary to plan, coordinate and conduct a training program through practical application under supervision. Emphasis on analysis of objectives, instructor planning, media utilization and evaluation of learning. Students perform as cadet officers. (P/NP grading only)—II. (II.)

144B. Military Training Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: upper division standing; courses 134A, 134B, 134C, and 141. Requirements for training of all other levels of the cadet corps are given to students for conduct in laboratory environment (under supervision). Students placed in realistic role of junior officer with appropriate level of responsibility. Students perform as cadet staff officers. (P/NP grading only)—II. (II.)

144C. Military Training Leadership Skills (0.5)
Laboratory—2 hours. Prerequisite: upper division standing; courses 134A, 134B, 134C, and 141. Final laboratory in military science sequence; students are prepared for final testing and certification prior to commissioning as officers. Students will demonstrate all leadership skills necessary to commissioned officers. Students perform leadership tasks at platoon, company, and battalion levels. (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 special or more critical problems in military science. Possible areas of study include leadership dimensions, principles of war, air-battle imperative, military strat-
Molecular Biosciences

Aerospace Studies (Air Force)
The Air Force Reserve Officer's Training Corps (AFROTC) is an educational program providing training in leadership, management, communications and military proficiency on college and university campuses. It also provides an opportunity to obtain a commission as a second lieutenant in the Air Force and enter the active duty forces after you complete a bachelor's or a graduate degree. The skills you acquire will become valuable assets for any career you choose.

The program is normally four years long, but a flexible design allows students to complete the curriculum in as little as two years. Undergraduate scholarships are available, but are not necessary for participation. 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 Sacramento 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 30 at time of graduation (may be waived)

Scholarships
Opportunities for four-year and three-year undergraduate scholarships are better than ever. Scholarships cover the full cost of tuition, books and required fees of California and are available for eligible high school seniors. It also includes $150 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 detachments for information.

Applications are also available from local Air Force recruiters or your high school guidance counselors. All scholarships are merit-based and consider a variety of factors: cumulative GPA, class standing, SAT/ACT scores, academic awards/achievements, leadership ability, athletic involvement, extracurricular activities, community service and letters of recommendation. All scholarship recipients must graduate and be commissioned before their 27th birthday (may be waived for prior military personnel). A personal interview with an Air Force officer is also part of the application process. Prior to accepting 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 700 universities and colleges nationwide.

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 scientific and technical majors such as engineering, atmospheric science, math, computer science, and physics. GPA Scholarship requirements for nontechnical majors are slightly higher. Applicants are primarily evaluated on their leadership ability and academic performance. Scholarship boards meet throughout the year for scientific and technical majors and in July for all academic majors. Scholarships also include a $150 monthly stipend throughout the school year, required books and fees. Other loans and grants may be used towards room and board costs.

Challenging Careers
All commissioned officers enter the Air Force as second lieutenants for a four-year active duty service commitment. Pilots and navigators serve longer commitments, 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 fighter, supervising 130 aircraft maintainers on the flightline, or caring for sick personnel in the emergency room, you will be rewarded knowing that you are making a difference.

AFROTC at UC Berkeley
AFROTC Detachment 85
176 Hearst Gym, Berkeley, CA, 94720-3610
(800) 852-5747 or (510) 642-3572; brown@clin64.berkeley.edu; http://airforotec.uc.berkeley.edu

To receive hands-on leadership and management practice, freshmen and sophomores take a one-hour academic course and a two-hour Leadership Laboratory each week; juniors and seniors take a three-hour course plus the lab. All units can be used as elective credit towards graduation. See the Military Sciences course listings in the UC Berkeley catalog. Classes are held during the fall and spring semesters and the curriculum includes the history of airpower, leadership and management topics, communication skills, and aides.

Between the sophomore and junior years, cadets compete to attend a four- or six-week field training program at a designated Air Force base. This competitive program consists of physical conditioning, outdoor survival training, career and aircraft orientation evaluations, and an evaluation of leadership potential. Additional optional training opportunities are available during the summer months and include the Royal Air Force Exchange Program, Pentagon Internships, Jump School and Glider Training at the Air Force Academy, and summer job shadowing. Students are also encouraged to participate in optional orientation flights, base visits, and community service projects throughout the school year.

AFROTC at CSU Sacramento
California State University Sacramento
Public Service Building, Room 208
6000 J Street
Sacramento, CA 95819-6094
(916) 278-7315

The CSUS Department of Aerospace Studies offers two, three-, or four-year programs leading to a commission in the U.S. Air Force. About 30 percent of the corps graduates to CSUS from UC Davis. All course work (12 or 16 semester units) is completed on the CSUS campus. Drills and courses are normally offered on Tuesdays, Wednesdays, and Thursdays. Field training is conducted at an active Air Force base during the summer, normally between the student's sophomore and junior years.

Upon completion of the program (integrated with UC Davis' quarter system) and all requirements for a bachelor's degree are completed as second lieutenants in the Air Force and serve a minimum of four years on active duty. Graduates who are qualified and selected may enter pilot or navigator training after graduation, or serve in a specialty consistent with their academic major, individual goals, and existing Air Force needs. Graduates may request a delay of entry to active duty to continue their education or may apply for Air Force sponsored graduate study to begin immediately upon entry to active duty. Due to firm scheduling requirements for the AFROTC program, students are encouraged to work closely with their academic advisers in planning their academic program.

AFROTC offers 3-year and 2-year scholarships to qualified students. Applications are accepted in any academic discipline. Express scholarships are currently available for qualified students majoring in electrical engineering and meteorology. Express scholarships pay up to $15,000 annually in tuition and fees, $480 per year in textbooks, and $150 per month stipend.

Applications should normally be no later than the first quarter of a student's sophomore year. Juniors, seniors, and graduate students may also apply under certain conditions. Contact the Unit Admissions Office at the Department of Aerospace Studies Department at CSUS (916) 278-7315 for information.

Naval ROTC

Naval ROTC
Department of Naval Science
152 Hearst Gymnasium, UC Berkeley
Berkeley, CA 94270-3640
(510) 642-3351; 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 Systems I

Junior year:
- NS 12A Navigation and Naval Operations I
- NS 12B Navigation and Naval Operations II

Senior year:
- NS 401 Naval Ship Systems II
- NS 412 Leadership and Ethics

In lieu of NS401, NS10, NS12A and NS12B, Marine Corps students participate in Marine Seminars and complete MA154, History of Littoral Warfare and MA20, Evolution of Warfare (or a designated equivalent). Scholarship students are required to complete a number of other courses at Davis, including one year each of calculus, physics, and English, and one quarter each of computer science, and military history or national security policy.

Interested students should contact the Department of Naval Science at UC Berkeley at the address above to obtain information and apply.

Molecular Biosciences
Molecular and Cellular Biology

(College of Biological Sciences)

Michael E. Dahms, Ph.D., Chairperson of the Section

Section Office. 149 Briggs Hall
(530) 752-3611; http://www.mcb.ucdavis.edu

Faculty

Primary Section Members

Peter B. Armstrong, Ph.D., Professor
Enoch Baldwin, Ph.D., Associate Professor
Jamie R. Biehl, Ph.D., Assistant Professor
Kenneth C. Burris, Ph.D., Professor
Judy Callis, Ph.D., Professor
Frederic L. Chedin, Ph.D., Assistant Professor
Richard H. Doi, Ph.D., Professor
Ray H. Doi, Ph.D., Distinguished Professor
Bruce W. Draper, Ph.D., Assistant Professor
JoAnne Engbrecht, Ph.D., Associate Professor
Carol A. Erickson, Ph.D., Professor
Erick J. Fiehn, Ph.D., Associate Professor
Marilynn E. Etzler, Ph.D., Professor
Carol A. Erickson, Ph.D., Professor
Bruce W. Draper, Ph.D., Assistant Professor
Michael E. Dahms, Ph.D., Professor

Secondary Section Members

John J. Harada, Ph.D., Professor
Steven M. Theg, Ph.D., Professor
Martin L. Privalsky, Ph.D., Professor
Pamela A. Pappone, Ph.D., Professor
William J. Lucas, Ph.D., Professor
Raymond L. Rodriguez, Ph.D., Professor
Edmund R. Powers, Ph.D., Associate Professor

Academic Senate Distinguished Teaching Award

Senate Distinguished Teaching Award, UC Davis
(Chemistry)

Total Units for the Major ............107-112

Master Adviser. R.H. Doi

Advising Center for the major is located in 156 Briggs (530) 752-9032.

Graduate Study. See Biochemistry and Molecular Biology (A Graduate Group), on page 156; and Graduate Studies, on page 97 in this catalog.

The Cell Biology Major Program

The Cell Biology major program provides students with a comprehensive understanding of the cell, the basic structural and functional unit of all living organisms.

The Program. To understand living organisms, the biologist must understand cell. Hence, cell biology lies at the core of the biological sciences. Students taking this major gain a solid foundation in biological principles. The major emphasizes how cellular organization and function contribute to the development, maintenance and reproduction of adult organisms. The major illustrates the ways in which principles derived from the physical sciences, genetics, biochemistry, molecular biology and physiology are integrated in the study of living cells and emphasizes the experimental nature of the study of cell biology.

Career Alternatives. The major provides an excellent background for those wishing to enter postgraduate and professional programs in biological, health sciences or veterinary sciences; for students pursuing careers involving teaching or research in the biomedical sciences; for students interested in careers in the biotechnological or pharmaceutical industries; or for students interested in careers related to the administrative, legal or commercial aspects of biomedical science.

B.S. Major Requirements:

Preparatory Subject Matter ...............54-58

Biology Sciences 1A-1B-1C ........................15
Chemistry 2A-2B-2C .............................15
Mathematics 16A-16B-16C .................9
Physics 7A-7B-7C ..............................12
Statistics 1A-1B-1C, 103 (recommended) ....6
Chemistry 8B-8C or 118A-118B-118C ..........................6-12

Depth Subject Matter ...........45-47

Biology Sciences 101, 102, 103, 104, 110, 202, 204, Molecular and Cellular Biology 140, 150, 150L ....9
Two courses from Molecular and Cellular Biology 143, 144, or 145 ....6
Molecular and Cellular Biology 121 or 161 ...............3
One additional upper division laboratory course from: Molecular and Cellular Biology 120L, 160L; Pathology, Microbiology, and Immunology 126 and 126L ...............4.6
Select at least 10 units from the following:
Chemistry 107A, 107B, 108, Molecular and Cellular Biology 120L, 138, 142, 148, 158, 160L, 163, 178; Neurobiology, Physiology, and Behavior 103; Pathology, Microbiology, and Immunology 126, 126L; no more than 4 units of research (193, 194H, 199) can be used for credit in this category .................10

Total Units for the Major .............106-114

Master Adviser. D.G. Myles

Advising Center for the major is located in 156 Briggs (530) 752-2020.

The Genetics Major Program

The Genetics major provides a broad background in the biological, mathematical, and physical sciences basic to the study of heredity, gene expression and evolution. 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 such as biotechnology, medicine, and agriculture.
The Program. The genetics program begins with the four-course, upper division core curriculum that provides an introduction to the principles of genetics, biochemistry, and cell biology. Students then take additional upper division courses in specialized areas of modern genetics, including gene expression, evolution, development, human genetics and genomics, as well as a laboratory course in the principles of genetics. Additional upper division courses in biological sciences, as well as an internship/research coursework can be chosen to fulfill required elective units.

Career Alternatives. The genetics degree provides suitable preparation for a wide variety of careers, including teaching, research, work in biotechnology companies, medicine, and all the health sciences. It is also an excellent background for students wishing to continue their education in a graduate program, a teacher-training program, medical school, veterinary school, or other professional schools.

B.S. Major Requirements:

<table>
<thead>
<tr>
<th>Preparatory Subject Matter</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences 1A-1B-1C</td>
<td>15</td>
</tr>
<tr>
<td>Chemistry 2A-2B-2C or 2AH-2BH</td>
<td>2CH</td>
</tr>
<tr>
<td>Chemistry 8A-8B or 118A-118B</td>
<td>6-12</td>
</tr>
<tr>
<td>Mathematics 16A-16B-16C or 21A-21B</td>
<td>21C</td>
</tr>
<tr>
<td>Physics 7A-7B-7C</td>
<td>12</td>
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<thead>
<tr>
<th>Degree Subject Matter</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Molecular and Cellular Biology 101, 102, 103, 104</td>
<td>13</td>
</tr>
<tr>
<td>Molecular and Cellular Biology 160L</td>
<td>16.4</td>
</tr>
<tr>
<td>Evolution and Ecology 100</td>
<td>4</td>
</tr>
<tr>
<td>One course from Molecular and Cellular Biology 161 (recommended) or 121</td>
<td>3</td>
</tr>
<tr>
<td>Two courses from Molecular and Cellular Biology 162, 163, 182 or Evolution and Ecology 102</td>
<td>6-7</td>
</tr>
<tr>
<td>Statistics 100</td>
<td>4</td>
</tr>
<tr>
<td>Restricted Electives</td>
<td>11</td>
</tr>
</tbody>
</table>

Upper division courses in genetics or other fields relevant to the student’s interest chosen in consultation with the adviser. No more than 4 units of 192, 193, 198, or 199 can be used for credit in this category.

Total Units for the Major | 105-115

Masters Adviser, J.E. Natzle

Advising Center for the major is located in 156 Briggs Hall (530) 752-0202.

Graduate Studies, The Graduate Group in Genetics offers study and research leading to the M.S. and Ph.D. degrees in Genetics.

Courses in Molecular and Cellular Biology (MCB)

Lower Division Courses

10. Introduction to Human Heredity (4)
   Lecture—3 hours, discussion—1 hour. Topics in human genetics, gene structure and function, including the genetic basis of human development, causes of birth defects, mental retardation, genetic diseases, sexual determination, development, and behavior. GE credit: SciEng—II, III, III. Sanders

99. Special Study (1-5)
   Independent study—3-15 hours. Prerequisite: consent of instructor. (P/NP grading only)

Upper Division Courses

120L. Biochemistry Laboratory (6)
   Laboratory—10 hours, lecture—2 hours, laboratory/dissertation—1 hour. Prerequisite: a biological sciences 103 (may be taken concurrently). Introduction to laboratory methods and procedures employed in studying biochemical processes. Designed for students who need experience in the use of biochemical techniques as laboratory tools—I, II, III, (II, III) Gasser, Hilt, J.C. Lagarias, L. Morand, Robin, L. Segel

121. Molecular Biology of Eukaryotic Cells (3)
   Lecture—3 hours. Prerequisite: Biological Sciences 101 and 102. Structure, expression, and regulation of eukaryotic gene. Chromatin structure and replication; gene structure, transcription, and RNA processing; protein synthesis and translation control; development, immune system, and oncogenes. Not open to credit for students who have completed Molecular and Cellular Biology 161. I, III, (II, III) Dahmus, Gasser, Harmer

122. Structure and Function of Proteins (3)
   Lecture—3 hours. Prerequisite: Biological Sciences 102. 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, multiregulated systems, enzyme assays, membrane transport and computer-assisted simulations and analyses. — I, III, (II, III) Segel, Wilson

126. Plant Biochemistry (3)
   Lecture—3 hours. Prerequisite: Biological Sciences 1C or the equivalent, and Biological Sciences 103. The biochemistry of important plant processes and metabolic pathways. Discussion of methods used to understand plant processes, including use of transgenic plants. [Same course as Plant Biology 126]—I, II, III. Abel, Callis

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 problems. May be repeated twice for credit when topic differs. (P/NP grading only)—I, II, III, (II, III) Calis, Gasser, Kaplan, Scholay

140L. Cell Biology Laboratory (4)
   Lecture—2 hours, laboratory—6 hours. Prerequisite: Biological Sciences 104 (may be taken concurrently). Exercises illustrating the principles of cell biology with emphasis on light microscopy.—II, III Numair

142. Advanced Cell Biology: Contractile and Motile Systems (4)
   Lecture—3 hours, term paper. Prerequisite: Biological Sciences 102, 104 (may be taken concurrently). Mathews 168. Advanced cell biology with emphasis on molecular, biophysical and cellular properties of contractile and motile systems.

143. Cell Biophysics (3)
   Lecture—3 hours. Prerequisite: Biological Sciences 101, 102, 103, 104. Physical principles underlying observations and interpretations of cell motility. Organization of biomolecules into higher order subcellular structures that function as macromolecular machines. Examples include cytoskeletal filaments, polymer-motor systems, neurites, axonemes and mitotic spindles.—I, II, (II, III) Scholay

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 cycle growth, DNA replication, segregation of chromosomes and cell division.—II, (III) McNally

154. 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, components of various signaling pathways, and downstream effectors of signaling on cell adhesion, cell differentiation, and programmed cell death.—III (III) Erickson

148. Undergraduate Seminar in Cell Biology (2)
   Seminar—2 hours. Prerequisite: upper division standing in the biological sciences or a related discipline. Students report on current topics in cell biology 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)

150. Embryology (4)
   Lecture—4 hours. Prerequisite: Biological Sciences 101 and concurrent enrollment in course 150L. The events and mechanisms of embryonic development, including fertilization, morphogenesis, cell differentiation and organogenesis, with emphasis on vertebrates.—I, III, (III) Armstrong, Edwards

150L. Laboratory in Vertebrate Embryology (1)
   Laboratory—3 hours. Prerequisite: concurrent enrollment in course 150. The comparative analysis of the embryonic development of vertebrates. (P/NP grading only)—I, III, (II, III) Edwards

158. Undergraduate Seminar in Developmental Biology (2)
   Seminar—2 hours. Prerequisite: upper division standing in the biological sciences or a related discipline. Students report on current topics in cell biology 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)

160L. Principles of Genetics Laboratory (4)
   Laboratory—6 hours, lecture—2 hours. Prerequisite: Biological Sciences 101. Laboratory work in basic and molecular genetics including gene mapping and isolation of mutations. Not open for credit to students who have completed Genetics 100L.—I, II, III, (II, III) Brit, Kiger, Kimbell, Natzle, Rose, Sanders, Sundaresan

161. Molecular Genetics (3)
   Lecture—3 hours. Prerequisite: Biological Sciences 101. Biological Sciences 102 may be taken concurrently. Molecular mechanisms and expression of the genome in eukaryotic and prokaryotic model organisms. How genetic and molecular tools, both classical and modern, are applied to the study of gene structure, function, and regulation. Not open for credit to students who have completed course 121.—II, III Powers

162. Human Genetics (3)
   Lecture—3 hours. Prerequisite: course 161 (preferred) or 121. 164. Human molecular genetic variation, molecular basis of metabolic disorders, chromosome aberrations and consequences, analysis of the human genome, and computational techniques of genetic analysis.—II, III Chedin

163. Developmental Genetics (3)
   Lecture—3 hours. Prerequisite: course 161 (preferred) or 121. 164. Current aspects of development genetics. Historical background and current genetic approaches to development of higher animals.—II, III Natzle

164. Advanced Eukaryotic Genetics (3)
   Lecture—3 hours. Prerequisite: course 161 or 121. The five basic operations of genetic analysis: mutation, segregation, recombination, complementation, and regulation. Emphasis on the theory and practice of isolating and analyzing mutations, as well as understanding mechanisms underlying both Mendelian and epigenetic inheritance.—III, (III) Burgin

178. Undergraduate Seminar in Molecular Genetics (1)
   Seminar—1 hour. Prerequisite: upper division standing, completion of Biological Sciences 101, course 180L, and completion or concurrent enrollment in course 161. Discussion of current topics in molecular genetics to show advanced applications of basic
principles and to highlight professional career opportunities. May be repeated for credit. (P/NP grading only.)—I, II, III, (II, III) Englebrecht, Rodriguez.

182. Principles of Genomics (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101, course 121 or 161. Fundamentals of genomics, including structural genomics, functional genomics, and pathogen genomics, focusing on the impact of these disciplines on research in the biological sciences. Social impacts of genomic research. —III. (III) Korf

190C. Undergraduate Research Conference (1)
Discussion—1 hour. Prerequisite: upper division standing and consent of instructor; concurrent enrollment in course 192 or 199. Presentation and discussion of research projects of faculty and students. May be repeated for credit. (P/NP grading only)—I, II, III, (II, III, III)

191. Introduction to Research (1)
Seminar—1 hour. Prerequisite: Biological Sciences 102 may be taken concurrently or consent of instructor. Various topics in molecular and cellular biology including biochemistry, genetics, and cell biology will be discussed, along with ways undergraduate research can contribute to research projects of faculty members. May be repeated for credit. (P/NP grading only)—I, III, (II, III, III) L. Segel

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: completion of 64 units and consent of instructor. Technical or practical experience on and off campus, supervised by a member of the Section of Molecular and Cellular Biology faculty. (P/ NP grading only.)

193. Advanced Research (3)
Laboratory—6 hours; discussion—1 hour. Prerequisite: upper division standing, completion of an upper division Molecular and Cellular Biology 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 on a weekly basis with faculty sponsor. May include presentation of a seminar to a research group. May be repeated for credit. (P/ NP grading only)—I, II, III, (II, III, III)

194H. Research Honors (3)
Independent study—9 hours. Prerequisite: 6 units of course 193 and/or 199 with faculty director; senior standing, and consent of Section Honors project. Continuation of an intensive, individual laboratory research project in biochemistry, genetics, or cell biology culminating with the presentation of the work and a written thesis and in a seminar. (P/ NP grading only.)

197T. Tutoring in Molecular and Cellular Biology (1-5)
Tutorial—2.6 hours. Prerequisite: upper division standing, completion of course to be tutored, and consent of instructor. Assisting the instructor in one of the section’s regular courses by tutoring individual or small groups of students in a laboratory, in voluntary discussion groups, or other voluntary course activities. May be repeated for credit. (P/ NP grading only)—I, II, III, (II, III)

198. Directed Group Study (1-5)
Variable—1.5 hours. Prerequisite: consent of instructor. (P/ NP grading only)

199. Special Study for Advanced Undergraduates (1-5)
Independent study—3.15 hours. Prerequisite: consent of instructor. (P/ NP grading only)

Graduate Courses

200A. Current Techniques in Cell Biology (2)
Lecture—2 hours. Prerequisite: graduate standing; Biological Sciences 102 or the equivalent courses. Current techniques used in cell biology research including microscopy, spectroscopy, electrophysiology, immunohistochemistry, histology, organelle isolation, calorimetry, tissue culture and gel electrophoresis. Lectures are presented by experts on each technique, with an emphasis on pit-falls to avoid when using the technique. (Same course as Cell and Developmental Biology 200.) (5/ U grading only.)—I, (II) Bed

200B. Current Techniques in Biochemistry (2)
Lecture—2 hours. Prerequisite: Biological Sciences 103 and course 120L or the equivalent. Current techniques used in biochemical research including protein and carbohydrate analyses, immunohistochemistry, recombinant DNA methods, electrophoretic and chromatographic methods. (5/ U grading only.)—II, (II) Kaplan

200C. Current Techniques in Biophysics (2)
Lecture—2 hours. Prerequisite: graduate standing; Biological Sciences 102 or the equivalent. Current techniques in biophysics research including diffraction, magnetic resonance spectroscopy, calorimetry, optical spectroscopy, and electrophysiology. (Same course as Biophysics Graduate Course 200.) (5/ U grading only.)—II, (II) T. Chen, Joe

220L. Advanced Biochemistry Laboratory Rotations (5)
Laboratory—15 hours. Prerequisite: course 221A (may be taken concurrently) and 120L or the equivalent. Two five-week assignments in biochemistry research laboratory can consist of biochemistry research laboratory projects with emphasis on methodological/procedural exper- ience and experimental design. May be repeated twice for credit.—I, II, III, (II, III, III) Chedin, S. Lin

221A. Physical Biochemistry (4)
Lecture—4 hours. Prerequisite: Biological Sciences 103, Chemistry 107B, 108, and 128C, 129C, or 118C or the equivalent or consent of instructor. Chemical and physical properties of biomacromolecules emphasizing the interactions of molecular interactions and thermodynamic properties as deter- minants of higher order structure. The use of NMR and crystallography in determining macromolecular structure. —I, (I) Baldwin, Schmid, Stahlberg, D. Wilson

221B. Mechanistic Enzymology (3)
Lecture—3 hours. Prerequisite: undergraduate level organic and biochemical chemistry, one course in physical chemistry recommended. Analysis of organic enzyme reaction mechanisms and the explo- ration of enzyme catalyzed reactions. —I. (I) Baldwin, Tonev

221C. Molecular Biology (4)
Lecture—4 hours. Prerequisite: course 221A or the equivalent. Pass 1 restricted to graduate students in biochemistry and molecular biology, microbiology, or genetics. Structure and organization of DNA and chromosome, DNA replication, repair and recombin- ation; transcription and RNA processing; protein bio- synthesis and turnover; transcriptional and posttranscriptional control mechanisms; examples from eukaryotic and prokaryotic organisms. (Same course as Genetics 201C.)—III. (III) Baldwin, Bur- gess, H. Chen, Heyer, Powers, Stewart

221D. Cellular Biochemistry (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 102, course 221A or the equiv- alent or consent of instructor. Molecular structure and biochemical properties of cells: membranes; organelle biogenesis and trafficking; signal transduction, metabolism and the cytoskeleton; cytokinetic organization, biophysics of the cytoskeleton and force-generating mechanisms, mechanism of intracel- lular transport and mitosis; cell reproduction and the cell cycle. —II, (II) McNally, Nunnen, Powers, Scholay

241. Membrane Biology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 102, 103, 104 or consent of instructor. Advanced topics on membrane biochemistry and biophysics. Relationship of the unique properties of biomem- branes to their roles in cell biology and physiology. (Same course as Biophysics 241.)—III. (III) Longo, Voss

242. Muscle Biophysics (4)
Lecture—2 hours; discussion—1 hour; term paper. Prerequisite: Biological Sciences 102, 103 and Mathematics 168 or 218; or consent of instructor. The physical and chemical aspects of muscle function.

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. Cellular and functional properties of the molecular and cellular levels of biolog- ical systems. May be repeated for credit.—I. (I) Myles

251. Biology of Fertilization (2)
Lecture—2 hours; term paper. Prerequisite: Biological Sciences 104 or the equivalent, and consent of instructor. The morphology, physiology, and bio- chemistry of gametes, and the mechanism and con- sequences of their union. Offered in alternate years. —(II) Myles

252. Cellular Basis of Morphogenesis (4)
Lecture/discussion—3 hours; term paper. Prerequi- site: course 150. Development of form and structure; morphogenetic movements in systems of cellular motility, cell adhesion, intercellular invasion, interac- tion of cells and tissues in development. Offered in alternate years. —(II) Armstrong

255. Molecular Mechanisms in Animal Development (3)
Lecture—1.5 hours; seminar—1.5 hours. Prerequi- site: graduate standing or consent of instructor; introductory background in developmental biology and molecular genetics recommended. Analysis of the molecular mechanisms that control animal develop- ment, with a special focus on multiple levels of gene regulation. Experimental systems including Drosophila, amphibians, C. elegans, and mice will be dis- cussed. Readings will be taken from current literature. Offered in alternate years. —III. Natzel, L. Rose

256. Cell and Molecular Biology of Cancer (2)
Lecture—1 hour; term paper. Prerequisite: course in cell or developmental biology (e.g., course 150, 141, 163, or Biological Sciences 104). Analysis at the cellular and molecular levels of the regulation of normal and neoplastic tissue growth; tumor dissemi- nation; identification and characterization of onco- genic agents; characterization of oncogenes and trans- suppressor genes. —II, (II) Armstrong

257. Cell Proliferation and Cancer Genes (3)
Lecture—1.5 hours; seminar—1.5 hours. Prerequisite: course 221C and 221D or the equivalent. Genetic and molecular alterations underlying the conversion of normal cells to cancers, emphasizing regulatory mechanisms and pathways. Critical read- ing of the current literature and development of experimental approaches in the future.

258. Seminar in Development (2)
Seminar—2 hours. Prerequisite: consent of instructor. Reports and discussion on embryology, morphogen- esis, and developmental mechanisms. May be repeated for credit.—I, II, (I, III) Armstrong, Erickson, Myles

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, (II, III, III) Armstrong, Erickson, Myles

262. Transgenic Expression Systems (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101 and course 161 or consent of instructor. The molecular biology underlying current transgenic expression systems. Strategies for achieving regu- lated expression and secretion of proteins. Survey of bacterial, yeast, insect cell, mammalian cell, plant and animal expression systems. Offered in alternate years.
Molecular, Cellular, and Integrative Physiology (A Graduate Group)

James R. Millam, Ph.D., Chairperson of the Group

Group Office: 310 Life Sciences Addition
Phone: (530) 752-9092;
http://biosci.ucdavis.edu/ggc/pgg

263. Biotechnology Fundamentals and Application (2)
Lecture—7 hours. Prerequisite: Biological Sciences 101, 102, Microbiology 102, graduate student in good standing. To train graduate students interested in a biotechnology career track, to learn recombinant DNA, rate processes of biological systems, optimi-
zation of bioreactor performance, practical issues in biotechnology, and some course studies of the development of biotechnology products and pro-
cesses. Offered in alternate years.—II. III. McDonald, Privalsky, Rodriguez, Vanderheyst

282. Biotechnology Internship (7-12)
Internship—21-36 hours. Prerequisite: graduate standing and consent of instructor. Research at a bio-
technology company or interdisciplinary crosscol-
lege for a minimum of 3 months as part of the Designated Emphasis in Biotechnology Program. (S/ U grading only)—II. III. (II, III, III) Dandekar

290C. Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Research at seminars presented by guest lectures on subject of their own research activities. May be repeated for credit. (S/U grading only)—II. III. (II, III) Starr

291. Current Progress in Molecular and Cellular Biology (1)
Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Seminars presented by guest lecturers on subject of their own research activities. May be repeated for credit. (S/U grading only)—II. III. (II, III) Starr

294. Current Progress in Biotechnology (1)
Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Seminars presented by guest lecturers on subject of their own research activities. May be repeated for credit. (Same course as Chemi-
ical Engineering 294)—II. III. (II, III) Kjelstrom, McDonald, Rodriguez

295. Literature in Molecular and Cellular Biology (1)
Seminar—1 hour. Prerequisite: graduate standing and consent of instructor. Critical reading and eval-
uation of current literature in molecular and cellular biology disciplines. Papers will be presented and discussed in detail. May be repeated for credit. (S/U grading only)—II. III. (II, III) Baldwin, Fisher, Myles, Privalsky, Radke, Wilson

298. Group Study (1-5)
Variable—1-5 hours. Prerequisite: consent of instruc-
tor. (S/U grading only)

299. Research (1-12)
Independent study—3-36 hours. (S/U grading only)

Professional Course

390. Methods of Teaching (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Practical experience in the methods and problems of teaching biochemistry/ genetics/cell biology. Includes analysis of texts and supporting material, discussion of teaching tech-
niques, preparing for and conducting discussion and laboratory sections, formulating examinations under supervision of instructor. Participating in the teaching program required for Ph.D. May be repeated for credit. (S/U grading only)—II. III. (II, III) Starr

Faculty

Thomas E. Adams, Ph.D., Professor (Animal Science)
Gary B. Anderson, Ph.D., Professor (Animal Science)
Joseph F. Antognini, M.D., Professor (Anesthesiology and Pain Medicine)
Hilary P. Benton, Ph.D., Associate Professor (Anatomy, Physiology and Cell Biology)
Trish J. Berger, Ph.D., Professor (Animal Science)
 Sue Bodine, Ph.D., Professor (Exercise Science)
Ann C. Bonham, Ph.D., Professor (Medical Pharmacology and Toxicology)
Michael L. Bruss, D.V.M., Ph.D., Professor (Anatomy, Physiology and Cell Biology)
Peter M. Cala, Ph.D., Professor (Physiology and Membrane Biology)
Christopher C. Calvert, Ph.D., (Animal Science)
Earl C. Carstens, Ph.D., Professor (Neurophysiology, Physiology, and Behavior)
Joseph J. Ceich, Jr., Ph.D., Professor (Wildlife, Fish, and Conservation Biology)
Leo M. Chalupa, Ph.D., Professor (Neurophysiology, Physiology, and Behavior)
Emre S. Chang, Ph.D., Professor (Bodega Marine Laboratory)
Tsung-Yu Chen, Ph.D., Assistant Professor (Neurology)
Gary N. Chen, Ph.D., Professor (Bodega Marine Laboratory)
Anthony T. Y. Cheung, Ph.D. Professor (Med. Pathology)
Thomas F. Coombs-Hahn, Ph.D., Assistant Professor (Zoology Field Station)
Nipavan Chiamvimonvat, M.D., Associate Professor (Cardiovascular Medicine)
Alan J. Conley, Ph.D., Professor (Population Health and Reproduction)
Carroll E. Cross, M.D., Professor (Internal Medicine, Human Physiology)
Fitz-Ear E. Curry, Ph.D. Professor (Physiology and Membrane Biology)
Jason P. Eiserich, Ph.D., Associate Professor (Neurology)
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 lynelle R. Johnson, D.V.M., Ph.D., Assistant Professor (Medicine and Epidemiology)
James H. Jones, D.V.M., Ph.D., Professor (Surgical and Radiological Sciences)
Thomas Jue, Ph.D., Professor (Biological Chemistry)
Radiha Kajekar, Ph.D., Professor (VM: APC)
C. Tissa Kappagoda, M.D., Professor (Internal Medicine)
Marc P. Kaufman, Ph.D., Professor (Internal Medicine, Physiology and Membrane Biology)
George A. Kayesen, M.D., Professor (Internal Medicine)
Nguyen D. Kien, Ph.D., Professor (Anesthesiology and Pain Medicine)
Mark Kittleson, Ph.D., Professor (Medicine and Epidemiology)
Amie A. Knowlton, M.D., Associate Professor (Cardiovascular Medicine)
Dietmar Kueltz, Ph.D., Associate Professor (Animal Science)
Vijaya G. Kumar, M.D., Ph.D., Professor (Cell Biology and Human Anatomy)
Bill L. Lasley, Ph.D., Professor (Population Health and Reproduction)
Ye-Fong Lin, Ph.D., Assistant Professor (Physiology and Membrane Biology)
Irwin K. M. Liu, D.V.M., Ph.D., Professor (Population Health and Reproduction)
K.C. Kent Lloyd, D.V.M., Ph.D. Professor (Anatomy, Physiology and Cell Biology)
Roger B. McDonald, Ph.D., Professor (Nutrition)
Stuart A. Meyers, Ph.D., Assistant Professor (VM: APC)
Gabrielle A. Nevitt, Ph.D., Associate Professor (Neurophysiology, Physiology, and Behavior)
Crina Nimigean, Ph.D., Assistant Professor (Physiology and Membrane Biology)
Martha E. O’Donnell, Ph.D., Professor (Physiology and Membrane Biology)
Anita M. Oehrberg, Ph.D., Professor (Animal Science)
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John A. Payne, Ph.D. Associate Professor (Physiology and Membrane Biology)
Isaac N. Pesah, Ph.D., Professor (Molecular Biosciences)
Helen E. Raybould, Ph.D., Professor (Anatomy, Physiology and Cell Biology)
Michael P. Remler, M.D., Professor (Neurology)
Janet F. Roser, Ph.D., Professor (Animal Science)
Gabor M. Rubanyi, Ph.D., Adjunct Professor (Berlex Biosciences)
John C. Rutledge, M.D., Professor (Internal Medicine)
Jose Eduarado Santoso, Ph.D., AssociateProfessor (VIMRC)
Seut Schoeler, M.D., Professor (Internal Medicine)
Edward S. Schlegeth, Ph.D., Assistant Professor (Anatomy, Physiology and Cell Biology)
Michael F. Seldin, M.D., Ph.D., Professor (Biological Chemistry)
Arnold J. Sillman, Ph.D., Professor (Neurophysiology, Physiology, and Behavior)
Esper E. Spangenberg, Ph.D., Assistant Professor (Exercise Science)
Charles L. Stebbins, Ph.D., Professor (Internal Medi-
cine, Physiology and Membrane Biology)
 Eugene F. Steffey, V.M.D., Ph.D., Professor (Surgical and Radiological Sciences)
Judith S. Stern, Sc.D., Professor (Nahrung, Internal Medicine)
Alice F. Tarantal, Ph.D., Professor (Pediatrics)
Anamar Villalobos, M.D., Associate Professor (Internal Medicine)
Peter C. Wainwright, Ph.D., Professor (Evolution and Ecology)
W. Jeffrey Weidner, Ph.D., Professor (Neurophysiology, Physiology, and Behavior)
Robert H. Weiss, M.D., Professor (Internal Medicine)
Jonathan Widalcombe, Ph.D., Professor (Physiology and Membrane Biology)
Barry W. Wilson, Ph.D., Professor (Animal Science)
Martin Wilson, Ph.D., Professor (Neurophysiology, Physiology, and Behavior)
Reen Wu, Ph.D., Professor (Anatomy, Physiology and Cell Biology)
Clare E. Yellowley, Ph.D., Assistant Professor (Anatomy, Physiology and Cell Biology)
Jie Zheng, Ph.D., Assistant Professor (MED: Physiology and Membrane Biology)

Emeriti Faculty

Marylyn S. Barkley, Ph.D., Professor Emeritus
Edmund M. Bernauer, Ph.D., Professor Emeritus
Richard C. Carlsen, Ph.D., Professor Emeritus
John H. Crowe, Ph.D., Professor Emeritus
Irwin Feinberg, M.D., Professor Emeritus
Dorothy W. Gietzen, Ph.D., Professor Emeritus
John H. Crowe, Ph.D., Professor Emeritus
Marylynn S. Barkley, Ph.D., Professor Emeritus

Affiliated Faculty

Steven E. Anderson, Ph.D., Associate Researcher
(Physiology and Membrane Biology)
Chao-Yin Chen, Ph.D., Assistant Research Physician
(Medical Pharmacology and Toxicology)
Peter J. Havel, D.V.M., Ph.D., Associate Researcher
(Nutrition)
Marta D. Van Loan, Ph.D., Associate Adjunct Profes-
sor (Nutrition)

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses.
Understanding events of mammalian gametogenesis and the fertilization process. Published results, conclusions derived from these results, and their contribution to our understanding will be discussed. —III. (III) Berger

230. Advanced Endocrinology (2)
Lecture—2 hours. Prerequisite: Neurobiology, Physiology, and Behavior 110 or the equivalent. Examination of current research and critical analysis of future research strategies in the area. May be repeated for credit when topic differs.

231. Neuroendocrinology (3)
Lecture—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 110 or the equivalent course in system physiology. Neurobiology, Physiology, and Behavior 130 or the equivalent course in endocrinology. Neural-endocrine interactions; neural regulation of the endocrine system, especially in relation to reproduction; the role of hormones and growth factors in sexual development.

234. Neurophysiological Basis of Neurotoxicology (3)
Lecture—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 110 or the equivalent, basic understanding of neuroanatomy and neurochemistry. Mechanisms of action at the cellular and systemic level of a number of different neurotoxins and toxicants. Examples of ways toxins may act on the nervous system and techniques for their detection. (Same course as Environmental Toxicology 234.)—I. (I) Woolley

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 desynchronization in areas of pharmacology and space medicine; telemetry; mathematical methods; chronometry; daily, reproductive, and annual periods; shift-work, jet lag and sleep disorders. Offered in alternate years.—I. (I) Fuller

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 Neuroscience 261A and Neurobiology, 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 system underlying vision. Mechanisms. Recent research on aspects of anatomy, biochemistry, electrophysiology, psychophysics, development, and genetics of the visual system. (Same course as Neuroscience 261B and Neurobiology, Physiology, and Behavior 261B.) (S/U grading only) Offered in alternate years.—II. Olsenhaver

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 Neurobiology, Physiology, and Behavior 261C.) (S/U grading only)—I, II, III. (I, II, III)

275. Neurohumoral Regulatory Mechanisms of Thermogenesis (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: Biological Sciences 104 or the equivalent; Biological Sciences 110 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).

290. 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)

295. Research Conference in Physiology (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Presentation and discussion of faculty and graduate student research in physiology. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III)

296. Seminar in Cellular Mechanisms of Adaptation (1)
Discussion—0.5 hour; seminar—0.5 hour. Prerequisite: Neurobiology, Physiology, and Behavior 100B; Biological Sciences 103; consent of instructor. 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)

297. Research Approaches in Physiology (2)
Seminar—2 hours. Prerequisite: graduate standing in Graduate Group in Physiology or consent of instructor. Current research in physiology. Overall design of experiments and particular research areas. (S/U grading only)—II. (II) Eschen, Raybould

298. Group Study (1-5)
299. Research (1-12)
(S/U grading only)

Professional Courses

300A-300B. Pedagogical Aspects of Physiology in Higher Education (3-3)
Lecture, discussion, or laboratory, or combination. Prerequisite: meet qualifications for teaching assistant for one quarter in a designated physiology course. Instruction in methods of leading discussion groups, leading 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 consent of instructor. Practical experience in methods and problems of teaching physiology lecture courses. May include analyses of texts and supporting material, discussion of teaching techniques, preparing for and conducting discussion sessions, and formulation of topics and questions for examinations under supervision of instructor. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III)

Music

(College of Letters and Science)

Pablo Ortiz, D.M.A., Chairperson of the Department

Department Office. 112 Music Building (530) 752-5537; Fax (530) 752-0983; http://music.ucdavis.edu

Faculty

Ross Bauer, Ph.D., Professor
William Beck, D.M.A., Lecturer
Anna Maria Busse Berger, Ph.D., Professor
Yui-Hui Chang, Ph.D., Assistant Professor
Phebe Craig, M.M., Lecturer
study of composition, history, or performance, during the last two years of undergraduate work.

**Career Alternatives.** Many students who graduate with a B.A. in music continue on to careers in medicine, law, or business. Students who graduate with a B.A. in music from UC Davis have gone on to graduate programs in music at major universities and conservatories in the country. Some have become professors at distinguished universities or have received teaching credentials to teach at primary or secondary schools; others have become editors or found employment in music advertising or record companies.

A.B. Major Requirements:

**Preparatory Subject Matter** .......................... 27-45

Music 6A, 6B, 6C ............................................ 9
plus Music 2A, 2B, 2C ............................... (0-6)*
and Music 16A, 16B, 16C .......................... (0-6)*
Music 7A, 7B, 7C, 7D, 7E, 7F ..................... 9
plus Music 17A, 17B, 17C .......................... (0-6)*
Music 24A, 24B, 24C ............................... 9
* May be excused by diagnostic examination at the beginning of each quarter.

**Depth Subject Matter** ............................... 36-37

Choose upper division courses from one of the following tracks:

**Track 1: Theory/Composition** .......................... 36-37

Music 124A, 124B ...................................... 6
Music 195 .................................................. 2
At least 9 units selected from Music 130, 131, 140, 141, 142, 143, 144, 145, 146, 147, 154 .................. 9
Music 101A, 101B ........................................ 8
Music 103 or 199 (for composers); or
Music 122 (for theorists) ......................... (0-3) 4
*** Note: Music 103 and 199 may be taken only once for credit toward the major.

**Track 2: Music History** ............................... 37

Music 124A, 124B ...................................... 6
Music 195 .................................................. 2
At least 9 units selected from Music 130, 131, 140, 141, 142, 143, 144, 145, 146, 147, 154 .................. 9
Two of at least 12 units of Music 121 (one different subject) .......................... 8

**Track 3: Music Performance** .......................... 37

Music 124A, 124B ...................................... 6
Music 195 .................................................. 2
At least 19 units selected from Music 130, 131, 140, 141, 142, 143, 144, 145, 146, 147, 154 .................. 19

**Total Units for the Major** ............................ 63-82

**Honors Programs.** Students who wish to pursue particularly intensive studies in music should elect one of the following honors programs in place of one of the tracks above:

**Theory/Composition Honors** .......................... 45-49

Music 124A, 124B ...................................... 6
At least 11 units selected from Music 130, 131, 140, 141, 142, 143, 144, 145, 146, 147, 154 .................. 11
Music 101A, 101B ........................................ 8
Two quarters of Music 194H for a total of 6 units resulting in a Senior composition project. .................. 6

**Music History Honors** ............................... 41-45

Music 124A, 124B ...................................... 6
At least 11 units selected from Music 130, 131, 140, 141, 142, 143, 144, 145, 146, 147, 154 .................. 11
Music 101A, 101B ........................................ 8
Two quarters of Music 194H for a total of at least 6 units resulting in a Senior thesis. .................. 6

**Major Advisers.** Y.H. Chang (A-F), J.W. Thomas (G-M), D.K. Holoman (N-Z)

**Minor Program Requirements:**

A minimum of 16 units of upper division Music courses .......................... 16
Classes chosen from Music 105, 106, 107, 110, 126, 129
A minimum of six units in upper division music performance courses (Music 140, 141, 142, 143, 144, 145, 146, 147, 148, 154) may count toward the minor. .......................... 6

**Foreign Language Requirement.** Students contemplating graduate study in music are advised to consider pursuing foreign language study beyond the elementary level.

**Diagnostic Exams** are given before admission into Music 6A:6B:6C (Music 3A:3B may be recommended as an alternative). Diagnostic exams are also given for Music 16A-16B-16C and 17A-17B-17C at the beginning of each year. Transfer students should take the Music 6 diagnostic exam given during the first class meetings.

**Beginning and transfer students** are required to take Music 2A-2B-2C (Keyboard Competence) unless they can pass out of one or more of the classes by demonstrating proficiency through a diagnostic exam given at the beginning of each quarter. Students learn 1) four-part keyboard harmony in all major and minor keys; 2) moderate fluency with figured bass at the keyboard; 3) major and minor scales with proper fingering; ability to sight read simple piano music and Bach chorales.

**Student Performing Activities.** The Department of Music presents over 100 concerts each year, offering performance opportunities for both majors and non-majors in the UCSD Symphony Orchestra, University Chorus and Chamber Chorus, Concert Band, Wind Ensemble, Early Music Ensemble, Baroque Chamber Orchestra, Gospel Choir, and numerous chamber ensembles. The large groups regularly present three concerts each year, while chamber ensembles perform frequently in the weekly Thursday Noon Concerts. Performance groups have collaborated with the Department of Dramatic Art 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.

The Empyrean Ensemble, a professional new music ensemble, is in residence at UC Davis. The American Bach Soloists, an ensemble of professional singers and instrumentalists specializing in music of the eighteenth and early nineteenth century, is affiliated with the Department of Music.

**Faculty and Facilities.** The faculty is noted for its achievements in a variety of areas. The musicologists 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 during one quarter each year by a visiting Artist-in-Residence, a distinguished performer who gives public concerts and lectures and who works with students informally.

The department’s facilities include a large collection of Renaissance, Baroque, and modern instruments, the Computer and Electronic Music Studio, practice
and rehearsal rooms, and an excellent music library with some 20,000 recordings, CDs, laser discs and videos.

Graduate Study. The Department of Music offers programs of study and research leading to the M.A. degree in composition/theory, musicology, ethnomusicology, and conducting, and the Ph.D. degree in composition/theory, and ethnomusicology. Detailed information regarding graduate study may be obtained from the Graduate Adviser.

Graduate Advisers. D.A. Nutter, C.A. Reynolds

Courses in Music (MUS)

Lower Division Courses

2A. Keyboard Competence, Part 1 (2)
Performance—2 hours. Prerequisite: course 6A and 16A concurrently. Training to meet the minimum piano requirements for the major in music. All music majors will be expected to perform scales and simple harmonic progressions in twelve keys, both major and minor. (P/NP grading only).—I. Triest

2B. Keyboard Competence, Part 2 (2)
Performance—2 hours. Prerequisite: course 6B and 16B concurrently. Training to meet the minimum piano requirements for the major in music. The study of scales with both hands, harmonizations, and sight reading at the piano. (P/NP grading only).—II. Triest

3A. Introduction to Music Theory (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.—I, II, III, (I, II, III.)

3B. Introduction to Music Theory (4)
Lecture—3 hours; laboratory—1 hour. Prerequisite: course 3A. Continuation of course 3A. Intended for the general student.—I, II, III, (I, II, III.)

6A. Elementary Theory, Part 1 (3)
Lecture—3 hours. Prerequisite: admission by examination given at the beginning of fall quarter; and 16A concurrently or demonstration of required proficiency on diagnostic exam. Development of music writing and listening skills through the study of music fundamentals, species counterpoint, harmony, analysis of repertory. Intended primarily for music majors. Not open for credit to students who have completed course 4A.—I. Chang

6B. Elementary Theory, Part 2 (3)
Lecture—3 hours. Prerequisite: course 6A; course 2B and 16B concurrently or demonstration of required proficiency level on diagnostic exam. Development of music writing and listening skills through the study of music fundamentals, species counterpoint, harmony, analysis of repertory. Intended primarily for music majors. Not open for credit to students who have completed course 6A.—I. Chang

6C. Elementary Theory, Part 3 (3)
Lecture—3 hours. Prerequisite: course 6B; course 2C and 16C concurrently or demonstration of required proficiency level on diagnostic exam. Development of music writing and listening skills through the study of music fundamentals, species counterpoint, harmony, analysis of repertory. Intended primarily for music majors. Not open for credit to students who have completed course 6B.—I. Chang

7A. Intermediate Theory, Part 1 (3)
Lecture—3 hours. Prerequisite: course 6C. Harmonic music of the Classical era with a focus on analysis of music by Haydn, Mozart, and Beethoven. Composition of pieces in the homophonic forms such as Minuet and Trio. Theme and Variations, Rondo and Sonata. Intended for music majors. Not open for credit to students who have completed course 5B.—I. III, II, (I, II, III.)

7B. Intermediate Theory, Part 2 (3)
Lecture—3 hours. Prerequisite: course 7A. Nineteenth-century harmony and voice leading through the music of the Romantic era. Focus on analysis of music by Chopin, Schumann, Brahms, Wagner, and Wolf. Composition of character pieces and songs. Intended for music majors. Not open for credit to students who have completed course 5C.—II. Frank

7C. Intermediate Theory, Part 3 (3)
Lecture—3 hours. Prerequisite: course 7B. The music of the first thirty years of the twentieth century and the various analytical tools pertaining to it. Works of Debussy, Stravinsky, Schoenberg, Berg, and others are discussed. Composition of pieces for solo instruments, voice and piano. Intended for music majors. Not open for credit to students who have completed course 104A.—III. Frank

10. Introduction to Musical Literature (4)

16A. Elementary Musicianship, Part 1 (2)
Lecture/laboratory—2 hours. Prerequisite: course 6A concurrently, passing score on short diagnostic exam at the beginning of the quarter. The melodic, rhythmic, and harmonic materials of Western Music. Includes sight singing, explanations, drills, melodic/rythmic/harmonic dictations, and listening analysis. Recommended for those who intend to major in music.—I. Triest

16B. Elementary Musicianship, Part 2 (2)
Lecture/laboratory—2 hours. Prerequisite: course 6B concurrently, course 6A or required proficiency level on diagnostic exam. The melodic, rhythmic, and harmonic materials of Western Music. Includes sight singing, explanations, drills, melodic/rythmic/harmonic dictations, and listening analysis. Recommended for those who intend to major in music.—II. Triest

16C. Elementary Musicianship, Part 3 (2)
Lecture/laboratory—2 hours. Prerequisite: course 6C concurrently, course 16B or required proficiency level on diagnostic exam. The melodic, rhythmic, and harmonic materials of Western Music. Includes sight singing, explanations, drills, melodic/rythmic/harmonic dictations, and listening analysis. Recommended for those who intend to major in music.—III. Triest

17A. Intermediated Theory, Part 1 (2)
Lecture/laboratory—2 hours. Prerequisite: course 16C or required proficiency level on diagnostic exam. The melodic, rhythmic, and harmonic materials of Western Music. Includes sight singing, explanations, drills, melodic/rythmic/harmonic dictations, and listening analysis. Recommended for those who intend to major in music.—I. Craig

17B. Intermediated Theory, Part 2 (2)
Lecture/laboratory—2 hours. Prerequisite: course 17A or required proficiency level on diagnostic exam. The melodic, rhythmic, and harmonic materials of Western Music. Includes sight singing, explanations, drills, melodic/rythmic/harmonic dictations, and listening analysis. Recommended for those who intend to major in music.—II. Craig

17C. Intermediated Theory, Part 3 (2)
Lecture/laboratory—2 hours. Prerequisite: course 17B or required proficiency level on diagnostic exam. The melodic, rhythmic, and harmonic materials of Western Music. Includes sight singing, explanations, drills, melodic/rythmic/harmonic dictations, and listening analysis. Recommended for those who intend to major in music.—III. Craig

24A. Introduction to the History of Music I (3)
Lecture—3 hours. Prerequisite: course 6A (may be taken concurrently). History of music from the late Baroque to Beethoven. Intended primarily for majors in music. GE credit: Wrt.—II. Reynolds

24B. introduction to the History of Music II (3)
Lecture—3 hours. Prerequisite: course 24A, course 6B (may be taken concurrently). The history of music from the Romantic Period to the nineteenth century. Intended primarily for majors in music. GE credit: Wrt.—III. Reynolds

24C. introduction to the History of Music III (3)
Lecture—3 hours. Prerequisite: course 24B, course 6C (may be taken concurrently). The history of music of the 20th century. Intended primarily for majors in music. GE credit: Wrt.—I. Levy

28. Introduction to African American Music (4)
Lecture/discussion—3 hours; discussion—1 hour; listening; project. Survey of African American music such as spirituals, blues, ragtime, jazz, theater, gospel, R&B, rap, and art music. Emphasis on historical and sociocultural contexts, as well as African roots. GE credit: Div. Wrt.—I. Levy

30A-U. Applied Study of Music: Intermediate (1)
Performance instruction—1 hour. Prerequisite: open to music majors with ability to perform scales and short compositions from the repertoire. 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) Trumpet; (O) Trombone; (P) Piano; (Q) Percussion; (R) Classical Guitar; (S) Lute; (T) Viola da gamba; (U) Recorder. May be repeated for credit. Offered as demand indicates.—I, II, III, (I, II, III.)

Performance instruction—0.5 to 1 hour. Prerequisite: open to music majors only; audition by admission 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) Trumpet; (O) Trombone; (P) Piano; (Q) Percussion; (R) Classical Guitar; (S) Lute; (T) Viola da gamba; (U) Recorder. May be repeated for credit. Offered as demand indicates.—I, II, III, (I, II, III.)

47. University Wind Ensemble (2)
Rehearsal—4 hours. Prerequisite: consent of instructor. Open to students in any major. Rehearsal, study, and performance of a full variety of wind ensemble music; and to have students share their work in public performances. May be repeated for credit. (Same course as African American and African Studies 54.) (P/NP grading only).—I. (I.) Nowlen

54. University Gospel Choir (2)
Rehearsal—4 hours. Prerequisite: consent of instructor; open to any student in the university. Rehearsal, study, and performance of Gospel music. May be repeated for credit. (Same course as African American and African Studies 54.) (P/NP grading only).—I, II, III, (I, II, III.) Lymos

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

99. Special Study for Undergraduates (1-5)
(P/NP grading only)

Upper Division Courses

101A. Advanced Theory, Part 1 (4)
Lecture—3 hours; laboratory—1 hour. Prerequisite: course 7C. Twentieth-century music from 1930 through 1950 and the various analytical tools pertaining to it. Works of Copland, Ives, Schoenberg, Bartok, and Stravinsky are discussed. Composition of small pieces for piano and voice. For music majors. Not open for credit to students who have completed course 104B.—I. Bauer
101B. Advanced Theory, Part 2 (4)  Lecture—3 hours; laboratory—1 hour. Prerequisite: course 101A. Music from 1900 to the present and the various analytical tools pertaining to it. Works of Bartók, Carter, Dallapiccola, Ligeti, Messiaen, Reich and others are discussed. Composition of small pieces for ensemble. Intended for music majors. Not open for credit to students who have completed course 104C. — II. Bauer

102. Tonal Counterpoint (4)  Lecture—3 hours; practice—1 hour. Prerequisite: course 101A. Music from the tonal common-practice period with an analytical focus on the Two Part Inventions and Fugues (from the Well Tempered Clavier) of J.S. Bach. Composition of exercises and short pieces using contrapuntal techniques. Intended for music majors. Not open for credit to students who have completed course 5A.—III. Ortiz

103. Workshop in Composition (3)  Workshop—3 hours. Prerequisite: course 4C. Workshop in practical composition for undergraduates who are interested in pursuing serious compositional studies. Course will allow students to explore the techniques and materials of musical composition. May be repeated for credit (P/NP grading only).—II, III. Ill. Ortiz

105. History and Analysis of Jazz (4)  Lecture—3 hours; discussion—1 hour. Prerequisite: course 3A or 10 or the equivalent. Jazz will be studied in its historical, cultural, and social contexts; the evolution of jazz styles will be analyzed. Lectures, discussion/guided listening sections, and selected readings. Designed for non-majors. GE credit: ArtHum, Wrt.—II. Frank

106. History of Rock Music (4)  Lecture—3 hours; laboratory—1 hour. Prerequisite: consent of instructor. Rock studied in its musical, historical, and cultural contexts; analysis of the evolution of rock styles. Includes guided listening sections and selected readings. Designed for non-majors. GE credit: ArtHum, Wrt.—II. Reynolds

107A. Computer and Electronic Music (3)  Lecture—2 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.—I. (I) Beck

107B. Computer and Electronic Music (3)  Lecture—3 hours; laboratory—1 hour. Prerequisite: consent of instructor. Continuation of course 107A. Limited enrollment.—II. (I) Beck

107C. Computer and Electronic Music (3)  Lecture—3 hours; laboratory—1 hour. Prerequisite: course 107B and consent of instructor. Continuation of course 107B. Limited enrollment.—III. (I) Beck

108A-108B. Orchestration (2-2)  Lecture—2 hours. Prerequisite: course 5C. Techniques of orchestration from study of basic instrumental techniques to analysis of orchestral scores and scoring for various instrumental combinations.—I, II. San Martin

109. Masterworks in Performance (2)  Lecture—2 hours. Prerequisite: course 10 recommended. Thorough score study of a single master-work to be performed on campus during the quarter. Guided rehearsal and performance. Limited to 16 members. Recommended especially for members of the performing ensembles scheduled to present the work.

110A. 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.—II. Busse Berger

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.—II. Frank

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.—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.—III. San Martin

110E. The Music of a Major Composer: Haydn (4)  Lecture—3 hours; discussion—1 hour. Prerequisite: course 10 or 3A-3B. The work of Haydn in the context of his time and his contemporaries. Lectures, discussion/guided listening sections, and selected readings. For non-majors. GE credit: ArtHum, Wrt.

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. The works from Charles Ives to Leonard Bernstein will be presented. Lectures, discussion/guided listening sections, and selected readings. For non-majors. GE credit: ArtHum, Wrt.—III. Ill. Ortiz

111. Introduction to Conducting (2)  Lecture—1 hour; performance—1 hour. Prerequisite: course 6C. Principles and techniques of conducting as they apply to both choral and instrumental ensembles. Not open for credit to students who have completed course 111 or 112. Offered in alternate years.—II.

114. Intermediate Conducting (2)  Lecture—1 hour; performance—1 hour. Prerequisite: course 113. Intermediate conducting with a continued focus on principles and techniques as they apply to both choral and instrumental ensembles.—II.

121. Topics in Music History and Criticism (4)  Seminar—4 hours (includes selected listening). Prerequisite: courses 4A-4B-4C, 24A-24B-24C, and consent of instructor. Sources and problems of a historical period or musical style selected by the instructor and announced in advance. May be repeated for credit. GE credit: Wrt.—II, III. Nutter, Reynolds

122. Topics in Analysis and Theory (4)  Seminar—4 hours (includes selected listening). Prerequisite: courses 5C and 25C. 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: Wrt.

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: Wrt.—II. Busse 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 16th century to the mid-18th century. GE credit: Wrt.—III. Busse Berger

126. American Music (4)  Lecture—3 hours; listening—1 hour. Prerequisite: course 3A or 3B. An overview of American music by master composers from the 16th century to the present. Survey of American music, including Native American music, Hispanic polyphony, New England psalmody, and selected 20th-century composers and styles. Offered in alternate years. GE credit: Div, Wrt.

127. Music from Latin America (4)  Lecture—3 hours; discussion—1 hour. Prerequisite: consent of instructor. Examination of music from Latin America, including Charango music (i.e. tango, bolero, maria nava, salsa, musica motena, musica andina) as well as its implications in other musical genres. Taught in Spanish. Not open to students who have taken Spanish 171 or 171S. (Same course as Spanish 171) Offered in alternate years.—II. Ortiz

129A. Musics of the Americas (4)  Lecture—3 hours; discussion—1 hour. Prerequisite: course 3A or 3B recommended. Survey of music culture from North, Central, and South America including the Caribbean, with emphasis on the role of music in society and on the elements of music (instruments, theory, genres, and form). Introduction to ethnomusicological theory, methods, approaches. Not offered every year. GE credit: ArtHum, Div, Wrt.—Graham

129B. Musics of Africa, Middle East, Indian Subcontinent (4)  Lecture—3 hours; discussion—1 hour. Prerequisite: course 3A or 3B recommended. Survey of music cultures with special emphasis on the role of music in society and on the elements of music (instruments, theory, genres, and form). Introduction to ethnomusicological theory, methods, approaches. Not offered every year. GE credit: ArtHum, Div, Wrt.—Graham

129C. Musics of East and Southeast Asia (4)  Lecture—3 hours; discussion—1 hour. Prerequisite: course 3A or 3B recommended. Survey of music cultures from Japan, China, Korea, Vietnam, and Indonesia, with special emphasis on the role of music in society and on the elements of music (instruments, theory, genres, and form.). Introduction to ethnomusicological theory, methods, approaches. Not offered every year. GE credit: ArtHum, Div, Wrt.

130A-U. Applied Study of Music: Advanced (1)  Performance instruction—1 hour. Prerequisite: open to Music majors with ability to perform scales and short compositions from standard repertoire; admission by audition and consent of instructor, arranged by section: (A) Voice (prerequisite of course 1 or the equivalent); (B) Piano; (C) Harpsichord; (D) Organ; (E) Viola; (F) Viola (G) Cello; (H) Double Bass; (I) Flute; (J) Oboe; (K) Clarinet; (L) Bassoon; (M) French Horn; (N) Trumpet; (O) Trombone; (P) Tuba; (Q) Percussion; (R) Classical Guitar; (S) Lute; (T) Viola da gamba; (U) Recorder. May be repeated for credit. Offered as demand indicates.—I, II, III. (I, II, III)

131A-U. Applied Study of Music: Advanced (Individual) (2)  Performance instruction—0.5 hour; independent practice—5 hours. Prerequisite: open to Music 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) Viola; (F) Viola; (G) Cello; (H) Double Bass; (I) Flute; (J) Oboe; (K) Clarinet; (L) Bassoon; (M) French Horn; (N) Trumpet; (O) Trombone; (P) Tuba; (Q) Percussion; (R) Classical Guitar; (S) Lute; (T) Viola da gamba; (U) Recorder. May be repeated for credit. Offered as demand indicates.—I, II, III. (I, II, III)
132. Singing for Actors (1) Performance—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)

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 band styles, including swing, bebop, and contemporary jazz styles. May be repeated for credit. (P/NP grading only) I, II, III, (I, II, III) McMullen

141. University Symphony (2) Rehearsal—4 hours. Prerequisite: admission subject to audition before first class meeting. Open to any student in the University who 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) I, II, III, (I, II, III) Holoman

142. University Chamber Singers (2) Rehearsal—3 hours, plus sectionals—least 1 hour. Prerequisite: admission subject to audition before first class meeting. Rehearsal and performance of music for band. May be repeated for credit. (P/NP grading only) I, II, III, (I, II, III) Thomas

143. University Concert Band (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) I, II, III, (I, II, III) Nutter

146. Chamber Music Ensemble (1) Rehearsal—2 hours. Prerequisite: consent of instructor. 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) I, II, III, (I, II, III) Thomas

147. University Wind 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) I, II, III, (I, II, III) Holoman

120C. Proseminar in Music (Ethnomusicology) (4) Seminar—3 hours; term paper. Intensive examination of major trends in ethnomusicology as exemplified by scholars working in several non-Western cultures. Ethnomusicological theory, ranging from ethnomusicological description to ethnomusicological study (Seeger) to analysis of individual works in sociological study. II—Graham

213. Transcription and Notation (4) Seminar—3 hours; project. Prerequisite: course 210C. The role, methodology, perception and assumptions of the ethnomusicologist in ethnomusicological scholarship. Examination of complex ethical and political questions in relation to practical field work techniques. Offered in alternate years. —Graham

222. Techniques of Analysis (4) Seminar—3 hours. Analysis and analytical techniques as applied to music of all historical style periods. May be repeated for credit. —III. Chiang

223. Ethnomusicology (Pacific Cultures) (4) Seminar—3 hours; term paper. Court music, religious music, and popular forms of China, Japan, Korea, Melanesia, and Polynesia. A survey of history, historical, and political questions in relation to practical field work techniques. May be repeated for credit. —S/U grading only.

299. Individual Study (1-12) (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, (I, II, III, IV) Granger

Native American Studies

(College of Letters and Science) Stefano Varese, Ph.D., Chairperson of the Department

Department Office. 2401 Hart Hall (530) 752-3237, http://nas.ucdavis.edu

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Victor D. Montejo, Ph.D., Professor
Hulleah Tsinhnahjinnie, M.F.A., Assistant Professor
Edward Valandra Ph.D., Assistant Professor
Stefano Varese, Ph.D., Professor
Emeriti Faculty

Jack D. Forbes, Ph.D., Professor Emeritus
George C. Long, M.F.A., Professor Emeritus
David Riseling, M.A., Senior Lecturer 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 issues of cultural diversity, sovereignty, and indigenous knowledge systems in preparation for living...
Native American Studies

ing 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 experience in North America (north of Mexico). Plan II encourages interested students to focus upon South America, 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 other parts of the Americas.

Career Alternatives. Native American Studies is excellent preparation for a scholarly career or 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:

Preparatory Subject Matter ................................ 20

Native American Studies 1, 108, 109, 110

One or two courses from Native American Studies 32, 33, 46, 55 .............................................. 4-8

One or two courses from African and American Studies 12, 52, Anthropology 2, 3, Asian American Studies 1, Chicano/a Studies 10, History 17A ......................... 4-8

Depth Subject Matter ........................................ 16

Native American Studies 130A, 157, 163A, 163B, 165, 166A, 166B, 167, 172, 173, 174, 175, 176


American Studies 100, 101, 110, 111, 112

Chicano/a Studies 100, 110, 111, 154, 156, Sociology 128, Women's Studies 102, 107, 112

One upper division Native American Studies course, selected in consultation with adviser .................................................. 4

Plan I—North American Emphasis ........................................ 28

Two courses from Native American Studies 107, 111, 115, 116, 120, 123, 133, 156, 163A, 163B, 167, 172, 173, 174, 175, 176

North, Central, and South America. Emphasis on the diverse cultures of Native American peoples from Mexico to the north.

Plan II—Mexico-Central America Emphasis .......................... 28

Three courses from History 161A, 166A, 166B, Anthropology 134, 145, 146, 174, 175, Chicano/a Studies 130, Native American Studies 122, 123, 124, 125 ........................................... 12

Two courses from Spanish 155, 172, Art History 151, Native American Studies 101, 107, 181A, 181B, 181C, 182 .................................................. 12

If student's work is specifically focused upon a Meso-American language or topic, from Native American Studies 188, 191 ..................... 8

Plan III—South American Emphasis ..................................... 28

Native American Studies 107, 120, 122, 123, 133, 156, 163A, 163B, 167, 172, 173, 174, 175

South American language or topic, from America and South America. Plan III focuses upon South America, with some course work integrating that region with other parts of the Americas.

Totals Units for the Major ........................................... 64

Major Adviser. S. Crum

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. The minor program must include five upper division courses, at least one of which is chosen from each of the following groups:

UNITs

Native American Studies ................................. 24

Five upper division courses, at least one of which is chosen from each of the following groups:


Two courses from American and African Studies 100, 101, 107

One other upper division course selected in consultation with adviser

Studying Off Campus. Majors have the option of spending one to three quarters elsewhere in the Americas or on a near 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 coordinator and may fulfill from 12 to 20 of the 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 equivalent or 117A must 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. Students must be enrolled in the UC Education Abroad Program, 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 other graduate programs. Further information regarding graduate study may be obtained at the Department Office and at Graduate Studies.

Graduate Adviser. M. Macri

Courses in Native American Studies (NAS)

Lower Division Courses

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.—I, II, III, (I, II, III) Montejo, Crum

5. Introduction to Native American Literature (4)

Lecture/discussion—4 hours. Prerequisite: completion of Subject A requirement. Study of selected Native American texts. Intensive focus on analysis of these texts, with frequent writing assignments to develop critical thinking and composition skills. GE credit: AnthHum, Div, Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously].—I, II, III, (I, II, III)

10. Native American Experience (4)

Lecture—3 hours; discussion—1 hour. Introduction to the diverse cultures of Native American peoples from North, Central, and South America. Emphasis on Native American voices in the expression of cultural views and in the experience of conflicting values. GE credit: AnthHum, Div—III, (I, II, III, Varese, Hernandez-Avila, Macri

32. Native American Music and Dance (4)

Lecture/discussion—4 hours. Introduction to the music and dance of the native peoples of the Americas. Students will study secular native music and dance from a cross-section of regions and tribes. GE credit: Div.—I (I) Mendoza

33. Native American Art in the U.S. (4)

Lecture—4 hours. Comprehensive survey of Indian art forms with emphasis upon design, media, and function. Intent is to familiarize the student with a wide range of styles and techniques. GE credit: AnthHum, Div—III

34. Native American Art Workshop (4)

Lecture—1 hour; laboratory—6 hours; 3 hours to be arranged. Prerequisite: consent of instructor; course 33 recommended. Studio projects in Native American art, design, and crafts. (P/NP grading only)—I

46. Orientation to Research in Native American Studies (4)

Lecture/discussion—3 hours; term paper. Prerequisite: Native American Studies major or minor, or consent of instructor. Introduction to the basic research resources pertinent to Native American subjects available in the region, including libraries, archives, museums, etc. Emphasis is upon learning to use documentary research and other sources of data. Students will carry out individual projects. Limited enrollment. GE credit: SocSci, Div, Wrt.

55. Americanisms: Native American Contributions to World Culture (4)

Lecture/discussion—4 hours. Prerequisite: course 1 or 10 recommended. American indigenous people's contributions to the contemporary world, with attention to forced participation of Indian societies in the development of Western dominion and resulting appropriation of cultural creations. Responses and initiatives of indigenous peoples will be analyzed. GE credit: SocSci, Div, Wrt

99. Special Study for Undergraduates (1-5)

Prerequisite: consent of instructor. (P/NP grading only)

Upper Division Courses

101. Contemporary Indian Art (4)

Lecture—4 hours. Prerequisite: course 33. Historical review of contemporary Indian art from 1900 to the present by looking at the two art centers of Oklahoma and Santa Fe. Social and political factors that have influenced the imagery that exists today will be examined. GE credit: AnthHum, Div.—II

107. Special Topics in Native American Languages (4)

Lecture/discussion—4 hours. Prerequisite: consent of instructor. Investigation of various subjects in contemporary and historical Native American language studies. May be repeated for credit when a different topic is studied. GE credit: Div.—II, (I, III) Macri

115. Native Americans in the Contemporary World (4)

Lecture/discussion—4 hours. Prerequisite: course 1, 10, or 55. The sociocultural development of American Indian populations in modern times with emphasis upon North America. Attention will be given to contemporary Indian affairs and problems as well as to the background for present day conditions. Not open for credit to students who have completed Anthropology 141B. (Former course Anthropology 141B) GE credit: SocSci, Div, Wrt.—II, Montejo

116. Native American Tribal Governments (4)

Lecture—4 hours. Prerequisite: course 1; Anthropology 2. Study of selected Native American tribal governments, confederations, leagues, and alliance systems. Offered in alternate years. GE credit: SocSci, Div.
Lecture—4 hours. Prerequisite: course 116, Political Science 2; Anthropology 123 recommended. Native American governmental and community decision making with emphasis on federal and state programs, tribal issues, and current political trends and funding for tribal services. Offered in alternate years. GE credit: SocSci, Div.—II.

118. Native American Politics (4)
Lecture—4 hours. Prerequisite: course 117. Examination of the various interest groups and movements found among Native people and how they relate to the determination of Indian affairs. Study of political action available to Native groups, and local community interests. GE credit: SocSci, Div.—Wrt.—III. Varese

120. Ethnopolitics of South American Indians (4)
Lecture/discussion—4 hours. Prerequisite: course 1, 10 or 55. Social, political, cultural movements of indigenous South Americans in response to establishment, expansion of European colonialism, post-colonial development, and interaction with the Americas. Offered in alternate years. GE credit: SocSci, Div.—II.

122. Native American Community Development (4)
Lecture—4 hours. Prerequisite: course 1, Community and Regional Development 151. Application of community development theory and techniques to the development problems of Native American communities. Offered in alternate years. (Former course 161.) GE credit: SocSci, Div. Wrt.—I. Varese

125. Performance and Culture Among Native Americans (4)
Lecture—3 hours; listening—3 hours. Prerequisite: upper division standing in cultural or the social sciences or consent of instructor. Interdisciplinary study of public expressive forms among Native Americans. Comparative analysis of music, dances, rituals, and dramas from throughout the Americas in their social and cultural contexts. Offered in alternate years. Not open for credit to students who have completed Music 125.—III. (M.III) Mendoza

130A. Native American Ethno-Historical Development (4)
Lecture—4 hours. Prerequisite: course 1 or 10; History 1770A recommended. Study of Native American ethno-history in North America before 1770s. GE credit: SocSci, Div. Wrt.—I. (J) Crum

130B. Native American Ethno-Historical Development (4)
Lecture—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.—II. (II) Crum

130C. Native American Ethno-Historical Development (4)
Lecture—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.—III. (III) Crum

133. 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 and colonial Mexican and Central American indigenous people, the impact of economic and political factors on the process of cultural adaptation. Attention is given to the questions of native building, assimilation, resistance, organized political responses. GE credit: SocSci, Div.—III. (III) Varese

134. Race and Sex: Race Mixture and Mixed Peoples (4)
Lecture—4 hours. Prerequisite: one course chosen from Anthropology 1 or 2, Native American Studies 10, Chicana/o Studies 110, African American and African Studies 100 or Asian American Studies 110. The phenomena of racial, ethnic and interreligious mixture and marriage, and of multi-ethnic people. Emphasis is placed on the sociocultural effects of intermarriage and on the lives of bicultural and multi-ethnic persons. (Same course as Anthropology 134.) GE credit: SocSci, Div. Wrt.—IV. 156. Native American Ethics and Value Systems (4)
Lecture—4 hours. Prerequisite: upper division standing; course 1 or Anthropology 2. Religious and philosophical foundations of the Native American people with emphasis upon North America. Offered in alternate years. GE credit: ArtHum, Div.—Wrt.—II. (II) Varese

157. Native American Religion and Philosophy (4)
Lecture—4 hours. Prerequisite: upper division standing; course 1 or Anthropology 2. Religious and philosophical foundations of the Native American people with emphasis upon North America. Offered in alternate years. GE credit: ArtHum, Div.—Wrt.—II. (II) Varese

181A-181B. Native American Literature (4-4-4)
Lecture—4 hours. Prerequisite: English 3, Comparative Literature 1, 2, 3, or any course from the General Education Literature Preparation List. Analysis of works by or about Native Americans including novels and autobiographies, analysis of Native American poetry, oral literature, songs, and tales. (A), the novel and fiction; (B), nonfiction works by native authors; (C), traditional literature and poetry. Offered in alternate years. GE credit: ArtHum, Div. Wrt.—I, II, III. (I, II, III) Hernández-Avila, Montejo

184. Contemporary Indigenous Literature of Mexico (4)
Lecture—4 hours. Prerequisite: course 1 or 10; course 181A or 181B 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 of and influences on the Native writers themselves. Offered in alternate years.—III. Hernández-Avila

188. Special Topics in Native American Literary Studies (4-4-4)
Lecture/discussion—3 hours; term paper. Prerequisite: upper division standing and consent of instructor. Special topics drawn from Native American literature. May be repeated for credit when a different topic is studied. GE credit: ArtHum, Div.—Wrt.—I, II, III. (I, II, III) Hernández-Avila, Montejo

190. Seminar in Native American Studies (2)
Seminar—2 hours. Prerequisite: senior standing. Seminar of critical issues faced by Native American people. (P/NP grading only).—II. (II) 191. Topics in Native American Studies (4)
Lecture/discussion—3 hours; term paper. Prerequisite: upper division standing and consent of instructor. Selected topics in Native American ethno-historical development, culture, and thought. May be repeated for credit when a different topic is studied. GE credit: ArtHum, Div.—II. (II) 194A-194B. 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. Open only by consent of faculty adviser. (Deferred grading only, pending completion of sequence.)

195. Field Experience in Native American Studies (12)
Field work—12 hours. Prerequisite: senior standing and major in Native American Studies, completion of lower division major requirements, and course 161. Field work with governmental and community groups, under supervision of a faculty sponsor. Knowledge acquired in other courses to be applied in field work. (P/NP grading only).—I, II, III, (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 195 may be taken concurrently, and consent of instructor. Directed 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, (I, II, III)

197TC. Community Tutoring in Native American Studies (1-5)
Tutorial—1-3.5 hours. Prerequisite: consent of major committee; upper division standing with major in Native American Studies; Supervise tutoring in community. (P/NP grading only) 198. Directed Group Study (1-5)
Prerequisite: upper division standing; consent of instructor. (P/NP grading only)

199. Special Study for Advanced Undergraduates (1-12)
Prerequisite: consent of instructor. (P/NP grading only)

Graduate Courses

200. Basic Concepts 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 be announced at the time of offering. May be repeated for credit when a different topic is offered. GE credit: ArtHum, Div.—I, II, III (I, II, III) Hernández-Avila, Montejo, Macri

212. Community Development for Sovereignty and Autonomy (4)
Seminar—4 hours. Prerequisite: graduate standing and consent of instructor. Examines a sample of contemporary indigenous communities from south, central and north America with the goal of understanding and evaluating the strategies adopted by Native American communities to develop and implement forms of sovereignty or autonomous self-management. Offered in alternate years.—II. Varese

213. Native Criminality and “Deviance” in Native Communities (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 sociological perspectives on criminality and deviance.

220. Colonialism/Racism and Self-Determination (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing. Study of imperial/colonial 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 and other groups will also be considered. Offered in alternate years.—II. Varese
Natural Sciences

[College of Letters and Science]
Advising Center, 174 Physics/Geology Building
(530) 752-9100;
http://naturalsciences.ucdavis.edu/

Committee in Charge
Howard W. Day, Ph.D., Chairperson (Geology)
Patricia Boeschaar, Ph.D., (Physics)
Charles P. Nash, Ph.D., (Chemistry)
J. Richard Pomeroy, Ph.D. (Geology)
Laurie Glover, Ph.D., (English)
Laurie Glover, Ph.D., (Physics)
Peter Moyle, Ph.D. (Biology)
Peter Moyle, Ph.D. (Geology)

The 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 acquire training in more than one science. The major is sponsored by the Department of Geology.

The Program. The Natural Sciences curriculum offers a variety of courses in science and mathematics. All students must complete a one year sequence in calculus, a course in statistics and one year sequences 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 adviser at their first opportunity in order to combine the prerequisites with General Education requirements.

Career Alternatives. The study of natural sciences prepares students to meet the subject matter requirements for a science teaching credential in California as well as a variety of other careers. Students whose goals include business, journalism, law, or medicine may acquire a broad background in science through this curriculum.

B.S. Major Requirements:

Preparatory Subject Matter................. 68
Chemistry 2A, 2B, 2C .......................... 15
Biological Sciences 1A, 1B, 1C ......... 15
Geology 2, 3, 3L, 50L, 60 ................. 13
Mathematics 16A, 16B, 16C  ............. 12
Physics 7A, 7B, 7C .......................... 12
Statistics 100 or 102 ....................... 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 counted toward the requirements for both a Concentration and a Supplementary Field. ............... 15

Total Units for the Major .................. 110

Fields of Concentration:

Chemistry 39 
Geology 33
Earth Science 27
Life Science 27-34

Chemistry 197 or 199 ..................... 2

Earth Science 27
Soil Science 100 ............................ 4
Geology 199 ................................. 3

Life Science 27-34
Chemistry 8A, 8B or 118A, 118B, 118C 6-12
Biological Sciences 101 .......................... 4
Evolution and Ecology 100, 101, 111 ........................................ 8
Neurobiology, Physiology, and Behavior 101 .......................... 5
Neurobiology, Physiology, and Behavior 101L or Molecular and Cellular Biology 160 .................... 3-4
One 199 course from Biological Sciences, Evolution and Ecology, Molecular and Cellular Biology 160, Neurobiology, Physiology, and Behavior .................... 1

Physics 27
Chemistry 107A, 110A .................... 7
Geology 121 ................................. 6
Physics 108, 122, 127 ..................... 7
Physics 137 or 160 ......................... 3
Physics 199 ................................. 4

Supplementary Fields:

Chemistry 39 
Geology 33
Earth Science 27
Life Science 27

Biological Sciences 101* 4
Evolution and Ecology 100 ................. 4
Neurobiology, Physiology, and Behavior 101 ........................................ 5
Approved electives .......................... 2
Other Biological Sciences or related science courses may be substituted with the prior approval of the major adviser.

Life Science 27

Biological Sciences 101* 4
Evolution and Ecology 100 ................. 4
Neurobiology, Physiology, and Behavior 101 ........................................ 5
Approved electives .......................... 2
Other Biological Sciences or related science courses may be substituted with the prior approval of the major adviser.

A.B. Major Requirements:

Preparatory Subject Matter................. 38-41

Quarter Offered: I=Fall; II=Winter; III=Spring; IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArthHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Social-Cultural Diversity; Wrt=Writing Experience
Recommended. Statistics 13, 32, 102, or 103.

Depth Subject Matter .................................. 44
Nature and Culture 100 and 180—-8
Nature and Culture 120 or 140, or American Studies 157, or Veterinary Medicine 170—-4
Environmental Science and Policy 100, or Evolution and Ecology 101 or Plant Biology 147—-4
Anthropology/Environmental Science and Policy 101 or 102—-4
English 184 or Native American Studies 181A, 181B, or 181C, or Comparative Literature 120—-4
Ejectives, a minimum of 20 units selected in consultation with an adviser from one or two thematic clusters. Possible clusters include Human Evolution and Ecology, Human Culture and Society, Indigenous Peoples, California and the Southwest, Art and Literature, Earth and Environment, The Impact of Humans on the Environment, Environmental Law, Policy and Planning. A representative list of clusters and courses is available from advisers and from the Program office ........................................ 20

Total Units for the Major ............................ 82-85

Major Advisers. Consult the Program office.

Minor Program Requirements:

UNITS

Nature and Culture ..................................... 24
Nature and Culture 1—-4
Nature and Culture 100—-4
Environmental Science and Policy 100, or Evolution and Ecology 101, or Plant Biology 147—-4
Nature and Culture 120 or 140, or Veterinary Medicine 170—-4
Anthropology/Environmental Science and Policy 101 or 102—-4
English 184 or Native American Studies 181A, 181B, or 181C—-4

Courses in Nature and Culture (NAC)

Lower Division Courses

1. Intersections of Nature and Culture (4)
Lecture/discussion—3 hours; term paper. Prerequisite: satisfactory completion of Subject A requirement; Comparative Literature 1, 2, or 3, or English 3 recommended. Nature and culture as human constructs, conditioned by both time and place; importance of nature in human thought, both scientific and spiritual; scientific and literary view of the relationship between nature and culture, including forms of observation and methods of analysis. GE credit: ArtHum or SciEng, Wrt—I—(II.)

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

99. Individual Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Upper Division Courses

100. The Culture of Nature: Theoretical Frameworks and Case Studies (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 1. Problems in nature and culture, with particular attention to integrative theoretical frameworks available for the investigation of specific issues. Case studies will vary with instructor. May be repeated once for credit when topic and instructor differ. GE credit: ArtHum or SciEng, Wrt—I—III. (III.)

120. Environmental Ethics (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 1. Ethical issues underlying environmental/ ecological controversies, including anthropocentrism vs. ecocentrism, wilderness and species preservation, human population growth, animal rights, deep ecology, and ecofeminism. Emphasis is on critical examination of issues from cross-cultural, theoretical, and applied perspectives. GE credit: ArtHum or SciEng. (III.) McLean

130. The Nature of Exploration (4)
Lecture/discussion—3 hours; term paper. Prerequisite: upper division standing. Writings and drawings of a historical period of exploration, with a focus on descriptions of nature. Consideration of what representations of the enterprise of exploration reveal about the cultural values of the explorers, and how those values persist. Offered in alternate years. GE credit: ArtHum or SciEng. Jaffee

140. Animal Rights (4)
Lecture/discussion—3 hours; term paper. Prerequisite: upper division standing. Issues surrounding animal rights, including hunting, fishing, industrial husbandry and slaughter, experimentation, and pets. Emphasis on the complexities of human relations to other animals from historical, literary, and cross-cultural perspectives. Offered in alternate years. GE credit: ArtHum, Wrt—I—McLean

160. Art and the Natural World (4)
Studio—6 hours. Field trips. Exploration of how the people of various cultures, from traditional to contemporary, have expressed their relationship to the natural world in an art.

180. Fieldwork in Nature and Culture (4)
Discussion—1 hour; fieldwork—70 hours/quarter; term paper. Prerequisite: course 100 and consent of instructor. Fieldwork: one week prior to the beginning of the quarter, plus two weekends. Natural scientific, social scientific, and literary/artistic approaches to the study of nature and culture in one place, which will vary with instructor. —I—(II.)

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)

197. Tutoring in Nature and Culture (1-5)
Tutoring—3-15 hours. Prerequisite: consent of instructor. Assist in field trips, lead study sessions with groups and individual students. (P/NP grading only)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

199. Individual Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Nematology

(Communicated Agricultural and Environmental Sciences)

Steven A. Nadler, Ph.D., Chairperson of the Department
Chair Office, 489 Hutchinson Hall
(530) 752-7567, http://ucdema.ucdavis.edu
Department Office, 354 Hutchinson Hall
(530) 752-0300

Faculty
Edward P. Caswell-Chen, Ph.D., Professor
Howard Ferris, Ph.D., Professor
Bruce A. Jaffee, Ph.D., Professor
Harry K. Kaya, Ph.D., Professor (Entomology)
Edwin E. Lewis, Professor
Steven A. Nadler, Ph.D., Professor
Becky B. Westerdahl, Ph.D., Professor
Valerie M. Williamson, Ph.D., Professor

Emeriti Faculty
Armand R. Maggenti, Ph.D., Professor Emeritus
Dewey J. Raskan, Ph.D., Professor Emeritus

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.................... B-10
(a) Plant Science: Microbiology 102; Entomology 100, 135, 153, 156; 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; Microbiology 102; Plant Biology 121; Plant Pathology 120, 148; Soil Science 102, 111, 112

Minor Adviser. S. A. Nadler

Graduate Study. Graduate degrees specializing in Nematology are offered through the Department 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)

Upper Division Courses

100. General Plant Nematology (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 18 or 10. An introduction to the classification, morphology, biology, and control of the nematodes attacking cultivated crops. —I—(II.) Feist

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. —II. (II.) Caswell-Chen, Nadler

150. Revising Scientific Prose (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course in English composition, understanding of English grammar and parts of speech, upper division standing in a science major, or consent of instructor. Principles of detailed revision; close analysis of writing styles in research papers, popular scientific articles, and other scientific reports; use of verb-based and noun-based writing styles. GE credit: Wrt—I—III. (II.) Jaffee

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Graduate Courses

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-parasite 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

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2007-2008 offering in parentheses

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 determine their effectiveness. Offered in alternate years. — III. 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) Kaiser, Lewis

260. Neurobiology, 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 consider 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, and the 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. — (I) Nadler, Sanderson

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 problems, advantages for control field plot design, and establishment in association with diverse California crops. (S/U grading only.) — I.

290. Seminar (1)
Seminar—1 hour. (S/U grading only.)—II, III, IV.

290C. Advanced Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Planning and results of research programs, proposals, and experiments. Discourse 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]
Lea M. Chalupe, Ph.D., Chairperson of the Section
Section Office. 196 Briggs Hall
(530) 752-0203, http://www.npb.ucdavis.edu

Faculty

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Joseph F. Antognini, Ph.D., M.D., Professor (Anesthesiology and Pain Medicine)
Sue C. Bodine, Ph.D., Professor (Physiology & Membrane Biology)
Kenneth H. Britten, Ph.D., Professor
Earl E. Carstens, Ph.D., Professor
Leo M. Chalupe, Ph.D., Distinguished Professor (Ophthalmology)
Ernest S. Chang, Ph.D., Professor (Animal Science)
Barbara X. Chapman, Ph.D., Associate Professor
Hwai-Jong Cheng, Ph.D., Assistant Professor
William Debello, Ph.D., Assistant Professor
Jochen Ditterich, Ph.D., Assistant Professor
Charles A. Fuller, Ph.D., Professor
John D. Furlow, Ph.D., Professor (Pathology)
Jack M. Goldberg, Ph.D., Senior Lecturer
Thomas P. Hahn, Ph.D., Associate Professor
David A. Hawkins, Ph.D., Professor
Barbara A. Horwitz, Ph.D., Distinguished Professor, (Physiology & Membrane Biology) Academic Senate Distinguished Teaching Award, UC Davis Prize for Teaching and Scholarly Achievement
Andrew T. Ishida, Ph.D., Professor
Kim McAllister, Ph.D., Associate Professor (Neurology)
Lee Miller, Ph.D., Assistant Professor
Alexander Legg, Ph.D., Professor (Mathematics)
Brian C. Mulloney, Ph.D., Professor
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W. Jeff Weidner, Ph.D., Professor
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Keith R. Williams, Ph.D., Senior Lecturer
Martin C. Wilson, Ph.D., Professor
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John H. Crowe, Ph.D., Professor
Judy A. Stamps, Ph.D., Professor (Neurology)
Emeriti Faculty
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James M. Boda, Ph.D., Professor Emeritus
Edmund M. Cagnetta, Ph.D., Professor Emeritus
Harry W. Calvin, Ph.D., Professor Emeritus
Robert G. Holly, Ph.D., Senior Lecturer Emeritus
John M. Horwitz, Ph.D., Professor Emeritus
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William L. Lott, Ph.D., Senior Lecturer Emeritus
Peter K. Marler, Ph.D., Professor Emeritus
Verne E. Mendel, Ph.D., Professor Emeritus
Deen Ryan, Ed.D., Professor Emeritus
Arthur H. Smith, Ph.D., Professor Emeritus
Dorothy S. Woolley, Ph.D., Professor Emerita
Affiliated Faculty
Erwin A. Bautista, Ph.D., Lecturer
Gretchen Casazza, Ph.D., Assistant Adjunct Professor (Sports Medicine Program)
Stacey S. Choi, Adjunct Assistant Professor
Grace L. Rosenquist, Ph.D., Assistant Adjunct Professor
The Exercise Biology Major Program
The Program. The focus is on both the acute and chronic effects of physical activity (and inactivity) on the organism (human ecological) level. We examine these mechanisms and consequences during growth, development, aging, disease and in altered environmental conditions. The exercise biology major encompasses the critical aspects of an integrative program in applied human biology. The bachelor of arts program provides a greater breadth of knowledge in the humanities and social sciences and is more appropriate for those wishing 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.

Career Alternatives. 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 program 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., physical therapy), biomechanics and biomedical engineering and medical equipment and pharmaceutical development and sales.

A.B. Major Requirements:

Preparatory Subject Matter........................38-41
Biological Sciences 1A-1B-1C ..................... 15
Chemistry 2A, 2B .................................. 10
Physics 1A-1B or 7A-7B .......................... 6-8
Psychology 1 ........................................ 3
Statistics 1, 32, 100, or 102 .......................... 3-4

Psychology 41 recommended

Depth Subject Matter ................................40-45
Biological Sciences 101 ................................ 4
Neurobiology, Physiology, and Behavior 101 ... 5
Cell Biology and Human Anatomy 101 and 101L ........................................... 7
Exercise Biology 101, 102, 104L, 105 ........................................... 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 161; Community and Regional Development 176; Exercise Biology 120; History 178; History and Philosophy of Science 150; Science and Society 105, 120; Sociology 122, 154, 159, 172
Exercise Biology 101, 102, 104L, 105 ........................................... 15
One additional upper division course in Exercise Biology ........................................... 3-4
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 ................................78-86

B.S. Major Requirements:

Preparatory Subject Matter.........................60-70
Biological Sciences 1A-1B-1C ..................... 15
Chemistry 2A-2B-2C ................................ 15
Chemistry 8A-8B or 118A-118B .................. 15
Mathematics 1A-1B-1C or 17A-17B-17C or 21A-21B-21C ........................................... 12
Physics 7A-7B-7C or 9A-9B-9C .................... 12
Statistics 13, 32, 100, or 102 .......................... 3-4
Psychology 1 is highly recommended for all students.
Mathematics 21A-21B-21C-21D, 22A-22B, Physics 9A-9B-9C-9D and Engineering 5, 35 are recommended for students interested in the Biomechanics option.
Depth Subject Matter .......................... 49-50
Biological Sciences 101, 102, 103, 104, .......................... 13
Neurobiology, Physiology, and Behavior 101, .......................... 5
Cell Biology and Human Anatomy 101 and 101L .......................... 7
Exercise Biology 101, 102, 103, 104L .................................. 15
Completion of one Option listed below, or with adviser approval, select 3 courses as follows: 2 courses (at least 1 must have a laboratory component) from Exercise Biology 110, 111, 112, 115, 117, 125, 126 and 1 additional course from this group or from Exercise Biology 113, 116; Applied Science Engineering 115, Engineering 102; Neurobiology, Physiology, and Behavior 112, 113, 140; Nutrition 111AV, Physical Education 133 ......................... 9-10
Physiology option: Exercise Biology 111 and either 110 or 125 ............... 6
Select 1 additional course from Exercise Biology 110, 113, 116, 125, Neurobiology, Physiology, and Behavior 112, 113, 140 .................. 3-4
Biomechanics option: Exercise Biology 115, 126 .......................... 6
Select 1 course from Exercise Biology 113; Engineering 102; Applied Science Engineering 115; Neurobiology, Physiology, and Behavior 112 .............. 3-4
Applied Exercise Biology option: Exercise Biology 112, 117 .................. 7
Select 1 course from Exercise Biology 116, 118; Nutrition 111AV, Physical Education 133 ......................... 3
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 .................. 109-120

Minor Program Requirements:
Exercise Biology .......................... 18
At least 18 upper division units in exercise biology from one of three options ...... 18
(a) Biomechanics
(1) Exercise Biology 103.
(2) Exercise Biology 113, 115, 126.
(3) Additional courses to complete a total of 18 upper division units. None of the variable-unit courses or Exercise Biology 148, 148L may be used to fulfill these requirements. Consult your adviser regularly.
(b) Exercise Physiology
(1) Exercise Biology 101.
(3) Additional courses to complete a total of 18 upper division units. None of the variable-unit courses or Exercise Biology 148, 148L may be used to fulfill these requirements. Consult your adviser regularly.
(c) Psychological Aspects
(1) Exercise Biology 102.
(2) Exercise Biology 120, 121, 122.
(3) Additional courses to complete a total of 18 upper division units. None of the variable-unit courses or Exercise Biology 148, 148L may be used to fulfill these requirements. Consult your adviser regularly.

Master Adviser. Keith R. Williams for the Exercise Biology Major and Exercise Biology Minor

Honors Program. Those students with an outstanding academic record and an Exercise Biology GPA of 3.500 or higher may enter the Honors Program with the concurrence of a faculty adviser. An honors project must be completed consisting of 2 quarters of course 199 (at least 3 units per quarter), 2 units of course 194H, and an honors thesis. These units are taken in addition to the major requirements.

Graduate Study. A program of study and research leading to a master’s degree is available through the Graduate Group in Exercise Science. For detailed information regarding graduate study, write to the Graduate Adviser, Graduate Group in Exercise Science. See also the Graduate Studies chapter of this catalog.

Graduate Advisers. D. Hawkins, M.P. Kaufman, C.L. Stebbins, K.R. Williams

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, their 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 organ, and the organism.

The Program. In the freshman and sophomore years, students take one or two college level teaching or research. It also serves as the basis for further training in the health professions, including but not limited to human and veterinary medicine, medical technology, physical therapy, pharmacy, 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 .................. 60-70
Biological Sciences 1A-1B-1C .................. 15
Chemistry 2A-2B-2C .................. 15
Chemistry 8A-8B or 118A-118B-
118C ................. 6-12
Mathematics 16A-16B-16C or 17A-17B-
17C or 21A-21B-21C .................. 9-12
Physics 7A-7B-7C .................. 12
Statistics 13, 32, 100 (recommended), or 102 .......... 3-4
Depth Subject Matter .................. 46-48
Biological Sciences 101, 102, 103, 104 .................. 13
Neurobiology, Physiology, and Behavior 100, 101, 101L, 102, 102L .............. 15
Select three or more upper division course work from the following list ............ 3
Neurobiology, Physiology, and Behavior 104L, 106, 111C, 111L, 1601, 194H; other courses with the approval of the master adviser.

Additional Neurobiology, Physiology, and Behavior depth unit requirement .......... 12
All other Neurobiology, Physiology, and Behavior courses not used in satisfaction of any other requirement, or Anthropology 154A, 154B, or Entomology 104; or Exercise Biology 101, 102, 111. Courses 192, 197T, 199 may not be used to satisfy the depth unit requirement.

One course from Anthropology 151, Evolution and Ecology 100, Geology 107 ........................................ 3-4

Total Units for Major .................. 106-118

Minor Program Requirements:
Neuroscience .................. 18
Neurobiology, Physiology, & Behavior 100 .............. 4
Five courses from:
Choose at least four from following: Neurobiology, Physiology, & Behavior 103, 112, 124, 126, 160, 161, 162, 163, 164, 165, 168, 169
One of the following may be completed to fulfill course requirement: Psychology 113, 121, 129, Linguistics 175, Philosophy 103, Human Development 163
The following courses are cross-listed and either offering can be used to fulfill the course requirement: NB 124/PSC 124, NB 160/NSC 160, NB 163/PSC 128

Master Adviser. Jack Goldberg in 191 Briggs Hall, for the Neurobiology, Physiology, & Behavior Major and the Neuroscience Minor.

Advising Center. 188 Briggs Hall [S30] 752-9696

Graduate Study. Information on graduate study in neuroscience, physiology or behavior may be obtained by writing the Graduate Group in Exercise Science. See also the graduate course offerings listed under Animal Behavior [A Graduate Group], on page 131, Neuroscience [A Graduate Group], on page 397, and Physiology, on page 413. See also Graduate Studies, on page 97, in this catalog.

Courses in Exercise Biology (EXB)
Lower Division Courses
10. Exercise and Fitness: Principles and Practice (3)
Lecture—3 hours. Human movement from physiologi- cal, psychological, sociological, and historical per spectives. Biology and psychology of exercise across the human lifespan. Not open for credit to stu dents who have completed an upper division Exercise Biology course. GE credit: SciEng, Div.—II. (III)
Salisisky, Shaffath
90X. Lower Division Seminar (1-2)
Lecture—1-2 hours. Prerequisite: lower division standing and consent of instructor. Gives freshman or sophomore level students the opportunity to study a special topic in the general area of Exercise Biology in a small class setting.

92. Exercise Biology Internship (1-5)
Internship—3-15 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 department faculty supervision. May be repeated once for credit. (P/NP grading only.)

97T. Tutoring in Exercise Biology (1-5)
Tutorial—3-15 hours. Prerequisite: lower division standing and consent of instructor. Assisting the pro fessor by tutoring students in exercise biology course-related projects. May be repeated for credit for 10 units including courses 197 and 197TC. No tutorial units will be counted towards the Exercise Biology major. (P/NP grading only.)—I, II, III, IV, V
97TC. Tutoring Exercise Biology in the Community (1-5)
Tutorial—3-15 hours. Prerequisite: consent of instruc tor and chairperson. Tutoring in the community in exercise biology related projects under the guidance of the faculty. May be repeated once for credit. (P/ NP grading only.)

98. Directed Group Study
Prerequisite: consent of instructor and chairperson. (P/NP grading only.)
Upper Division Courses

101. Exercise Physiology (4)
Lecture—4 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101 recommended. Focus on the neurophysiological basis of motor control, and biomechanical bases of human movement. Human movement is understood in the context of body structures, basic principles of physics, and functional characteristics of nerve and muscle. One unit of credit allowed to students who have completed Exercise Science 104. Only 2 units of credit allowed to students who have completed Exercise Science 105. Not open for credit to students who have completed Exercise Science 104. Prerequisite: course 103 or consent of instructor. Biomechanical bases of human movement investigated; topics include muscle-skeletal mechanics, tissue mechanics, electromyography, and measurement and analysis techniques. A minimum of 1 hour of laboratory or exercise test ing, exercise prescription and effects of exercise conditioning are examined in detail. — (II.) Shaffrath

113. Growth and Development in Human Performance (3)
Lecture—3 hours. Prerequisite: Cell Biology and Human Anatomy 101, and Biomechanics 104. Analysis and Control of Human Movement (4)
Analysis and Control of Human Movement (4)
Lecture—2 hours; laboratory—3 hours to alternate weekly with discussion—1 hour. Prerequisite: course 103 or consent of instructor. Physical activity as a therapeutic modality is examined in normal and diseased populations (cardiovascular, pulmonary, di abetic). Basic knowledge of open loop theories, motor programming, cognitive learning strategies, and the effects of biochemical and biomechanical influence is required. — (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.—II. (II.) Hawkins

148. Theory and Practice of Exercise Testing (1)
Lecture/discussion—1 hour. Prerequisite: courses 111, 112 (may be taken concurrently); current CPR. Theory and practice of exercise testing applied to older adult populations. Physiological responses to and limitations of exercise testing. Application of exercise testing and training to healthy and diseased populations. (P/NP grading only.)—I, II, III

148L. Adult Fitness Testing Laboratory (1)
Lecture—3 hours. Prerequisite: courses 148 (concurrently); current CPR. Testing symptomatic and asymptomatic older adults for functional aerobic capacity, body composition, and cardiovascular function, and cardiovascular disease risk. Counseling adults in appropriate exercise programs and lifestyle modifications. Two quarters minimum; third quarter permitted. (Former course Physical Education 148L) (P/NP grading only.)—I, II, III

Casazza

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 92. (P/NP grading only.)
99. Special Study for Undergraduates (1-5)
Prerequisite: lower division standing and consent of instructor. (P/NP grading only)
Upper Division Courses
100. Neurobiology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1A, 1B, Physics 5C or 7C re-
commended. Brains and nervous systems, neurons and neural circuits. Vision, hearing, and feature extraction by the central nervous system. Develop-
ment of nervous systems. Coordination of movement. The cell biology of learning and memory. Percep-
tion, cognition, and disorders of the brain. Not open for credit to students who have completed course 101. (Former course 114 recommended.)—I. (I.) Millam, Zadpoles, Bautista, Goldberg, Furlow, Ishida, Silliman, Usrey, Weidner.
101L. Systemic Physiology Laboratory (3)
Laboratory—3 hours; discussion—2 hours. Prerequi-
tive: course 101 prior to taking 101L recommended, but 101 may be taken concurrently. Selected experi-
101. Systemic Physiology (5)
Lecture—5 hours. Prerequisite: Biological Sciences 19, Physics 18A, or 18B. Introduction to sys-
temic physiology with emphasis on aspects of human physiology. Functions of major organ systems, with the structure of those systems described as a basis for understanding the functions. Only three units of credit awarded for students having taken Biomedical Engineering 116. —I, II, III. (I, II, III.) Bautista, Debello, Goldberg, Furlow, Ishida, Silliman, Usrey, Weidner.
102. Animal Behavior (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C. Basic principles of behavioral organiza-
tion in vertebrate and invertebrate animals. Underly-
ing 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.)—II. (II.) Hahn, Nevitt.
103. Cellular Physiology/Neurobiology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 103 and 104. Physics 7C recommended. Cellular physiology with emphasis on membrane transport processes and neuronal physiology. 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 1008. (Former course 1008.)—II. (II.) Pappone.
104L. Cellular Physiology/Neurobiology Laboratory (4)
Laboratory—1 hour, laboratory—five 6-hour sessions and discussion—1 hour per week; sessions altered in late weekly; extensive writing. Prerequisite: course 100 or 101 and Biological Sciences 103 and 104. Experiments in the physical and chemical processes of cells and tissues. GE credit. Wrt.—II. (II.) Lies.
105. Introduction to Computer Models (4)
Lecture—3 hours; laboratory/course—1 hour. Prerequi-
tive: Mathematics 16C or the equivalent, Phys-
ics 7C, Chemistry 2C, and course 100 or 101. Introduction to biophysical and mathematical techniques and computer tools required for developing models of cellular processes in physiology and neurobiol-
ogy. Applications include membrane transport, ionic channels, action potentials, Ca²⁺ oscillations, respi-
ation, and muscle contraction. Offered in alternate years.
106. Experiments in Neurobiology, Physiology, and Behavior: Design and Execution (3)
Laboratory—2.5 hours; discussion—0.5 hours. Prerequi-
tive: course 100 or 101 or 102, and 199 and consent of instructor. Design and execution of exper-
iments in neurobiology, physiology, and/or behavior. Students choose and design a project in
consultation with the supervising faculty member. May be repeated once 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) —I, II, III. (II, III.) Rosenquist.
111C. Advanced Systemic Physiology Laboratory (3)
Laboratory—1 hour; laboratory—6 hours. Prerequisite: courses 101, 101L. Statistics 13; course 112, 113, or 114 recommended. Interfacing physiological recording equipment with data acquisition and analysis using the microcomputer; data interpretation within the framework of physiolo-
gical concepts. Wrt.—II. (II.) Ditterich.
111L. Advanced Systemic Physiology Laboratory (3)
Laboratory—1 hour; laboratory—6 hours; discussion—2 hours (laboratory and discussion alternate weekly). Prerequisite: courses 101, 101L. Selected compre-
hensive experiments in the autonomic nervous sys-
tem, the cardiovascular, respiratory, and rou-
112. Neuroscience (3)
Lecture—3 hours. Prerequisite: course 100 or 101. Presentation of concepts in neuroscience including sensory systems, motor systems, and higher neuro-
integration. Emphasis on mammalian nervous sys-
113. Cardiovascular, Respiratory, and Renal Physiology (4)
Laboratory—4 hours. Prerequisite: course 101; Chemis-
try 88, Physics 76 and 7C recommended. An intense and advanced presentation of concepts in cardiovascular, respiratory, and renal physiology including discussion of acid-base balance. —II. (II.) Goldberg.
114. Gastrointestinal Physiology (3)
Lecture—3 hours; term paper. Prerequisite: course 101; Biological Sciences 103 recommended. Advanced gastrointestinal physiology covering absorption, secretion, motility, and special emphasis on endocrinology and innervation. Emphasis will be on physiology of the gastrointestinal tract; some pathophysiology and nutritional items will be covered. GE credit. Wrt.—I. (I.) Bautista.
117. Avian Physiology (3)
Lecture—3 hours. Prerequisite: course 101 or Biolog-
ical Sciences 18. Physiology of the various systems of birds with emphasis on respiration, excretion, and endocrine systems.—III. (III.) Millam.
121. Physiology of Reproduction (3)
Lecture—3 hours. Prerequisite: course 101. Physio-
logical mechanisms related to reproduction, breed-
ing efficiency, and fertility, with special reference to domestic animals. —II. (II.) Berger.
121L. Physiology of Reproduction Laboratory (1)
Laboratory—3 hours. Prerequisite: course 121 rec-
ommended (may be taken concurrently). Experi-
mits on the reproductive systems of domestic animals including male and female gametes. (P/NP grading only)—I, II. (II.) Berger.
122. Developmental Endocrinology (3)
Lecture—3 hours. Prerequisite: course 101. Hormo-
nal control of development, maturation and senes-
cence from the cellular to the organismal level, with emphasis on the human. Prenatal and neonatal life, childhood and adolescence, adulthood and pregnancy, as well as the endocrinology of aging. —I. (I.)
123. Comparative Vertebrate Organology (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Biological Sciences 1A and 1B. 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 per-
form diverse physiological functions. (Same course as Anatomy, Physiology and Cell Biology 100.—II. [II.] Ramsey.)

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 animal species and non-mammalian vertebrates. Examine changes or modifications to neural structures as a result of morphological or behavioral specializations. (Same course as Psychology 124.—II. [II.] Krubitzer.)

125. Comparative Physiology: Neurointegrated Mechanisms (3) Lecture—3 hours. Prerequisite: course 101. Comparisons of physiological functions in the animal kingdom: neurointegrated mechanisms of integration including aspects of phylogenetic development at both neuronal and systemic levels. Woolley

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 mechanosensitive systems (audition, lateral lines, touch, electro) chemosensitive systems (olfaction, taste, pheromones), photosensitive systems (vision, infrared detection, UV detection), electroreception, and pain. Emphasis on receptors. —II. [II.] Simons.


129. Comparative Physiology: Respiration (3) Lecture—3 hours. Prerequisite: course 101. Comparisons of physiological functions in the animal kingdom: respiration.


139. Frontiers in Physiology (3) Lecture—2 hours; discussion—1 hour. Prerequisite: courses 100 and 101; 102 may be taken concurrently. Lectures by leading authorities and discussion of the latest research in newly emerging areas in physiology. Offered every third year. —III. [III.]

140. Principles of Environmental Physiology (3) Lecture—3 hours. Prerequisite: course 101; Biological Sciences 102 recommended. Physiological aspects of interactions of organisms and environmental, cellular, system, and organismal levels. Emphasis on molecular responses/mechanisms to thermal, pressure, gravity and light environmental variables. Not open for credit to students who have completed course 148. (Former course 148.—II. [II.] Fuller.)

141. Physiological Adaptation of Marine Organisms (3) Lecture—2 hours; laboratory—3 hours. Prerequisite: Biological Sciences 103. Residence at Bodega Marine Laboratory required. Physiological adaptation to the environment among organisms in marine and estuarine habitats. (See Bodega Marine Laboratory Program.—II. [II.] Sutter)

141P. Physiological Adaptation of Marine Organisms/Advanced Laboratory Topics (5) Laboratory—12 hours; discussion—1 hour. Prerequisite: course 141 concurrently. Residence at Bodega Marine Laboratory required. Scientific research from hypothesis to publication, including training in methods of library research. Research related to topic covered in course 141. Final presentation both oral and written. (See Bodega Marine Laboratory Program.—II. [II.] Chang, Cher

150. Advanced Animal Behavior (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: course 102 or Psychology 101. Advanced integrative survey of behavioral 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.—III. [III.] Overstreet.)

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 behavior. Fundamental relationships between hormones and behavior. —II. [II.] Simons. Laboratory exercises in the study of behavior in response to endocrine agents. Role of endocrine regulation of behavior in the animal during its lifetime. Role of hormones in behavioral homeostasis, social behavior, reproductive behavior, parental behavior, adaptation to stress. (Same course as Psychology 132.—III. [III.] Bates, Furlow, Hahn

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 third year. (Same course as Psychology 193.—III. [III.]

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 molecular and cellular neurobiology. Topics include channel biophysics, action potential propagation, intracellular signal transduction pathways, synaptic physiology and quantal analysis, cellular mechanisms of synaptic plasticity, and neuroendocrine regulation of synaptic circuitry. (Same course as Neuroscience 103.—II. [II.] Bums, Chen, Mulloney.

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 neurotransmitters. Morgan

161. Developmental Neurobiology (3) Lecture—3 hours. Prerequisite: course 100 or 101. Issues, theoretical concepts, and methodologies in developmental neurobiology. Topics include prenatal and postnatal differentiation of neurons, and plasticity in the mature and aging brain. Integration of neurochemical, structural, and behavioral perspectives. —III. [III.] Chalupa, McAllister

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 to be considered are birdsong, locomotion, echolocation. —III. [III.] Britten

163. Information Processing Models in Neuroscience and Psychology (4) Lecture—3 hours; term paper. Prerequisite: Mathematics 16B, Physics 7B, course 100 or Psychology 101. Basic mathematical modeling techniques used in neuroscience and psychology. Specific topics include linear systems theory, Fourier transforms, neural networks, adaptive systems, probabilistic inference and information theory. Emphasis on understanding information processing in neural systems. (Same course as Psychology 125.—II. Sutter

164. Mammalian Vision (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 100, 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. Britten, Werner

165. Neurobiology of Speech Perception (3) Lecture—3 hours. Prerequisite: course 100 or 101. Interdisciplinary approach to speech perception with emphasis on functional neuroanatomy and behavior. Topics include auditory processing in time and space, intelligibility in noise and reverberation, speech, evolution of vocal communication, models of speech perception, development, and hearing impairment. —I. [I.] Miller

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, methadone), amphetamines, cocaine, nicotine, marijuana (cannabinoids), alcohol, caffeine, and mind-altering drugs such as LSD and anti-depressants. —III. [III.] Lents

169. Undergraduate in Neurobiology (3) Lecture—2 hours; discussion—1 hour. Prerequisite: courses 100 and 101, course 102 may be taken concurrently. Lectures by leading authorities and discussion of the latest research in newly emerging areas in neurobiology. Offered every third year. —III. [III.]

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 faculty and students. May be repeated for credit. (P/NP grading only.)—I, II, III, IV, 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 physiology. (P/NP grading only.)

194HA-194HB-194HC. Neurobiology, Physiology, and Behavior—Honors (1-4-2) Laboratory—3-12 hours. Prerequisite: senior standing; minimum 3.5 GPA in courses counted toward major; approval by the Master Adviser. Emphasis on current research findings and methods 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, IV, III.

197T. Tutoring in Neurobiology, Physiology, and Behavior (1) Project—1 hour. Prerequisite: consent of instructor. Assisting the instructor by tutoring students in one of the Student’s regular courses. May be repeated for credit. (P/NP grading only.)—I, II, III, IV, III.

198. Directed Group Study (1-5) (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.)

Graduate Courses

217. Advanced Avian Physiology (1) Project—1 hour. Prerequisite: course 117 concurrently and graduate standing. Study in depth of a topic in avian physiology through development of a lecture with associated instructional materials such as lesson plan, readings, manipulative aids. (S/U grading only.)—II. [II.] Millant
228. Systems Neuroscience (3)
Lecture—4 hours; discussion—1 hour. Prerequisite: graduate standing or consent of instructor. Integrative and information-processing 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 Neuroscience 222.)—II. [I.]—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. —II. [I.]—Usrey

267. 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.)—III. Chaudry

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 eye and retina, including optics, anatomy, transduction, retinal synapses, adaptation, and parallel processing. (Same course as Neuroscience 261A and Molecular, Cellular, and Integrative Physiology 261A.) (S/U grading only)—II. [I.]—Ishida

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.—II. [I.]—Ishida

261C. Topics in Vision: Clinical Vision Science (2)
Lecture/discussion—2 hours. Prerequisite: courses 261A and 261B or consent of instructor. Causes and consequences of major visual and nonvisual disorders. 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.) Not offered every year. (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 electrophysiology, brain localization, electrophysiological, communications, and motor systems. Other topics include transforms, modeling assumptions, scales and linearity. Offered in alternate years.—Sutter

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.—III. [I.]—Chalupa

285. Literature in Visual Neuroscience (2)
Seminar—2 hours. Critical presentation and discussion of current literature in visual neuroscience. (Same course as Neuroscience 285.) May be repeated for credit if topic differs. (S/U grading only)—II, III, [I, I, III]. Usrey, Britten, Ditterich

291. Auditory Neuroscience I
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, behavior and psychophysics through review of original literature. New topic each quarter. May be repeated for credit with consent of instructor. (S/U grading only)—II, III, [I, I, III]. Recanzone, Sutter

See Neurobiology, Physiology, and Behavior, on page 392; and Neuroscience (A Graduate Group), below.

Neuroscience (A Graduate Group)
David Amaral, Ph.D., Chairperson of the Group
Group Office, 148 Center for Neuroscience (530) 757-8845; http://neuroscience.ucdavis.edu/ncg

Faculty
David Amaral, Ph.D., Professor (Psychiatry)
Kathleen Baynes, Ph.D., Associate Professor (Neurology)
Robert Bertram, Ph.D., Professor (Neurology)
Ann Bonham, Ph.D., Associate Professor (Internal Medicine, Pharmacology)
Kenneth H. Britten, Ph.D., Professor (Neurobiology, Physiology, and Behavior)
Silvia Bunge, Ph.D., Assistant Professor (Psychology)
Marie Burns, Ph.D., Associate Professor (Psychiatry)
Earl F. Carstens, Ph.D., Professor (Neurobiology, Physiology, and Behavior)
Cameron Carter, Ph.D., Professor (Psychology and Behavioral Science)
Leo M. Chalupa, Ph.D., Professor (Neurobiology, Physiology, and Behavior)
Barbara Chapman, Ph.D., Associate Professor (Neurobiology, Physiology, and Behavior)
Tung-Yi Chen, Ph.D., Assistant Professor (Neurology)
Hwai-Jong Cheng, M.D., Ph.D., Assistant Professor (Neurobiology, Physiology, and Behavior)
Blythe Corbett, Ph.D., Assistant Professor (Psychology)
Gino Cortopassi, Ph.D., Associate Professor (Molecular Biosciences)
William DeBello, Ph.D., Assistant Professor (Neurobiology, Physiology, and Behavior)
Charlie DeCarli, Ph.D., Professor (Neurology)
Elva Diaz, Ph.D., Assistant Professor (Pharmacology and Toxicology)
Elizabeth Dlsbrow, Ph.D., Assistant Professor (Neurology)
Jochen Ditterich, Ph.D., Assistant Professor (Neurobiology, Physiology, and Behavior)
Michael Ferns, Ph.D., Associate Professor (Anesthesiology and Pain Medicine)
Dorothy W. Gietzen, Ph.D., Professor (Anatomy and Cell Biology)
Fredric Gorin, M.D., Ph.D., Professor (Neurology)
Paul Hagerman, M.D., Ph.D., Professor (Biochemistry and Molecular Medicine)
Randi Haggard, M.D., Ph.D., Professor (Pediatrics)
Linda Hall, Ph.D., Professor (Biochemical Pharmacology)
Andrew T. Ishida, Ph.D., Professor (Neurobiology, Physiology, and Behavior)
Per Jonatza, Ph.D., Assistant Professor (Psychology)
Lee-Way Jin, Ph.D., Associate Professor (Pathology)
Edward G. Jones, M.D., Ph.D., Professor (Psychiatry)
Leah Krubitzer, Ph.D., Assistant Professor (Psychology)
Janine LaSalle, Ph.D., Associate Professor (Medical Microbiology and Immunology)
Noelle L'Etoile, Ph.D., Assistant Professor (Psychiatry)
Bruce Lyeth, Ph.D., Associate Professor (Neurological Surgery)
Richard Maddock, Ph.D., Professor (Psychology and Behavioral Science)
George (Ron) Mangun, Ph.D., Professor (Psychology, Neurology)
Kimberly McAllister, Ph.D., Assistant Professor (Neurology)
Lee Miller, Ph.D., Assistant Professor (Neurobiology, Physiology, and Behavior)
Brian Mulloney, Ph.D., Professor (Neurobiology, Physiology, and Behavior)
Pamela A. Pappone, Ph.D., Professor (Neurobiology, Physiology, and Behavior)
Isaac N. Pessah, Ph.D., Associate Professor (Molecular Biosciences)
David Pleasure, M.D., Ph.D., Professor (Neurology)
Charan Ranganath, Ph.D., Assistant Professor (Psychology)
Gregg H. Recanzone, Ph.D., Professor (Neurobiology)
David Richman, M.D., Professor (Neurology)
Susan Rivera, Ph.D., Assistant Professor (Psychology)
Karen Sigvardi, Ph.D., Adjunct Professor (Neurology)
Mitchell L. Sutter, Ph.D., Assistant Professor (Neurobiology)
Diane Swick, Ph.D., Assistant Adjunct Professor (Neurology)
Jim Trimmer, Ph.D., Professor (Pharmacology and Toxicology)
Martin Usey, Ph.D., Assistant Professor (Neurobiology, Physiology, and Behavior)
Ana Elena Vazquez, Ph.D., Assistant Adjunct Professor (Otolaryngology)
John Werner, Ph.D., Professor (Ophthalmology)
Martin C. Wilson, Ph.D., Professor (Neurobiology, Physiology, and Behavior)
Ewa Wojciulik, Ph.D., Assistant Professor (Psychology)
David Woods, Ph.D., Adjunct Professor (Neurology)
Ebenazer Yamao, Ph.D., Professor (Otolaryngology)
Andrew Yonelinas, Ph.D., Associate Professor (Psychology)
Chengzi Zhou, Ph.D., Assistant Professor (Human Anatomy)

Graduate Study. The Graduate Group in Neuroscience offers programs of study leading to the Ph.D. degree. Neuroscience is a broad, interdepartmental program with faculty interests ranging from molecular biophysics of chemical signaling to general organization and cognition. A major goal of the program is to prepare students for careers as research scientists. Details of the program may be obtained from the Group office.

Graduate Advisers. R. Berman (Neurological Surgery), E. Carstens (Neurobiology, Physiology, and Behavior), B. Chapman (Neurobiology, Physiology, and Behavior), K. Sigvardi (Center for Neuroscience)

Courses in Neuroscience (NSC)
Upper Division Course
160. Molecular and Cellular Neurobiology (3)
Lecture—1.5 hours; discussion—1.5 hours. Prerequisite: Neuroscience, Physiology, and Behavior 100. Lower Division Courses 101 and consent of instructor. Selected topics in neurobiology. Topics include channel biology, action potential propagation, intracellular signal transduction pathways, synaptic physiology and quantal analysis, cellular mechanisms of synaptic plasticity, and neuromodulation of...
synaptic circuitry. (Same course as Neurobiology, Physiology, and Behavior 160.)—II. (III.) Burns, Chen, Mulleoney

Graduate Courses

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 both with respect to 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) Amaral, Jones, Usrey

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.—II-III. (III.) McAllister

221. Cellular Neurophysiology (4) Lecture—3 hours; discussion—1 hour. 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, synaptic transmission and, mechanisms of synaptic transmission, and the cellular basis of learning and memory.—I. (I) Trimmer, Yamoah

222. Systems Neuroscience (5) Lecture—4 hours; discussion—1 hour. Prerequisite: graduate standing or consent of instructor. Integrative and information-processing 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. (II) Usrey

223. Cognitive Neuroscience (4) Lecture—4 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 three-quarter sequence. (Same course as Psychology 261.)—III. (III)

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. (II) Diaz, L’Etoile

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 experiments and methods described in associated literature.—III. (III) Chavanes, McAllister

226. Molecular and Developmental Neurobiology (4) Lecture/discussion—4 hours. Prerequisite: consent of instructor. Introduction to molecular and developmenta; neurobiology. Topics range from neuroinflammation to development of sensory systems and include modern molecular methods and their application in developmental neuroscience.—II. (II) McAllister, L’Etoile

243. Topics in Cellular and Behavioral Neurobiology (3) 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)—III. (III) Ishida

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 Neurobiology, Physiology, and Behavior 247)—II. Choudary

250. Biology of Neuroglia (2) Lecture/discussion—1.5 hours. Prerequisite: consent of instructor. The properties and functions of non-neuronal or neuroglial 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)—III. Kumari

261A. Topics in Vision: Eyes and Retinal Mechanisms (3) 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 Psychology 261A.) (S/U grading only)—II. (II) Ishida

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 of major visual system. (Same course as Neurobiology, Physiology, and Behavior 261B and Molecular, Cellular, and Integrative Psychology 261B.) (S/U grading only). Offered in alternate years.—II. (II) Olthausen

261C. Topics in Vision: Clinical Vision Science (2) Lecture/discussion—2 hours. Prerequisite: courses 261A and 261B, or consent of instructor. Causes and mechanisms 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 Neurobiology, Physiology, and Behavior 261C and Molecular, Cellular, and Integrative Physiology 261C.) (S/U grading only). Not offered every year.—II. (II)

283. Neurobiological Literature (1) Seminar—1 hour. Prerequisite: consent of instructor. Critical presentation and analysis of recent journal articles in neuroscience. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III) Mulloney, Wilson

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. (II, III) Chapman

285. Literature in Visual Neuroscience (2) Seminar—2 hours. Critical presentation and discussion of current literature in visual neuroscience. (Same course as Neurobiology, Physiology, and Behavior 285.) May be repeated for credit if topic differs. (S/U grading only)—I, II, III. (I, II, III) Usrey, Britten

290C. Research Conference in Neurobiology (1) Discussion—1 hour. Prerequisite: graduate standing in Neuroscience or consent of instructor; course 299 (concurrently). Presentation and discussion of faculty and graduate student research in neurobiology. May be repeated for credit. (S/U grading only)—I, II, III. (I, II, III)

292. Cortical Plasticity and Perception (2) Lecture/discussion—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 studies of the somatosensory, visual, auditory, and motor cortex. (Same course as Neurobiology, Physiology, and Behavior 292.) Offered in alternate years. (S/U grading only)—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 345.

Neurosurgery

See Medicine, School of, on page 345.

Nutrition

See Clinical Nutrition, on page 174;
Food Service Management, on page 277;
Nutrition; Nutritional Biology (A Graduate Group), on page 401;
Nutrition Science, on page 402; and
Internal Medicine—Clinical Nutrition and Metabolism (NCM), on page 360.

Nutrition

(College of Agricultural and Environmental Sciences)

Carl L. Keen, Ph.D., Chairperson of the Department
Robert B. Rucker, Ph.D., Vice-Chairperson of the Department

Department Office. 3135 Meyer Hall
(530) 752-4630, http://nutrition.ucdavis.edu

Faculty

Elizabeth Applegate, Ph.D., Senior Lecturer (SOE)
Kenneth H. Brown, M.D., Professor

Quarter Offered: I=Fall; II=Winter; III=Spring; IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Social-Cultural Diversity; Wrt=Writing Experience
Nutrition

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Gary Cherry, Ph.D., Professor
(Nutrition, Environmental Toxicology)
Andrea J. Clifton, Ph.D., Professor
Kathryn G. Dewey, Ph.D., Professor
M.R.C. Greenwood, Ph.D., Professor
Louis E. Grossman, Professor
(Nutrition, Geography)
Carl L. Keen, Ph.D., Distinguished Professor
(Nutrition, Internal Medicine)
Bo I. Lonnertal, Ph.D., Distinguished Professor
(Nutrition, Internal Medicine)
Rager McDonald, Ph.D., Professor
Patricia Olezie, Ph.D., Associate Professor
Robert B. Rucker, Ph.D., Professor
Barbara O. Schneeman, Ph.D., Professor (Nutrition, Food Science and Technology, Internal Medicine)
Francene M. Steinberg, Ph.D., R.D., Associate Professor
Judith S. Stern, Sc.D., R.D., Distinguished Professor
(Nutrition, Internal Medicine)

Emerit Faculty
Lindsay H. Allen, Ph.D., Professor Emeritus
Janet King, Ph.D., Professor Emeritus
Frances J. Zeman, Ph.D., Professor Emeritus

Affiliated Faculty
Sean Adams, Ph.D., Assistant Adjunct Professor
Ellen Bonnel, Ph.D., Academic Administrator
Betti Burri, Ph.D., Associate Adjunct Professor
Brit Burton-Freeman, Ph.D., Assistant Research Nutritionist
Paul A. Davis, Ph.D., Research Nutritionist
Cesar Fraga, Ph.D., Research Chemist
Robert M. Hackman, Ph.D., Research Nutritionist
Marjorie Haskell, Ph.D., Associate Researcher
Peter Havel, Ph.D., D.V.M., Researcher
Wayne Hawkes, Ph.D., Assistant Adjunct Professor
M. Jane Hening, Ph.D., Academic Administrator
Liping Huang, Ph.D., Assistant Adjunct Professor
Nancy Hudson, M.S., R.D., Lecturer
Daniel Hwang, Ph.D., Adjunct Professor
Amy Block Joy, Ph.D., Specialist in Cooperative Extension
Lucia Kaiser, Ph.D., R.D., Associate Specialist in Cooperative Extension
Nancy Keim, Ph.D., Adjunct Professor
Shannon Kelleher, Ph.D., Assistant Researcher
Darshen Kelley, Ph.D., Adjunct Professor
Louise Lanoue, Ph.D., Assistant Researcher
John Newman, Ph.D., Assistant Adjunct Professor
John Polakurto, Ph.D., Academic Administrator
Hagen Schroeter, Ph.D., Assistant Researcher
Charles Stephenshen, Ph.D., Associate Adjunct Professor
Barbara Sutherland, Ph.D., Academic Administrator
Marilyn S. Townsend, M.S., R.D., Specialist in Cooperative Extension
Janet Uriu-Adams, Ph.D., Associate Researcher
Marla Van Loan, Ph.D., Associate 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 174 and Nutrition Science, on page 402.

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 .................................. 24
Preparation: plan in advance to include the required course prerequisites.
Nutrition 111AV and 11B ......................... 5
Nutrition 118B, 122, 124, 201, 202 .................. 6
Nutrition 120AN or 120BN ......................... 4

Food Service Management ....................... 25
Preparation. Plan in advance to include the required course prerequisites.
Food Science and Technology 100A-100B, 101A-101B and 108 ....................... 13
Food Service Management 120, 120B, 122 .................. 6
Agricultural and Resource Economics ........... 8

Nutrition and Food ................................... 24
Preparation. Plan in advance to include the required course prerequisites.
Nutrition 111AV and 11B ......................... 5
Nutrition 120AN or 120BN ......................... 4
Food Science and Technology 100A-100B, 101A-101B .............................. 13
Nutrition 114, 116A-116B, 116AL-116BL ............. UNITS

Nutrition Science .................................... 20
Preparation. Plan in advance to include the required course prerequisites.
Animal Biology 102 and 103, or Biological Sciences 102 and 103 and Nutrition 111AV and 111B .................. 11-15
Nutrition 114, 116A-116B, 117, 120AN or 120BN, 122, 123, 124, 201, 204 ............ UNITS

Nutritional Assessment: Dietary, Anthropometric, and Nutritional Measurements (Nut) Lecture—2 hours, laboratory—3 hours.
Preparation: Chemistry 8B, Nutrition 111AV and 111B, 116A-116B, 116AL-116BL, 120AN or 120BN, 122, 123, 124, 201, 204

Nutritional Toxicants (Nutrition) Lecture—2 hours, laboratory—3 hours.
Preparation: courses 116AL and 116BL. Clinical Nutrition Practicum (3-3)
Lecture—1 hour, laboratory—3 hours; discussion—1 hour.
Preparation: courses 116AL and 116BL. Clinical Nutrition Practicum (Nutrition) (3-3)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 101, Biological Sciences 103 or Animal Biology 103.

Upper Division Courses
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 103.
Clinical Nutrition Practicum (Nutrition) (3-3)
Lecture—1 hour; laboratory—3 hours; discussion—1 hour.
Preparation: courses 116AL and 116BL.

Patient education for pathological conditions covered in 1168. Continuation of course 116AL.—II. (II) Streefkerk

117. Experimental Nutrition (6)
Lecture—3 hours; laboratory—6 hours; extensive writing. Prerequisite: courses 111, Biological Sciences 102 and 103, and a laboratory course in nutrition, methods of assessing nutritional status. Application of chemical, microbiological, chromographic and enzymatic techniques to current problems in nutrition. GE credit: Wrt.—I. (I) Clifford

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 education.—II. (II) Dewey

119A. International Community-Based Nutritional Assessment (1)
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 country, major nutritional problems in low-income countries; ethical issues in human investigation; survey design, data collection techniques, and data analysis; preparation for international travel, cross-cultural communications, health, and safety while living abroad.—Brown

119B. International Community-Based Nutritional Assessment (6)
Lecture—2 hours, fieldwork—12 hours. Prerequisite: course 119A and consent of instructor. A six-week summer course in Peru. Implementation of a community-based nutritional assessment survey, including development of the survey instrument; selection of the study sample, collection and verification of data, and analysis and interpretation of the results; the project will be carried out by paired participation of students and faculty members of UC Davis and the collaborating foreign institution.—Brown

120AN. Nutritional Anthropology (4)
Lecture—3 hours, discussion—1 hour. Prerequisite: course 2 or Geography 2 recommended. Nutritional anthropology from historical and contemporary perspectives; the anthropological approach to food and diet, field work methods; case histories that explore food patterns and their nutritional implications. GE Credit: Div.—IV. (IV) Corder

120BN. Nutritional Geography (4)
Lecture—3 hours: discussion—1 hour. Prerequisite: Geography 2 recommended. Nutritional geography from historical and contemporary perspectives; the geographical approach to food and diet: cultural and environmental factors that influence dietary practices; food-related landscapes and patterns. GE Credit: Div, SciEng, SocSci.—IV. (IV)

122. Ruminant Nutrition and Digestive Physiology (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: upper division standing. Animal Biology 103 or consent of instructor; Neurobiology, Physiology, and Behavior 101 or Biological Sciences 1C, and Mathematics 168 recommended. Study of nutrient utilization as influenced by the unique aspects of digestion and fermentation in ruminants, both domestic and wild. Comparative anatomy, comparative anatomy, feed evaluation, digestion kinetics using fistulated cows, computer modeling, and microbial exercises.—III. (III) Fazzalari

123. Comparative Animal Nutrition (3)
Lecture—3 hours. Prerequisite: Animal Biology 103. Restricted to upper division or graduate students. Comparative nutrition of animals, including laboratory, companion, zoo, and wild animals. Digestion and metabolic adaptations required for animal species to consume diverse diets ranging from grasses and leaves to nectar to insects and meat. Relation of nutrition to metabolic adaptations and physiological states, including growth, reproduction, and diseases.—III. (III) Stephens

123L. Comparative Animal Nutrition Laboratory (1)
Laboratory—3 hours. Prerequisite: Animal Biology 103, course 123 (may be taken concurrently). Laboratory exercises according to written reports on establishment of nutritional requirements and formulation of complete diets for laboratory, companion, zoo and wild animals.—III. (III) Kissing

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 nutrition to the environment and conservation of endangered species.—I. (I) Hung

127. Environmental Stress and Development in Marine Organisms (10)
Lecture—4 hours, laboratory—12 hours; discussion—2 hours. Prerequisite: Environmental Toxicology 101 or Biological Sciences 102 or the equivalent; Environmental Toxicology 114A or course 114 recommended. Course taught at Bodega Marine Laboratory to environmental and nutritional stress, including pollutants, on development and function in embryos and larvae of marine organisms. Emphasis on advanced experimental methods. (Same course as Environmental Toxicology 127.) GE credit: SciEng.—IV. (IV) Cherr

129. Journalistic Practice 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 campus media. Course may be repeated once for credit.—III. (III) Stern

130. Experiments in Nutrition: Design and Execution (2)
Laboratory—6 hours. Prerequisite: consent of instructor; course 101, 110, 111, or 114 recommended. Experiments in current nutritional problems. Experimental design: students choose project and, independently or in groups of two-three, design a protocol, complete the project, and report findings. May be repeated for credit up to six times (three times per instructor) with consent of instructor.—I, II, III, IV. (I, II, III, IV)

190. Professional Seminar 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, IV. (I, II, III, IV)

190C. Nutrition Research Conference (1)
Seminar—1 hour. Prerequisite: upper division standing in Nutrition or related biological science; consent of instructor. Introduction to research findings and methods in nutrition. Presentation and discussion of research by faculty and students. May be repeated for credit. [P/NP grading only.—I, II, III, IV]

192. Internship (1-12)
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 a protocol, carry out the project, 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, IV. (I, II, III, IV)

199. Special Study for Advanced Undergraduates (1-5)
(P/NP grading only)

Graduate Courses

201. Vitamin and Cofactor Metabolism (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: one upper division nutritional biochemistry and physiology course. Review of studies and relationships involving the metabolic functions of vitamins. Comparative nutritional aspects and the metabolism and chemistry of vitamins and vitamin-like compounds.—III. (III) Kucker, Steinberg

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. Evaluation of energy transformations associated with food utilization. Energy expenditures at cellular, tissue, and animal levels as affected by diet and physiological state. Current and future feeding systems.—III. (III) Sainz

203. Advanced Protein and Amino Acid Nutrition (4)
Lecture—2 hours. Prerequisite: upper division nutritional biochemistry or physiology course. Nutritional significance of protein and amino acids, including studies of the influence of dietary protein on digestion, absorption, metabolism, resistance to disease, and food intake. Study of dietary requirements and interrelationships among amino acids.—III. (III) Colvert

204. Mineral Metabolism (2)
Lecture—2 hours. Prerequisite: upper division nutrition or biochemistry course. Studies of metabolic functions and nutritional interrelationships involving minerals.—II. (II) Limner, Keen

219A. International Nutrition (3)
Lecture—3 hours. Prerequisite: graduate standing; undergraduates only admitted with consent of instructor after completion of course 111A. 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. Brown, 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.—II. Brown, Dewey

230. Experiments in Nutrition: Design and Execution (2)
Laboratory—6 hours. Prerequisite: consent of instructor; courses 201-204, 205, 206 or the equivalent recommended. Student selected projects to enhance laboratory skills. Independently, or in groups of two-three students, design a protocol, carry out the project, 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, IV. (I, II, III, IV)

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.—I. (I)

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 interactions of nutrition and immune function, including modulation of immunocompetence by diet and
252. Nutrition and Development (3)
Lecture—3 hours. Prerequisite: courses 201, 202, 203, and 204. Relationships of nutrition to perinatal and early postnatal development.—II. —(II.) Keen

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 lecture, laboratory, and discussion with students in the laboratory where students and staff will critically evaluate the literature. Offered in alternate years.—III. Ramsey

254. Applications of Systems Analysis in Nutrition (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 202, Physiological Sciences 205A-205B 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. Critical evaluations of mechanistic models used analytically in support of nutritional research. Offered in alternate years.—II. Fadel

257. Selected Topics in Nutritional and Hormonal Control of Nitrogen Metabolism (2)
Lecture—2 hours. Prerequisite: courses 201 through 204; Physiological Sciences 205A-205B or the equivalent. Quantitative and qualitative aspects of nitrogen metabolism; critical evaluation of dietary intake, hormones and diuretic interactions which affect nitrogen metabolism, including protein synthesis-degradation, amino acid synthesis-catabolism, nitrogen transport-excretion, depending on current literature. Offered in alternate years.—(I.) Klausing, Calvert

258. Field Research Methods in International Nutrition (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing or consent of instructor. Issues and problems related to implementation of nutrition field research in less-developed countries, including ethical, legal, international, developmental, and administrative and personal issues. Offered in alternate years.—(I.) Brown, Dewey

259. Nutrition and Aging (2)
Lecture—2 hours. Prerequisite: three of courses 201, 202, 203, and 204. Interaction between nutrition and aging. Topics include physiological/biochemical basis of aging, age-related changes affecting nutritional requirements, nutrition and mortality rate, assessment of nutritional status in the elderly, and relationship between developmental nutrition and the rate of aging. Offered in alternate years.—McDonald

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 pregnancy outcomes.—I. —(I.) Hening

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 both mother and infant. Development of skills in assessment, nutrition counseling, education and support of new mothers and their families.—II. —(II.) Hening

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, social, and economic factors contributing to nutritional status. Nutritional needs and interventions for special groups, including obese children/adolescents, athletes, and eating disorders.—III. —(III.) Hening

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 research protections. Not open for credit to students who have completed course 492B.—III. —(III.) Steinberg

290. Beginning Nutrition Seminar (2)
Lecture—2 hours. Prerequisite: first year graduate standing. Discussion and critical evaluation of topics in nutrition with emphasis on literature review and evaluation in this field. Students will complete a research project on relevant topics.—I. (I.) Schneeman, Dewey, Conklin

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 project proposals presented and evaluated. Format will combine seminar and discussion style. (S/U 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. (S/U 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.—I, II, III, (I, II, III)

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.—II. —(II.) Stern

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 topics differ.—I. —(I.) Lanoue

297. 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 evaluation 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)

299. Research (1-12)
(S/U grading only)

Professional Courses

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.—II. (II.) Grivetti

492C. Grant Writing (1)
Lecture—1.5 hours; discussion—1.5 hours. Prerequisite: graduate standing in Nutrition or consent of instructor. 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.—III. Stern

Nutritional Biology
(A Graduate Group)

C. Christopher Calvert, Ph.D., Chairperson of the Group

Group Office. 3135 Meyer Hall (530) 752-6784; http://nutrition.ucdavis.edu/ggn

Faculty
Lindsay H. Allen, Ph.D., R.D., Professor (Nutrition)
Lars Berglund, Ph.D., Professor (Endocrinology)
Kenneth H. Brown, M.D., Professor (Nutrition)
C. Christopher Calvert, Ph.D., Professor (Animal Science)
Andrew J. Clifford, Ph.D., Professor (Nutrition)
Douglas E. Conklin, 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. Fadl, Ph.D., Professor (Animal Science)
Andrea J. Fascetti, D.V.M., Ph.D., Assistant 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)
Louis E. Grivetti, Ph.D., Professor (Nutrition, Geography)
Jean-Xavier Guinard, Ph.D., Professor (Food Science and Technology)
Charles H. Halsted, M.D., Professor (Internal Medicine, Nutrition)
Robert J. Hansen, Ph.D., Professor (Molecular Biosciences)
Silas S. O. Hung, Ph.D., Professor (Animal Science)
Thomas Jue, Ph.D., Professor (Biological Chemistry)
Sidika E. Kasim-Karakas, M.D., Associate Professor (Internal Medicine)
George A. Kaysen, M.D., Ph.D., Professor (Renal Medicine)
Carl L. Keen, Ph.D., Distinguished Professor (Nutrition, Internal Medicine)
Kirk C. Klausing, Ph.D., Professor (Animal Science)
Bo L. Lonnert, M.D., Professor (Nutrition, Internal Medicine)
Stanley L. Marks, B.V.S., Ph.D., Associate Professor (Medicine and Epidemiology)
Roger B. McDonald, Ph.D., Professor (Nutrition)
Alyson Mitchell, Ph.D., Assistant Professor (Food Science and Technology)
Patricia Orteiza, Ph.D., Associate Professor (Nutrition, Environmental Science)
Anthony F. Philipps, M.D., Professor (Pediatrics)
Jon Ramsey, Ph.D., Associate Professor (Molecular Biochemistry)
Helen E. Raybould, Ph.D., Professor (Anatomy, Physiology and Cell Biology)
Quinton R. Rodgers, Ph.D., Professor (Molecular Biosciences)

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer, 2007/2008 offering in parentheses

General Education (GE) credit: AritHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Social-Cultural Diversity; Wrt—Writing Experience
Nutrition Science

Robert B. Rucker, Ph.D., Distinguished Professor (Nutrition, Biological Chemistry)
Robert E. Free, Ph.D., Associate Professor (Neurobiology, Physiology, and Behavior)
José Santos, Ph.D., Associate Professor (Nutrition, Internal Medicine)
Francene M. Steinberg, Ph.D., R.D., Assistant Professor
Vincent A. Ziboh, Ph.D., Professor
Donal A. Walsh, Ph.D., Professor
Jose Santos, Ph.D., Associate Professor
Bruce M. Wolfe, M.D., Professor Emeritus
Howard G. Schutz, Ph.D., Professor Emeritus
Ernesto Pollitt, Ph.D., Professor Emeritus
James G. Morris, Ph.D., Professor Emeritus
Jiro J. Kaneko, D.V.M., Ph.D., D.V.Sc.(hc), Professor
C. Richard Grau, Ph.D., Professor Emeritus
Robert E. Feeney, Ph.D., Professor Emeritus
Harry W. Colvin, Jr., Ph.D., Professor Emeritus

Nutrition, nutrition and development, nutrient bioavailability, human/clinical nutrition, nutrition and behavior, nutritional energetics, community nutrition, 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.

Nourishment Science

[College of Agricultural and Environmental Sciences]

Faculty

See the Department of Nutrition, on page 398.

The Major Program

The study of nutrition encompasses all aspects of the consumption and utilization of food and its constituents. Key areas of study are nutritional biochemistry—reactions important to utilization of nutrients and food constituents and to the impact of diet on health and disease, and nutrition-related policy and public health issues. The major includes two options for studying these areas: nutritional biochemistry and community nutrition.

The Program. 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 either physics (nutritional biochemistry option) or economics (community nutrition option). These courses are generally completed during the first two years, and along with biochemistry, must be completed before most major classes can be taken. During their junior and senior years, students in the nutritional biochemistry option take additional course work in biochemistry, genetics, microbiology, physiology, immunology, and/or toxicology. Students in the community nutrition 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 biochemistry option also provides preparation for technical work in nutrition in the animal, food, and pharmaceutical industries. The community nutrition option prepares students for jobs in administrative, teaching, or public health/public service positions. Students in the community nutrition option may complete the additional academic requirements for an internship in dietetics. Also qualified for careers in dietetics following completion of an internship.

B.S. Major Requirements:

Units

English Composition Requirement 0-8
Preparatory Subject Matter 60-66
Biology 2 or Geography 2
Sociology 3
Chemistry 1A or 1B, 1C
Mathematics 2A
Physics 1A-1B
Economics 1A-1B
Community Nutrition option
Sociology 46A
Psychology 41

Unrestricted Electives 8-38
Total Units for the Degree 180

Major Advisers. B. L. Önenural
Advising Center for the major is located in 3211 Meyer Hall (530) 752-2512.

Dietetics Internship. To fulfill the academic requirements for an internship in Dietetics, choose the following courses from the categories in which they appear above:

English 3 or University Writing Program 1, Psychology 1, Communication 1, Sociology 3 or Anthropology 2, Economics 1A or 1B, Nutrition 116A/LBL. The following courses may also be added (some of which may meet restricted General Education credit):

Arts and Humanities, Science and Engineering, Social Sciences, Div = Social-Cultural Diversity, Wrt = Writing Experience
Pathology, Microbiology, and Immunology

See Veterinary Medicine, School of, on page 469.

Pediatrics

See Medicine, School of, on page 345.

Pharmacology and Toxicology

See Medical Pharmacology and Toxicology (PHA), on page 364; Molecular Biosciences (VMB), on page 475; and Pharmacology and Toxicology (A Graduate Group), on page 403.

Pharmacology and Toxicology (A Graduate Group)

Alan R. Buckpitt, Ph.D., Chairperson of the Group

Group Office, 4117 Meyer Hall (Department of Environmental Toxicology (PTX)
http://www.envtox.ucdavis.edu/ptx

Faculty. The 78 faculty in the graduate group are from more than 36 academic departments and organized research units within the College of Agricultural and Environmental Sciences, the School of Medicine and the School of Veterinary Medicine.

Graduate Study. The program of study and research leading to the Ph.D. degree emphasizes an interdisciplinary approach to graduate student training. Many specialty areas in pharmacology and toxicology which emphasize the effects of chemicals in the environment, on human health, and on ecosystems. Molecular and analytical approaches are used to study reproductive, genetic and developmental, respiratory and neurological systems, as well as metabolic fate and pharmacokinetics. Career opportunities include teaching in professional schools and hospitals, laboratory research in academia, government, industry, environmental control, and agricultural and drug regulatory agencies. For detailed information on the program, contact the Group office, appropriate graduate adviser, or the group chairperson.

Individual courses are taught under departments of faculty in the group, including Environmental Toxicology, Molecular and Biological Sciences, Animal Physiology, Veterinary Medicine, and the School of Medicine.

Graduate Advisers. A.R. Buckpitt (Molecular Biosciences), J.A. Last (Pulmonary Medicine), M.G. Miller (Environmental Toxicology), K. Pinkerton (Institute of Toxicology and Environmental Health), R. Wu (Pulmonary Medicine)

Courses in Pharmacology and Toxicology (PTX)

Graduate Courses

201. Principles of Pharmacology and Toxicology I (S)
Lecture—5 hours. Prerequisite: Biological Sciences 102 and Neurobiology, Physiology, and Behavior 101. First of three courses presenting fundamental principles of pharmacology and toxicology. Introductory overview of basic concepts in pharmacology/toxicology, followed by in-depth blocks on fate processes of chemicals in the body, fate processes in tissue selective responses, selective toxicity employed therapeutically. —I. (I.)

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.)

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.)

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. (I, II, III.)

290. Seminar (1)
Current topics in pharmacology and toxicology. (S/U grading only).—I, II, III. (I, II, III.)

299. Research (1-12)
(S/U grading only)

Philosophy

(College of Letters and Science)

James R. Griesemer, Ph.D., Chairperson of the Department

Department Office, 1241 Social Sciences and Humanities Building (530) 752-0607; http://philosophy.ucdavis.edu

Faculty

Michael Glazenberg, Ph. D., Associate Professor
James R. Griesemer, Ph.D., Professor
Gerald Dworkin, Ph.D., Professor
Michael Glanzberg, Ph.D., Associate Professor
Karen L. Neander, Ph.D., Professor
Erik Konijn, Ph.D., Assistant Professor

Emeriti Faculty

Henry Allison, Ph.D., Professor Emeritus
Ronald A. Arbini, Ph.D., Professor Emeritus
William H. Bossart, Ph.D., Professor Emeritus
Robert C. Cummins, Ph.D., Professor Emeritus
Joel I. Friedman, Ph.D., Professor Emeritus
Neal W. Gilbert, Ph.D., Professor Emeritus
Marjorie Grene, Ph.D., Professor Emerita
Michael J. Hunter, Ph.D., Professor Emeritus
Michael J. Palmer, Ph.D., Professor Emeritus
Michael J. V exon, Ph.D., Professor Emeritus
George Wilson, Ph.D., Professor Emeritus

The Major Program

Philosophy addresses problems and questions that arise in all areas of human thought and experience and in all disciplines. Recurring questions about the nature of value, the good life, right conduct, knowledge, truth, language, mind, and reality are central...
to philosophical study. Philosophy also investigates the methodologies and assumptions of the major disciplines in the university in order to deepen understanding of the sciences, of mathematics, of art, literature, and history, and of religion and morality. It leads us to address issues about the nature of these subjects, about the methods of reasoning characteristic of them, and about the contributions they make to our understanding of ourselves and our world. Philosophy contributes to the liberal education of its students. The department emphasizes an analytic approach to philosophical questions, which trains students to understand and evaluate arguments and to think and write precisely and clearly. These skills are of immense value in a variety of careers.

The Program. The Department of Philosophy offers courses in such areas as the theory of knowledge, metaphysics, logic, ethics, and political philosophy. In addition, upper division courses are offered in moral and political philosophy, and aesthetics, and in the philosophy of religion, of mind, of language, of mathematics, of law, and of the physical, biological, and social sciences.

The problems of philosophy have important roots in past. The history of philosophy is important not only as part of the heritage of educated persons, but also because it is relevant to contemporary issues. For these reasons, the department places great emphasis on the history of philosophy, providing courses on the major figures and traditions of Western philosophy.

Career Alternatives. Students of philosophy learn to understand and evaluate arguments and to think and write precisely and clearly. These analytical skills are of value in any career. Many of our majors have pursued graduate study in philosophy, and have become philosophers in their own right. Others have pursued academic careers in related disciplines in the humanities and social sciences. Philosophy majors are well prepared for law, business, or other professional schools and have found careers in computer programming, government service, teaching, the ministry, and social work.

A.B. Major Requirements:

### Minor Program Requirements:

#### Depth Subject Matter

One course from any of the following areas .......................................... 12

- (a) General Philosophy: Philosophy 1
- (b) Ancient Philosophy: Philosophy 21
- (c) Early Modern Philosophy: Philosophy 22N
- (d) Philosophy of Mind: Philosophy 13
- (e) Ethics: Philosophy 14, 15 or 24
- (f) Philosophy of Science: Philosophy 30, 31, 32 or 38
- (g) Metaphysics: Philosophy 101
- (h) Theory of Knowledge: Philosophy 102

**Philosophy 12**  .......... 4

### Minor Adviser.

G.J. Mattey

Advising Office. 1242 Social Science and Humanities

Minor Program Requirements:

Students wishing to minor in Philosophy may choose a general minor or a minor specializing in logic. There are no specific courses required for the general minor, so students may create a program to suit their own interests. The range of choice in the logic specialization is limited to the courses listed.

<table>
<thead>
<tr>
<th>Philosophy—General</th>
<th>20</th>
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<tbody>
<tr>
<td>Twenty upper division units in philosophy. Philosophy 12 may be substituted for four of the upper division units.</td>
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<tr>
<th>Philosophy—Logic</th>
<th>20</th>
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<tr>
<td>Philosophy 12 or Mathematics 108 ........ 4</td>
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<tr>
<td>Philosophy 112 ........ 4</td>
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<tr>
<td>Select units from Philosophy 113, 131, 134, 135, 189K, 190 ........ 12</td>
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**Minor Adviser.** G.J. Mattey

**Honors Program.** The department offers an honors program, which gives qualifying majors the opportunity to work closely with faculty and graduate students.

**Courses for Non-Majors.** Students majoring in most disciplines in the university will find courses relevant to their educational or career goals. Philosophy 1 is the introductory course for non-majors.

<table>
<thead>
<tr>
<th>Philosophy 5 teaches critical thinking. The following courses are recommended:</th>
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<tbody>
<tr>
<td>(1) Pre-law: 12, 14, 24, 30, 102, 112, 115, 116, 118 and, especially, 119;</td>
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<tr>
<td>(2) Pre-medical: 14, 30, 108, 114, 115, 116, 118;</td>
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<tr>
<td>(3) Business: 14, 102, 112, 114, 115, 116, 117, 118, 119;</td>
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<tr>
<td>(5) Social Sciences: 12, 30, 31, 32, 101, 102, 103, 109, 118, 131;</td>
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<tr>
<td>(6) Physical Sciences: 12, 30, 31, 32, 101, 102, 106, 107, 112, 131;</td>
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<tr>
<td>(7) Biological Sciences: 30, 31, 32, 101, 102, 108, 110;</td>
</tr>
<tr>
<td>(8) Humanities and the Arts: 14, 21 through 24, 101, 102, 103, 105, 114, 116, 118, 123, 160 through 172;</td>
</tr>
<tr>
<td>(9) Agricultural and Environmental Science and Policy: 5, 14, 24, 30, 31, 114, 115, 116, 118;</td>
</tr>
</tbody>
</table>

**Department Activities.** The Philosophy department sponsors a lecture-seminar series of well-known philosophers who present papers in their fields of expertise. The department also organizes faculty and graduate student colloquia. 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.** K. Neander

**Courses in Philosophy (PHI)**

<table>
<thead>
<tr>
<th>Lower Division Courses</th>
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<tbody>
<tr>
<td>1. Introduction to Philosophy (4)</td>
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<tr>
<td>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, Wrt.—I, II, III, [I, II, III]</td>
</tr>
</tbody>
</table>

| 5. Critical Reasoning (4) |
| Lecture—3 hours; discussion—1 hour. Criteria of good reasoning in everyday life and in science. Topos to be covered 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: Wrt. |

| 11. Philosophy East and West (4) |
| Lecture—3 hours; discussion—1 hour. Comparative treatment of select theories in Eastern and Western philosophy, e.g., of self, God, being, knowledge, enlightenment. Topics selected from the following: Eastern—Buddhist, Confucian, Hindu, Taoist; and Western—Platonist, Aristotelian, Medieval Christian, Modern Rationalist/Epimristic, Kantian, Hegelian, Existentialist. GE credit: ArtHum, Div, Wrt. |

| 12. Introduction to Symbolic Logic (4) |

| 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 the mind. Offered in alternate years. GE credit: SciEng or SocSci, Wrt. |

| 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, environment, population control, technology, and human values, sexual morality, freedom in society. GE credit: ArtHum, Div, Wrt. |

| 15. Bioethics (4) |
| Lecture—3 hours; discussion—1 hour. Critical analysis of normative issues raised by contemporary medical and biological possibilities. Topics include euthanasia, abortion, reproductive technologies, genetic engineering, practitioners/patient relationships, allocation of medical resources, experimentation on human subjects. GE credit: ArtHum, Wrt.—Dworkin |

| 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, Wrt. |

| 22N. 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. Not open for credit to students who have completed former course 22 or 23. GE credit: ArtHum, Wrt. |

| 24. Introduction to Ethics and Political Philosophy (4) |
| Lecture—3 hours; discussion—1 hour. Reading of historical and contemporary works highlighting central problems in ethical and political philosophy. Why should we be moral? What is moral behavior? What is justice, both for the individual and for society? Is there a right of rebellion? GE credit: ArtHum, Wrt.—Väyrynen |

| 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 for credit to students who have taken course 104. GE credit: ArtHum or SciEng. Wrt.—Teller |

| 31. Appraising Scientific Reasoning (4) |
| Lecture—3 hours; discussion—1 hour. Introduction to scientific hypotheses and theories. Methods of reasoning used to justify such hypotheses. Emphasis on adequate justification, criteria, and strategies for distinguishing scientific from nonscientific theories. GE credit: ArtHum or SciEng—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 intellectual change, 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. Wrt.—Griesemer |

### General Education (GE) credit: ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Social/Cultural Diversity; Wrt—Writing Experience

**Quarter Offered:** I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses
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 Courses
(Certain upper division courses may not be offered every year.)

101. Metaphysics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in philosophy recommended. Theories of being: reality, substance, 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, Wrt. —Griesemer, Neander

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, coherentist and externalist theories of justified belief. Examination of skepticism. GE credit: ArtHum, Wrt. —Matten

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, Wrt. —Neander

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 in terms 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: ArtHum, Wrt. —Griesemer

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, Wrt.

107. Philosophy of the Physical Sciences (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in philosophy or a science background recommended. Nature of testability 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 or SciEng, Wrt. —Teller

108. Philosophy of the Biological Sciences (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in biology or one course in philosophy. Scientific method in biology. Nature of biological theories, explanations, and models. Problems of evolutionary theory, ecology, genetics, and sociobiology. Science and human values. GE credit: ArtHum or SciEng, Wrt. —Griesemer

109. Philosophy of the Social Sciences (4)

111. Philosophy of Space and Time (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one upper division course. 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 reality, conventionality, absolutist versus relationalist views of space and time, philosophical impact of relativity theory. —Teller

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. Proof techniques. Identity, functions, and definite descriptions. Introduction to concepts of meta-theory.—B. Matten

113. Advanced Logic (4)
Lecture/discussion—4 hours. Prerequisite: course 112 or Mathematics 108 or the equivalent. Topics will vary between metalogic of First-Order logic through the Completeness and Löwenheim-Skolem theorems; and Zermelo-Fraenkel set theory typically axiomatized as a First-Order theory. May be repeated once when subject area differs.

114. History of the Philosophy of Science (4)
Lecture/discussion—4 hours. Prerequisite: one philosophy course. Study of some classic texts from the history of philosophical writing on central problems of ethics, taking the form either of a survey or concentrated examination of selected historical figures. Readings from such philosophers as Aristotle, Butler, Hume, Kant, Mill. GE credit: ArtHum, Wrt.

115. Problems in Normative Ethics (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course in philosophy. Moral philosophy studied through examination of moral 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, Wrt.

116. Ethical Theories (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one course in philosophy. Study of fundamental concepts and problems in ethical theory through an examination of classical and contemporary philosophical theories of ethics. Among the topics that may be discussed are: utilitarianism, virtue theory, theories of natural rights, Kantian ethical theory, and contractarianism.—Väyrynen

117. Foundations of Ethics (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one of courses 114, 115, 116, 110, 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 skepticism, normative language and normative belief.

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, obligation, freedom, law, authority, and responsibility. GE credit: SocSci, Div, Wrt.

119. Philosophy of Law (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: one course in philosophy. Concepts and issues of law, legal obligation, the relation of law and morals. Problems for law involving liberty and justice; freedom of expression, privacy, rights, discrimination and fairness, responsibility, and punishment. GE credit: SocSci, Div, Wrt.

123. Aesthetics (4)
Lecture/discussion—3 hours, term paper. Prerequisite: one course in philosophy or consent of instructor. 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, Wrt.

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. Includes issues about the nature of intentional action and the conceptual character of explanations of actions in terms of the agent’s reasons. Offered in alternate years. GE credit: ArtHum, Wrt.

127. Film Theory (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: Film Studies 1 or consent of instructor. Survey of the conceptual frameworks used to study film (including semiotics, psychoanalysis, spectatorship, auteur, genre and narrative theories). Historical survey of major film theorists. (Same course as Film Studies 127.) GE credit: ArtHum, Wrt.

128. Rationality (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: at least one course in philosophy. Philosophical issues concerning rationality in its various forms. Focus is on theoretical and practical reasoning and conditions for rationality, choice, and action. Possible additional topics include rationality and human limitations; paradoxes of rationality; varieties of irrationality; rationality and objectivity.—Väyrynen

131. Philosophy of Logic and Mathematics (4)
Lecture/discussion—4 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.

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.—Matten

135. Alternative Logics (4)
Lecture/discussion—4 hours. 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.—Matten

137. Philosophy of Language (4)
Lecture/discussion—3 hours, term paper. Prerequisite: one course in philosophy or linguistics. Discussion of philosophical theories of how languages work and philosophical problems arising from thinking about language. Emphasis on modern (1879-present) philosophical views on language.—Glanzberg

143. Hellenistic and Neo-Platonic Philosophy (4)
Lecture/discussion—4 hours. Prerequisite: course 21. Greek philosophy after Aristotle, including Epicureanism, Stoicism, Skepticism and Neo-Platonism. GE: ArtHum, Wrt.

145. Medieval Philosophy (4)
Lecture/discussion—3 hours, written reports. Prerequisite: course 21. Study of major philosophers in the medieval period. GE credit: ArtHum, Wrt.

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 material...
The basic activities series includes Physical Education 1, fitness, lifetime, and sports skills, Physical Education 6 for students participating in intercollegiate athletics, and Physical Education 7 for students interested in a career in teaching/coaching or officiating sports.

Additional lower division courses include those in special skill areas, such as lifesaving and water safety, scuba diving, and health and fitness. Upper division courses include advanced skills in scuba diving and a series of courses that meet the mandated requirements for students pursuing teacher preparation and certification.

Teaching Credential Subject Representative.
S. Williams, the Teaching Credential/M.A. Program on page 102

Class and Recreational Use of Facilities.
The incident fee is paid by all students at the time of registration entitles students to the use of the gymnasium, showers, towels, lockers, tennis courts, and athletic fields. Equipment for games and sports are 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 transgression necessitated by failure of the student to comply with the regulations of the program.

Courses in Physical Education (PHE)

Lower Division Courses

1. Physical Activities (0.5)
Laboratory—2 hours. Sections in: (a) sports skills, rules and strategies; 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/NP grading only) I, II, III, IV, I, II, III.

2. Preparation and Participation in ICA Competition (1)
Discussion/laboratory—10.20 hours. Prerequisite: consent of instructor (coach). Preparation and participation in Intercollegiate Athletics. Development of fundamental and advanced individual and team skills. In-depth 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, IV, I, II, III.

7. Professional Physical Education Activities: Men and Women (1)
Lecture—1 hour; laboratory—2 hours. Fundamentals and advanced individual and team skills. In-depth knowledge of rules and strategy. Advanced sports competition and Conference and NCAA levels. May be repeated for a total of 6 units. (P/NP grading only) I, II, III, I, II.

8. Student-Athlete Life Skills (1)
Lecture—1 hour. For student-athletes. Balancing academic and athletic demands. Academic, psychological, and sociocultural issues which influence success as a college student-athlete. May be repeated up to 3 times for credit. (P/NP grading only) I, II, III, I, II.

15. Administration of Intramural Sports (2)
Lecture—2 hours. Planning and administering intramural sports programs at the high school and college level. I—II. (I, II)

25. Theory of Lifesaving and Water Safety (2)
Lecture—1 hour; laboratory—2 hours. Prerequisite: sound physical condition, 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, organizational procedures, and skill development necessary to provide for water safety and save his/ her own life in an aquatic emergency. (American Red Cross Advanced Lifesaving Certificate awarded upon successful completion of necessary requirements) I—II. (III) John.

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 Advanced Life-Saving 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) I—II. (III) John.

29. Basic Scuba (2)
Lecture—2 hours; laboratory—2 hours. Prerequisite: good physical condition, ability to pass preliminary swimming test. Introduction to basic knowledge required for scuba diving, function and maintenance of equipment, physics and physiology of diving, first aid and CPR, oceanography and marine life, and underwater communication. Pool and open water sessions available for certification. (P/NP grading only) I, II, III, I, II.

40. Drugs and Society (2)
Lecture—2 hours; fieldwork—2 hours total; film-viewing—5 hours total. Pharmacology, methods of use, and effects of use of psychoactive and performance-enhancing drugs. Historical overview of drug use. Identification of behavior of “atrisk” and “user” populations. (P/NP grading only) I, II, III, I, II, III.

44. Principles of Healthful Living (2)
Lecture—2 hours. Application of scientific and empirical knowledge to health, family, and community health problems. (P/NP grading only) I, II, III, I, II, III.

92. Physical Education Internship (1-5)
Internship—3-15 hours. Written project proposal and evaluation. Prerequisite: consent of instructor, enrollment dependent on availability of intern positions, with priority given to Exercise Biology majors. Work experience in the application of physical activity programs to teaching, recreational, and clinical or research situations under department faculty supervision. May be repeated for credit once but no internship units will be counted toward Exercise Biology major. (P/NP grading only) I, II, III, I, II, III.

97T. Tutoring in Physical Education (1-5)
Tutoring—1 hour. 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 once for credit. (P/NP grading only) I, II, III, I, II, III.

97TC. Tutoring in the Community (1-5)
Tutoring—1-2 hours. Discussion—1 hour. Prerequisite: lower division standing and consent of Program Director. Tutoring in the community in physical activity related projects under the guidance of the Physical Education faculty. Weekly meetings with instructor in charge of courses. Written reports on methods and materials required. May be repeated once for credit. (P/NP grading only) I, II, III, I, II, III.

98. Directed Group Study (1-5)
Prerequisite: consent of instructor and Program Director. (P/NP grading only) I, II, III, I, II, III.

99. Special Study for Undergraduates (1-5)
(P/NP grading only) I, II, III, I, II, III.

Upper Division Courses

100. Field Experience in Teaching Physical Education (2)
Discussion—1 hour; fieldwork—4 hours. Prerequisite: upper division standing and appropriate course 1 or 7. Tutoring or teacher's aide in physical education activities, including athletic coaching, in public schools under the guidance of a regular teacher with supervision by a departmental faculty person. May be repeated once for credit. (P/NP grading only) I, II, III, I, II, III

120. Sports in American Society (4)
Lecture—3 hours; discussion—1 hour. Sociological approaches to the study of sport and contemporary American culture, including analysis of politics, economics, religion, gender, race, media and ethics. Socialization factors involving youth, scholastic, collegiate, and Olympic sport. (Same course as Exercise Biology 120) GE credit. SocSci, Div.—I, II, I, II, I, II, I, II, I, II.
128A. Intermediate Scuba Diving (4) Lecture—3 hours; laboratory—3 hours; fieldwork—2 hours. Prerequisite: course 29 and consent of instruc- tor. Lectures and practice in diver safety, accident management and patient care. Pool and open water sessions required for certification. [P/NP grading only]—II. (III.) Fastenau

128B. Research Diving Techniques (4) Lecture—3 hours; laboratory—3 hours; fieldwork—3 hours. Prerequisite: course 128A; consent of instruc- tor. Lectures and application on search and light salv- age, night diving, research techniques, cold-water, low visibility diving, blue water, deep and altitude diving. Pool and open water sessions required for certification. [P/NP grading only]—II. (III.) Fastenau

131. Physical Activity and the Disabled (4) Lecture—3 hours; laboratory—3 hours. The study of the diverse and complex nature of individuals with disabilities and how they adapt to their disabilities in daily living. Integration of individuals with disabili- ties into the community, school, and physical activity and recreational programs. Not open for credit to students who have completed Exercise Biology 131. Vochatzer

133. Prevention and Care of Sports Injuries (3) Lecture—2 hours; laboratory—3 hours. Prerequisite: Cell Biology and Human Anatomy 101 (may be taken concurrently). Prevention, care, and rehabilita- tion of injuries incurred by athletes. Laboratory on anatomy, emergency care, physical therapy meth- ods, and taping techniques. Not open for credit to students who have completed Exercise Biology 133.—II. (III.)

135. Advanced Procedures in Evaluation and Management of Athletic Injuries (3) Lecture—3 hours. Prerequisite: course 133 or Exer- cise Biology 133, Cell Biology and Human Anatomy 101, consent of instructor. Advanced study of the evaluation and management of athletic injuries, including mechanism of injury, biomechanics and pathophysiology. Current topics in athletic training. Not open for credit to students who have completed Exercise Biology 135.—III.

142. Physical Education in the Public Schools (3) Lecture—3 hours. Analysis and study of the princi- ples and methods basic to teaching physical educa- tion at the elementary and secondary levels.—II. (II.) S. Williams

143. Coaching Effectiveness (3) Lecture—3 hours. Prerequisite: upper division standing; 3 units of courses 1 and 6 combined. Synthesis and application of basic components of sport psy- chology, sport pedagogy, and sport physiology and basic management and administration of athletics in public high schools. [P/NP grading only]—II. (II.) Bronzan

144. Principles of Health Education (1) 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 commu- nity recreation programs in California with emphasis on low income, highly populated areas, and poor rural communities.

197. Tutoring in Physical Education (1-5) Tutorial—1-1.5 hours. Prerequisite: consent of chair- person. Tutoring of students in lower division physi- cal activity courses. Written reports on methods and materials required. May be repeated once for credit. [P/NP grading only]

197TC. Tutoring in the Community (1-5) Tutorial—2-1.5 hours; discussion—1 hour. Prerequi- site: upper division standing and consent of Depart- ment Chairperson. Tutoring in the community in physical education related projects under the guid- ance of the Physical Education Faculty. Regular meet- ings with instructor in charge and written report required. May be repeated once for credit. [P/NP grading only]

198. Directed Group Study (1-5) Prerequisite: consent of instructor and Department Chairperson. [P/NP grading only]

199. Special Study for Advanced Undergraduates (1-5) Prerequisite: consent of instructor. [P/NP grading only]

Professional Courses

300. The Elementary Physical Education Program (2) Lecture—1 hour; laboratory—2 hours; field trips to selected programs. Prerequisite: senior standing or credential student. Introduction to principles, theo- ries, material, 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 indi- vidual activities for grades K-12; program planning, class management, organization, and evaluation. [P/NP grading only]—I-5. Williams

Physical Medicine and Rehabilitation

See Medicine, School of, on page 345.

Physics

[College of Letters and Science] Shirley Chiang, Ph.D., Chairperson of the Depart- ment

Lori Lubin, Ph.D., Vice Chairperson of the Depart- ment (Administration and Undergraduate Matters)

Steven Carlip, Ph.D., Vice Chairperson of the Department (Graduate Matters)

Department Office. 225 Physics/Geology Building

S30: 752-1500; http://www.physics.ucdavis.edu

Faculty

Andreas J. Allbrecht, Ph.D., Professor

Robert H. Becker, Ph.D., Professor

Patricia C. Boeshaar, Ph.D., Senior Lecturer

Manuel Calderon de la Barca Sanchez, Ph.D., Assistant Professor

Steven Carlip, Ph.D., Professor

Daniel A. Cebara, Ph.D., Professor

Ling-Le Chau, Ph.D., Professor

Huy-Chinh Cheng, Ph.D., Assistant Professor

Maxwell B. Chertok, Ph.D., Associate Professor

Shirley Chiang, Ph.D., Professor, Academic Senate Distinguished Teaching Award

Linton R. Corruccini, Ph.D., Professor, Academic Senate Distinguished Teaching Award

Lori Lubin, Ph.D., Associate Professor, Academic Senate Distinguished Teaching Award

John Conway, Ph.D., Professor

Linton R. Corruccini, Ph.D., Professor

Daniel L. Cox, Ph.D., Professor

Charles S. Fadley, Ph.D., Professor

Robin Erbacher, Ph.D., Professor

Christopher D. Fassnacht, Ph.D., Assistant Professor

Daniel Ferenc, Ph.D., Associate Professor

Ching-Yao Fong, Ph.D., Professor

John F. Gunion, Ph.D., Professor

Nemanja Kaloper, Ph.D., Professor

Joseph E. Kiskis, Ph.D., Professor

Barry M. Klein, Ph.D., Professor

Lloyd E. Knox, Ph.D., Professor

Winston T. Koo, Ph.D., Professor

Richard L. Lander, Ph.D., Professor

Kai Liu, Ph.D., Associate Professor

Lori Lubin, Ph.D., Associate Professor

David E. Pellett, Ph.D., Professor

Warren E. Pickett, Ph.D., Professor

John B. Rundle, Ph.D., Professor

Sergey Savrasov, Ph.D., Associate Professor

Richard T. Scalettar, Ph.D., Professor

Rajiv P. Singh, Ph.D., Professor

John Ferning, Ph.D., Associate Professor

S. Mani Tripathi, Ph.D., Professor

J. Anthony Tyson, Ph.D., Professor

David J. Webb, Ph.D., Associate Professor

Philip M. Yager, Ph.D., Professor

Xiangdong Zhu, Ph.D., Professor

Rena J. Zieve, Ph.D., Associate Professor

Gergely Zimanyi, Ph.D., Professor

Emeriti Faculty

Franklin B. Brady, Ph.D., Professor Emeritus

Thomas A. Cahill, Ph.D., Professor Emeritus

James E. Draper, Ph.D., Professor Emeritus

Glenn W. Erickson, Ph.D., Professor Emeritus

Claude Garrod, Ph.D., Professor Emeritus

James P. Hurley, Ph.D., Professor Emeritus

John A. Jungerman, Ph.D., Professor Emeritus

William J. Knox, Ph.D., Professor Emeritus

Douglas W. McCollin, Ph.D., Senior Lecturer Emeritus

Academic Senate Distinguished Teaching Award

Neal Peck, Ph.D., Senior Lecturer Emeritus

Wendell H. Puffer, Ph.D., Senior Lecturer Emeritus

Academic Senate Distinguished Teaching Award

Rodrick V. Reid, Jr., Ph.D., Professor Emeritus

Affiliated Faculty

Roderick W. Cole, Ph.D., Lecturer, Academic Federa- tion Excellence in Teaching Award

Randy R. Harris, Ph.D., Lecturer, Academic Federa- tion Excellence in Teaching Award

Eckart Lorenz, Ph.D., Adjunct Professor

Michael McElfresh, Ph.D., Adjunct Professor

Randy Phelps, Ph.D., Associate Adjunct Professor

Harry B. Radousky, Ph.D., Adjunct Professor

Michael Van Hove, Ph.D., Adjunct Professor

Ramona Vogt, Ph.D., Associate Adjunct Professor

The Major Program

From the smallest subatomic particles to atoms, mole- cules, stars, and galaxies, the study of physics is the study of what makes the universe work. Information learned from high-energy particle atomic-scale microscopes and high-energy particle accelerators and nuclear reactors teaches us not only what holds the nucleus of a atom and the atom nucleus together but also how proteins function and why stars shine.

The Program. The Department of Physics offers three degree programs: the Bachelor of Arts in Phys- ics and the Bachelor of Science in Physics and in Applied Physics. The B.A. degree provides a broad coverage of classical and modern physics while per- mitting a broader liberal arts education than is possi- ble 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 pro- fession. The B.S. in Applied Physics provides the stu- dent with a solid introduction to a particular applied physics specialty. For the student who plans to enter the job market on completing a B.S. degree, the
applied physics orientation would be an asset. Either a 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, geo-physics and environmental physics, astrophysics and astronomy, computer science, and materials science.

**Physics**

**A.B. Major Requirements:**

<table>
<thead>
<tr>
<th>Preparatory Subject Matter</th>
<th>41-47</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 9A, 9B, 9C, 9D or 9HA, 9HB, 9HC, 9HD, 9HE</td>
<td>19-25</td>
</tr>
<tr>
<td>Mathematics 21A, 21B, 21C, 21D, 22A, 22B</td>
<td>22</td>
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**Depth Subject Matter**

| Physics 102 (1 unit) or 104B | 4 |

Further courses from approved lists within one of the following concentrations chosen in consultation with a major adviser, to bring total number of three-five unit Depth courses to 15

| 20-24 |

Lists of approved courses for concentrations in atmospheric physics, chemical physics, computational physics, geophysics, materials science, physical electronics, and physical oceanography are available from the Physics Department.

**Total Units for the Major**

41-106

**109-118**

**B.S. Major Requirements:**

**Preparatory Subject Matter**

<table>
<thead>
<tr>
<th>50-56</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 9A, 9B, 9C, 9D or 9HA, 9HB, 9HC, 9HD, 9HE</td>
</tr>
<tr>
<td>Mathematics 21A, 21B, 21C, 21D, 22A, 22B</td>
</tr>
<tr>
<td>Computer Science Engineering 30 (or equivalent programming course)</td>
</tr>
</tbody>
</table>

1. At least one additional fixed-unit upper division Physics course excluding 137 and 160

| 9-4 |

**Total Units for the Major**

76-84

**Courses in Physics (PHY)**

Physics 10 is primarily a concept-oriented one-semester lecture/discussion course requiring relatively little mathematical background.

Physics 2 is a two-quarter sequence requiring some mathematics (trigonometry). Either 1A alone or both quarters may be taken. The sequence is not intended to satisfy entrance requirements of a year of physics for professional schools. You 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 do not need 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 7A is most like the last quarter or semester which, in 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.

Next, 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 and 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 a Physics 7 instructor.

Students not intending to take the entire sequence should take Physics 1.

Physics 9 is a four-quarter sequence using calculus throughout and including laboratory work as an integral part. The course is open to 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. In all course requirements and prerequisites, Physics 9HA-9HE can be substituted for Physics 9A-9D.
### Lower Division Courses

**1A. Principles of Physics (3)**
- Lecture: 3 hours. Prerequisite: trigonometry or consent of instructor. 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 7B or 9A.

**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 7A, 7B, 7C, 9B, 9C, or 9D. —II. (III)

**7A. General Physics (4)**
- Lecture: 1.5 hours; discussion/laboratory—5 hours. Prerequisite: Mathematics 16B (may be taken concurrently). 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 courses 9B, 9C, or 9D. —II. (III)

**7B. General Physics (4)**
- Lecture: 1.5 hours; discussion/laboratory—5 hours. Prerequisite: course 7A. Continuation of course 7A. Only two units of credit allowed to students who have completed course 9B, 9C, or 9D. —II. (III)

**7C. General Physics (4)**
- Lecture: 1.5 hours; discussion/laboratory—5 hours. Prerequisite: course 7B. Continuation of course 7B. Only two units of credit allowed to students who have completed course 9B, 9C, or 9D. —II. (III)

**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. Only 2 units of credit to students who have completed course 9A or 7B. Not open for credit to students who have completed course 9B, 9C, or 9D. —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 9A. Not open for credit to students who have completed course 9B, 9C, or 9D. —II. (III)

**9C. Classical Physics (5)**
- Lecture: 3 hours; laboratory—2.5 hours; discussion—1 hour. Prerequisite: course 9B, Mathematics 21D, 22A (may be taken concurrently). Electricity and magnetism. Theory of circuits and Maxwell’s equations. Only 3 units of credit to students who have completed course 7C. Not open for credit to students who have completed course 9HD. —II. III. (III)

**9D. Modern Physics (4)**
- Lecture: 3 hours; discussion—1.5 hours. Prerequisite: course 9C and Mathematics 22A; Mathematics 22B recommended (may be taken concurrently). Introduction to the physics concepts developed since 1900. Special relativity, quantum mechanics, atomic, molecular, condensed matter, nuclear and particle physics. Not open for credit to students who have completed course 9HD or 9HE. —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. Same 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 9A. —II. (III)

**9HB. Honors Physics (5)**
- Lecture: 3 hours; discussion/laboratory—4 hours. Prerequisite: Physics 9HA or 9A, Mathematics 21C (may be taken concurrently). Special relativity, thermodynamics. Continuation of course 9HA. Only 2 units of credit to students who have completed course 9B or 9D. —II. (III)

**9HC. Honors Physics (5)**
- Lecture: 3 hours; discussion/laboratory—4 hours. Prerequisite: course 9HB and Mathematics 21D. Electromagnetism. Continuation of Physics 9HC. Not open for credit to students who have completed course 9B or 9D. —II. (III)

**9HD. Honors Physics (5)**
- Lecture: 3 hours; discussion/laboratory—4 hours. Prerequisite: course 9HC and Mathematics 21D. Continuation of Physics 9HC. Not open for credit to students who have completed course 9C. —II. (III)

**9HE. Honors Physics (5)**
- Lecture: 3 hours; discussion/laboratory—4 hours. Prerequisite: course 9HD and Mathematics 22B (may be taken concurrently). Application of quantum mechanics. Not open for credit to students who have completed course 9D. —II. (III)

**10. Topics in Physics for Nonscientists (4)**
- Lecture: 3 hours; discussion—1 hour. Prerequisite: high school algebra. 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; few topics available to the environment; and natural phenomena. Check with the Department office for the current emphasis. No units of credit allowed if taken after any other physics course. GE credit: SciEng. —II. (III)

**49. Supplementary Work in Lower Division Physics (1-3)**
- Students with partial credit in lower division physics courses may, with consent of instructor, complete the credit under this heading. May be repeated for credit. —II. (III)

**90X. Lower Division Seminar (2)**
- Seminar—2 hours. Prerequisite: lower division standing and consent of instructor. Examination of a special topic in physics through shared readings, discussions, written assignments, or special activities such as laboratory work. May be repeated for credit. Limited enrollment. —II. (III)

**92. Directed Group Study (1-5)**
- Prerequisite: consent of instructor, formerly 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 Courses

### 102. Computational Laboratory in Physics (1-4-2-2-2)
- Laboratory—3 hours. Prerequisite: Mathematics 21D, 22A, 22B, Computer Science Engineering 30, course 9D or 9HD, course 104A concurrently. Introduction to computational physics and to the computational resources in the physics department. Preparation for brief programming assignments required in other upper division physics classes. Not open for credit to students who have completed course 9HB or 9HC. —II. III. (III)

**104A. Introductory Methods of Mathematical Physics (4)**
- Lecture: 3 hours; extensive problem solving. Prerequisite: courses 9B, 9C, 9D and Mathematics 21D, 22A, and 22B with grade C- or better, or consent of department; prerequisite for 110B is course 110A and 104A with a grade of C- or better or consent of department; prerequisite for course 110C is courses 110B and 104B passed with a grade of C- or better, or consent of department. Theory of electrodynamics, electromagnetism, Maxwell’s equations, electromagnetic waves. —II. III. (III)

**112. Thermodynamics and Statistical Mechanics (4)**
- Lecture: 3 hours; extensive problem solving. 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 magnetic models and then extended to studies of solids, quantum fluids, and chemical equilibria. —II. (III)

**115A. Foundation of Quantum Mechanics (4)**
- Lecture: 3 hours; extensive problem solving. Prerequisite: courses 110A and 105B with grade C- of better, or consent of instructor. Introduction to the methods of quantum mechanics with applications to atoms, molecules, solid state, nuclear and elementary particle physics. —II. (III)

**115B. Applications of Quantum Mechanics (4)**
- Lecture: 3 hours; extensive problem solving. Prerequisite: course 115A passed with a grade of C- or better, or consent of department. Angular momentum and spin, hydrogen atom and atomic spectra, perturbation theory; scattering theory. —II. (III)
116A. Electronic Instrumentation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 9C, Mathematics 1B. An experimental and theoretical study of important electronic circuits commonly used in physics.—I. (I)

116B. Electronic Instrumentation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 9D, 116A. Continuation of course 116A. Introduction to the use of digital electronics and microcomputers in experimental physics.—II. (II)

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 making physical measurements using computer-based instrumentation.—I. (I)

121. Atomic Physics (4)
Lecture—3 hours; term paper. Prerequisite: course 9D. The phenomena of atomic physics including contemporary topics in fine-and hyperfine-structure, quantum electrodynamics, laser spectroscopy, beam foil experiments and trapped atoms.—I. (I)

122. Advanced Physics Laboratory (4)
Laboratory—8 hours; extensive problem solving. Prerequisite: course 9D with grade C- or better or consent of instructor. Instruction in experimental techniques and measurements in atomic, condensed matter, nuclear and high energy physics. Student performs three to six experiments depending on difficulty. Individual work is stressed. May be repeated for credit.—II. (II), III. (III)

126. Introduction to Cosmology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 105A or consent of instructor. Introduction to cosmology.—III. (III)

127. Introduction to Astrophysics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 105A passed with grade C- or better, or consent of instructor. Celestial mechanics, radiation, astrophysical elements, electromagnetic processes, the sun, binary and variable stars, stellar structure and evolution, galaxies, cosmology.—II. (II)

129A. Introduction to Nuclear Physics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 115A passed with a grade of C- or better or consent of instructor. Survey of basic nuclear properties and concepts requiring introductory knowledge of quantum mechanics: nuclear models and forces, radioactive decay and detecting nuclear radiation and nuclear reaction products, alpha, beta and gamma decay.—II. (II), III. (III)

129B. Nuclear Physics, Extensions and Applications (4)
Lecture—3 hours; term paper. Prerequisite: course 129A. Continuation of course 129A. 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. Not offered every year.

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. Not offered every year.—I. (I), II. (II)

137. Weapons of Mass Destruction, the Cold War, and Modern Terrorism (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: upper division standing, one course from 7C, 9C, 9D, or 116A. Course of nuclear, biological, and chemical weapons related to the Cold War and terrorism. Order of magnitude calculations and modern quantums of mass destruction. (Same course as Applied Science and Engineering 137) CE credit: SciEng, Writ—II. Cox

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, simple metals, energy bands and Fermi surfaces, semiconductors, optical properties, magnetism, superconductivity.—II. (II)

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. Impact of humankind on the environment will be discussed from the viewpoint of the physical sciences. Calculations based on physical principles will be made, and the resulting policy implications will be considered. (Same course as Engineering 160) GE credit: SciEng or SocSci.—III. (III)

194HA-194HB. Special Study for Honors Students (4-4)
Independent study—12 hours. Prerequisite: consent of instructor required. Open only to Physics and Applied Physics majors who satisfy the College of Letters and Science requirements for entrance into the Honors Program. Independent research project at a level significantly beyond that defined by the normal physics curriculum. (Deferred grading only pending completion of sequence).

195. Senior Thesis (5)
Independent study—15 hours. Prerequisite: consent of instructor required. Open only to Physics and Applied Physics majors with senior standing. Preparation of a senior thesis on a topic selected by the student with approval of the department. May be repeated for a total of 15 units.—I. (I), II. (II), III. (III)

197T. Tutoring in Physics and Astronomy (1-5)
Weekly meeting with instructor. (P/NP grading only).—I. (I), II. (II), III. (III)

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 Courses

200A. Theory of Mechanics and Electromagnetism (4)
Lecture—3 hours; independent study—1 hour. Prerequisite: courses 104B, 105B, and 110C or the equivalent; courses 104A and 110C concurrently. Theoretical approaches in classical mechanics including the use of generalized coordinates and virtual work; variational calculus; Lagrange equations; symmetries, conservation laws, and Noether theorem; Lagrangian density; Hamilton formalism, canonical transformations; Poisson brackets; and Hamilton-Jacobi equations.—I. (I)

200B-200C. Theory of Mechanics and Electromagnetism (4-4)
Lecture—3 hours; independent study—1 hour. Prerequisite: course 200A, and course 204B concurrently. Theoretical approaches in electromagnetics including static electromagnetic fields; Maxwell’s equations, plane waves in various media; magneto-hydrodynamics; diffusion theory; radiating systems; and special relativity.—II. (II), III. (III)

204A-204B. Methods of Mathematical Physics (4-4)
Lecture—3 hours; independent study—1 hour. Prerequisite: courses 104A and 104B or the equivalent. Linear vector spaces, operators and their spectral analysis, complete sets of functions, complex variables, functions of several complex variables, Green’s functions, calculus of variations, introduction to numerical analysis.—II. (II)

210. Computational Physics (3)
Lecture—3 hours. Prerequisite: knowledge of Fortran or C. Analytic techniques to solve differential equations and eigenvalue problems. Physics content of course will be self-contained, and adjusted according to background of students.—II. (II)

215A-215B. Quantum Mechanics (4-4)
Lecture—3 hours; independent study—1 hour. Prerequisite: course 115B or the equivalent. Formal development and interpretation of non-relativistic quantum mechanics: its applications in atomic, nuclear, molecular, and solid-state problems; brief introduction to relativistic quantum mechanics and the Dirac equation.—III. (III)

219A. Statistical Mechanics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 215B 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.—III. (III)

219B. Statistical Mechanics (4)
Lecture—3 hours; extensive problem solving. Prerequisite: course 219A. Further applications of thermodynamics and classical and quantum statistical mechanics. The modern theory of fluctuations about the equilibrium state, 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. Not offered every year.—I. (I)

223B. Group Theoretical Methods of Physics—Elementary Particles (3)
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. Not offered every year.

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. Not offered every year.

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. Not offered every year.

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. Not offered every year.

229A. Advanced Nuclear Theory (3)
Lecture—3 hours. Prerequisite: course 224C. Advanced topics in nuclear theory; theory of quan- tum-mechanical scattering processes. Exact formal theory and models for two-body scattering. Not offered every year.

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. Not offered every year.

230A. Quantum Theory of Fields (3)
Lecture—3 hours. Prerequisite: course 215C. Relativistic quantum mechanics for particles; techniques and applications of second quantization; Feynman diagrams; renormalization.—I. (I)

230B. Quantum Theory of Fields (3)
Lecture—3 hours. Prerequisite: course 230A. Continuation of 230A, with selected advanced topics, such as S-matrix theory, dispersion relations, axiomatic formulations.—II. (II)
240A. High-Energy Physics (3)

252A. Techniques of Experimental Physics (3)
Lecture—3 hours. Introduction to techniques and methods of designing and executing experiments. Problems and examples from condensed matter research will be utilized. Not offered every year.—I, II, III. (I, II, III.)

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.—I, II (I, II, III.)

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: the Big Bang, inflation, primordial nucleosynthesis, dark matter, dark energy, and other topics of current interest.—I, II, III (I, II, III.)

263. Cosmic Structure Formation (3)
Lecture—3 hours. Prerequisite: course 260. Growth of structure from small density inhomonogeneities in the early universe to the diverse structures observable today. Use of computer simulations to study galaxies (cosmic microwave background, gravitational lensing, peculiar velocities, number density, etc.) to constrain models of structure formation and fundamental physics.—I, II (I, II, III.)

265. High Energy Astrophysics and Radiative Processes (3)
Lecture—3 hours. Prerequisite: graduate standing in Physics or consent of instructor. Survey of current research in high energy astrophysics: gamma rays, x-rays, gamma-ray astronomy, cosmic rays, and high-energy astrophysics.—I, II (I, II, III.)

266. Data Analysis for Astrophysics (3)
Lecture—3 hours. Prerequisite: courses 240A, 240B. Development of data analysis techniques for applications to observational astronomy: radiation processes, statistical methods, dimensionality reduction, and data mining.—I, II, III (I, II, III.)

270. Current Topics in Physics Research (2)
Seminar—1 hour. Seminar to introduce first- and second-year physics graduate students to the fields of specialization and research of the Physics staff. Prerequisite: graduate standing in Physics; 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 (I, II, III.)

280. Seminar in Ethics for Scientists (2)
Seminar—1 hour. 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 (I, II, III.)

290. Seminar in 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 nuclear physics. May be repeated for credit. (S/U grading only)—I, II, III, I, II, III.

292. 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.

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. 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 (I, II, III.)

298. Group Study (1-5)
Prerequisite: consent of instructor. (S/U grading only.)

299. Research (1-12)
Prerequisite: graduate standing in Physics. May be repeated for credit. (S/U grading only.)

Professional Courses
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 the differences between conventional and active-engagement instructional settings. The appropriate role of the instructor in specific instructional settings. (S/U grading only.)

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, 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.
### Physiology

**See Anatomy, Physiology and Cell Biology (APC), on page 473; Human Physiology (BH), on page 358; Molecular, Cellular, and Integrative Physiology (A Graduate Group), on page 382; Neurobiology, Physiology, and Behavior, on page 392.**

### Plant Biology

**See Agricultural Management and Rangeland Resources, on page 124; Crop Science and Management, on page 187; Environmental Horticulture, on page 258; Plant Biology, on page 413; Plant Biology (A Graduate Group), on page 416; and Vegetable Crops, on page 469.**

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**Plant Biology**

*(College of Biological Sciences)*

Venkatesan Sundaresan, Ph.D., Chairperson of the Section

**Section Office.** 1002 Life Sciences Addition (530) 752-0617; http://www.plb.ucdavis.edu

**Committee in Charge of the Major**

Deborah Canington, Ph.D. (Plant Biology)

Judy Jernstedt, Ph.D. (Plant Sciences)

John Labavitch, Ph.D. (Plant Sciences)

Alan Stemler, Ph.D. (Plant Biology)

Terence Murphy, Ph.D. (Plant Biology)

**Faculty**

Faculty includes members of the Departments of Plant Sciences, on page 419 and the Sections of the College of Biological Sciences.

**Primary Section Members**

John L. Bowman, Ph.D., Professor

Anne Britt, Ph.D., Professor

Katyaon Dehesh, Ph.D., Professor

John J. Harada, Ph.D., Professor

Stacey Harmer, Ph.D., Assistant Professor

Bo Liu, Ph.D., Associate Professor

William J. Lucas, Ph.D., Professor

Julin Maloof, Ph.D., Assistant Professor

Terence M. Murphy, Ph.D., Professor

Shayon N. O’Neill, Ph.D., Professor

Thomas L. Rost, Ph.D., Professor, Academic Senate Distinguished Teaching Award

Neelema Sinha, Ph.D., Professor

Venkatesan Sundaresan, Ph.D., Professor

Alan J. Stemler, Ph.D., Professor

Steven M. Thieg, Ph.D., Professor

Larry N. Vanderhorst, Ph.D., Professor

**Secondary Section Members**

Judy Callis, Ph.D., Professor

James A. Doyle, Ph.D., Professor (Geology)

Marilyn E. Etzler, Ph.D., Professor

Charles S. Gasser, Ph.D., Professor

Marcel Rejsek, Ph.D., Professor

Raymond L. Rodriguez, Ph.D., Professor

Irwin H. Segel, Ph.D., Professor

Maureen L. Stanton, Ph.D., Professor

Donald R. Strong, Ph.D., Professor

**Emeriti Faculty**

Frederick T. Addicott, Ph.D., Professor Emeritus

Floyd M. Ashton, Ph.D., Professor Emeritus

David E. Bayer, Ph.D., Professor Emeritus

Bruce A. Bonner, Ph.D., Professor Emeritus

Paul A. Castelfranco, Ph.D., Professor Emeritus

Deborah P. Decker, Ph.D., Professor Emeritus

Emanuel Epstein, Ph.D., Professor Emeritus

Richard H. Fank, Ph.D., Professor Emeritus

Ernest M. Gilliard, Ph.D., Professor Emeritus

Norino L. Lang, Ph.D., Professor Emeritus

C. Ralph Stocking, Ph.D., Professor Emeritus

Robert M. Thornton, Ph.D., Senior Lecturer Emeritus

Academic Senate Distinguished Teaching Award

Hendrick J. Ketellapper, Ph.D., Professor Emeritus

Donald W. Kyhos, Ph.D., Professor Emeritus

Norma J. Lang, Ph.D., Professor Emeritus

Terence Murphy, Ph.D., Professor Emeritus

Kathleen Wells, Ph.D., Professor Emeritus

**Affiliated Faculty**

Deborah Canington, Ph.D., Lecturer, Academic Federation Excellence in Teaching Award

Tom Goliber, Ph.D., Academic Coordinator

Andrew Groover, Ph.D., Adjunct Assistant Professor

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**The Major Program**

Plant Biology is the scientific study of plants as organisms. It includes the disciplines of cellular and molecular plant biology and the traditional areas of botany, such as anatomy, morphology, systematics, physiology, mycology, physiology, ecology, and evolution.

**The Program.**

The plant biology major consists of core courses in applied plant biology, plant anatomy, plant physiology, and plant ecology, as well as biochemistry, cell biology, and genetics. In addition, students complete a set of courses in one of the following areas: (1) general botany, (2) applied plant biology, (3) plant genetics and breeding, and (4) plant physiology, development, and molecular biology. The major provides breadth in diverse areas of plant biology and depth in one of several areas of specialization. Independent research opportunities in plant biology are available. Consult with an adviser.

**Career Alternatives.** A plant biology degree is an excellent credential for a wide range of career options, including domestic and international opportunities in business, teaching and research in both governmental and private sectors. Plant biologists can work in the field, in the forest, in the laboratory, in botanical gardens or nurseries, in food or seed companies, or in pharmaceutical, energy or chemical industries, and pursue rewarding careers in the areas of biotechnology, environmental protection, farming, or agribusiness. The program is also a background for graduate school or professionals interested in medicine, law or journalism.

**A.B. Major Requirements:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>Prep.</td>
<td>Preparatory Subject Matter</td>
<td>35</td>
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<tr>
<td></td>
<td>Biologica Sciences 1A-1B-1C</td>
<td>15</td>
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<td>Chemistry 2A-2B</td>
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<td>Plant Biology 105, 111, 112 and Plant Biology 117/Evolution and Ecology</td>
<td>11-15</td>
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<tr>
<td></td>
<td>Additional upper division units in Plant Biology or related natural science courses</td>
<td>13-14</td>
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<tr>
<td>Total Units for the Major</td>
<td>76-78</td>
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<tr>
<td>Recommended</td>
<td>Chemistry 2C; Evolution and Ecology 100; Plant Biology 118 and Plant Biology 148/Plant Pathology 148</td>
<td></td>
</tr>
</tbody>
</table>

For students with interests in specialized areas of plant biology (e.g., agricultural botany, ecology, systematics and evolution, morphology, plant physiology, etc.), certain substitutions, including courses in other sections or departments, may be allowed upon prior consultation with a Plant Biology major adviser.

**B.S. Major Requirements:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prep.</td>
<td>Preparatory Subject Matter</td>
<td>60-67</td>
</tr>
<tr>
<td></td>
<td>Biological Sciences 1A-1B-1C</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Chemistry 2A-2B-2C</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Chemistry 8A-8B or 118A-118B</td>
<td>11BC</td>
</tr>
<tr>
<td></td>
<td>Mathematics 16A-16B-16C</td>
<td>6-12</td>
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<tr>
<td></td>
<td>Physics 7A-7B-7C</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Agricultural Management and Rangeland Resources 120 or Statistics 32, 132, 100, or 102</td>
<td>3-4</td>
</tr>
</tbody>
</table>

**Depth Subject Matter | 45**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology Sciences 101 or Plant Biology 152</td>
<td>(Students completing the Applied Plant Biology option or the Plant Genetics and Breeding option should take Plant Biology 152)</td>
<td></td>
</tr>
<tr>
<td>Biology Sciences 102, 103, 104</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Plant Biology 105, 111</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

Completion of one option listed below: 24 Research experience through internships or special studies is recommended.

**General Botany option**

Evolution and Ecology 100, Plant Biology 112, Plant Biology 117 or 142 | 4 |

One course from the Applied Plant Biology course list | 3-5 |

One course from the Evolution and Diversity course list | 3-5 |

Additional upper division course work from any of the five course lists, chosen in consultation with an adviser, to achieve a total of 24 or more units. At least one course chosen from the option course lists must include a formal laboratory or fieldwork section | 3-7 |

**Applied Plant Biology option**

Plant Biology 112 | 3     |

Plant Biology 142 or 143 | 3-4 |

Plant Biology 160 | 3-4 |

Molecular and Cellular Biology 120I; Plant Biology 153, 158, 172L, 189; or Plant Pathology 120 | 2-6 |

Additional upper division course work from the Applied Plant Biology course list to achieve a total of 24 or more units | 8-13 |

**Plant Evolution and Ecology option**

Evolution and Ecology 100 | 4 |

Plant Biology 117 or 142 | 4 |

One course from the Applied Plant Biology course list | 3-5 |

Additional upper division course work from the Ecology and/or Evolution and Diversity course lists to achieve a total of 24 or more units. At least one course chosen must include a formal laboratory or fieldwork section | 11-13 |

**Plant Genetics and Breeding option**

Plant Biology 108 or 143 | 3-5 |

Plant Biology 134 | 4 |

Plant Biology 112 or 113 or 160 | 3 |

Plant Biology 161A or 161B | 3 |

Additional upper division course work from the Plant Genetics and Breeding course list to achieve a total of 24 or more units | 8-10 |

**Plant Physiology, Development, and Molecular Biology option**

Plant Biology 112 | 3 |

Molecular and Cellular Biology 120L or Plant Biology 153 | 4 |

One course from the Applied Plant Biology course list | 3-5 |

One course from the Ecology course list (Plant Biology 117 recommended) | 3-4 |

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer, 2007-2008 offering in parentheses

**General Education (GE) credit:**

- Arts and Humanities: 2 Div
- Science and Engineering: 2 Div
- Social, Cultural Diversity: 2 Div
- Writing Experience: 1 Div
Courses in Plant Biology (PLB)

Lower Division Courses

1. Plants for Garden, Orchard and Landscape (2)
   Lecture—1 hour; laboratory—3 hours. For non-majors. Hands-on experience with plants cultivated for food, ornamentals, and personal satisfaction. Topics include grading a vegetable garden, pruning and propagating trees and vines, growing flowers and ornamental plants, and the role of plants in home landscapes. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 107. (Former course Plant Science 107.) GE credit: SciEng.—II. (II.) Tarkow

11. Plants and the Biosphere (3)
   Lecture—3 hours; one weekend field trip (half-day); term paper. Ethnobotanical and ecological themes are emphasized in examining our dependence on plants, the ecological roles of plants, and the development of botany as a contemporary science. Intended primarily for non-science majors. GE credit: SciEng.—II, III. (II, III.) Marcotra

19. Comparative Plant Morphology (3)
   Lecture—3 hours. Prerequisite: high school biology. Plants as a resource for food, recreation, and environmental enhancement. Emphasis on how our relationships to plants has changed through history and how the growth and development of plants affect their utility. Not open for credit to students who have completed Plant Science 10. (Former course Plant Science 10.) GE credit: SciEng.—II, III. (II, III.) Marrush

19. Introduction to the Morphology of Plants (1)
   Lecture—3 hours. Prerequisite: consent of instructor. Examination of a special topic in a small group setting. Not open for credit to students who have completed Plant Science 10. (Former course Plant Science 10.) GE credit: SciEng.—II, III. (II, III.) Marrush

24. Evolution of Angiosperms (5)
   Lecture—3 hours; laboratory—6 hours. Introduction to the form, development and evolutionary relationships of angiosperms and evolutionary relationships and trends within them based on morphological and molecular evidence. (Same course as Evolution and Ecology 105.) GE credit: SciEng.—III. (III.) Doyle

111. Plant Physiology (3)
   Lecture—3 hours. Prerequisite: Biological Sciences 1C, Chemistry 88 and Physics 7C (either may be taken concurrently), course 105 recommended. The plant as a functional unit. The processes of absorption, movement, and utilization of water and minerals. Water loss, translocation, photosynthesis, respiration.—I. (I.) Lucas, Dehesh

112. Problems in Plant Physiology (1)
   Discussion—1 hour. Prerequisite: course 111 concurrently. Discussion of problems and applications relating to principles presented in course 111. Students will be assigned problems each week showing novel applications of principles described in course 111 and will prepare answers to be delivered orally during the class period. (P/NP grading only)—I, II. (I, II.) Lucas, Dehesh

112. Plant Growth and Development (3)
   Lecture—3 hours. Prerequisite: Biological Sciences 1C, Chemistry 88. Introduction to the mechanisms and control systems that govern plant growth and development and the responses of plants to the environment. Strong emphasis on the development of flowering plants. GE credit: SciEng.—II. (II.) Harada, Sundaresan

112D. Problems in Plant Growth and Development (1)
   Discussion—1 hour. Prerequisite: course 112 concurrently. Discussion of problems and applications relating to principles presented in course 112. Students will be assigned problems each week showing novel applications of the principles described in course 112 and will prepare answers to be delivered orally during class period. (P/NP grading only)—II. (II.) Harada, Sundaresan

113. Molecular and Cellular Biology of Plants (3)
   Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1C, 101; Biological Sciences 102 recommended. Molecular and cellular aspects of the growth and development of plants and their response to biological and environmental stresses. Primary focus on processes unique to plants. Experimental approaches will be emphasized.—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. Assigned topics each week show novel applications of the principles described in course 113; discussion of topics during class period. (P/NP grading only)—III. (III.) Harada

116. Plant Morphology and Evolution (5)
   Lecture—3 hours; laboratory—6 hours. Prerequisite: introductory plant biology (e.g., Biological Sciences 1C); plant anatomy recommended (e.g., course 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.) Jernefelt

117. Plant Ecology (4)
   Lecture—3 hours; fieldwork—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C; course 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 break-up of class project required. (Same course as Evolution and Ecology 117.)—I, II. (I, II.) Rejmanek

118. Introductory Phycology and Bryology (5)
   Lecture—3 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1A and 1C. Comparative phycology, physiology, development and reproduction of cyanobacteria, the major algal groups, and the bryophytes. Focus on structure-function and evolu-
119. Plant Biology of Weeds (3)

Lecture—2 hours; laboratory—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, introductory statistics and calculus. The study of weeds and their control. Emphasis on understanding the ecological and genetic processes that lead to the evolution and spread of weeds. GE credit: SciEng. Wrt.—II. (I.) Cunning

123. Plant-Virus-Vector Interaction (3)

Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1C, 101; course 105, Plant Pathology 120, and Entomology 100 recommended. Analysis of the interaction of viruses with plants and insects that vectored viruses. Topics may include interspecies and intraspecies interactions of mutually infecting vectors and plants. GE credit: SciEng. Wrt.—III. (III.) Rejmanek

126. Plant Biochemistry (3)

Lecture—3 hours. Prerequisite: Biological Sciences 1C or the equivalent, and Biological Sciences 103. The biochemistry of important plant processes and metabolic pathways. Discussion of methods used to understand the role of enzymes, substrates, and products in plant metabolism. GE credit: SciEng.

140. Culinary and Medicinal Herbs (3)

Lecture/discussion—3 hours. Prerequisite: Biological Sciences 1C or the equivalent. Identification, cultivation, and use of common culinary and medicinal herbs; herbal plant families; effects of climate and soils on herbs; herbal medicine; ecology and geography of herbs, herbs as a component of food; and historical chemistry of active compounds. GE credit: SciEng or SocSci. Wrt.—II. (II.) Calis, Abel

141. Principles and Methods of Ethnobotany (4)

Lecture—3 hours; laboratory/discussion—2 hours. Prerequisite: Biological Sciences 1C or Plant Sciences 2 or the equivalent; course 108 recommended. Examination of concepts, questions, and methodologies involved in the study of human interactions with plants. GE credit: SciEng or SocSci. Wrt.—III. (III.) Potter, Dean

142. Ecology of Crop Systems (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: Plant Science 101, 102, 1C, Mathematies 16A or Physics 1A, or consent of instructor. Ecological processes governing the structure and behavior of managed ecosystems. Emphasis on mechanistic and systems views of the physical environment, photosynthesis productivity, competition, adaptation, nutrient cycling, energy relations and contemporary issues such as climate change. GE credit: SciEng. Wrt.—II. (II.) Bloom

143. Evolution of Crop Plants (3)

Lecture—3 hours. Prerequisite: Biological Sciences 1C or the equivalent. Origins of crops and agriculture, including methodological approaches, center of origin and areas of domestication, pathways, and differences between wild and cultivated plants. Group studies of individual crops are published on the Internet. Not open for credit to students who have completed Plant Science 102. GE credit: SciEng, Wrt.—III. (III.) Gepts

144. Trees and Forests (3)

Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1C. Biological structure and function of trees as organisms; understanding of forests as communities and as ecosystems; use of forests by humans; tree physiology; photosynthesis, respiration, transpiration; plant anatomy, dormancy, forest biodiversity, and agroforestry. (Same course as Environmental Horticulture 144 and Environmental and Resource Sciences 144.)—I. (I.) Barbary, Berry, Bledsoe

145. Sierra Nevada Flora (3)

Lecture/laboratory—30 hours (total); fieldwork—50 hours (total). Prerequisite: course 102 or 108 or Evolution and Ecology 121 or Environmental Horticulture 105. An introduction to the flora of the Sierra Nevada. Basic plant identification, the plant communities and species of the Sierra Nevada. Class offered the first two weeks in July in the Sierra Nevada. Offered in alternate years. (III.) Ronald

146. Rhizosphere Ecology (3)

Lecture—2 hours; discussion—1 hour. Prerequisite: Plants 2 or Biological Sciences 1C. Effects of plants on rhizosphere processes, including nutrient cycling, soil formation, and agricultural sustainability. Physical, chemical and biological processes that occur at the surface of plant roots. Evolution and modification of the biochemical and genetic bases of rhizosphere ecology. Offered in alternate years. (I.) Phillips

147. Survey of Plant Communities of California (4)

Lecture/discussion—2 hours; fieldwork—3 hours; extensive written work. Prerequisite: Biological Sciences 1A or 1B or 1C or Molecular and Cellular Biology 10 recommended. Consent of instructor required quarter prior to course. Upper division standing required if enrollment must be limited. Selected plant communities analyzed for their structure and the relationship of their component species to the environment. Four weekend field trips. GE credit: SciEng, Wrt.—III. (III.) Barbour, Jackson, Ronald

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.)—I. (I.) MacDonald, Rizzo

150. Plant Natural Product Chemistry (3)

Lecture—2 hours; discussion—1 hour. Prerequisite: Biological Sciences 101 and 103, or the equivalent. Traditional biochemical and modern genetic approaches for studying plant-derived compounds such as isoprenoids, alkaloids, and phenylpropanoids. The impact of plant-derived compounds on biological systems and synthetic plant product development. GE credit: SciEng. Wrt.—I. (I.) Houle, Klebenstein

152. Plant Genetics (4)

Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: Biological Sciences 1A or consent of instructor. Basic principles of transmission genetics, cytogenetics, population and quantitative genetics, and molecular genetics. Practical aspects of genetic analysis and segregation analysis. Not open for credit to students who have completed Plant Science 105. (Former course Plant Science 105.)—I. (I.)

153. Plant Cell, Tissue and Organ Culture (4)

Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: Biological Sciences 1C or Plant Sciences 2. Basic and applied aspects of plant tissue culture including media preparation, micropropagation, embryogenesis, and rooting of protoplast cultures of plants. Offered in alternate years. Not open for credit to students who have completed Plant Science 107. (Former course Plant Science 107.)—II. (II.)

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 crop improvement. Overview of plant processes. Introduction of how plant breeding is a dynamic, multidisciplinary, constantly-evolving science. Laboratory emphasizes hands-on experience in the basics of breeding through experiments. (Former course Plant Science 113.)—II. (II.) Clair

157. Physiology of Environmental Stresses in Plants (4)

Lecture—2 hours; discussion—2 hours. Prerequisite: course 112 or may be taken concurrently or the equivalent. Stress concepts related to growth and survival of plants under environmental conditions. The study of the chemical, developmental and morphological characteristics enabling plants to avoid or tolerate environmental stresses; mechanisms of acclimation common to many stresses; responses of wild and cultivated species to drought, flooding, nutrient deficiencies, salinity, toxic ions, extreme temperatures. Offered in alternate years. (I.) Tauer

158. Mineral Nutrition of Plants (4)

Lecture—2 hours; laboratory—3 hours. Prerequisite: course 111 or the equivalent. Evolution and scope of plant nutrition; essential and other elements; mechanisms of absorption and translocation; mineral deficiency symptoms, nutrient-specific and ecological aspects of plant nutrition. Not open for credit to students who have completed Plant Biology/Plant Science 125. (Former course Biological Sciences 125.)—I. (I.) Richards, Brown

160. Principles of Plant Biotechnology (3)

Lecture—3 hours. Prerequisite: Biological Sciences 1A and 101. Principles and concepts of plant biotechnology including recombinant DNA technology, plant molecular biology, tissue culture, biotechnology, and crop improvement. Not open for credit to students who have completed Plant Science 140. (Former course Plant Science 140.)—II. (II.) Dandekar, Beckles

161A. Plant Genetics and Biotechnology Laboratory (4)

Lecture—2 hours; laboratory—6 hours. Prerequisite: course 152 and/or 160. Advanced techniques of genetic analysis at the molecular and organismal levels, including segregation and linkage analysis, cytogenetics and recombinant DNA. Not open for credit to students who have completed Plant Science 141A. (Former course Plant Science 141A.)—I. (I.) Dandekar, Beckles

161B. Plant Genetics and Biotechnology Laboratory (4)

Lecture—2 hours; extensive problem solving. Prerequisite: Biological Sciences 1A or the equivalent, Mathematics 16A or the equivalent, Physics 7A-7B or Chemistry 2A-2B or the equivalent. Basic physiological, biochemical, and molecular principles of energy production in plant and animal cells. The use of energy to transport ions and nutrients in and out of the cell, and cellular and molecular mechanisms regulating these processes. (Former course Plant Science 141B.)—II. (II.)

162. Cellular and Molecular Bases of Ion Transport and Plasma Membrane Transport (4)

Lecture—2 hours. Prerequisite: course 152 and/or 160. Advanced techniques of genetic analysis at the molecular and organismal levels, including transformation, gene expression, analysis of transgenic plants and QTL analysis. Not open for credit to students who have completed Plant Science 141B. (Former course Plant Science 141B.)—II. (II.)

170. Plant Molecular Ecology (4)

Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 1A and 1C or the equivalent. Introduction to the application of molecular genetic techniques to questions concerning ecological, genetic and evolutionary processes in plant populations. Emphasis on the use of molecular genetic information for decision making and conservation. (Former course Plant Science 155.)—II. (II.) Jasieniuk

171. Plant Propagation (4)

Lecture—2 hours; discussion—1 hour; laboratory—3 hours. Prerequisite: Plant Sciences 2 or Biological Sciences 1C. Principles and practices of propagating plants covering anatomical, physiological, and practical aspects. Not open for credit to students who have completed Plant Science 109. (Former course Plant Science 109.)—I. (I.) Burger
172. Postharvest Physiology and Handling of Horticultural Commodities (3)
Lecture—3 hours. Prerequisite: General plant science background recommended (e.g., Plant Sciences 2, course 12 or Food Science and Technology 2); concurrent enrollment in course 172L recommended. Physiological processes related to the maturation and senescence of fruits, vegetables, and ornamentals; fundamentals involved in handling, transportation, storage, and marketing practices, e.g., temperature control, protective treatments, controlled atmospheres. Not open for credit to students who have completed Plant Science 112L. (Former course Plant Science 112.)—I. [I.] Kader, Reid, Salweit

172L. Postharvest Physiology and Handling Laboratory (2)
Discussion—1 hour; laboratory—3 hours. Prerequisite: course 172 may be taken concurrently. Demos and how students will become part of the subject matter of course 172. Not open for credit to students who have completed Plant Science 112L. (Former course Plant Science 112L.)—II. [II.] DeJong

174. Biological Applications in Fruit Production (3)
Lecture—1 hour; laboratory—3 hours. Prerequisite: Biological Sciences 1C or Plant Sciences 2 or the equivalents. Physiology, growth, development and environmental requirements of fruit trees and 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 who have completed Plant Science 115. (Former course Plant Science 115.)—II. [II.] DeJong, Polito

176. Introduction to Weed Science (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Plant Sciences 2 or Biological Sciences 1C. Principles of weed science including mechanical, biological, and chemical control methods. Weed control in crop, pasture, range, brush, forests, aquatic, and non-crop situations. Types of herbicides. Application of herbicides. Sight identification of common weeds and demonstrations to illustrate the principles. Not open for credit to students who have completed former course 129L. (Former course Plant Science 129.)—II. [II.] Fischer

178. Biology and Management of Freshwater Macrophytes (3)
Lecture—3 hours; two field trips. Prerequisite: Biological Sciences 1A, 1B, 1C, Chemistry 8B; course 111 or Hydrology and Ecology 112. A survey of common fresh water macrophytes, their reproductive modes, physiology, growth photosynthesis, nutrient utilization, development (hormonal interactions), ecology and management. Offered in alternate years. Not open for credit to students who have completed former course 150. (Former course 150.)—I. [I.] Anderson

180. Experiment in Plant Biology: Design and Execution (3)
Laboratory/discussion—6 hours. Prerequisite: Biological Sciences 1A, 1B, 1C or the equivalent courses in plant sciences, and consent of the instructor. Provides the 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)

190C. Research Conference in Botany (1)
Discussion—1 hour. Prerequisite: upper division standing in botany or related discipline; consent of instructor. Introduction to research methods in botany. Design 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—3-36 hours. Prerequisite: upper division standing; consent of instructor. Technical and/or professional experience on or off campus. Supervised by a member of the Plant Biology Section faculty. (P/NP grading only.)

194H. 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 involve the writing of a senior thesis. (P/NP grading only.)

196. Postharvest Technology of Horticultural Crops (3)
Lecture/discussion/demonstration—5 days; field trip—5 days. Prerequisite: upper division or graduate student standing. Intensive study of current procedures for postharvest handling of fruits, nuts, vegetables, and ornamentals in California. Scheduled first two weeks immediately following last day of spring quarter. Considered a spring course for preenrollment. Not open for credit to students who have completed Plant Science 196. (Former course Plant Science 196.)—II. [II.] Mitchum

197L. 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 Section’s regular courses. May be repeated for credit. (P/NP grading only.)—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.)

Plant Biology (A Graduate Group)

John Harada, Ph.D., Chairperson of the Group

Group Office. For students interested in graduate programs, this group offers courses designed to prepare students for advanced work in plant biology. This group also offers a number of courses for credit by examination. Further information is available in the Group Office.

Graduate Program:

Group Office.

SocSci =Spring, Div =Social-Cultural Diversity; Writing Experience

Quarter Offered: I, II, Fall; II, Winter; III, Spring; IV, Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum = Arts and Humanities; SciEng = Science and Engineering; SocSci = Social Sciences; Div = Social-Cultural Diversity; Wnt=Writing Experience

Don Durzan, Ph.D., Professor (Plant Sciences)
Marie Lynn Ezler, Ph.D., Professor (Molecular and Cellular Biology)
Bryce Falk, Ph.D., Professor (Plant Pathology)
Albert Fischer, Ph.D., Associate Professor (Plant Sciences)
Charles Gasser, Ph.D., Professor (Molecular and Cellular Biology)
David Gilchrist, Ph.D., Professor (Plant Pathology)
Thomas Gradziel, Ph.D., Professor (Plant Sciences)
John Harada, Ph.D., Professor (Plant Sciences)
James Harding, Ph.D., Professor (Plant Sciences)
Stacey Harmer, Ph.D., Assistant Professor (Plant Biology)
Theodore Hsiao, Ph.D., Professor (Land, Air, and Water Resources)
Kentaro Ioue, Ph.D., Assistant Professor (Plant Sciences)
Louise Jackson, Ph.D., Professor (Plant Sciences)
Marie Jasieniuk, Ph.D., Assistant Professor (Plant Sciences)
Judy Jernestedt, Ph.D., Professor (Plant Sciences)
Adel Kader, Ph.D., Professor (Plant Pathology)
Clarence Kado, Ph.D., Professor (Plant Pathology)
Daniel Klenkenstein, Ph.D., Assistant Professor (Plant Sciences)
John Labavitch, Ph.D., Professor (Plant Sciences)
Clark Lagarias, Ph.D., Professor (Molecular and Cellular Biology)
Andre Lawochl, Ph.D., Professor (Land, Air, and Water Resources)
J. Heinrich Lieth, Ph.D., Professor (Plant Sciences)
Bo Liu, Ph.D., Associate Professor (Plant Biology)
William Lucas, Ph.D., Professor (Plant Sciences)
Julin Maloof, Ph.D., Assistant Professor (Plant Biology)
Mark Matthews, Ph.D., Professor (Viticulture and Enology)
Richard Michelmore, Ph.D., Professor (Plant Sciences)
Terence Murphy, Ph.D., Professor (Plant Biology)
Florence Negre, Ph.D., Assistant Professor (Plant Sciences)
Donald Nevins, Ph.D., Professor (Plant Sciences)
Sharan O’Neill, Ph.D., Professor (Plant Biology)
Kyaw Tha Pauw, Ph.D., Professor (Land, Air, and Water Resources)
Robert Pearce, Ph.D., Professor (Evolution and Ecology)
Donald Phillips, Ph.D., Professor (Plant Sciences)
Vito Polito, Ph.D., Professor (Plant Sciences)
Daniel Polter, Ph.D., Associate Professor (Plant Sciences)
Carlos Quiros, Ph.D., Professor (Plant Sciences)
Michael Reid, Ph.D., Professor (Plant Sciences)
Marcel Rejmanek, Ph.D., Professor (Evolution and Ecology)
Elika Rejmanova, Ph.D., Professor (Environmental Science and Policy)
Jim Richards, Ph.D., Professor (Land, Air, and Water Resources)
Raymond Rodriguez, Ph.D., Professor (Molecular and Cellular Biology)
Pamela Ronald, Ph.D., Associate Professor (Plant Pathology)
Thomas Rost, Ph.D., Professor (Plant Biology)
Mikal Salweit, Ph.D., Professor (Plant Sciences)
Michael Sanderson, Ph.D., Professor (Evolution and Ecology)
Ken Shackel, Ph.D., Professor (Plant Sciences)
Wendy Silk, Ph.D., Professor (Land, Air, and Water Resources)
Neelima Sinha, Ph.D., Professor (Plant Biology)
Alan Sternier, Ph.D., Professor (Plant Biology)
Venkatesan Sundaresan, Ph.D., Professor (Plant Biology)
Steve They, Ph.D., Professor (Plant Biology)
M. Andrew Walker, Ph.D., Professor (Viticulture and Enology)
Larry Williams, Ph.D., Professor (Viticulture and Enology)
Valerie Williamson, Ph.D., Professor (Nematology)
Lin Wu, Ph.D., Professor (Plant Sciences)
John Yoder, Ph.D., Professor (Plant Sciences)
Affiliated Faculty
Marita Cantwell-De Trejo, Ph.D., Lecturer (Plant Sciences)
Carlos Crisosto, Ph.D., Associate Specialist (Plant Sciences)
Richard Evans, Ph.D., Lecturer (Plant Sciences)
Teresa Fahn, Ph.D., Assistant Research Biochemist (Plant Sciences)
Matthew Fidelibus, Ph.D., Assistant Cooperative Extension Viticulture Specialist (Viticulture & Enology)
Sharon Goyal, Ph.D., Lecturer (Plant Sciences)
Andrew Groover, Ph.D., Assistant Adjunct Professor (Plant Biology)
Jim Hill, Ph.D., Specialist in CE (Plant Sciences)
Kirk Larson, Ph.D., Pomologist & CE Specialist (Plant Sciences)
Michelle McMahon, Ph.D., Assistant Researcher (Evolution & Ecology)
Elizabeth Mitcham, Ph.D., Associate Specialist (Plant Sciences)
Ann Powell, Ph.D., Assistant Researcher (Plant Sciences)
Alan Rose, Ph.D., Assistant Researcher Biochemist (Molecular & Cellular Biology)
Thomas Tai, Ph.D., Associate AES (Plant Sciences)
Allen Van Deynze, Ph.D., Specialist Biotechnology (Plant Sciences)
Graduate Study. The Graduate Group in Plant Biology offers programs of study and research leading to the M.S. and Ph.D. degrees. The program prepares students for careers in teaching and research at colleges and universities, government or industry laboratories. The graduate curriculum involves both a broad overview of the discipline and in-depth study and research in one of four areas of specialization: cell and developmental biology; systematics and evolutionary biology; environmental and integrative biology; and molecular biology, biochemistry and genomics. These areas of specialization permit individual study and research into diverse aspects of plant biology, including anatomy, biochemistry, cell biology, cytolgy, developmental biology, ecology, genetics, molecular biology, morphology, physiology, population biology, systematics, and weed science.
Preparation. For both the M.S. and Ph.D. programs, a level of scholastic development equivalent to that of a Bachelor's degree in biological sciences from a recognized college or university is required. Courses in the following areas are considered to be prerequisites to the advanced degrees in Plant Biology: inorganic chemistry, organic chemistry, introductory physics, general biology, introductory botany, biochemistry, introductory plant physiology, introductory plant physiology laboratory, calculus, introductory statistics, plant ecology/systematics/evolution, genetics, and plant cell/molecular biology. Limited deficiencies can be made up after admission. The graduate advisor, the major professor, and the student will design a program of advanced courses to meet individual academic needs within one of the specializations.
Graduate Adviser. Contact the Group office.
Courses in Plant Biology (PBI)
Graduate Courses
200A. PBGG Core Course Series-Fall quarter (5)
Lecture—3 hours; discussion—2 hours. Prerequisite: course 200A. The second of three PBGG graduate core courses. Coverage includes (1) embryo development, (2) cytoskeleton and vesicle trafficking, (3) cell walls, (4) cell growth, (5) secondary metabolism, (6) plastids and their functions. —II. Labavitch, Nevins
200C. PBGG Core Course Series-Spring quarter (5)
Lecture—3 hours; discussion—2 hours. Prerequisite: course 200A and 200B. The third of three PBGG graduate core courses. Coverage includes (1) plant water relations, (2) cellular and 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. Blumwald, Silk
201. Plant Senescence: Cellular and Molecular Aspects (4)
Lecture—4 hours. Prerequisite: Plant Biology 111, 112; Biological Sciences 102 and 103. Cellular and molecular phenomena associated with the senescence of plants and plant parts. Emphasis on principles and mechanisms. Offered in alternate years.—II. Reid
202. Advanced Physiology of Cultivated Plants (2)
Lecture—1 hour; discussion—1 hour. Prerequisite: Plant Biology 111 or the equivalent. Physiological processes as they pertain to growth and partitioning in higher plants. Back- ground lectures on source-sink concepts and current areas of investigation. Weekly round table discussion led by students on focused sub-topics in the source-sink area. Offered in alternate years. (S/U grading only).—I. Delong
203N. Research Tools in Plant Cell and Molecular Biology (4)
Lecture—3 hours; discussion/laboratory—2 hours. Prerequisite: Plant Biology 111 or Biological Sciences 104 or the equivalent. Theories of commonly employed approaches in plant cell and molecular biology, including antibodies, epoetope-tagging, bioluminescence, protein identification, and protein localization. Breakthroughs on techniques used in plant biology. Offered in alternate years. (S/U grading only).—I. Liu
205B. Advanced Plant Physiology (3)
Lecture/discussion—3 hours. Prerequisite: Plant Biology 111, 112, and Biological Sciences 103. Photosynthesis, photophosphorylation, chloroplast metabolism and biology. Offered in alternate years.—II. Thog
205C. Advanced Plant Physiology/ Biochemistry (3)
Lecture—3 hours. Prerequisite: Plant Biology 111, 112, Biological Sciences 103. Integrative studies that combine physiological, biochemical and molecular approaches to study of plant metabolism. Fundamental mechanisms of basic metabolic pathways extending to use of mutants and genetic engineering to dissect such pathways; how pathways are integrated and respond to signals. Offered in alternate years.—II. Sinha
208. Plant Hormones and Regulators (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Plant Biology 112. Chemistry, biochemistry and physiological activity of major classes of natural plant growth regulators. Primary consideration given to concepts that help in the rational design and organization. Examines plant cells, tissues, and organs with special emphasis on experimental evidence for mechanisms regulating developmental processes. Offered in alternate years. —Bowman, Sinha
223. Special Topics in Scientific Method (2)
Discussion—2 hours. Examines the historical and philosophical background of the scientific method. Analyzes the rational, perceptual, causal, creative and social aspects of scientific knowledge. Clarify the roles of reason, experimentation and creativity in scientific research. (S/U grading only).—I. (II) Bradford
224. Water in Physiology and Ecology of Plants (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Hydrologic Science 124, or Plant Biology 111 and 117, or consent of instructor. Water transport to be included; water transport to, within, and from plants; dynamics and regulation of water status; drought resistance; responses to water deficits and salinity; water use efficiency; adaptation to aridity; productivity in relation to water. Offered every fourth quarter. (Former course Plant Science 224.)—II. Hsiao
225. Methods and Instrumentation for Crop and Soil Science (3)  Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: basic knowledge of plant physiology, soil science, chemistry and physics. Theory and practice of in situ sampling and instrumentation methods for crop science (broadly defined to include tree crops) and related aspects of soil science (e.g., moisture and fertility) and laboratory analysis. Offered in alternate years.— III.

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, molecular genetics, mechanisms of gene regulation, gene transfer, and special topics related to development and response to biological and environmental stimuli.—(II) Brits, 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)  Seminar—1 hour. Seminars presented by members of Plant Biology faculty describing their areas of research. Required of all beginning students in the Plant Biology Graduate Group. (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, (II, III)

290C. Research Conference in Botany (1)  Discussion—1 hour. Prerequisite: graduate standing and/or consent of instructor. Presentation and discussion by faculty and graduate students of research projects in botany. May be repeated for credit. (S/U grading only)—I, II, III, (I, II, III)

291. Graduate Student Seminar in Plant Biology (1)  Seminar—1 hour. Prerequisite: graduate student standing. Student-presented seminars on topics in plant biology, with critiques by instructor and peers. How to give a seminar, including preparation of visual and other teaching aids. Topic determined by instructor in charge. May be repeated for credit. (S/U grading only)—I, II, III, (I, II, III)

292. Seminars in Plant Biology (1)  Seminar—1 hour. Prerequisite: consent of instructor. Review of current literature in botanical disciplines. Disciplines and special subjects to be announced quarterly. Students present and analyze assigned topics. May be repeated for credit. (S/U grading only)—I, II, III, (I, II, III)

293. Seminar in Postharvest Biology (1)  Discussion—1 hour. Prerequisite: consent of instructor; open to advanced undergraduates. Intensive study of selected topics in the postharvest biology of fruits, vegetables, and ornamentals. May be repeated for credit. (S/U grading only)—I, II, III, (I, II, III)

297. Tutoring in Plant Biology (1–5)  Tutorial—2 to 15 hours. Offers graduate students, particularly those not serving as teaching assistants, the opportunity to gain teaching experience. (S/U grading only)

299. Research (1-12)  Prerequisite: graduate standing. (S/U grading only)

Professional Course

300. The Teaching of Plant Biology (2)  Discussion—2 hours. Prerequisite: graduate standing; concurrent appointment as a teaching assistant in Plant Biology. Consideration of the problems of teaching botany, especially of preparing for and conducting discussions, guiding student laboratory work, and the formulation of questions and topics for examinations. (S/U grading only)—I, II, III, (I, II, III)

Plant Pathology

[College of Agricultural and Environmental Sciences]  Thomas R. Gordon, Ph.D., Chairperson of the Department

Department Office.  354 Hutchison Hall  (530) 752-0300;  http://plantpathology.ucdavis.edu/course/index.htm

Faculty
Richard M. Bostock, Ph.D., Professor George Bruneing, Ph.D., Professor Douglas R. Cook, Ph.D., Professor R. Michael Davis, Ph.D., Professor Lynn Epstein, Ph.D., Professor Bryce W. Falk, Ph.D., Professor Robert L. Gilbertson, Ph.D., Professor David G. Gilchrist, Ph.D., Professor Thomas R. Gordon, Ph.D., Professor Clarence I. Kado, Ph.D., Professor Bruce Kirkpatrick, Ph.D., Professor James D. MacDonald, Ph.D., Ph.D., Professor (Plant Pathology, Plant Sciences)  Plant Biology 105, course 120, and Entomology 100 recommended. Analysis of the 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 virus infection and modern experimental approaches to the interdiction of viral movement. Offered alternate years. [Some course as Entomology 123] (Plant Biology 123)—I. Lucas, Gilbertson, Ullman

130. Fungal Biotechnology and Biochemistry (3)  Lecture—3 hours. Prerequisite: Plant Biology 119, Biological Sciences 103. How fundamental physiological and biochemical activities of fungi impact the destructive and beneficial roles of these organisms in nature. Utilization and manipulation of fungi for biotechnological and industrial applications.—II. (II) Gilchrist, Bostock

135. Field Identification of Mushrooms (1)  Field work; three-day mandatory field trip. Prerequisite: introductory course in biological sciences; course in mycology recommended. Collection and identification of mushrooms and other fleshy fungi based on macroscopic and microscopic features. (S/U grading only)—II. (I) Davis

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 technologies, 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.—III. (III) Bruening, Williamson

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 Biology 148]—I. MacDonald, Rizzo

150. Fungal Ecology (3)  Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1C or equivalent. The ecological roles of fungi as saprobes, mutualists and parasites in native and managed ecosystems. Physiological and reproductive strategies associated with adaptations to diverse habitats.—II. (II) Gordon

151A-151B. Fungal Biodiversity in Natural Environments (4-4)  Lecture—1 hour; laboratory—6 hours, field work—three or four one-day-long weekend field trips. Prerequisite: introductory course in mycology (e.g., Plant Biology 148/course 148). Plant Pathology 150 [may be taken concurrently]. Fungal biodiversity within a natural habitat. Fungi collected on field trips will be identified during laboratory periods. The ecological roles of the various fungal taxa are emphasized. Offered in alternate years.—(III) MacDonald

155. Ecology of Forest Diseases (3)  Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C. Tree diseases and their role in temperate and tropical forest ecosystems. Impacts of both native and exotic pathogens. Interactions between forest pathogens and insects. Approaches to management and regulation. One field trip is required. Offered in alternate years.—III. MacDonald

185. Advanced Mushroom Taxonomy (2) Laboratory/discussion—1 hour; field work—three or four one-day-long weekend field trips. 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; one-day field trip is required. Offered in alternate years. —I. Davis
192. Internship (1-12)
Internship—3-36 hours. Prerequisite: course 120 and consent of instructor. Work experience on and off 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 (1-5)
(P/NP grading only.)

Graduate Courses

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. Emphasis on epidemiology, diagnosis, and control. Field trips required. Offered in alternate years.—III. Davis, Webster

205B. Diseases of Vegetable and Field Crops—Summer Field Trip (1)
Fieldwork—3 hours. Prerequisite: 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, Webster

206A-206B. Diseases of Fruit, Nut, and Vine Crops (3-3)
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 epidemiology, diagnostic techniques, and control. Offered in alternate years. (Deferred grading only, pending completion of sequence.)—IIIIV. (IIIIV.)

208. Ecology of Plant Pathogens and Epidemiology of Plant Diseases (4)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 120 or equivalent. Interaction between higher plants, plant pathogens, and the environment which is important in the occurrence and severity of plant disease. Emphasis is placed on the population dynamics and ecology of plant pathogens in the aerial and soil environment. Offered in alternate years.—III. Duniyaw

209. Principles of Plant Disease Control (3)
Lecture—2 hours. Prerequisite: course 120 or the equivalent. Discussion of the underlying principles and methods used for the control of plant diseases. Emphasis placed on the application of epidemiological principles, biological (including host resistance), and chemical strategies to achieve disease control. Offered in alternate years.—II.

210. Biochemistry and Molecular Biology of Plant-Microbe Interaction (4)
Lecture/discussion—4 hours. Prerequisite: Biological Sciences 101, 102, 103, and 104, or the equivalent. Discussion of plant-microbe interactions, focused on the underlying cellular, biochemical, and molecular events that determine the diseased state. Offered in alternate years.—I. Gilchrist, Bostock

215X. Genetics and Molecular Biology of Plant Pathogens (4)
Lecture—3 hours; laboratory/discussion—3 hours. Prerequisite: course 120 and Biological Sciences 101. Genetic analysis of pathogenicity, cultivar specificity, and host-specificity in plant pathogens, particularly fungi; application of molecular biology to the isolation and characterization of the genes involved; and to aspects of pathogen identification; emphasis on research techniques and problem-solving. Offered in alternate years.—II.

217. Molecular Genetics of Fungi (3)
Lecture—3 hours. Prerequisite: graduate standing in a biological science. Biological Sciences 101, 103, Molecular and Cellular Biology 161, Plant Biology 119, courses 130, 215X. Microbiology 215 recommended. Advanced treatment of molecular biology and genetics of filamentous fungi and yeasts, including gene structure, organization and regulation; plant pathogenesis; secretion; control of reproduction; molecular evolution, transformation; and gene manipulation. Offered in alternate years. (Same course as Biological Chemistry 217.)—II. Hollenstein

222. Advanced Mycology (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 148 or Plant Biology 148 or consent of instructor. Systematics, evolution, and ecology of the fungi. Topics include modern techniques and theories on classification of fungi, species concepts, sexual compatibility and vegetative compatibility. Laboratories emphasize various approaches to fungal identification. Offered in alternate years.—II. Rizzo

228. Plant Bacteriology (5)
Lecture—2 hours; laboratory—9 hours. Prerequisite: course 120, Microbiology 2 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.—II. Kirkpatrick, Gilchrist

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 spread in the plant; cytology 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, IV. Bruning, Falk

230L. Plant Pathology Laboratory (2)
Lecture—2 hours. Prerequisite: course 230 (may be taken concurrently). Experimental approaches and methods for plant virus identification; investigation of plant virus infection cycles, disease induction, plant reaction to infection, and the structure of virus particles. Not open for credit to students who have completed course 226.—Bruning, Falk

230C. Advanced Research Conference (1)
Seminar—1 hour. Review and evaluation of current research in plant pathology. (S/U grading only.)—II, III. (II, III)

239C. Advanced Research Conference (1)
Seminar—1 hour. Prerequisite: course 120 or consent of instructor. Presentation, evaluation, and critical discussion of research activities in the area of advanced plant pathology; primarily designed for graduate students. (S/U grading only.)—I, II, III. (I, II, III)

239L. Seminar in Plant Pathology (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: course 120 or the equivalent. Avoiding common research pitfalls. Offered in alternate years.—II. Epstein

249. Special Group Study (1-5)
(S/U grading only.)

Plant Physiology

See Plant Biology, on page 413; and Plant Biology (A Graduate Group), on page 416.

Plant Protection and Pest Management

See Integrated Pest Management (A Graduate Group), on page 311.

Plant Sciences

(For 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://plantsciences.ucdavis.edu/

Faculty

Steffen Abel, Ph.D., Associate Professor
Michael G. Barbour, Ph.D., Professor, Academic Senate Distinguished Teaching Award
Dianne M. Beckles, Ph.D., Associate Professor
Alan B. Bennett, Ph.D., Professor
Alison M. Berry, Ph.D., Professor
Arnold J. Bloom, Ph.D., Professor
Eduardo Bluemwald, Ph.D., Professor
Kent J. Bradford, Ph.D., Professor
Patrick H. Brown, Ph.D., Professor
David W. Burger, Ph.D., Professor
Mary Cadena, Ph.D., Assistant Professor
Abhay A. Dandekar, Ph.D., Professor
Theodore D. Dalong, Ph.D., Professor
Montague W. Demment, Ph.D., Professor
Jorge Dubcovsky, Ph.D., Professor
Don J. Durzan, Ph.D., Professor
Jan Dvorak, Ph.D., Professor
Valerie Evner, Ph.D., Assistant Professor
Albert J. Fischer, Ph.D., Associate Professor
Theodore C. Foin, Jr., Ph.D., Professor
Shu Geng, Ph.D., Professor
Paul L. Gepts, Ph.D., Professor
Thomas M. Gradziel, Ph.D., Professor
James A. Harding, Ph.D., Professor
Kentaro Inoue, Ph.D., Assistant Professor
Marie A. Jasieniuk, Ph.D., Assistant Professor
Adel A. Kader, Ph.D., Professor
Daniel J. Kliebenstein, Ph.D., Assistant Professor
John M. Labavitch, Ph.D., Professor
Emilio A. Laca, Ph.D., Associate Professor
J. Heinrich Lieth, Ph.D., Professor
James D. MacDonald, Ph.D., Professor
Paul L. Gepts, Ph.D., Professor
Richard W. Michelmore, Ph.D., Professor
David B. Neale, Ph.D., Professor
Florence Negre, Ph.D., Assistant Professor
Donald J. Nevins, Ph.D., Professor
Michael P. Porrellas, Ph.D., Professor
(Entomology) Donald A. Phillips, Ph.D., Professor
Richard L. Plant, Ph.D., Professor
Vito S. Polito, Ph.D., Professor
Kent R. Rice, Ph.D., Professor
Dina S. Clair, Ph.D., Associate Professor
110B. Management of Agronomic Crops in Temperate and Tropical Systems (3)
Lecture—1 hour; laboratory—2 hours; fieldwork—3 hours. Prerequisite: course 2 or equivalent computer experience; Mathematics 16A. The process of systems analysis and dynamic simulation of biological and environmental systems. Development of systems analysis for development of optimal management strategies for agricultural and environmental systems. GE credit: SciEng. Writ. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 121. [Former course Agricultural Management and Rangeland Resources 121.—I. (II) Foin]

122. Management of Information for the Agricultural and Environmental Sciences (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: course 2 or equivalent introduction to systems and technology for acquiring, storing, manipulating and communicating various types of information including numerical data, text, graphics and multimedia images. Laboratory exercises introduce a wide variety of information management systems used in offices and laboratories. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 112. [Former course Agricultural Management and Rangeland Resources 112.—II. (II) Rice]

130. Rangelands: Ecology, Conservation and Restoration (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1C; introductory ecology course and junior standing recommended. Introduction to the ecological principles and processes important for an understanding of the dynamics of rangeland ecosystems. Emphasis on an ecological and evolutionary concepts underlying management strategies for conserving biodiversity and environmental quality in rangelands. Offered in alternate years. GE credit: SciEng, Writ. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 130. [Former course Agricultural Management and Rangeland Resources 122.—II. (II) Rice]

131. Identification and Ecology of Grassland Ecosystems (2)
Lecture—7.5 hours; laboratory—20 hours; discussion—2 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 grassland and savanna ecosystems. Offered the week following spring quarter. Offered in alternate years. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 131. [Former course Agricultural Management and Rangeland Resources 131.—III. Rice]

134. Comparative Ecology of Major Rangeland Systems (3)
Lecture—3 hours; one Saturday field trip required. Prerequisite: general biology course or the equivalent; Environmental Science and Policy 100 recommended. Study of vegetation structure, composition, and succession in North American rangelands. Description and comparison of interactions between vegetation and grazing animals on grassland, desert, forested, and tundra rangelands. Discussion of current rangeland management strategies. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 134. [Former course Agricultural Management and Rangeland Resources 134.—I. (I) Teuber]

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 or equivalent). Description and importance of grassland herbivores and their role in the evolution of herbivorous communities and social systems. Optimal foraging, interspecific interactions, and primary productivity are considered as factors structuring natural and managed grassland and savannah systems. Offered in alternate years. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 135. [Former course Agricultural Management and Rangeland Resources 135.—I. (I) Demment]

137. Field Course in Rangeland Monitoring and Management (2)
Lecture—1 hour; fieldwork—3 hours (week-long intensive field course given the week following spring quarter). Prerequisite: course 2 or the equivalent; Plant Biology 102 and junior standing recommended. Introduction to rangeland vegetation monitoring methods and management strategies. Field sampling of vegetation communities, floristic associations, species diversity, stock, soil status, and wildlife and fish habitat. Grazing management strategies to achieve desired future condition of rangelands. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 137. [Former course Agricultural Management and Rangeland Resources 137.—I. (I) Foin]

150. Cropping Systems of the World (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or Biological Sciences 1C, and Soil Science 10. General concepts of the functioning of cropping systems as related to resource availability, energy flow, economic yield, sustainability and integration; means of increasing resource use efficiency; low and high input cropping systems in temperate and tropical zones. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 150. [Former course Agricultural Management and Rangeland Resources 150.—I. (I) von Kessels]

160. Agroforestry: Global and Local Perspectives (3)
Lecture/discussion—3 hours. Prerequisite: course 2 or Biological Sciences 1C, Plant Biology 142 or a general ecology course (Environmental Science and Policy 100 or equivalent). Traditional and modern systems of agriculture in agricultural ecosystems; their multiple roles in environmental stabilization and production of food, fuel, fiber, and fiber; and socioeconomic barriers to the adoption and implementation of agroforestry practices. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 160. [Former course Agricultural Management and Rangeland Resources 160.] [Same course as International Agricultural Development 160.] Offered in alternate years.—I. Gradziel

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 pomological crops, analysis of current cultural and harvesting problems and concerns associated with commercial fruit growing. Offered in alternate years. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 170A. [Former course Agricultural Management and Rangeland Resources 170A.—I. (I) 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 pomological crops, including analysis of current cultural and harvesting problems and concerns associated with commercial fruit growing. Offered in alternate years. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 170B. [Former course Agricultural Management and Rangeland Resources 170B.—II. (II) Gradziel, McGranahan]

180. Introduction to Geographic Information Systems (4)
Lecture—3 hours; laboratory/discussion—3 hours. Prerequisite: course 2 or equivalent familiarity with computers, course 120 or the equivalent. Mathematical 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 180. [Former course Agricultural Management and Rangeland Resources 180.] [Same course as Applied Biological Systems Technology 180.—I. (I) Plant]
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).—I, II, III. Von Taks

192. Internship (1-12)
Internship—3-36 hours. Prerequisite: consent of instructor. Work experience on or off campus in plant and environmental sciences. Internship supervised by a faculty member. (P/NP grading only.)

194H. Senior Honors Thesis (2-6)
Independent study. Prerequisite: Senior standing; overall GPA of 3.250 or higher and consent of master adviser. Two or three successive quarters of guided research on a subject of special interest to the student. (P/NP grading only; deferred grading only, pending completion of thesis.)

197T. Tutoring in Plant Sciences (1-5)
Tutorial—1-1.5 hours. Prerequisite: upper division standing, course being tutored 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. (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 Courses

205. Experimental Design and Analysis (4)
Lecture—2 hours; discussion—1 hour. Prerequisite: course 120 or the equivalent. Graduate students in agricultural and environmental sciences will be introduced to the research process and statistical methods to interpret experiments. Not open for credit to students who have completed Agronomy 205. [Former course Agronomy 205.]—I, II, III. Dubcovsky

206. Multivariate Systems and Modeling (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 120 or the equivalent. Graduate students in the biological and environmental sciences will be presented with methods and computer modeling methods needed to conduct research experiments and analyze multivariate data systems. —III. (III.) 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 including 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 Agronomy 211. [Former course Agronomy 211.]—III. (III.) Goyal

212. Postharvest Biology and Biotechnology of Fruits and Nuts (3)
Lecture—3 hours. Prerequisite: Plant Biology 172 or the equivalent. Review of postharvest biology of fruits and nuts in relation to biotechnological procedures used in handling and emphasizing research needs. Not open for credit to students who have completed Pomology 212. [Former course Pomology 212.] Offered in alternate years. —III. (III.) Kader, Miller

213. Postharvest Physiology of Vegetables (3)
Lecture—2 hours; discussion—1 hour. Prerequisite: Plant Biology 172. Comparative physiology of harvest vegetables; emphasis on maturation, senescence, compositional changes, physiological disorders and effects of environmental factors. Concepts and research procedures. Not open for credit to students who have completed Vegetable Crops 212. [Former course Vegetable Crops 212.] Offered in alternate years. (III.) Saltveit

216. Ecology and Agriculture (3)
Lecture/discussion—3 hours. Prerequisite: Plant Biology 142 or consent of instructor. Ecological principles and relationships as applied to agriculture. Integration of ecological concepts into agricultural research to develop environmentally sound management practices. Topics include crop ecology, biotic interactions among crops and pests, and crop systems ecology. Not open for credit to students who have completed Vegetable Crops 216. [Former course Vegetable Crops 216.]—Same course as Ecology 216.—I, II, III. Jackson

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 output traits. Not open for credit to students who have completed Vegetable Crops 221. [Former course Vegetable Crops 220.]—Same course as Genetics 220.—Michelmore

221. Genomics and Breeding of Vegetable Crops (3)
Lecture—3 hours. Prerequisite: Biological Sciences 101 or the equivalent. Review 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.]—III. (III.) Quiros

222. Advanced Plant Breeding (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 205; Genetics Graduate Group 201D or Animal Genetics 103A; Plant Biology 134. Philosophy, methods, and problems in developing improved plant species. Topics include: inbreeding, heterosis, progeny testing, breeding methodology, index selection, germplasm evaluation, and breeding for stress resistance. Laboratories include tours of breeding facilities and calculation and interpretation of quantitative data. Not open for credit to students who have completed Agronomy 221. [Former course Agronomy 221.] Offered in alternate years. —III. (III.) Teuber

290. Seminar (1-2)
Seminar—1-2 hours. Topics of current interest related to Plant Sciences. (S/U grading only).—I, II, III. (I, II, III.)

290C. Research Group Conference (1)
Discussion—1-2 hours. Prerequisite: students in a graduate program. Research conference conducted by departmental faculty to discuss design, philosophy, and interpretation of ongoing research. Not open for credit to students who have completed Agronomy 290C. [Former course Agronomy 290C.]—Same course as Plant Sciences 290C.—I, II, III. (I, II, III.)

290R. Research Group Conference (1)
Discussion—1-2 hours. Prerequisite: students in a graduate program. Research conference conducted by departmental faculty to discuss design, philosophy, and interpretation of ongoing research. Not open for credit to students who have completed Agronomy 290R. [Former course Agronomy 290R.]—Same course as Plant Sciences 290R.—I, II, III. (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 5 units. Same course may not be tutored more than one time. (S/U grading only.)

298. Group Study (1-5)
Prerequisite: graduate standing. (S/U grading only.)

299. Research (1-12)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)

Plastic Surgery

See Medicine, School of, on page 345.

Political Science

[College of Letters and Science] Walter Stone, Ph.D., Chairperson of the Department
Department Office: 1236 Social Sciences and Humanities Building (530) 752-0966
Undergraduate Student Matters, 1273 Social Sciences and Humanities Building (530) 752-3063
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Faculty
James Adams, Ph.D., Associate Professor Josephine Andrews, Ph.D., Associate Professor
Larry Berman, Ph.D., Professor
James Fowler, Ph.D., Assistant Professor
Scott Gartner, Ph.D., Associate Professor
John B. Gates, Ph.D., Associate Professor
Jeff Gill, Ph.D., Associate Professor
Emily O. Goldman, Ph.D., Associate Professor
Benjamin Highton, Ph.D., Associate Professor
Stuart L. Hill, Ph.D., Associate Professor
Robert Huckfeldt, Ph.D., Professor
Robert W. Jackman, Ph.D., Professor
Cindy Kam, Ph.D., Assistant Professor
Daniel Y. Kono, Ph.D., Assistant Professor
Jeanette Money, Ph.D., Associate Professor
Gabriella R. Montinola, Ph.D., Associate Professor
Miroslav Nincic, Ph.D., Professor
Larry I. Peterman, Ph.D., Professor
Donald S. Rothchild, Ph.D., Professor
Brian R. Sala, Ph.D., Associate Professor
Ethan Scheiner, Ph.D., Assistant Professor
John T. Scott, Ph.D., Professor
Randolph M. Siverson, Ph.D., Professor
James F. Spiggis II, Ph.D., Professor
Walter Stone, Ph.D., Professor
Robert Taylor, Ph.D., Assistant Professor
Elizabeth Zechmeister, Ph.D., Assistant Professor

Emeriti Faculty
Edmond Costantini, Ph.D., Professor Emeritus
Richard W. Gable, Ph.D., Professor Emeritus
Alexander J. Groth, Ph.D., Professor Emeritus
Clyde E. Jacobs, Ph.D., Professor Emeritus
Joyce K. Kallgren, Ph.D., Professor Emerita
Lloyd D. Musolf, Ph.D., Professor Emeritus
John R. Owens, Ph.D., Professor Emeritus
Larry L. Wade, Ph.D., Professor Emeritus
Geoffrey A. Wandesforde-Smith, Ph.D., Professor Emeritus
Paul E. Zinner, Ph.D., Professor Emeritus

The Major Program

Political science is the study of politics and political systems at the local, national, and international levels. It concerns not only the institutions of government but also the analysis of such phenomena as political behavior, political values, political change and stability, parties, pressure groups, bureaucracies, administrative behavior, justice, national security, and international affairs.
A.B. Major Requirements:

Preparatory Subject Matter

**Depth Subject Matter**

Fields of Concentration

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political Science 100, 104, 105, 106, 113, 180</td>
<td>8</td>
</tr>
<tr>
<td>Political Science 108, 109</td>
<td>8</td>
</tr>
<tr>
<td>Political Science 192A, 192B, or 192W</td>
<td>8</td>
</tr>
</tbody>
</table>

Research paper, Political Science 193...2-4

Fields of concentration...24

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.


Field (2) Policy implementation and evaluation: Political Science 180, 183, 187; Economics 131

Field (3) Policy interpretation—Substance and procedures (public/pre-law): Political Science 150, 151, 152, 155

Field (4) Policy areas:
(a) Urban policy and implementation: Political Science 100, 102, Environmental Horticulture 110; Environmental Science and Policy 173
(b) Environmental policy and implementation: Political Science 107, Environmental Science and Policy 160, 161, 166, 168A-168B, 172, 179
(c) Environmental policy and implementation: open field that might include courses relevant to health care, welfare, education, community development, transportation, science and technology, etc.; requires approval of Political Science/Public Service Adviser.

**Total Units for the Major**

68

Major Advisers: Consult Department office.

Minor Program Requirements:

Students electing a minor in Political Science may choose one of two plans.

**Political Science**

UNITs

### Courses in Political Science (POL)

**Lower Division Courses**

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.—I, II, III.

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 formal political and governmental structures. GE credit: SocSci, Wrt.—I, II, III.

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.—I, II, III.

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 the rights resident in the work of the major political philosophers. GE credit: SocSci, Wrt.—I.

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.—II.

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 40.0 units. GE credit. SocSci, Wrt.—III.

7. **Scientific Study of Politics (4)**
   - Lecture/discussion—4 hours. 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: SocSci, Wrt.—I, II, III.

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/np grading only)

### Upper Division Courses

100. **Local Government and Politics (4)**
   - Lecture—3 hours; discussion—1 hour. Prerequisite: course 1, 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 boards. GE credit: SocSci, Wrt.

102. **Urban Public Policy (4)**
   - Lecture—3 hours; discussion—1 hour. Prerequisite: course 1, upper division standing or consent of instructor. Political and economic relationships among central cities, suburbs, and regional, state, and federal governments. Focuses on policy areas such as poverty, transportation,
Principles of American thought as they emerge from Lecture—3 hours; term paper. Prerequisite: course 1. The American presidency’s origins and development; presidential power and influence as manifest in relationships with Congress, courts, parties, and the public in the formulation and implementation of foreign and domestic policy; nominations, campaigns, and elections. GE credit: SocSci, Wrt.—II, III.

106. The Presidency (4)
Lecture—3 hours; discussion—1 hour; optional term paper. Prerequisite: course 1. The American presidency’s origins and development; presidential power and influence as manifest in relationships with Congress, courts, parties, and the public in the formulation and implementation of foreign and domestic policy; nominations, campaigns, and elections. GE credit: SocSci, Wrt.—II, III.

107. Environmental Politics and Administration (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. The theoretical rationale for governmental activity, program evaluation, PRBS, positive theories of policy making, the quantitative study of policy determinants, implementation, and proposals for improved decision making. GE credit: SocSci, Wrt.

108. Policy Making in the Public Sector (4)
Lecture—3 hours; research paper. Prerequisite: course 1. The theoretical rationale for governmental activity, program evaluation, PRBS, positive theories of policy making, the quantitative study of policy determinants, implementation, and proposals for improved decision making. GE credit: SocSci, Wrt.

110. The Strategy of Politics (4)
Lecture/discussion—4 hours. Introduction to game theory: Explanation of the behavior of individuals in strategic interaction. Rational and behavioral approaches. Applications to political science and other fields. I, II.

111. Systematic Political Science (4)
Lecture/discussion—4 hours. Philosophical basis of modern political science; major specific approaches; selected concepts relevant to modern political concerns; and research design and execution. I, II.

112. Contemporary Democratic Theory (4)
Lecture—3 hours; term paper. Prerequisite: course 4. Major contemporary attempts to reformulate traditional democratic theory, attempts to replace traditional theories by conceptual models derived from modern social science findings. Offered in alternate years. GE credit: SocSci, Wrt.

113. American Political Thought (4)

114. Quantitative Analysis of Political Data (4)
Lecture—3 hours; term paper. Logic and methods of analyzing quantitative political data. Topics covered include central tendency, probability, correlation, and non-parametric statistics. Particular emphasis will be placed on understanding the use of statistics in political science research. Offered in alternate years. GE credit: SocSci, Wrt.

115. Medieval Political Thought (4)
Lecture—3 hours; term paper. Prerequisite: course 1. IBA. Examination of political thought in the Middle Ages. GE credit: SocSci, Wrt.

116. Foundations of Political Thought (4)
Lecture/discussion—3 hours; term paper. 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 once when topic differs. Offered in alternate years. GE credit: SocSci, Wrt.—III.

117. Marxism (4)
Lecture—3 hours; discussion—1 hour. Examination of the political and social philosophy of Karl Marx, with reference to the evolution of Marxism in the nineteenth and twentieth centuries. GE credit: SocSci, Wrt.—II.

118A. History of Political Theory: Ancient (4)
Lecture—3 hours; term paper. Prerequisite: course 4. Critical analysis of the works of early modern political philosophers such as Plato, Aristotle, Cicero and St. Thomas. GE credit: SocSci, Wrt.—I.

118B. History of Political Theory: Early Modern (4)
Lecture—3 hours; term paper. Prerequisite: course 4. Critical analysis of the works of early modern political philosophers such as Machiavelli, Montaigne, Hobbes, Locke and Hume. GE credit: SocSci, Wrt.—II.

118C. History of Political Theory: Late Modern (4)
Lecture—3 hours; term paper. Prerequisite: course 4. Critical analyses of the political thought of such modern philosophers as Kant, Hegel, Tocqueville, Mill, Marx and Nietzsche. GE credit: SocSci, Wrt.—III.

119. Contemporary Political Thought (4)
Lecture—3 hours; 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, Continent political thought, Eastern nationalism, Kant, Hegel, Tocqueville, Mill, Marx and Nietzsche. GE credit: SocSci, Wrt.—III.

120. Theories of International Politics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 4. 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.

121. The Scientific Study of War (4)
Lecture—3 hours; 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, Continent political thought, Eastern nationalism, Kant, Hegel, Tocqueville, Mill, Marx and Nietzsche. GE credit: SocSci, Wrt.—III.

122. International Law (4)
Lecture—4 hours. Prerequisite: course 3. Selected topics in international law: territory, sovereignty immunity, responsibility, the peaceful settlement or nonsettlement of international disputes. GE credit: SocSci, Wrt.—III.

123. The Politics of Interdependence (4)
Lecture—3 hours; term paper. Prerequisite: course 3. Upper division standing or consent of instructor. In the past several decades, growing economic interdependence has generated new problems in international relations. Course deals with difficulties in managing complex interdependence and its implications on national policies and politics. GE credit: SocSci, Wrt.—II, III.

124. The Politics of Global Inequality (4)
Lecture—3 hours; term paper. Prerequisite: course 3, upper division standing; course 123 recommended. Long-standing division of the global system into richer and poorer regions poses many important problems in international political economy. Course presents a theoretical background to North-South issues and analyses of current problems in economic and political relations. GE credit: SocSci, Div., Wrt.—I, II.

126. Ethnic Self-Determination and International Conflict (4)
Lecture—3 hours, individual meetings with students to discuss term papers. Prerequisite: course 3. Compares the claims of the state and ethnic peoples in countries undergoing internal conflicts, e.g., South Africa, Northern Ireland. Analyzes the role of the international community in facilitating the peaceful resolution of conflicts. GE credit: SocSci, Div., Wrt.—I, II.

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 politics. May be repeated once for credit when different topic is studied. GE credit: SocSci, Div.—I, II.

130. Recent U.S. Foreign Policy (4)
Lecture—3 hours; term paper. Prerequisite: course 3, upper division standing or consent of instructor. Broad survey of the development of U.S. foreign policy in the twentieth century with emphasis on the formulation of policy during and after World War II, and the introduction to analytic tools and concepts useful for understanding of current foreign policy issues. GE credit: SocSci, Wrt.—II.

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 formulation and execution of U.S. foreign policy. Survey of numerous factors influencing policy outcomes and how such determinants vary according to policy area issues. GE credit: SocSci, Wrt.

132. National Security Policy (4)
Lecture—3 hours; term paper. 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 contemporary war, alliance systems, and the international system. Prospects of security and stability through arms control. GE credit: SocSci, Wrt.—II.

134. Africa and U.S. Foreign Policy (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 3, upper division standing or consent of instructor. Upper division standing. Intensive examination of U.S. foreign policy toward Africa. Relationship to global adversities: Legacies of colonialism: Challenge of national self-determination and white racism. Policies on non-alignment, producer cartels, multinational corporations, continental integration and trade and aid relations.

137. International Relations in Western Europe (4)
Lecture—4 hours. Prerequisite: course 3, upper division standing. Analysis of European unity, problems of the Atlantic alliance, Atlantic political economy, East-West relations, communism in Western Europe and the relationship between domestic politics and foreign policy.

139. Special Studies in Foreign Policy (4)
Lecture—3 hours; term paper. Prerequisite: course 3, upper division standing or consent of instructor. Extensive examination of one or more special problems in foreign policy. May be repeated once for credit when topic differs.
140. Comparative Public Policy (4)
Lecture—3 hours; term paper. Prerequisite: course 2. Ideological orientations, institutions, processes, and public policies of modern states. Emphasis on democratic, socialist, communist and fascist experience.

140A. Comparative Electoral Systems (4)
Lecture/discussion—4 hours. Prerequisite: course 2. Working of electoral institutions, focusing on systems used to elect presidents and assemblies, pass laws, and generally make decisions. Examples from systems throughout the world, including cases from both advanced industrial and developing worlds. Offered in alternate years.—II.

142. Politics and Inequality (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 2. Examines the linkages between politics and the distribution of social and economic goods. Topics include the impact of civil rights legislation, the politics of welfare states, and the effects of political participation on the distribution of goods. GE credit: SocSci, Div.—II.

143. Latin American Politics (4)
Lecture—3 hours; term paper. Prerequisite: course 2. Issues related to democratic consolidation in Latin America. Topics include transitions to democracy, the role of the military, political economy, and political behavior. GE credit: SocSci, Wrt.—II.

144. Russian Politics and Policy (4)
Lecture/discussion—4 hours. Prerequisite: course 2 or consent of instructor. Democratization, state-building and political reform; creation of new institutions; impacts of Soviet rule. GE credit: SocSci, Wrt.—III. (II.)

145. Government and Politics in Emergent Nations (4)
Lecture—3 hours. Prerequisite: course 2. Conceptual study of problems of political organization and procedure in the context of rapid change engendered by social revolution in “emergent countries” and liberation from colonial oppression. Offered in alternate years.

147. Politics and Policy in Western Europe (4)
Lecture—4 hours. Prerequisite: course 2. The evolution, politics, and contemporary problems of selected political systems of Western Europe.

148A. Government and Politics in East Asia: China (4)
Lecture—4 hours. Prerequisite: course 2 or consent of instructor. Evolution of political institutions and political culture in China with emphasis on the post-1949 period. Primary attention to nationalism, modernization and political efficacy. —I. (II.)

148B. Government and Politics in East Asia: Pacific Rim (4)
Lecture—4 hours. Prerequisite: course 2 or consent of instructor. Establishment and evolution of political cultures and establishment of political institutions in selected countries of the Pacific Rim, namely Japan, Korea, Taiwan. Emphasis on post World War—II. III.

148C. Government and Politics in East Asia: Southeast Asia (4)
Lecture—3 hours; term paper. Prerequisite: course 2 or consent of instructor. Evolution of political culture, institutions, economy of selected nations in Southeast Asia including Vietnam plus two or three other examples. Emphasis on imperialist legacy, nation building in multi-ethnic communities, contrasts between socialists and non-socialist development models. Offered in alternate years.—III.

149. Politics of Development in Africa (4)
Lecture/discussion—4 hours. Prerequisite: course 2 or consent of instructor. Course 134 recommended. Political and economic development within Sub-Saharan Africa. States and institutions, democracy, party systems, military coups, trade unions, bureaucracies, corruption, resource distribution, national/international integration, trade unions, economic development strategies, class formation, and women’s roles and ideology.

150. Judicial Politics and Constitutional Interpretation (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1, upper division standing. Politics of judicial policymaking; issues surrounding constitutional interpretation and decision making; prerequisite for courses on the politics of constitutional law.—I, II.

151. The Constitutional Politics of the First Amendment and the Right to Privacy (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 150. The constitutional politics surrounding such issues as civil rights, associations, state action, public accommodations, due process, the right to free exercise of religious beliefs, and the right to privacy. GE credit: SocSci, Wrt.—II.

152. The Constitutional Politics of Equality (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 150. Constitutional politics of equality in the American political system; issues surrounding constitutional doctrine and judicial policymaking; special attention on racial and sexual equality. Offered in alternate years. GE credit: SocSci, Div, Wrt.—III.

153. The Constitutional Politics of the Justice System (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 150. Constitutional politics of the American criminal justice system; the issues surrounding constitutional doctrine and judicial policymaking on issues such as search and trial, incarceration, and other issues of due process. Offered in alternate years.—III.

154. Legal Philosophy (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1, 1 or 4. Discussion of nature and functions of law; law as an instrument of social control and the relationship between law and morality. Offered in alternate years.

155. Judicial Process and Behavior (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1, 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 in alternate years. GE credit: SocSci, Wrt.—II.

160. American Political Parties (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Analysis of the political parties 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.—II.

161. Comparative Political Parties (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Organization, operation, governmental function and social bases of political parties especially in Great Britain and France but with some reference to other Western European countries.

162. Elections and Voting Behavior (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Analysis of American elections and partisan behavior; political socialization, political participation, partisanship and individual and group determinants of voting. GE credit: SocSci, Wrt.—I.

163. Group Politics (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 1. Analysis of the political behavior of social groups, especially in American politics. Historical and analytical treatment of group theories as applied to interest groups (especially labor, business, agriculture, science, military, foreign, ethnic, and religious groups); to parties, public and legislative groups, bureaucracies. GE credit: SocSci, Wrt.—II.

164. Public Opinion (4)
Lecture—3 hours; 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 significan-
179. Special Studies in Comparative Politics (4) Seminar—4 hours. Prerequisite: course 2, consent of instructor and upper division standing. Intensive examination of one or more special problems appropriate to comparative politics. May be repeated once for credit.

180. Bureaucracy in Modern Society (4) Lecture—3 hours; 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, with emphasis upon changing relationships between government and the economy; consequences of rapid technological and social change for bureaucratic structures and processes; the problems of reconciling expertise and democracy and increasing the responsiveness of public bureaucracy. GE credit: SocSci, Wrt.

183. Administrative Behavior (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or consent of instructor. The implications for American public administration of evolving concepts about behavior in organizations.

187. Administrative Theory (4) Lecture—3 hours; discussion—1 hour. Prerequisite: course 1 or consent of instructor. Historical and critical analysis of the principal theories of organization and management of the literature on such concepts as decision making, bureaucracy, authority and power, communication and control; an examination of the role of government bureaucracies in the total society. GE credit: SocSci, Wrt., III.

190. International Relations (4) Lecture—2 hours; discussion—2 hours. Prerequisite: open to majors in International Relations, or consent of instructor. Analysis and evaluation of substantive issues in international relations. Readings drawn from current academic and non-academic periodicals.

192A. Internship in Public Affairs (5) Prerequisite: enrollment dependent on availability of internship positions with highest priority assigned to students with Political Science–Public Service major; upper division standing. Supervised internship and study in political, governmental, or related organizations. (P/NP grading only.) GE credit: SocSci, Wrt.

192B. Internship in Public Affairs (5) Prerequisite: course 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 political, governmental, or related organizations. (P/NP grading only.) GE credit: SocSci, Wrt.

192W. 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 193W concurrently. Internship in Washington, DC with associated, supervised research project. (Same course as UC Davis Washington Center 192.) P/NP grading only.—I, II, III.

193. Research in Practical Politics (2) Research project—6 hours. Prerequisite: courses 192A, 192B; open only to Political Science–Public Service majors, for whom it is required. Supervised preparation of an extensive paper relating internship experience to concepts, literature, and theory of political science.—II, III.

194W. Washington Center Research Seminar (4) Lecture/discussion—1 hour. Independent study—3 hours. Tutorial research. Prerequisite: consent of instructor and upper division standing in Political Science 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 UC Davis Washington Center 193.) GE credit: Wrt.—I, II, III.

194HA-194HB. Special Study for Honors Students (4) Seminar—3 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.)—I, II.

195. Special Studies in American Politics (4) Seminar—4 hours. Prerequisite: consent of instructor and upper division standing. Intensive examination of one or more special problems appropriate to American politics. May be repeated once for credit when topic differs.

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 American politics. Topics may include Congress, the Presidency, the Supreme Court, methods such as voting behavior, interest groups, ethnic groups or other topics with a more specialized content than normal course offerings. May be repeated once for credit when topic differs.—I, II, III.

196B. Seminar in Comparative Politics (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, EU, NATO) or interstate relations (war, trade, immigration) and other topics with more specialized content than normal course offerings. May be repeated once for credit when topic differs.—I, II, III.

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, EU, NATO) or interstate relations (war, trade, immigration) and other topics with more specialized content than normal course offerings. May be repeated once for credit when topic differs.—I, II, III.

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, a group of related thinkers, development of political concepts, or other topics with more specialized content than normal course offerings. May be repeated once for credit when topic differs.—I, II, III.

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, writing in the field of research methods, including research design, statistics, game theory. May be repeated once for credit when topic differs.—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) (P/NP grading only.)

Graduate Courses

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. Approaches to the study of political concepts, including case studies, and the major approaches to public policy formation and evaluation.—I, II.

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—4 hours. Thorough overview 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.—II. (III)

203B. American Government: Congress (4) Seminar—4 hours. Thorough overview 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.—III.

203C. American Government: Courts (4) Seminar—4 hours. Survey and analysis of the literature in the field of American government with a focus on courts. 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.—II, III.

209. The American Political System (4) Seminar—4 hours. Analysis of selected theoretical and empirical issues posed by contemporary research in American government and politics.—II.

210. Research Design in Political Science (4) Seminar—3 hours; discussion/laboratory—1 hour. Prerequisite: graduate standing. Introductory seminar introducing data analysis methods critical to basic empirical investigations in political science.—I.

212. Quantitative Analysis in Political Science (4) Seminar—4 hours. Prerequisite: course 211. Topics usually covered in an introductory course with an emphasis on applications in political science—descriptive statistics for samples, probability and probability distributions, hypothesis testing, ANOVA, bivariate regression, and introduction to multiple regression.—II.

213. Quantitative Analysis in Political Science II (4) Seminar—4 hours. Prerequisite: courses 211, 212. More advanced topics in the use of statistical methods, with emphasis on political applications. Topics include: properties of least squares estimates, problems in multiple regression, and advanced topics in probability analysis, simultaneous models, time-series analysis. etc.—III.

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. research, including research on Congress, with particular emphasis on policy; and adequate preparation for qualifying examinations.—II. (III)

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.
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.)—II. (I) Highton

215. Introduction to Modeling Political Behavior (4)
Seminar—3 hours. Prerequisite: courses 211 and 212. Introduction to formal and game theoretic analyses of politics. Students will learn basic game theory and modeling skills. We examine the benefits of modeling, and look at examples of formal analysis in a variety of political science sub-fields. Offered in alternate years.

216. Qualitative Research Methods (4)
Seminar—3 hours, term paper. Methodology for utilizing theoretically-oriented case studies and controlled comparison of a small number of cases to develop and test theories. Examination of how the case study method compliments experimental, statistical and deductive modes of research. Offered in alternate years.—III.

217. Social Choice Theory and Spatial Modeling (4)
Seminar—4 hours. Introduction to social choice theory and formal spatial modeling including Arrow’s Theorem, the paradox of voting, cycling and agenda control. Focus on mastering modeling techniques as well as interpretion of classic works. Offered in alternate years.

218. Topics in Political Theory (4)
Seminar—3 hours, term paper. Topics will vary and may be the work of a single theorist, time period, or political concept, such as justice. Offered in alternate years.—III.

219A. Political Theory Sequence (4)
Seminar—3 hours, term paper. Survey of the great works in ancient and medieval political theory including such writers as Plato, Aristotle, Cicero, St. Augustine, Aquinas, Alfarabi and Marsilius. Discussion 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 theory including such writers as Machiavelli, Hobbes, Locke, Rousseau, Marx, Mill, Nietzsche, and Rawls. Discussion of various interpretations of these authors. Offered in alternate years.—I. (III.)

219C. Contemporary Political Theory (4)
Seminar—3 hours, term paper. Survey of important works in contemporary political theory including such writers as Heidegger, Arendt, Rawls, Nozick, Sandel. May be repeated for credit if topic differs.—III. (III.)

220. Seminar in Political Theory (4)
Seminar—3 hours, term paper. Prerequisite: graduate standing or consent of instructor. Systematic survey of theories and methods used in the study of comparative politics.

223. International Relations (4)
Seminar—3 hours, term paper.—I.

225. The International System (4)
Seminar—3 hours, term paper. Analysis of the international system by means of theory formulation and integration; critique of research designs; use of various techniques of data generation and analysis.—III.

226. Seminar in International Political Economy (4)
Seminar—4 hours. Research in international political economy. Structure of the global economy, as well as specific dimensions of international economic relations, including trade, capital flows, global production structures, and migration. Offered in alternate years.—I.

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 intrastate war; cooperation and conflict resolution; trade and financial relations between domestic and international politics, norms and institutions. Open to political science graduate students only unless consent of instructor. Offered in alternate years.—III.

230. American Foreign Policy (4)
Seminar—3 hours, term paper.—III.

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 perspective, contemporary public opinion, decision making and implementation. Concludes by examining linkages between foreign policy behavior and democratic process. Offered in alternate years.—II.

241. Communist Political Systems (4)
Seminar—4 hours. Prerequisite: course 141 or the equivalent, or consent of instructor. Systematic analysis of selected politics dealing with the political process of communist political systems.

242. Seminar in Comparative Politics (4)
Seminar—3 hours, term paper. Prerequisite: graduate standing or consent of instructor. Systematic survey of political systems and methods used in the study of comparative politics.

243. Comparative Institutional Change (4)
Seminar—4 hours. Comparison of institutional changes in countries of the former Soviet Union and Eastern Europe during period of transition to democracy. Special attention to institutions of mass representation—electoral and party systems and national legislatures. 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 policymaking process in Third-World countries are such topics as political resources, institutional resources, decision making, resource allocations, planning, and budgeting, implementation, and distribution of world resources. Offered in alternate years.

250. Policy Development and Impact in U.S. Courts (4)
Seminar—3 hours, term paper. Prerequisite: graduate standing or consent of instructor. Included in an analysis of policymaking process in Third-World countries are such topics as political resources, institutional resources, decision making, resource allocations, planning, and budgeting, implementation, and distribution of world resources. Offered in alternate 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.—III.

274. Political Economy (4)
Seminar—4 hours. Politics of economic policy as reflected in taxation, spending and regulation; impact of prices, employment, and growth on political demands; government responses to economic conditions; electoral politics and the political business cycle. Offered in alternate years.—III.

280. Bayesian Methods: for Social and Behavioral Sciences (4)
Seminar—3 hours, lab—1 hour. Prerequisite: course 212 or equivalent; graduate standing. Methodology seminar introducing Bayesian quantitative methods to issues and problems in political science and other social and behavioral sciences. Offered in alternate years.—(I.)

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 computing issues in empirical models for political science and other social and behavioral sciences. Offered in alternate years.—(I.)

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 theory to political science. Review of relevant contributions in other social sciences. Consideration of advanced techniques in game theory. Rational and behavioral approaches.—III. (III.)

283. Organizational Behavior (4)
Seminar—4 hours. Organizational behavior as it relates to public sector decision making.

290A. Research in American Government and Public Policy (4)
Seminar—4 hours. Special research seminar on selected problems and issues in the study of American government and public policy. May be repeated up to 6 times for credit if taught by different instructor.—I, II, III

290B. Research in Political Theory (4)
Seminar—4 hours. Special research seminar on selected problems and issues in the study of political theory.—I, II, III

290C. Research in International Relations (4)
Seminar—4 hours. Special research seminar on selected problems and issues in the study of international relations.—I, II, III

290D. Research in Judicial Politics (4)
Seminar—4 hours. Prerequisite: graduate standing in political science or consent of instructor. Contemporary research on judicial politics, judicial institutions, jurisprudence, and judicial behavior.—I, II, III

290E. Research in Political Parties, Politics, and Political Behavior (4)
Seminar—4 hours. Special research seminar on selected problems and issues in the study of political parties, politics, and political behavior.—I, II, III

290F. Research in Comparative Government and Policy (4)
Seminar—4 hours. Special research seminar on selected problems and issues in the study of comparative government and public policy.—I, II, III

290G. Research in Methodology (4)
Lecture—3 hours, term paper. Prerequisite: course 212. Special research seminar on selected problems and issues in political science. May be repeated three times for credit if topic varies.—I, II, III. (I, II, III)

297. Internships in Political Science (2)
Seminar—2 hours. Prerequisite: open only to persons who have internships or other positions in government 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.)—I, II, III

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 Courses

300. 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.)—I, II, III.

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer, 2007/2008 offering in parentheses

General Education (GE) credit: Arthum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div=Social-Cultural Diversity; Wrt=Writing Experience
Courses in Population Biology (PBG)

Graduate Courses

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 ecological theory, population genetics, population growth models, structured populations, life history strategies, stochastic populations, basic population genetics theory, deleterious alleles in natural populations, and molecular population genetics.—I. (II.)

200B. Principles of Population Biology (6)
Lecture—5 hours; discussion—1 hour. Prerequisite: course 200A, 231. Principles of multi-species communities. Topics include competition, mutualism, metapopulations, food webs, community interactions, and patterns in ecological communities. (Same course as Evolution and Ecology 200A.)—II. (III.)

200C. Principles of Population Biology (6)
Lecture—5 hours; discussion—2 hours. Prerequisite: course 200B. Principles of microevolution and macroevolution. Topics include evolutionary quantitative genetics, analysis of hybrid zones, speciation, the fossil record, phylogeny, and recombination.—III. (IV.)

203. Advanced Evolution (3)
Lecture—1 hour; discussion—1 hour. Prerequisite: graduate standing. Adaptation and speciation, and biochemical and morphological evolution in plants and animals with emphasis on the evolution of patterns and processes of different methods of analysis. Offered in alternate years.

206. Ecology of Insect Parasitoids (4)
Lecture—3 hours; seminar—1 hour. Prerequisite: introductory animal ecology and behavior. Insect parasitoids will be investigated as model systems to address current issues in behavioral, population, and evolutionary ecology. Theory will be synthesized and tested hypotheses emphasized. (Same course as Entomology 206.) Offered in alternate years.

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, 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 112-112L, courses in evolutionary biology, systematics, and ecology highly recommended. Advanced seminar that critically examines problems relevant to evolutionary and speciation in invertebrates. May be repeated for credit when topic differs. (S/U grading only.)—III. (III.)

220. Spatial-Temporal Ecology (2)
Lecture/discussion—2 hours. Prerequisite: course 200B or Evolution and Ecology 104 or Environmental Science and Policy 121 or consent of instructor. Spatial-temporal ecological theory focusing on population persistence and stability, predator-prey and host-parasite 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 once for credit. (S/U grading only.)

221. Animal Behavior, Ecology and Evolution (3)
Lecture—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 102 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.)—I. (II.)

224. Field Reconnaissance for Population Biologists (2)
Fieldwork—6 hours. Prerequisite: graduate student in Population Biology, or consent of instructor. Biweekly field trips to acquaint students with plant and animal communities, behaviors, and life cycles, and to introduce students to the sampling and study of populations in their natural environments. May be repeated for credit. (S/U grading only.)

231. Mathematical Methods in Population Biology (3)
Lecture—1 hour; field work—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, and written and oral presentation of results will be stressed. (Same course as Ecology/Entomology 225.)—I. (II.)

231A. 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.

231B. Interdisciplinary Approaches to Biological Invasions (4)
Lecture—1 hour; field work—12 hours. Prerequisite: graduate standing. An integrative consideration of biological invasions, including an overview of concepts from history, sociology, communications, law, policy, management, and other areas. Emphasis on potential contributions of each area for interdisciplinary problem solving.

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 at the conclusion of the project. May be repeated up to five times. (S/U grading only.)—I, II, III, (IV.)

270. Research Conference in Evolutionary Biology (1)
Seminar—1 hour. Prerequisite: consent of instructor. Current literature and ongoing research in evolutionary biology. May be repeated for credit. (S/U grading only.)—I, II, III, (IV.)

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 Ecology (Evolution and Ecology 101 or the equivalent). Reading reports and discussion on current topics in animal behavior.
behavior, with a focus on topics that lie at the interface between animal behavior, ecology and evolution. 

290. Seminar (1) 
Seminar—1 hour. Prerequisite: graduate standing and consent of instructor. Seminars presented by visiting lecturers. UCD graduate students and faculty. May be repeated for credit. (S/U grading only.)—I, II, III (I, II, III)

290C. Research Conference in Population Biology (1) 
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor; concurrent enrollment in course 299. Presentation and discussion of faculty and graduate student research in population biology. May be repeated for credit. (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 296.) (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. May be repeated for credit. (S/U grading only.)—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 469.

Precision Agriculture 
(See Veterinary Medicine, School of, page 469.

Preventive Veterinary Medicine 
See Veterinary Medicine, School of, on page 469.

Psychiatry 
See Medicine, School of, page 345.

Psychology 

(College of Letters and Science) 
Phillip R. Shaver, Ph.D., Chairperson of the Department

Department Office, 135 Young Hall 
(530) 752-1880; http://psychology.ucdavis.edu

Faculty 
Karen L. Bales, Ph.D., Assistant Professor 
Jennifer Beer, Ph.D., Assistant Professor 
Shelley Blazis, Ph.D., Assistant Professor 
Silvia A. Bunge, Assistant Professor 
John P. Capitanio, Ph.D., Professor 
Cameron S. Carter, M.D., Professor 
Psychiatry and Behavioral Sciences) 
Richard G. Casper, Ph.D., Professor 
Robert A. Emmons, Ph.D., Professor 
Emilio Ferrer, Ph.D., Assistant Professor 
Simaona Ghetti, Ph.D., Assistant Professor 
Gail S. Goodman, Ph.D., Professor 
Kenneth R. Henry, Ph.D., Professor 
Gregory M. Herk, Ph.D., Professor 
Petra Janata, Ph.D., Assistant Professor 
Joel T. Johnson, Ph.D., Professor 
Neal E. A. Kroll, Ph.D., Professor 
Leah A. Krubitzer, Ph.D., Professor 
Kristin Lagattuta, Ph.D., Assistant Professor 
Debra L. Long, Ph.D., Professor, Academic Senate Distinguished Teaching Award 
George R. Mangun, Ph.D., Professor 
Sally P. Mendoza, Ph.D., Professor 
Research Faculty 
Donald H. Owings, Ph.D., Professor 
Cynthia Pickett, Ph.D., Associate Professor 
Robert B. Post, Ph.D., Professor 
Charan Ranganath, Ph.D., Assistant Professor 
Susan Rivera, Ph.D., Assistant Professor 
Richard W. Robbins, Ph.D., Associate Professor 
Jeffrey Schank, Ph.D., Associate Professor 
Phillip R. Shaver, Ph.D., Professor 
Jeffrey W. Sherman, Ph.D., Professor 
Dean K. Simonton, Ph.D., Professor, UC Davis Prize for Teaching and Scholarly Achievement 
Stanley Sue, Ph.D., Professor, UC Davis Prize for Teaching and Scholarly Achievement 
Tamarra Swaab, Ph.D., Assistant Professor 
Rosa Thompson, Ph.D., Professor 
Matthew Travers, Ph.D., Assistant Professor 
David Whitney, Ph.D., Assistant Professor 
Keith F. Widdaman, Ph.D., Professor 
Ewa Wojciulik, Ph.D., Assistant Professor 
Andrew P. Yonelinas, Ph.D., Professor 
Lisa Tavano-Hall, Ph.D., Professor 
Eva Schepler, Ph.D. Lecturer 
Katherine Gibbs, Ph.D., Lecturer 
Jacqueline Horn, Ph.D., Lecturer 
Elizabeth Poth, Ph.D., Lecturer 
Joanna Scheib, Ph.D., Adjunct Assistant Professor 
Eva Schepler, Ph.D., Lecturer 
Liso Tavano-Hall, Ph.D., Lecturer

Affiliated Faculty 
Katherine Gibbs, Ph.D., Lecturer 
Jacqueline Horn, Ph.D., Lecturer 
Elizabeth Poth, Ph.D., Lecturer 
Joanna Scheib, Ph.D., Adjunct Assistant Professor 
Eva Schepler, Ph.D., Lecturer

The Major Programs 
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, which involves the study of changes in behavior and abilities that occur as development proceeds and includes such topics as imaging the developing brain, development of self-esteem, problem solving, attachment theory, and cognitive representations in infants and children, development of children's understanding of mental states; Perception-Cognition, which involves the study of awareness and thought, and includes such topics as perception, learning, memory, and consciousness; Psychology, which involves the study of the biological correlates of behavior and includes such topics as physiological psychology, sensory processes, health psychology, and animal behavior; Social-Personality Psychology, which involves the study of the individual in his or her social environment and includes such topics as personality theory, abnormal psychology, individual differences, developmental psychology, and social psychology; Quantitative which involves the study of linear models and psychometrics which includes topics, such as experimental design and the analysis of variance, regression analysis, and multivariate analysis. 

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 for students with an interest in either biology or mathematics. The main objective of both programs is 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, environmental awareness, and organization 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 your experiences and understanding of the field of psychology. 

Preparatory Requirements. Before declaring a major in psychology, students must complete the following courses 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 1A.)

Psychology 1, 41 ....................... 8 units 
Psychology 77 .......................... 4 units 
Biological Sciences 1A or Biological Sciences 10 and one course from Anthropology 1, Molecular and Cellular Biology 10, Neurobiology, Physiology, and Behavior 10 ......... 5 or 8 units Sociology or cultural anthropology ........ 4 units 

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 other professions.
A.B. Major Requirements:  

Preparatory Subject Matter .......................... 21-25  
Psychology 1 or the equivalent ...................... 4  
Psychology 41 ........................................... 4  
Mathematics 13 or 102 ................................ 4  
Statistics 13 or 102 .................................... 4  

Recommended: Psychology 41 and Statistics 13 or 102 be completed in the first year.  

B.S. Major Requirements:  

Preparatory Subject Matter .......................... 52-61  
Psychology 1 or the equivalent ...................... 4  
Psychology 41 ........................................... 4  
Mathematics 13 or 102 ................................ 4  
Statistics 13 or 102 .................................... 4  

Recommended: Psychology 41 and Statistics 13 or 102 be completed in the first year.  

Mathematics Emphasis:  

B.S. Major Requirements:  

Preparatory Subject Matter .......................... 45-59  
Psychology 1 or the equivalent ...................... 4  
Psychology 41 ........................................... 4  
Mathematics 13 or 102 ................................ 4  
Statistics 13 or 102 .................................... 4  

Recommended: Psychology 41 and Statistics 13 or 102 be completed in the first year.  

Depth Subject Matter ................................. 48  
Five Psychology courses, distributed as specified:  

Group A: two courses from 100, 130, 131, 132, 135  

Group B: two courses from Psychology 101, 113, 121, 122, 123, 126, 127, 129  

Group C: one course from Psychology 151, 154, 162, 168  

Group D: one course from Psychology 140 (or Human Development 100A or 100B), Psychology 141, Human Development 101, Psychology 142, Human Development 102  

Total Units for the Major: .......................... 101-110  

Total Units for the Major: .......................... 93-107  

Recommended for All Majors: Students who plan to do graduate work in any area of psychology should complete the Core Requirements.  

B.S. Major Requirements:  

Preparatory Subject Matter .......................... 52-61  
Psychology 1 or the equivalent ...................... 4  
Psychology 41 ........................................... 4  
Mathematics 13 or 102 ................................ 4  
Statistics 13 or 102 .................................... 4  

Recommended: Psychology 41 and Statistics 13 or 102 be completed in the first year.  

Mathematics Emphasis:  

B.S. Major Requirements:  

Preparatory Subject Matter .......................... 45-59  
Psychology 1 or the equivalent ...................... 4  
Psychology 41 ........................................... 4  
Mathematics 13 or 102 ................................ 4  
Statistics 13 or 102 .................................... 4  

Recommended: Psychology 41 and Statistics 13 or 102 be completed in the first year.  

Depth Subject Matter ................................. 48  
Five Psychology courses, distributed as specified:  

Group A: two courses from 100, 130, 131, 132, 135  

Group B: two courses from Psychology 101, 113, 121, 122, 123, 126, 127, 129  

Group C: one course from Psychology 151, 154, 162, 168  

Group D: one course from Psychology 140 (or Human Development 100A or 100B), Psychology 141, Human Development 101, Psychology 142, Human Development 102  

Total Units for the Major: .......................... 101-110  

Total Units for the Major: .......................... 93-107  

Recommended for All Majors: Students who plan to do graduate work in any area of psychology should complete the Core Requirements.  

Human Development units can be credited toward satisfaction of the 40-unit requirement.  

Total Units for the Major: .......................... 61-65  

Biology Emphasis:  

B.S. Major Requirements:  

Preparatory Subject Matter .......................... 52-61  
Psychology 1 or the equivalent ...................... 4  
Psychology 41 ........................................... 4  
Mathematics 13 or 102 ................................ 4  
Statistics 13 or 102 .................................... 4  

Recommended: Psychology 41 and Statistics 13 or 102 be completed in the first year.  

Mathematics Emphasis:  

B.S. Major Requirements:  

Preparatory Subject Matter .......................... 45-59  
Psychology 1 or the equivalent ...................... 4  
Psychology 41 ........................................... 4  
Mathematics 13 or 102 ................................ 4  
Statistics 13 or 102 .................................... 4  

Recommended: Psychology 41 and Statistics 13 or 102 be completed in the first year.  

Depth Subject Matter ................................. 48  
Five Psychology courses, distributed as specified:  

Group A: two courses from 100, 130, 131, 132, 135  

Group B: two courses from Psychology 101, 113, 121, 122, 123, 126, 127, 129  

Group C: one course from Psychology 151, 154, 162, 168  

Group D: one course from Psychology 140 (or Human Development 100A or 100B), Psychology 141, Human Development 101, Psychology 142, Human Development 102  

Total Units for the Major: .......................... 101-110  

Total Units for the Major: .......................... 93-107  

Recommended for All Majors: Students who plan to do graduate work in any area of psychology should complete the Core Requirements.  

Minor Program Requirements:  

Preparatory Subject Matter .......................... 15-16  
Psychology 1 or the equivalent ...................... 4  

Recommended: Psychology 1 or the equivalent ............... 4  

Additional units to achieve a total of 20 upper division units  

One course selected from Human Development 100A, 100B, 100C, 101, 102, 120, 121 can be used toward satisfying the minor upper division unit requirement.  

Honor and Honors Program: In order to be eligible for high or highest honors in Psychology, the student must both meet the college criteria and complete a research project involving a minimum 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 by writing the Graduate Adviser, Department of Psychology.  

Graduate Adviser. See Class Schedule and Registration Guide.  

Courses in Psychology (PSY)  

Lower Division Courses  

1. General Psychology (4)  

Lecture—4 hours. Introduction emphasizing empirical approaches. Focus on perception, cognition, personality and social psychology, and biological aspects of behavior. Only 2 units of credit allowed for students who have completed course 15 or 16. Not open for credit to students who have completed course 15 and 16. GE credit: SocSci.—I, II, III. (I, II, III.) Shaver, Johnson, Capitanio, Thompson, Tavano, Traxel.  

20. Freshman Psychology Seminar (4)  

Seminar—4 hours. Prerequisite: 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 exppository writing and brief presentations.  

41. Research Methods in Psychology (4)  

Lecture—3 hours; tutorial. Prerequisite: course 1 or the equivalent; Statistics 13 or 102 recommended. Introduction to experimental design, interviews, questionnaires, field and observational methods, reliability, and statistical inference.—I, II, III. (I, II, III.) E. Post  

90X. Lower Division Seminar (1-2)  

Seminar—1-2 hours. Prerequisite: lower division standing and consent of instructor. Examination of a specialized topic in Psychology through readings, discussions, written assignments, or special activities such as fieldwork or laboratory work. May not be repeated for credit. Limited enrollment.  

98. Directed Group Study (1-5)  

Primarily for lower division students. (P/NP grading only)  

99. Special Study for Lower Division Students (1-5)  

(P/NP grading only)
Upper Division Courses

100. Introduction to Cognitive Psychology (4)
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 students who have completed former course 136. —I, II, III. (I, II, III) Gibbs, Kroll, Long

101. Introduction to Psychobiology (4)
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. (II, I, III) Coss, Henry, Krubitzer, Owings, Schank

103A. Statistical Analysis of Psychological Data (5)
Lecture—4 hours; laboratory—2 hours; term paper. Prerequisite: course 1, 41 and Statistics 13 or 102. Pass 1 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. —I, II, III. (I, II, III) Widaman, Blozis, Ferrer

103B. Statistical Analysis of Psychological Data (4)
Lecture—4 hours. Prerequisite: course 103A and Statistics 13 or 102. Pass 1 open to Psychology majors. Probability, sampling distributions, hypothesis testing, statistical inference, one-way and two-way analysis of variance, nonparametric statistics, with applications in psychology. Not open for credit to students who have completed course 105. —I, II, III. (I, II, III) Widaman, Blozis, Ferrer

104. Applied Psychometrics: An Introduction to Measurement Theory (4)
Lecture—4 hours. Prerequisite: upper division standing. Recommended: 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. — Widaman

109. Interactive Computer Programming for Psychological Experiments (4)
Lecture—2 hours; laboratory—3 hours. Prerequisite: courses 1, 41, and one of courses 100, 130, or 133 and consent of instructor. Instruction in programming with an emphasis on programming desktop computers as an interactive research tool. Not open for credit to students who have completed course 181. (Former course 181.)—Janata

113. Developmental Psychology (4)
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, II, III) Schank, Owings

121. Physiological Psychology (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 101. Introduction 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, Henry, Krubitzer

122. Advanced Sensory Behavior (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 101 or Neurobiology, Physiology, and Behavior 102. Pass 1 open to Psychology majors. Advanced integrative survey of biological principles of behavior and organization, emphasizing histological 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.)—I, II, III. (I, II, III) Schnebel, Owings, Schank

123. Hormones and Behavior (3)
Lecture—3 hours. Prerequisite: Neurobiology, Physiology, and Behavior 101 and either course 101 or Neurobiology, Physiology, and Behavior 102. Pass 1 open to Psychology majors. Overview of the importance of hormones in human behavior, with an emphasis on the principles of behavior. Fundamental relationships between hormones and various behaviors engaged in by the organism during its lifetime. Role of hormones in behavioral homestasis, social behavior, reproductive behavior, parental behavior, adaptation to stress. (Same course as Neurobiology, Physiology, and Behavior 152.) Not open for credit to students who have completed course 152. (Former course 152.)—III. (III) Bales

124. Comparative Neuroanatomy (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: course 101 or Neurobiology, Physiology, and Behavior 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 specialization. (Same course as Neurobiology, Physiology, and Behavior 124.)—I, II. (II) Krubitzer, Renganathan

126. Health Psychology (4)
Lecture—4 hours. Prerequisite: course 1, 41, 101. Pass 1 open to Psychology majors. Integrative review of the historical backdrop, theoretical issues, and scientific methods of studying 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 160. —II, III. (III) Capitano, Emmens

127. Animal Cognition (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: courses 1, 41, 101. Pass 1 open to Psychology majors. Integrative review of the historical development of human cognition and the relationship of mind to brain. —I, II. (I, II) Bunje, Janata, Owings

128. Information Processing Models in Neuroscience and Psychology (4)
Lecture—3 hours; term paper. Prerequisite: Mathematics 168, Physics 151A, and either Neurobiology, Physiology, and Behavior 100. Not open to Psychology majors. Basic mathematical modeling techniques used in neuroscience and psychology. Specific topics include: information theory, Fourier transforms, neural networks, adaptive systems, probabilistic inference and information theory. Emphasis on understanding information processing in neural systems. (Same course as Neurobiology, Physiology, and Behavior 163.) Not open for credit to students who have completed course 163. (Former course 163.)—(II) Ollahsean

129. Sensory Processes (4)
Lecture—3 hours; term paper. Prerequisite: course 1, 41, 101. Pass 1 open to Psychology majors. Psychobiology of sensory systems in humans and other animals. The relationship of behavior to the physiology, structure, and function of the nervous system. Not open for credit to students who have completed course 128. (Former course 128.)—I, II, III. (I, I, III) Henry, Krubitzer, Tavanova-Hall

130. Human Learning and Memory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: courses 1, 41, 101, and either Statistics 13 or 102, or consent of instructor. Credit GE credit: SciEng. (Former course 130.)—I, II, III. (II, I, III) Ghiotto, Goodman, Krull, Ranganathan, Yoneliri

131. Perception (4)
Lecture—3 hours; independent library work. Prerequisite: courses 1, 41. The cognitive organizations related to measurable physical energy changes mediated through sensory channels. The perception of objects, space, motion, events. —I, II, III. (I, II, III) Post, Verrico

132. Language and 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. Survey the biol- ogical foundations of language, speech perception, word recognition, syntax, reading ability, and pragmatics. —I, II. (II, III) Long, Swaab, Trautman

135. Cognitive Neurosciences (4)
Lecture—3 hours; term paper. Prerequisite: Human Development 100A or 100B or course 140. Pass 1 restricted to Human Development or Psychology majors. Topics include the role of human behavior through adolescence with emphasis on motor skills, mental abilities, motivation, and social interaction. Two units of credit allowed to students who have completed Human Development 100A or 100B. Not open for credit to students who have completed course 112. (Former course 112.)—I, II, III. (I, II, III) Gibbs, Goodman, Lagattuta, Rivera

140. Developmental Psychology (4)
Lecture—4 hours. Prerequisites: courses 1, 41. Pass 1 open to Psychology majors. Overview of the development of human behavior through adolescence with emphasis on motor skills, mental abilities, motivation, and social interaction. Two units of credit allowed to students who have completed course 112. (Former course 112.)—I, II, III. (II, III) Chen, Ghiotto, Gibbs, Goodman, Lagattuta, Rivera

142. Social and Personality Development (4)
Lecture—3 hours; term paper. Prerequisite: Human Development 100A or 100B or course 140. Pass 1 restricted to Human Development or Psychology majors. Social and personality development of children, infancy through adolescence, including the development of personality, achievement motivation, self-understanding, sex-role identity, and antisocial behavior. Emphasis on the interface between biological and social factors. Not open for credit to students who have completed course 120.) GE credit: SciSo: Wrt.—I, II, III. (I, II, III) Chen, Ghiotto, Gibbs, Goodman, Lagattuta, Rivera

146. The Development of Memory (4)
Lecture—3 hours; term paper. Prerequisite: courses 1, 41. Pass 1 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 133. (Former course 133.)—I, II. (I, II) Ghiotto, Thompson

151. Social Psychology (4)
Lecture—4 hours. Prerequisites: courses 1, 41. Pass 1 open to Psychology majors. Behavior of the individual in the group. Examination of basic psychological processes in social situations, including various problems of social interaction; group tensions, norm development, attitudes, values, public opinion, status. Not open for credit to students who have completed course 145. (Former course 145.)—I, II. (II, I, I) Johnson, Pickert, Shaver, Sherman

153. Psychology and Law (4)
Prerequisite: courses 1, 41. Pass 1 open to Psychology majors. Current theoretical and empirical issues in the study of psychology and law. Topics include eyewitness testimony, child abuse, jury decision making, juvenile delinquency and criminality, predication of violence, insanity defense, and memory for traumatic events. Not open for credit to students...
154. Psychology of Emotion (4)
Lecture—4 hours. Prerequisite: course 1, 41. Pass 1 open to Psychology majors. Introduction to current theories and research on emotion and bodily 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.

Beer, Robins, Shaver

155. Organizational Awareness (4)
Lecture—4 hours. Prerequisite: course 1. Pass 1 open to Psychology majors. Interactions of people and the environments they construct. Research methods for evaluating designed environments and reviews of current research in environmental psychology. Not open for credit to students who have completed course 144. (Former course 144.)—GE credit: SocSci.—I, II, III.

Emmons, Schepeler, Sue, Zane

160. Organizational Psychology (4)
Lecture—4 hours. Prerequisite: courses 1, 41. Pass 1 open to Psychology majors. Survey of interpersonal relationships among psychological processes, interpersonal dynamics, and organizational forms. Topics include motivation, communication, decision making, leadership, personnel selection and training, stress and conflict, career development, organizational development, and organization-community relations. Not open for credit to students who have completed course 183. (Former course 183.)—II, III. (Harrison

158. Sexual Orientation and Prejudice (4)
Lecture/discussion—4 hours. Prerequisite: course 1, 41. Pass 1 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 understanding of science and public policy issues relevant to sexuality. GE credit: SocSci, Div. Wrt.—II. (Husk,

159. Gender and Human Reproduction (4)
Lecture—4 hours. Prerequisite: course 1 and 41. Pass 1 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. Biological and social psychological explanations at the levels of mechanism and evolutionary function. Not open for credit to students who have completed former course 149. (Formally course 149.)—I, II, III. Schieb

162. Personality Theory (4)
Lecture—4 hours. Prerequisite: courses 1, 41, 168, and either 140 or 151. Major theoretical formulations in the history of clinical psychology, from classical psychoanalysis to contemporary existentialism and behavior modification. A survey, based on texts, films, and tapes, of what clinical psychologists do, including methods of appraisal, professional roles, and approaches to treatment. —I, II, II, III, I, II, III. (Horn, Sue, Zane)

Emmons, Schepeler, Sue, Zane

168. Abnormal Psychology (4)
Lecture—4 hours. Prerequisite: courses 1, 41. Descriptive and functional account of behavioral disorders, with primary consideration given to neurotic and psychotic behavior. GE credit: SocSci.—I, II, III, I, II, III. (Emmons, Schepeler, Sue, Zane

170. Psychology of Religion (4)
Lecture—4 hours. Prerequisite: courses 1 and 41. Major theoretical formulations in the history of clinical psychology, from classical psychoanalysis to contemporary existentialism and behavior modification. A survey, based on texts, films, and tapes, of what clinical psychologists do, including methods of appraisal, professional roles, and approaches to treatment. —I, II, II, III, I, II, III. (Horn, Sue, Zane)

Emmons, Schepeler, Sue, Zane

170. Psychology of Religion (4)
Lecture—4 hours. Prerequisite: courses 1 and 41. Major theoretical formulations in the history of clinical psychology, from classical psychoanalysis to contemporary existentialism and behavior modification. A survey, based on texts, films, and tapes, of what clinical psychologists do, including methods of appraisal, professional roles, and approaches to treatment. —I, II, II, III, I, II, III. (Horn, Sue, Zane)

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Emmons, Schepeler, Sue, Zane

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Emmons, Schepeler, Sue, Zane

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Emmons, Schepeler, Sue, Zane

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Lecture—4 hours. Prerequisite: courses 1 and 41. Major theoretical formulations in the history of clinical psychology, from classical psychoanalysis to contemporary existentialism and behavior modification. A survey, based on texts, films, and tapes, of what clinical psychologists do, including methods of appraisal, professional roles, and approaches to treatment. —I, II, II, III, I, II, III. (Horn, Sue, Zane)

Emmons, Schepeler, Sue, Zane

170. Psychology of Religion (4)
Lecture—4 hours. Prerequisite: courses 1 and 41. Major theoretical formulations in the history of clinical psychology, from classical psychoanalysis to contemporary existentialism and behavior modification. A survey, based on texts, films, and tapes, of what clinical psychologists do, including methods of appraisal, professional roles, and approaches to treatment. —I, II, II, III, I, II, III. (Horn, Sue, Zane)

Emmons, Schepeler, Sue, Zane

170. Psychology of Religion (4)
Lecture—4 hours. Prerequisite: courses 1 and 41. Major theoretical formulations in the history of clinical psychology, from classical psychoanalysis to contemporary existentialism and behavior modification. A survey, based on texts, films, and tapes, of what clinical psychologists do, including methods of appraisal, professional roles, and approaches to treatment. —I, II, II, III, I, II, III. (Horn, Sue, Zane)

Emmons, Schepeler, Sue, Zane
ity theory, sampling distributions, statistical inference and hypothesis testing, nonparametric statistics, Bayesian approach, and advanced issues in analysis of variance. Not open for credit to students who have completed course 205. (Former course 205.) Offered in alternate years.—II.

205A. Applied Multivariate Analysis of Psychological Data (4)
Lecture—4 hours. Prerequisite: three courses from 204A, 204B, 204C 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 computing language. Topics include multivariate analysis of variance, discriminant analysis, canonical analysis, factor analysis, and component analysis. Not open for credit to students who have completed course 207B. (Former course 207B.) Offered in alternate years.

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. Blosz, Widaman

205C. Structural Equation Modeling (4)
Lecture—4 hours. Prerequisite: graduate standing, course 204A and 204B or the equivalent or consent of instructor. Theory and methods of structural equation modeling, including path analysis, confirmatory factor analysis, and multiple-group modeling. Offered in alternate years.—II. Blosz, 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 cross-sectional clustered data or repeated-measures data. Topics include hierarchical linear models, latent growth curve models, and how these methods handle unbalanced and/or missing data.—II. (II) Blosz

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; practical aspects of surveying and questionnaire research. Not offered every year.—I. Herek

208. Physiological Psychology (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. A conceptual analysis of the contributions of neuroanatomy, neuropsychology and neurochemistry to an understanding of animal and human behavior.—Henry

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. Development of memory, perception, concepts (e.g., theory of mind, concepts about number), problem solving, and language from infancy to adulthood.—II. Ghetti, Goodman, Lagattuta, Rivera

212B. Developmental Psychology: Social, Emotional, and Personality Development (4)
Seminar—4 hours. Prerequisite: graduate standing or consent of instructor, completion of an 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

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

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

231. Sensation and Perception (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Theory and research of the role of sensory processes and perception in experience and their effects on behavior. Offered in alternate years.—II. Post, Whitney

245. Social Psychology (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Theory and research in social psychology.—III. Pickett, Robins, Johnson

247. Personality (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Theory and research in human personality.—III. Emmons, Robins

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. Owings

251. Topics in Genetic Correlates of Behavior (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Theory and experiment 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.—I.

261. Cognitive Neuroscience (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: graduate 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 three-quarter sequence. (Same course as Neuroscience 223.)—III. Bunge, Swaab, Wojciulik, Ranganath

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.—I. (I) Goodman, Kroll, Long, Post, Yonelinas, Rivera, Lagattuta

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.—Long, Traxler

265. Topics in Psychology of Consciousness (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Theory and research in the psychology of consciousness. 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 in psychology or consent of instructor. Critical study of a selected area of personality or social psychology. May be repeated for credit when topic differs.—I. (I) Emmons, Shaver, Beer, Herek, Pickett, Robins, Sherman

272. Topics in Developmental Psychology (4)
Seminar—4 hours. Prerequisite: graduate standing in psychology or consent of instructor. Selected topics in developmental psychology, including development, memory development, infancy, cognitive development, social development, child maltreatment, children and law, perceptual development, emotional development, children at risk, and adolescence, with emphasis on developmental processes and developmental theory. May be repeated for credit. Not offered every year.—I. Bunge, Ferrer, Ghetti, Goodman, Lagattuta, Rivera, Robins, Thompson, Widaman

290. Seminar (4)
Seminar—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 instructor and students.—I, III (I, III, III)

298. Group Study (1-5)
(S/U grading only.)

299. Research (2-9)
(S/U grading only.)

299D. Dissertation Research (1-12)
(S/U grading only.)

Professional Courses

390A-390B. The Teaching of Psychology (6-6)
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 undergraduate and graduate levels; curriculum design and evaluation. Practical experience in the preparation and presentation of material. (S/U grading only; deferred grading only, pending completion of sequence.)—III (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)

Quantitative Biology and Bioinformatics

(Open to biological sciences students.
The interdisciplinary minor in Quantitative Biology and Bioinformatics is an integrative program that introduces students to the quantitative and computational approaches that are refining all disciplines in the biological sciences, from molecular and cell biology, through genetics and physiology, to ecology 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 perspective that is now the foundation of modern biological 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 Sciences.)
Minor Program Requirements:

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 ......................... 4
Bioinformatics: Computer Science Engineering 124 ..................................... 4
Quantitative and Computational Preparation ......................................... 4
Complete one course from the following:
Applied Science Engineering 115; Computer Science Engineering 110;
Mathematics 128A, 128B, 128C, 131; Statistics 130A, 131A, 141A .................. 4
Restricted Electives ......................................................... 6-8
Complete two or more courses from the following list to achieve a total of 18-24 units:
Animal Genetics 120; Computer Science Engineering 122A, 165A;
Environmental Science and Policy 121; Evolution and Ecology 102, 103, 104, 175;
Molecular and Cellular Biology 123, 143, 182; Neurobiology, Physiology, and Behavior 105, 131, 163; Wildlife, Fish, and Conservation Biology 122 ........ 4

Restrictions. No more than two upper division courses from a single department/section 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.

*The programming 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.

Minor Adviser. Consult the College of Biological Sciences Dean's office in 202 Life Sciences Addition, (530) 752-0410.

Radiation Oncology

See Medicine, School of, on page 345.

Radiology

See Medicine, School of, on page 345.

Range and Wildlands Science

See Agronomy and Range Science, on page 128; and Range Science, on page 434.

Range and Wildlands Science

[College of Agricultural and Environmental Sciences]

Admission into the Range and Wildlands Science major has been discontinued. Students interested in this area should see the major for Agricultural Man-
agement and Rangeland Resources, on page 124; Range and Natural Resources specialization.

The Major Program

Range and Wildlands Science is the study of the biological and physical components of land resources which are used mostly for grazing domestic livestock, but which also provide wildlife habitats, watersheds, recreation, and open space.

The Program. The major provides background in the biological, physical, and social sciences. Comprehensive study in the plant, animal, soil, and resource sciences supplements the core of range management courses. Integration of the knowledge of a variety of specialized fields is learned as a basis for land management oriented toward the multiple use concept and the maintenance of environmental quality.

Career Alternatives. Range and Wildlands Science graduates, especially those with some experience, may be employed as consultants, extension specialists, ranch managers, or ranchers. They may also qualify for the position of Range Conservationist in governmental agencies such as the Forest Service, Soil Conservation Service, and the Bureau of Land Management. If career work with such an agency is desired, it is recommended that trainee or apprenticeship experience with that agency be included in the major program of study as an internship. In addition, the training provided by this major should give an excellent background for natural resource management positions.

B.S. Major Requirements: UNITS

English Composition Requirement .......... 0-8
See College requirement.

Preparatory Subject Matter ................. 63-67
Animal Science 2 ........................................... 4
Biological Sciences 1A, 1B, 1C ............... 15
Chemistry 2A, 2B, 8A, 8B ......................... 16
Agricultural Science and Management 21,
Engineering 5, or Computer Science Engineering 10 .................. 10
Agricultural and Resource Economics 1,
Economics 1A, or 1B ............................ 4-5
Geology 1-11 ............................................... 4
Mathematics 16A; 16B recommended .... 3-6
Physics 1A, 1B ........................................... 6
Soil Science 100 ......................................... 4
Agricultural Science and Management 150 .... 4

Breadth/General Education ................. 6-24
Satisfaction of General Education requirement to include two non-introductory courses in
Agricultural and Resource Economics,
Economics, Environmental Science and Policy, or Geography.

Depth Subject Matter ..................... 51-56
Botany 111 or Water Science 104 ........... 3-4
Botany 117 or Plant Science 101 ............. 4
Geography 3, Atmospheric Science 105 .... 3-4
Soil science, two upper division courses ... 6-8
Water Science 141 ..................................... 3
Nutrition 115 ............................................. 3
Wildlife ecology or management, one upper
division course in wildlife, fish and
conservation biology, or zoology ............ 3-4
Agronomy 112 ........................................... 3
Select units from Range Science 100, 133,
134, 135, 105, 160, 145; and Range
Science 192, 198, 199; not more than a total
of 3 units can be counted ........ 18
Geography 106 ........................................... 4

Restricted Electives ......................... 6-8
Two upper division natural science or applied
biological science courses in one or two of the following: geosciences, soil science, botany,
etymology, genetics, geography, mathematics, nematology, plant pathology,
plant science, environmental and resource
sciences, water science, or weed science.

Unrestricted Electives ....................... 17-47
Total Units for the Major ..................... 180

Major Adviser. Contact Plant Sciences Depart-
ment office.

Advising Center for the major is in 1220A Plant
and Environmental Sciences [530] 752-1715.

Graduate Study. See Ecology (A Graduate
Group), on page 196.

Range Science

[College of Agricultural and Environmental Sciences]

Faculty. See Plant Sciences, on page 419.

Related Courses. See Plant Sciences 101, 112,
130, 131, 134, 135, 137; Nutrition 115; Soil Sci-
ence 105, 120; Wildlife, Fish, and Conservation Biology 151.

Religious Studies

[College of Letters and Science]

Naomi Janowitz, Ph.D., Program Director

Program Office. 622 Sproul Hall
[530] 752-4999; http://religions.ucdavis.edu

Committee in Charge

David Biale, Ph.D. (History)
Lincoln D. Hurst, Ph.D. (Religious Studies)
Janet Shutes, Ph.D. (Religious Studies)
Winfred Lai, Ph.D. (Religious Studies)
Jay Meckling, Ph.D. (American Studies)
Baki Tezcan, Ph.D. (Religious Studies, History)

Faculty

Lincoln D. Hurst, Ph.D., Associate Professor
Naomi Janowitz, Ph.D., Professor
Winfred Lai, Ph.D., Professor
Baki Tezcan, Ph.D., Assistant Professor

The Major Program

Majoring in religious studies provides an opportunity to explore and analyze, from an academic perspective, the written and oral traditions of diverse reli-
gions.

The Program. The major introduces students to the academic study of religion. The religious studies major offers a broad choice of courses, including history, philosophy, sociology, anthropology, Ameri-
can studies, classics, and medieval studies. For some students, religious studies is an appropriate second major and might combine well with anything from philosophy to international agricultural development, from history to international relations.

Career Alternatives. The emphasis in religious studies courses on developing analytical thinking skills and clear writing expression is an asset for many career goals. As a strong liberal arts program, the major can lead to research and/or teaching on all levels in the field of religion. Because the major integrates so many academic areas, it is also an excellent background for graduate programs, espe-
cially in the humanities, and for professional schools including law, business, and foreign service.

A.B. Major Requirements: UNITS

Preparatory Subject Matter .................. 24
At least one course from each of the following groups
(a) Religious Studies 1, 2
(b) Religious Studies 21, 23, 40, 60, 70, 75
Anthropology 2, or with approval from
adviser, a lower division course related
to religion from African American and African
Courses in Hebrew (HEB)

Lower Division Courses

1. Elementary Hebrew (5)
Lecture/discussion—4 hours; laboratory—1 hour. Prerequisite: course 1 or the equivalent. 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 basis only. Although a passing grade will be charged to the students' P/NP option, no petition is required. All other students will receive a letter grade unless a P/NP petition is filed.)—II. (I., II.)

2. Elementary Hebrew (5)
Lecture/discussion—4 hours; laboratory—1 hour. Prerequisite: course 2 or the equivalent. Speaking, listening, comprehension, reading and writing fundamentals of modern Hebrew.—II. (I., II.)

21. Intermediate Modern Hebrew I (5)
Lecture/discussion—5 hours. Prerequisite: course 3 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. Not open to students who have taken course 101 or 102.—II. (I., II.)

23. Intermediate Modern Hebrew III (5)
Lecture/discussion—5 hours. Prerequisite: course 22 or consent of instructor. Further 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.)

Upper Division Courses

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.—II. (I.)

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 100BNN. Third year Hebrew. Advanced grammar and composition. Focus on reading of literary texts, oral skills and accuracy in writing.—II. (I., II., III.)

100CN. Advanced Modern Hebrew III (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 100BN. Students who have taken course 100C as 2nd year Hebrew may take course 100CNI. Third year Hebrew. Advanced grammar and composition. Focus on reading of literary texts, oral skills and accuracy in writing.—III. (I., III.)

Courses in Religious Studies (RST)

Lower Division Courses

1. Survey of Religion (4)
Lecture—3 hours; discussion—1 hour. Basic concepts introduced through readings of the primary religious literature. Discussion of central ideas (creation, history, law, 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, Writ.—II. (I., II.)

2. 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 religious symbols. GE credit: ArtHum, Div, Writ.—I. (I., III.)

3A-C. Topics in Comparative Religion (4)
Lecture—3 hours; discussion—1 hour. Introduction to the methods used in comparative religion, focusing on a particular theme in a number of religious traditions: [A] The Experiential Dimension: Pilgrimage; [B] The Mythic Dimension: Death and the After-life; [C] The Ritual Dimension: Sacraments. May be repeated for credit in a different subject area. GE credit: ArtHum, Div, Writ.—I. (I., III.)

3D. Topics in Comparative Religion (4)
Lecture—3 hours; discussion—1 hour. Introduction to the methods used in comparative religion, focusing on a particular theme in a number of religious traditions: [A] The Experiential Dimension: Pilgrimage; [B] The Mythic Dimension: Death and the After-life; [C] The Ritual Dimension: Sacraments. May be repeated for credit in a different subject area. GE credit: ArtHum, Div, Writ.—I. (I.)

110. Life, Meaning and Identity (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 40; course 23 recommended. Beginning of the Christian faith seen in relation to milieu in which it originated. Offered in alternate years.—I. (I.)

115. Mysticism (4)
Lecture—3 hours; term paper. Prerequisite: one lower division Religious Studies course except 100, 98, or 99. Historical and descriptive analysis of selected key figures in mystical traditions and readings of representative mystical texts. Analytic term paper. Offered every three four years. GE credit: ArtHum, Div, Writ.—III. (I.)
120. Religion, Magic and Science (4)
Lecture—3 hours; extensive writing. Religion, magic, and science from the middle ages to the present. Contrast between modern scientific methodology and religious and magical thinking. (Same course as Science and Technology Studies 120.) Offered in alternate years. GE credit: ArtHum, Div, Wrt. —(II.) Coudert

122. Studies in Biblical Texts (4)
Lecture—3 hours; term paper. Prerequisite: course 21. Study of a book from the Prophets or writings from the OT. Readings from the mid-fourth to the early second centuries. May be repeated once for credit in different subject area. —ill. (III.) Janowitz

124. Topics in Judaism (4)
Lecture—3 hours; term paper. Prerequisite: course 23. Examination of selected aspects of Jewish life, religion, or literature. Potential topics include: Jewish Perspectives on Jesus; The Golem: History and Legend; Sexuality and Gender in Late Antique Judaism and Early Christianity. May be repeated for credit when topic differs. —II.

125. Dead Sea Scrolls, Apocrypha, and Pseudepigrapha (4)
Lecture/discussion—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: Wrt. —I. Hurst

130. Topics in Religious Studies (4)
Lecture/discussion—3 hours; term paper. Prerequisite: one from course 1, 2, 3A, 3B, or 3C 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. —II, III.

135. The Bible and Film (4)
Lecture—2 hours; term paper; film-viewing—3 hours. Prerequisite: Humanities 10 recommended. Examination of the uses of the Judeo-Christian scriptures in film. Topics include dramatic depictions of biblical stories, the tension between science and religion, allegorical treatments of biblical themes, and the problems of religious conviction. —III. Hurst

140. Christian Theology (4)
Lecture—3 hours; term paper. Prerequisite: course 40; course 102 recommended. Historical and systematic introduction to Christian doctrine, with attention to divergent traditions and the problem of orthodox definition. GE credit: ArtHum, Div, Wrt. —(II.) Hurst

141A. New Testament Literature: Synoptics Gospels (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 40. Life and thought of the early Church as reflected by the Synoptic Tradition—Matthew, Mark, Luke and Acts. Offered every third year to alternate with 141B, 141C. GE credit: ArtHum, Wrt. —Hurst

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: ArtHum, Wrt. —III. Hurst

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: ArtHum, Wrt. —II. Hurst

145. Contemporary American Religion (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 40 and History 1B recommended. Examination of several major movements and phenomena in twentieth-century American religion. Offered in alternate years. —II.

150. Religious Ethics (4)
Lecture/discussion—4 hours. Prerequisite: course 4. Study of the religious bases to ethics through concentration on the ethical traits of one major tradition, or through a comparison of the attitudes of two or more traditions to a common ethical issue. Offered every three years. —III. Hurst

160. Introduction to Islamic Law (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, political theory, fundamentalist, al-Farabi, al-Ghazzali, Ibn Rushd, Tusi, Ibn al-Arabi, Rumi, Mulla Sadra, Ibn Khaldun, Ibn Abd al-Wahhab. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt. —II. Tezcan

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. Legal schools, legal theory, the Shari’a, reformist movements, human rights. Offered in alternate years. GE credit: ArtHum or SocSci, Div, Wrt. —II. Tezcan

165. Islam in Asia (4)
Lecture/discussion—3 hours; extensive writing. Islam as a lived religion in the Indian sub-continent, Central Asia, China, and Southeast Asia. Emphasis is on primary sources studied comparatively and historically. GE credit: ArtHum, Div, Wrt. —III.

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. —III. Lai

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. —III. Lai

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. Lai

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 scholarly debate about the methods for analyzing and comparing diverse religious traditions. —II, Lai

194HA-194HB. Special Study for Honors Students (1-5)
 Independent study. Open only to majors of 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 Course

201. Religion and the Body (4)
Seminar—3 hours; term paper. Prerequisite: graduate student standing. Some institutionalized religions view the body as the source of sin, requiring repres- sion to save the soul. Yet, other traditions also exist, in which the body is viewed positively. This course investigates cultural factors which account for this dif- ference. Offered in alternate years. —III. Hurst

See also the University and College requirements.

Total Units for the Major ..................44-71

A.B. Major Requirements:

Preparatory Subject Matter................. 4-31
Russian 1 through 6; or the equivalent ........................................ 0-27
Russian 41 or 42 or 101 or 101C ........... 4

Depth Subject Matter ...................... 40
Russian 101A, 101B, 101C ............... 12
Russian 102 or 103 or 104 or 105 ........ 4
Russian 150 ................................................. 4
Additional upper division units chosen in consultation with adviser .................. 20

Total Units for the Major ................. 44-71

Major Adviser. Contact Program office.

Minor Program Requirements: ............

Russian 101A, 101B, 101C ............... 12

Honors and Honors Program. The honors pro- gram comprises at least one quarter of study under course 194H, which will include a research paper. See also the University and College requirements.
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.

Teaching Credential Subject Representative. Staff; see the Teaching Credential/M.A. Program on page 102.

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 Courses

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)

Lecture—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 and a P/NP petition is required. All other students will receive a letter grade unless a P/NP petition is filed. —I. [I]

2. Elementary Russian (5)

Discussion—5 hours; laboratory—1 hour. Prerequisite: course 1. Continuation of grammar and language skills developed in course 1—II. [I]

3. Elementary Russian (5)

Discussion—5 hours; laboratory—1 hour. Prerequisite: course 2. Continuation of grammar and language skills developed in course 2—III. [I]

4. Intermediate Russian (4)

Discussion—4 hours; laboratory—1 hour. Prerequisite: course 3. Grammar review and conversational practice. —I. [I]

5. Intermediate Russian (4)

Discussion—4 hours; laboratory—1 hour. Prerequisite: course 4. Grammar review. Introduction to literary conversation. Conversational practice. —II. [I]

6. Intermediate Russian (4)

Discussion—4 hours; laboratory—1 hour. Prerequisite: course 5. Grammar review. Intermediate conversation and continued reading of literature. —III. [I]

10. Elementary Conversation (2)

Discussion—2 hours. Prerequisite: course 1; course 2 or 3 (concurrently). Conversational practice to improve pronunciation and master spoken idioms. May be repeated for credit up to a maximum of 6 units. —II. [I, II, III]

15. Russia Today and Tomorrow (4)

Lecture/discussion—4 hours. Examination of basic issues that have led to the former totalitarian superpower which is in transition to democracy, the conflicts in Russia, its civilization and intellectual history up to including the present day and its tendencies for the future. GE credit: ArtHum, Div.—III. Druzhnikov

41. Survey of Nineteenth-Century Russian Literature (in English) (4)

Lecture—3 hours. Introduction to dominant literary trends, major literary figures and landmarks of Russian prose and poetry from the period of Sentimentalism through Romanticism and Realism to the beginnings of Modernism. Offered in alternate years. GE credit: ArtHum, Wrt.—II.

42. Survey of Nineteenth-Century Russian Literature (in English) (4)

Lecture—3 hours. Introduction to major literary trends such as Symbolism, Acmeism, Futurism, Neo-realism, and Socialist Realism. Readings from repre-
myths that surround him. No knowledge of Russian required. GE credit: ArtHum, Div. Wrt. — I. Druzhnikov.

140. Dostoevsky (in English) (4)
Lecture—3 hours. Reading and analysis of Dosto-
evsky’s principal works such as Crime and Punish-
ment, 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, Div. Wrt. — III. (II.)

141. Tolstoy (in English) (4)
Lecture—3 hours. Study of Leo Tolstoy’s literary evolu-
tion and moral quest. Readings include his Confes-
sion, a major novel such as War and Peace or Anna
Kareina, and representative shorter fiction. Offered
in alternate years. GE credit: ArtHum, Div. Wrt. — I.

142. Women’s Autobiography (in English) (4)
Lecture—2 hours; discussion—1 hour; term paper.
Prerequisite: any introductory course in literature.
An examination of Russian women’s autobiography
from the 19th through the 20th centuries, emphasizing
the way in which the genre of autobiography
serves as a means of the writer’s creation of herself,
as opposed to her definition by others. Offered in
alternate years. GE credit: ArtHum, Div. Wrt. — I.

143. Alexander Solzhenitsyn (4)
Discussion—3 hours; term paper. Prerequi-
site: any introductory literature course or consent of
instructor. Examination of the literary and political
writings of the Russian dissident in the bio-
graphical context in which they were created.
Knowledge of Russian not required. GE credit:
ArtHum, Div. Wrt. — II. (III.)

150. Russian Culture (4)
Lecture—3 hours; discussion—1 hour. Term paper.
Knowledge of Russian not required. Study of Russian
culture in nineteen-
teenth and twentieth centuries. Brief introduction of
the beginnings up to nineteenth century. Russian art,
music, philosophy, church, traditions, and daily life.
Offered in alternate years. GE credit: ArtHum, Div.
Wrt. — II. (III.)

151. Writers and Censorship in Russia and the
Soviet Union (4)
Lecture—3 hours; discussion—1 hour. Prerequisite:
any introductory literature course or consent of
instructor. Literature and censorship in Russia. Per-
sonal responsibility of the author vs. conformism to
instructor. Literature and censorship in the Soviet
Union. GE credit: ArtHum, Div. Wrt. — I. Druzhnikov.

154. Russian Folklore (4)
Lecture—3 hours; term paper. Knowledge of Russian
not required. Russian folklore, rituals, and history
will be analyzed and compared with folklore of
other peoples. Sociological implications of attitudes
in the social and cultural diversity of Russia. Per-
sonal responsibility of the author vs. conformity to
state morality. Russian myths and Russian realities.
GE credit: ArtHum, Div. Wrt. — I. Druzhnikov

159. Yiddish Literature in Translation (4)
Lecture/discussion—3 hours; term paper. Major writ-
ers of Yiddish in English translation; major genres of
Yiddish literature from the mid-19th century to the
present. GE credit: ArtHum, Div. Wrt. — III.

166. Representation of Sexuality in
Russian Literature (4)
Lecture—3 hours; term paper. Prerequisite: Women’s
Studies 50 or introductory psychology. Sexuality
in Russian oral and written literature from a dual,
fi-
nisterial and psychoanalytic perspective. Manogamy, free
love, sexism, homosexuality, incest, androgyny, and
others as depicted by such writers as Puschkin,
Gogol, Tolstoy, Dostoevsky, Akhmatova, Blok, Tol-
stoy, and others. GE credit: ArtHum, Div. Wrt.

192. Research Essay (2)
Prerequisite: a Russian literature course (may be
taken concurrently). A research essay, based on pri-
mary and secondary sources, dealing in depth with
the topic arising from or related to the prerequisite lit-
erature course. May be repeated for credit.

194H. Special Study for Honors Students
(4)
Independent study—4 hours. Prerequisite: open only
to majors of senior standing who qualify for honors
program. Guided research, under the direction of a
faculty member. Literature and censorship in Russia.

195H. Honors Thesis (4)
Independent study—4 hours. Prerequisite: course
194H. Writing an honors thesis, under the direction
of a faculty member. GE credit: ArtHum, Div. Wrt.

198. Directed Group Study (1-5)
(P/NP grading only)

199. Special Study for Advanced
Undergraduates (1-5)
(P/NP grading only)

Science and Society

([College of Agricultural and Environmental Sciences]
David M. Rizzo, Ph.D., Program Director
Program Office. 354 Hutchinson Hall
(530) 752-0300)

Committee in Charge
Thomas R. Gordon, Ph.D., Professor
(School of Plant and Environmental Sciences)
Susan B. Kaiser, Ph.D. (Textiles and Clothing)
Kathryn Radke, Ph.D., Associate Professor
(Agriculture, Consumer and Environmental Sciences)
David S. Reid, Ph.D. (Food Science and Technology)
Carl K. Winter, Ph.D. (Entomology)

Faculty
Arnold Bloom, Ph.D., Professor (Plant Sciences)
Richard M. Bostock, Ph.D., Professor
(Plant Pathology)
George Bruening, Ph.D., Professor (Plant Pathology)
James Carey, Ph.D., Professor (Entomology)
Douglas R. Cook, Ph.D., Professor (Plant Pathology)
Randy Dalgren, Ph.D., Professor
(Land, Air, and Water Resources)
R. Michael Davis, Ph.D. (Specialist)
(Enterprise Extension Specialist)
Lynn Epstein, Ph.D., Professor (Plant Pathology)
Graham Fogg, Ph.D., Professor
(Land, Air, and Water Resources)
Thomas R. Gordon, Ph.D., Professor
(Plant Pathology)
Peter Hermes, Ph.D., Assistant Professor
(Land, Air, and Water Resources)
Adel A. Kader, Ph.D., Professor (Pomology)
Susan B. Kaiser, Ph.D., Professor
(Textiles and Clothing)
Annie King, Ph.D., Professor (Animal Science)
James D. Murray, Ph.D., Professor (Animal Science)
Dan E. Parfitt, Ph.D., Professor (Entomology)
Gregory Pasternack, Ph.D., Associate Professor
(Land, Air, and Water Resources)
Kathryn Radke, Ph.D., Associate Professor
(Animal Science)
David S. Reid, Ph.D. (Food Science and Technology)
David Rizzo, Ph.D., Professor (Plant Pathology)
Pamela C. Ronald, Ph.D., Professor (Plant Pathology)
Barry W. Wilson, Ph.D., Professor
(Animal Science, Environmental Toxicology)
Carl K. Winter, Ph.D., Extension Specialist
(Food Science and Technology)

The Program. Science and Society is an interde-
partmental teaching program administered by the
College of Agricultural and Environmental Sciences
that offers students throughout the campus the oppor-
tunity to discover the connections that link the social,
biological, and physical sciences with societal issues
and cultural discourses. Course work examines dis-
covery processes in relation to societal values, pub-
lic policy and ethics, including issues associated with
agricultural diversity. Whenever possible, opportuni-
ties 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 allows
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 Science and Society courses, upper
division courses from both the College of Agri-
cultural and Environmental Sciences and the College
of Letters and Science in the area of history or the
philosophy of science, policy and decision making,
communication of science, and culture, ethics and
applications.

Minor Program Requirements:

Science and Society ..........................22-27
Science and Society 2, 5, 15, 20, 30, 90A,
90B, 90C or 90X ...............................2-4
One course from each of the following four areas:
History and Philosophy of Science: Community and Regional Development 118, 162, History 185A, 185B, History and Philosophy of Science 150, Nature and Culture 100, Philosophy 107, 108, or 109 ........................................4
Policy and Decision Making: Agricultural and Resource Economics 120, 147, 150, Consumer Science 100, Environmental Science and Policy 160, 165, Political Science 175, Sociology 155, or 181 ............................................3
Communication of Science: Agricultural Education 172, Agricultural Management and Rangeland Resources 122, Anthropology 120, Communication 115, 130, 135, 138, 140, Community and 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, 164, Fiber and Polymer Science 110, International Agricultural Development 104, Plant Biology 151, Plant Pathology 140, or Sociology 144 .............3
Minor Adviser: D. M. Rizzo

Related Courses. See Agricultural and Resource Economics 120, 147, Agricultural Management and Rangeland Resources 1, 101, 122, Communication 115, 140, Community and Regional Development 118, 142, 162, 174, Avian Sciences 13, Environment

Courses in Science and Society (SAS)

Lower Division Courses
1. Critical Inquiry into Contemporary Issues
(4)
Lecture/discussion—3 hours; discussion—1 hour. Contemporary issues, including global population
trends, economic and environmental changes, cul-
tural diversity and biodiversity, food safety, fiber and textiles, changing consumer cul-
tures. Inquiry processes emphasize ethics, multiple
disciplines, and multiple perspectives. GE credit: Sci-

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer. 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Societal Diversity; Wrt=Writing Experience
2. Feeding the Planet: Influences on the Global Food Supply (3)
Lecture/discussion—2 hours. Scientific principles and dynamic interactions involved in food production, food processing, nutrition, shelf life and marketing from differing viewpoints. Physical, biological, and social sciences influencing the availability and safety of the food supply worldwide. GE credit: SciEng or SocSci, Wrt.—II. (II.) Bruening, Bostock, Davis

3. Science, Technology and Society (4)
Lecture—4 hours. Impact of developments in science and technology on the individual in society and how economics, politics, culture and values affect technological development. Not open for credit to students who have completed former course Applied Behavioral Sciences 18. GE credit: SciEng or SocSci, Wrt.—III. (III.)

4. Water in Popular Culture (3)
Film viewing—2 hours; discussion—1 hour. Importance of water in many aspects of society as revealed through a survey of its depictions in film. GE credit: SciEng, SocSci, Wrt.—I. (I.) Fastenack

5. Pathways to Discovery: Science and Society (3)
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 with topic offered. May be repeated twice for credit. Course not offered every year. GE credit: SciEng or SocSci, Wrt.

6. Terrorism and War (4)
Lecture—3 hours; discussion—1 hour; term paper. Exploration of terrorism and war from science and social sciences perspectives. Terrorist cells and groups; 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, Wrt.—II. (II.) Carey

7. Water Quality at Risk (3)
Lecture—2 hours; discussion—1 hour. Natural and human threats to water quality. Balance of 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. GE credit: SciEng, SocSci, Wrt. (Same course as Environmental and Resource Sciences 8)—II. (II.) Hernes

8. Water and Power and 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 of water quantity and quality. Roles of science and policy in solving water problems. (Same course as Hydrologic Science 10) GE credit: SciEng, SocSci, Wrt.—III. (III.) Fogg

9. AIDS and Society (4)
Lecture—3 hours; discussion—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, genetic changes in social relationships and public policy, global implications. GE credit: SciEng or SocSci, Div, Wrt.—III. (III.) Radke

10. Genetics and Society (4)
Lecture—3 hours; discussion—1 hour. Not open for credit to students who have completed course 140. Basic concepts of genetics, modern 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.—II, II. (II.) Cook, Epstein, Ronald

25. Global Climate Change: Convergence of Biological, Geophysical, & Social Sciences (3)
Lecture—2 hours; discussion—1 hour. Causes of global climate change and the biological, geophysical, and social consequences of such change. Methods used by different scientists for understanding these events. Complexity of global affairs. Decision making under uncertainty. GE credit: Div, SciEng, SocSci, Wrt.—II. (II.) Bloom

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.—II, II. (II.) Gordon, Rizzo

90A. Issues in Environmental and Resource Sciences (2)
Seminar—2 hours; two Saturday field trips. Prerequisite: limited to 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. (I.) II. (II.) Stasulat

90B. Observing and Writing in Biology (2)
Seminar—1 hour; laboratory—1 hour; term paper. Students will observe the interactions between microorganisms, conduct simple laboratory experiments, describe these interactions and discuss scientific observations and writing.—Jaffe

90C. Herbal Medicine: Relevance for the 21st Century (2)
Seminar—2 hours. Medicinal usage of plants from both folk and traditional cultures, physiological 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 conservation, comparisons to animal conservation issues, and the economics of and justification for preserving endangered plants.—I. (I.) Parfit

90E. Biotechnology—a New Era, a New Struggle (2)
Seminar—2 hours. Animal biotechnology and its applications. Discussion topics include potential societal, environmental, and economic impacts of biotechnology. Complexity and public opinion, and ethical and moral questions arising 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 harvest and consumption.—I. (I.) Kader

90G. Science, Society and the Environment (2)
Seminar—2 hours. Contemporary environmental issues, scientific approaches to addressing these issues, and accompanying societal and ethical considerations.—I. (I.) 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 Society through shared readings, discussions, written assignments, or special activities such as fieldwork, laboratory work, etc. May be repeated for credit. Limited enrollment.—I. (I.) Wilson

91A. Explorations in Science and Society: Cultures and Identities (2)
Seminar—1 hour; extensive writing or discussion—1 hour. Prerequisite: participation in the summer Special Transitions Enrichment Program (STEP) or consent of instructor; course 1 concurrently. Exploration of linkages among identity and culture, multi-disciplinary inquiry, and agricultural and environmental science issues.—I. (I.) Means

91B. Explorations in Science and Society: Leadership and Collaboration (2)
Seminar—1 hour; extensive writing or discussion—1 hour. Prerequisite: coursework or consent of instructor. 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. Exploration 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 intern-ship on and off campus, in the community, or in institutional settings. (P/NP grading only.)

97T. 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 foster effective communication and interaction. 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 Courses

105. Organizational Interactions in Everyday Life (3)
Lecture—2 hours; discussion/laboratory—1 hour. Prerequisite: Biological Sciences 10 or 1A. Ecology and evolution of organizational interactions and the importance of these interactions to human health and welfare and a sustainable environment. Students will debate environmental issues on scientific, political, and ethical grounds. GE credit: SciEng, Wrt.

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 once for credit. Course not offered every year. GE credit: SciEng or SocSci, Wrt.—III. (III.)

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 ethical and legal issues arising from the development and use of modern methods of biotechnology. Presentation, evaluation, and critical discussions of the present and future impact of biotechnology on society. Not open for credit to students who have completed course 20. GE credit: SocSci, Wrt.—II. (II.) Epstein
Science and Technology Studies

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.)

197T. 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. I tutoring another Science and Society course. (P/NP grading only.)

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 Courses

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: consent of instructor. May be repeated for credit. (S/U grading only.)

Professional Course

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. Discussion of critical pedagogies specific to teaching of science-societal issues, preparing for and conducting discussion sessions, analyses of texts and supporting material, formulation of assignments, and exams. May be repeated for credit. (S/U grading only.)—I, II, III, (II, III)

Science and Technology Studies

[College of Letters and Science]
Joseph Dumit, Ph. D., Program Director
Program Office, 1241 Social Sciences and Humanities Building
(530) 752-9621, http://sts.ucdavis.edu

Committee in Charge
Thomas Beamish, Ph.D. (Sociology)
Joan Cadden, Ph.D. (History)
Marias de la Cadena, Ph.D. (Anthropology)
Patrick Carroll, Ph.D. (Sociology)
Joseph Dumit, Ph.D. (Anthropology, Science and Technology Studies)
James Griesemer, Ph.D. (Philosophy)
Catherine J. Kudlick, Ph.D. (History)
Curtin Milburn, Ph.D. (English)
Benjamin S. Orlove, Ph.D.
(Anthropology, Science and Policy)
Carolyn de la Pena, Ph.D. (American Studies)

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 culture in a wide range of perspectives, including American Studies, Anthropology, Economics, 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 twelve units from each of two different, complementing areas of concentration, and twelve units plus prerequisites, providing depth, concentration, and field work opportunities in the sciences. The modules are: I. Cultural Studies of Science and Technology; II. Ethics, Values, and Science Policy; III. History and Philosophy of Science; IV. Medicine, 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 for timely completion. 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 see 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 site 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; Environmental Studies 1; Nature and Culture 1; Philosophy 30, 31, 32; Science and Society 1, 2, 3, 5; Sociology 176 ........ 12

Depth Subject Matter ............. 44-46
Twelve units each from two of the following four modules: ........................................ 24
I. Cultural Studies of Science and Technology: Urban Community and Regional Development 118, 126; History 139A, 139B; Nature and Culture 100, 180; Science and Technology Studies 130A, 131, 130, 131; Sociology 76; Philosophy 12
II. Ethics, Values, and Science Policy: Agricultural and Resource Economics 120, 147; Environmental Science and Policy 165; History 195; Philosophy 120; Philosophy 115, 116; Physics 137, 160; Plant Pathology 140; Political Science 171, 175; Veterinary Medicine 170 ........ 12
III. History and Philosophy of Science: History 135A, 135B, 136, 185A, 185B; Philosophy 104, 108, 109; Science and Technology Studies 130A, 130B, 131, 131; Sociology 76; Anthropology 12
IV. Medicine, Society, and Culture: Epidemiology and Preventive Medicine

Total Units for the Major .................. 60-82

Approved Science Electives. Courses may be drawn from any of the following approved subject areas:
Aeronautical Science and Engineering; Animal Genetics; Animal Science; Anthropology; Applied Behavioral Sciences; Applied Biological Systems Technology; Atmospheric Science; Avian Sciences; Biological Chemistry; Biological Sciences; Cell Biology and Human Anatomy; Chemistry; Engineering; Environmental Law; Engineering; Psychology; Environmental Science; Environmental Studies; Environmental Horticulture; Environmental, Science, and Policy; Environmental Toxicology; Evolution and Ecology; Exercise Science; Fiber and Polymer Science; Food Science and Technology; Geology; Hydrologic Science; Material Science and Engineering; Medical Microbiology; Medical Pharmacology and Toxicology; Microbiology; Molecular and Cellular Biology; Neurobiology; Physiology; Physics; Plant Biology; Plant Pathology; Population Health and Reproduction; Psychology; Soil Science; Wildlife, Fish, and Conservation Biology.

Major Adviser, J. Dumit

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer, 2007-2008 offering in parentheses

General Education (GE) credit: Anthropology, Arts and Humanities, SciEng=Science and Engineering, SocSci=Societal Changes, Div=S=Social-Cultural Diversity; Wrt=W=Writing Experience

101, 160, History 139A, 139B; Psychology 160; Sociology 12—12
Note: Although a course may be listed in more than one module, that course may satisfy only one requirement.

Science and Technology Studies 180 ........ 4
Science and Technology Studies 190, 190A, 190B, 190A/190B .... 4-6
Science Electives: Select twelve units, at least eight of which must be from upper division courses, from the Approved Science Electives list below. (Unit totals will vary with required electives.) ................................. 12-32
Note: Students are strongly advised to choose science elective courses in consultation with faculty advisors. Some courses in some areas may require prerequisites too extensive to be used for the STS major.

Total Units for the Major .................. 60-82

Courses in Science and Technology Studies (STS)

Lower Division Courses

1. Introduction to Science, Technology and Medicine Studies (4)
Lecture—3 hours; discussion—1 hour. History, philosophy, sociology, politics, and cultural studies of science, technology, and medicine. Emphasis on a broad range of perspectives. GE credit: SciEng or SocSci. —Carroll

Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 recommended. Methodological issues concerning the historical, philosophical, sociological, ethical, and political analysis of science, technology, and medicine. Detailed case studies to illustrate different methods of analysis. GE credit: SciEng or SocSci, Wrt.—Carroll

32. Drugs, Science and Culture (4)
Lecture—3 hours; discussion—1 hour. Drugs, science, society in a cultural context. 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 glorification in sugar, opium, cocaine. [Same course as Anthropology 32] (III, III) Dumit
Upper Division Courses

120. Religion, Magic and Science (4)
Lecture—3 hours; extensive writing. Religion, magic, and science from the middle ages to the present. Contrast between modern scientific methodology and religious and magical thinking. (Same course as Religious Studies 120.) Offered in alternate years. GE credit: ArtHum, Div, Wrt.—Coudert

130A. From Natural History to the History of Nature (4)
Lecture/discussion—3 hours; term paper. Prerequisite: History 135A recommended. Evolution and demise of natural history as a discipline from Aristotle to Linnaeus. Considers ancient views of nature and its Renaissance rediscovery; the emergence of biology, botany, geography, and zoology; the history of taxonomy and classification. GE credit: ArtHum or SciEng, Wrt.

130B. History of Modern Biology (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 130A recommended. Development of modern biology from pre-Darwinian roots to the present. Considers emergence of modern biological specialties and consolidation of biological theory around evolutionary ideas. History of allied fields such as genetics, paleontology, embryology, ecology, systemsatics and molecular biology. GE credit: ArtHum or SciEng, Wrt.

131. Darwin (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing or consent of instructor. Students will trace the life and times of Charles Darwin and 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.—Griesemer

150. Gender and Science (4)
Lecture/discussion—3 hours; term paper. An interdisciplinary approach to the relations between gender 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.

161. Time: Mechanism and Measurement (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 1. Cultural concepts of time; units and instruments of time measurement; historical differences in the social organization of time; and time measurement in seventeenth and eighteenth centuries. GE credit: SocSci, Wrt.

163. History of Communication Technologies (4)
Lecture—3 hours; term paper. History of communication technologies from the late Middle Ages to the twentieth century. Questions of technology, knowledge, power and culture. Particular attention to questions about information and truth. Offered in alternate years. GE credit: SocSci.

165. Built Environments (4)
Lecture—3 hours; extensive writing. Built environments, which are designed to support forms of life. These can be casters of cultural memory and in turn shaping knowledge of nature into social assets. Historical constellations of knowledge, social order, and power. Offered in alternate years. GE credit: SocSci, Wrt.

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. Laboratory and historical case studies. Scientific and technical knowledge in institutional and organizational contexts. (Same course as Sociology 176.)—Carroll

180. Topics in History and Philosophy of Science (4)
Seminar—3 hours; term paper. Prerequisite: 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. Focus on individual research projects.

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 Courses

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 Course

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)

Sexuality Studies

(College of Letters and Science)
http://wmts.ucdavis.edu/wgssite/sexualitystudies/default.html

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 are not reducible to 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:
Women and Gender Studies 170 ............... 4

Two Elective courses from the following:
Anthropology 139 BN, English 186, Epidemiology and Preventative Medicine 163, History 184, Human Development 12, Psychology 158, Science and Society 15, Women and Gender Studies 70 ............ 7-8
Sufficient courses from Additional Course List (below) or seminars/individual study by petition to achieve a total of 18-20 units ......... 7-8

Additional course list:
American Studies 115, Asian American Studies 112, Chicana/o Studies 160, English 166, German 145, History 132, Political Science 150, 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 Seminar courses 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) 752-4686

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

Advising. Contact Women and Gender Studies in 2222 Hart Hall, (530) 752-4686.

Restrictions. (a) Courses applied toward the satisfaction of a major may not also be offered in satisfaction of the minor. (b) Courses may take no more than four units (one course) may be lower division.
**Social Sciences**

**Comparative History**
are often engaged in interdepartmental teaching.

**Committee in Charge**
Elizabeth Cascio, Ph.D. (Economics)
Eric Grodsky, Ph.D. (Sociology)
Michael Kurlender, Ph.D. (School of Education)
GJ Mathey, Ph.D. (Philosophy)
MarieAnne Page, Ph.D. (Economics)
Ralphald Siverson, Ph.D. (Political Science)
Kimberlee Shauuman, 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. Simons, 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**

Marisol de la Cadena, Ph.D., Interim Program Director and Associate Professor (Anthropology)

**Program Office.** Center for History, Society, and Culture, 2231 Social Sciences and Humanities Building (530) 754-8328

**Graduate Study.** The program comprises coursework and research leading to the Ph.D. with a designated emphasis in Social Theory and Comparative History. The program provides theoretical training and interdisciplinary perspective to Ph.D. candidates in the major, integrating courses and graduate groups (Anthropology, Comparative Literature, Cultural Studies, Economics, English, Geography, History, Political Science, and Sociology). Students from other departments are also welcome. All students must fulfill all Ph.D. requirements of their home department. The additional requirements leading to the designated emphasis include: (1) four graduate courses [Social Theory and Comparative History 250, Sociology 242A, and two courses sponsored by the Social Theory and Comparative History program, one of which must be offered by a department other than the student’s home department]; (2) presentation of a Social Theory and Comparative History field as one area of specialization in the departmental Ph.D. qualifying examination; (3) an oral discussion, following passage of the Ph.D. qualifying examination, based on the student’s dissertation prospectus; (4) completion of the dissertation to the satisfaction of the student’s thesis committee, one of whose members will be a representative of the Social Theory and Comparative History program.

**Graduate Adviser.** Consult the Program Director, Program office, or see http://chsc.ucdavis.edu for advising and detailed information on application and requirements.

**Courses in Social Theory and Comparative History (STH)**

**Graduate Courses**

**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. Prerequisites include Center for History, Society, and Culture faculty and visitors discussing current research. III (III)

**290. Advanced Topics in Social Theory and Comparative History (4)**
Seminar—3 hours; term paper. Prerequisite: consent of instructor and History 204 or Sociology 242A. Interdisciplinary study of particular substantive problems in social theory and comparative history. Topics vary—II, III (I, II, III)

**295. Advanced Group Research in Social Theory and Comparative History (1)**
Discussion—1 hour. Prerequisite: consent of instructor. Participation in research workshops sponsored by the Center for Comparative Research for History, Society, and Culture. May be repeated for credit (S/U grading only)—I, II, III (I, II, III)

**296. Theory and Society Journal Editorial Workshop (1-4)**
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)

**Gouldner**

**Social Theory**

[College of Letters and Science]

**James C. Cramer, Ph.D., Chairperson of the Department**

**Department Office.** 1282 Social Sciences and Humanities Building (530) 752-0782, http://sociology.ucdavis.edu

**Faculty**

Thomas D. Beamish, Ph.D., Associate Professor
Nicole W. Biggart, Ph.D., Professor (Sociology, Management)
Fred Block, Ph.D., Professor
Patrick Carroll, Ph.D., Associate Professor
Lawrence E. Cohen, Ph.D., Professor
James C. Cramer, Ph.D., Professor
Diane H. Feinleib, Ph.D., Professor
T. Ryken Graftet, Ph.D., Associate Professor
Laura Grindstaff, Ph.D., Associate Professor
Eric Grodsky, Ph.D., Assistant Professor
Drew Hallman, Ph.D., Assistant Professor
John R. Hall, Ph.D., Professor
Bruce D. Haynes, Ph.D., Professor
Mary Jackman, Ph.D., Professor
Carole E. Joffe, Ph.D., Professor
Carl C. Jorgensen, Ph.D., Associate Professor
David J. Kyle, Ph.D., Associate Professor
Ming-Cheng Lo, Ph.D., Associate Professor
William McCarthy, Ph.D., Professor
Dina O. Okamoto, Ph.D., Assistant Professor
Donald A. Palmer, Ph.D., Professor (Management)
Kimberlee A. Shauuman, Ph.D., Assistant Professor
Vicki Smith, Ph.D., Professor
Diane L. Wolf, Ph.D., Professor

**Emeriti Faculty**

Bruce M. Hackett, Ph.D., Professor Emeritus
John F. Loffland, Ph.D., Professor Emeritus
Lyn H. Lofland, Ph.D., Research Professor Emerita
John F. Scott, Ph.D., Professor Emeritus
John T. Walton, Ph.D., Research Professor Emeritus

**Affiliated Faculty**
Debora Paterniti, Ph.D., Associate-Adjunct Professor
Norman Skonavd, Ph.D., Lecturer

**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, intellectual quest for knowledge about the fundamental nature of things.

**The Program.** The Department of Sociology offers two major programs, Sociology and Sociology—Organizational Studies. Students selecting the Sociology major may choose from four options in the major. The General Sociology emphasis allows students to obtain a broad understanding of the concepts, methods, and theories of sociology. Students with a special interest in the areas of Law and Society or Social Services may choose a more specialized program of courses and practical experience within the sociology major. The Comparative Studies and World Development emphasis provides a sociological perspective on social and economic changes throughout the world, with a stress on relationships between “developed” and “underdeveloped” societies. In their junior year, students are encouraged to consider the Education Abroad Program—especially one in a developing country.

The Sociology—Organizational Studies major develops a broad understanding of the political, social, and economic organizations that comprise modern society. This major emphasizes a sociological 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 or 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 any entry requirements for programs of professional training leading to a Masters 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.**

Sociology 1, 46A, and 46B; or the equivalents
Sociology 2, 3, 4 or 5
Anthropology 2 or 20
Select from History 4A, 4B, 4C, 8, 9A, 9B, 10C, 15, 16A, 17B
Select from Philosophy 5, 14

**Depth Subject Matter.**

A (Sociology 100) .......................... 4
B (Select one course from each of the following four clusters) ................. 16
Individual, Culture, and Society: Sociology 125, 126, 135
Socialization and Social Differentiation: Sociology 130, 132, 140
Organizations and Institutions: Sociology 118, 131, 146, 180A
Social Dynamics: Sociology 104, 141, 143A, 170

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer. 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Social-Cultural Diversity; Wrt=Writing Experience
### Law and Society emphasis:

<table>
<thead>
<tr>
<th>Category</th>
<th>Units</th>
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<tbody>
<tr>
<td>Sociology 10, 123, 125, 128, 141, 143A, 145A, 145B, 147, 148,</td>
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<tr>
<td>156, 158, 172, 183, 185, 188, and not more than one of the following</td>
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<tr>
<td>courses: African American and African Studies 123, Asian American Studies</td>
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<tr>
<td>100, Chicano/o Studies 110, or Native American Studies 115</td>
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<tr>
<td>Organizations and Institutions: Sociology 118, 124, 131, 133, 138,</td>
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<tr>
<td>144, 146, 149, 150, 155, 157, 159, 180A, 180B, 181, 182, 183, 185</td>
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<tr>
<td>Social Dynamics: Sociology 104, 123, 125, 128, 141, 143A, 145A, 145B,</td>
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<tr>
<td>147, 148, 156, 158, 172, 183, 185</td>
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<tr>
<td>Student-initiated thematic cluster: developed with a faculty adviser and</td>
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<tr>
<td>approved by the Sociology Undergraduate Curriculum Committee</td>
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<tr>
<td>Eight units of Sociology beyond courses taken to fulfill above</td>
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<tr>
<td>requirements, and outside of the course cluster used to fulfill</td>
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<tr>
<td>requirement C.</td>
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<tr>
<td>One integrative course: prerequisite: senior standing and completion of</td>
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<tr>
<td>requirement for Preparatory Subject Matter, Depth Subject Matter, and</td>
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<tr>
<td>at least two of the courses for requirement B.</td>
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<tr>
<td>Sociology 190X, 191, 192/193, 194HA-194HB, 195</td>
<td></td>
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<tr>
<td><strong>Total Units for the Major</strong></td>
<td><strong>73</strong></td>
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</tbody>
</table>

### Comparative Studies and World Development emphasis:

#### Preparatory Subject Matter

| Sociology 1, 3, 46A and 46B (or the equivalents)                         | 17    |
| Anthropology 2 or 20.                                                    |       |
| Select from History 4A, 4B, 4C, 8, 9A, 9B, 10C, 15, 17A, 17B           |       |
| Philosophy 5 or 14.                                                     |       |
| **Depth Subject Matter**                                                | **44**|
| Sociology 100 and 155                                                    |       |
| Select courses from the following categories:                           |       |
| Individual Culture and Society: Sociology 125, 126, 128, 130, 132       |
| Stratification and Social Differentiation: Sociology 130, 132, 140        |
| Organizations and Institutions: Sociology 118, 124, 146, 149, 150,       |
| Crime and Social Dynamics: Sociology 120, 150, 151, 152                  |
| Stratifications and Social Dynamics: Sociology 120, 150, 151, 152        |
| African American and African Studies 121, 145A, 145B, Asian American     |
| Studies 155, Chicano/o Studies 130, 132, Native American Studies 117,    |
| 118                                                                       |
| Legal Studies: Philosophy 119, Political Science 122, 154, 161, 162,    |
| 163, 164, 170, 171, 172, 173, 174, 175, 176, 177, 178                    |
| Methodology: Prerequisite: senior standing and completion of requirement |
| for preparatory subject matter; select one course                      |
| Sociology 190X, 192/193, 194HA-194HB, 195                               |
| **Total Units for the Major**                                           | **73**|

### Sociology—Organizational Studies

#### Preparatory Subject Matter

| Sociology 1 or 2, 5, 46A, and 46B, or the equivalents                   | 16-17 |
| Economics 1A, 1B                                                      | 10    |
| **Depth Subject Matter**                                             | **44**|
| Sociology 180A, 180B                                                  |       |
| Select from Psychology 156, Communication 130 or 136                  |
| Select six courses from below, at least three courses                  |
| Sociology 190X, 192/193, 194HA-194HB                                  |
| **Total Units for the Major**                                         | **78-104**|

### Sociology—Regional Development

#### Preparatory Subject Matter

| Sociology 131, 140, 185                                                  | 12    |
| Select four units in Language and Communication psychology            |
| Psychology 140, 152, 168                                                |       |
| Select seven courses distributed as specified                         |
| Social Issues: Sociology 104, 120, 122, 124, 139, 143A, 144, 146, 150, |
| 152, 154, 155, 170                                                     |       |
| Social Interaction: Sociology 126, 128, 143B,                              |
| Race and Ethnicity: African American and African Studies 100, Community |
| and Regional Development 176, Asian American Studies 110, 111, 115,     |
| 117, 119, 120, 122, 124, 126, 128, 141A, 145B, 146B, 147, 148, 149, 150, |
| 152, 154, 155, 170                                                    |       |
| Organizational Behavior: Sociology 151, 180A, 180B, 181, 182, 183        |
| Methodology: Prerequisite: senior standing and completion of requirement|
| for preparatory subject matter: Sociology 103, 106, or the equivalents,|
| 190X, 192/193, 194HA-194HB, 195                                     |
| **Total Units for the Major**                                          | **70-71**|

### Minor Programs

#### Minor Program Requirements:

Students in other disciplines may elect to minor in Sociology by choosing a sociological subject emphasis listed below. On transcripts, the minor will appear as a minor in Sociology.

| Sociology                        | 20    |

### Honors Program

An Honors Program is available to students 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, the honors student writes an honors thesis and participates in a two-quarter honors seminar (course 194HA-194HB).

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 Web site.
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 Feminial Theory and Research. See these headings for further details on these interdisciplinary pro-
grams.

Graduate Advisers. Consult the Graduate Program Coordinator in 1287 Social Sciences and Humanities Building.

Courses in Sociology (SOC)

Lower Division Courses

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, ecology, role, status, and personality. GE credit: SocSci. —I, II, III, IV, V, VI.

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, iden-

3. Social Problems (4)
Lecture—3 hours; discussion—1 hour. General sociological consideration of contemporary social problems in relation to sociocultural change and pro-

4. Immigration and Opportunity (4)
Lecture—3 hours; discussion—1 hour. An introduction to change and diversity in world history, includ-
ing the United States. Examines population and family, technological change and economic develop-

11. Sociology of Labor and Employment (4)
Lecture—3 hours; discussion—1 hour. Labor and employ-
ment issues in the contemporary United States with some use of historical and comparative materials. Topics will include strategies pursued by employers and employees to counter market discrimination and the role of social policies in shaping labor markets. GE Credit: SocSci, Wrt.-II.

25. Sociology of Popular Culture (4)
Lecture—3 hours; discussion—1 hour. Social mecha-
nisms that shape popular culture. High, folk, and mass culture: historical emergence of popular culture. Mass media, commercialization, ideology and cultural styles. Theories and methods for analyz-

30A. Intercultural Relations in Multicultural Societies (3)
Lecture—1.5 hours; discussion—1.5 hours. Macro-
structural analysis of contemporary multicultural soci-
esties; immigration and assimilation in comparative perspective; social construction of racial and ethnic groups; ethnicity and gender; group conflict and cooperation; controversies surrounding multicultur-

30B. Intercultural Relations in Multicultural Societies (3)
Lecture—1.5 hours; discussion—1.5 hours. Prerequi-
site: course 30A or consent of instructor. Social-psycholog-
al analysis of personal experiences living in a multicultural society; conforming to or rejecting group identity or stereotypes; managing and reduc-
ning conflict; cross-cultural communication; promises and problems of diversity at UC Davis. Second course in a two-course Multicultural Immersion Pro-
gram. GE credit: SocSci, Div.-II.

46A. Introduction to Social Research (4)
Lecture—3 hours; discussion—1 hour or term paper or project (instructor’s option). Examination of the meth-
ological problems of social research. Selection and 
definition of problems of investigation, data-gathering techniques, and sampling.—I, II, III, IV, V, VI.

46B. Introduction to Social Research (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Data-analysis techniques, mea-
surement, scaling, multivariate analysis, and quantifi-
cation of mediating and moderating effects.—I, II, III, IV, V, VI.

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.

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. Primarily intended for lower division students. GE credit: SocSci, Div.-I, II, III, IV, V, VI, VII.

101. Sociology of Culture (4)
Lecture—3 hours; term paper. Prerequisite: upper divi-
sion standing or consent of instructor. Historical intro-
duction of sociological thought, with special refer-
tence to its 19th-century origins and 20th-century lines of development. Consideration of theoretical texts may include works of Marx, Durkheim, Simmel, early critical theorists, Parsons, and the Chicago School. Not open for credit to students who have received credit for course 165A. GE credit: Wrt.-I, II, III, IV, V, VI.

102. Society and Culture of California (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisi-
te: introductory course in Sociology recom-
mended. California’s distinctive society and culture; sociological analysis of topical issues concerning diversity, environment, cities.—II.

103. Evaluation Research Methods (4)
Lecture—3 hours; discussion—1 hour or field research (instructor’s option). Prerequisite: course 46A and 46B, or Statistics 13 or the equivalent. Sur-
veys applications of research methods to the evalua-
tion of social programs, particularly emphasizing methodological issues, e.g., research design and data collec-
tion; uses of evaluation research are also discussed and placed in theoretical context. Par-
ticipation in an evaluation project.—III.

104. The Political Economy of International Migration (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisi-

30A. Intercultural Relations in Multicultural Societies (3)
Lecture—1.5 hours; discussion—1.5 hours. Prerequi-
site: course 30A or consent of instructor. Social-psycholog-
al analysis of personal experiences living in a multicultural society; conforming to or rejecting group identity or stereotypes; managing and reduc-
ning conflict; cross-cultural communication; promises and problems of diversity at UC Davis. Second course in a two-course Multicultural Immersion Pro-
gram. GE credit: SocSci, Div.-II.

125. Sociology of Culture (4)
Lecture—3 hours; term paper or research project. Prerequisite: course 2. Everyday interaction in natural settings; ethnographic approaches to the understanding of social mean-
ings, situations, personal identity and human rela-
tionships. Particular attention to the work of Erving Goffman and to principles of field observation and qualitative analysis. GE credit: Wrt.-I, II, III, IV, V, VI.

129. Sociology of Black Experience in America (4)
Lecture—3 hours; discussion—1 hour or research or term paper (instructor’s option). Prerequisite: one course from courses 1, 2, 3, Afro-American Studies 10, Asian American Studies 1, 2, Chicano Studies 10, Native American Studies 1, 20. Analysis of the influences of cultural differences and racial strati-
fication on interpersonal interaction in instrumental set-
ings [e.g., work, education, political] and intimate settings [e.g., friendship, love, marriage, family]. minority-majority relationships. GE credit: Div.-I.
130. Race Relations (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. 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 relationships within the U.S. GE credit: Div.—I, II, (I, II.)

131. The Family (4)
Lecture—3 hours; discussion—1 hour. Contemporaneous family life in historical and cross-cultural perspective. Social change in family form and 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.—I, II, III, (I, II, III.)

132. The Sociology of Gender (4)
Lecture—3 hours; discussion—1 hour. Analysis of biological, psychological, cultural and structural conditions underlying the status and roles of men and women in contemporary society, drawing on a historical and comparative perspective. GE credit: SocSci, Div.—I, II, III, (I, II, III.)

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 implications 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 social movements for and against sexual equality. GE credit: Div.

134. Sociology of Racial Ethnic Families (4)
Lecture—3 hours; discussion—1 hour or term paper. Asian American, Black, Chicano, and Native American family life in comparative historical perspective. Family structure and gender roles are considered in relation to socio-historical dynamics. Offered in alternate years. GE credit: Div, Wrt.

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. Wrt.—II, (II.)

137. African American Society and Culture 1790-1990 (4)
Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: course 1. Political and social transformation of African American communities 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: Wrt.—II, (II.)

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.—I, II, III, (I, II, III.)

139. Corporations and Society (4)
Lecture—3 hours; discussion—1 hour or 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; politics, the state, and the corporation; labor unions and the labor process; competition, regulation and international markets; the multinational and conglomerate corporation; and mass markets and consumerism.—I, II, III, (I, II, III.)

140. Social Stratification (4)
Lecture—3 hours; discussion—1 hour or term paper or research project (instructor's option). Systems of social ranking, theories of stratification; power, prestige, culture, and inequality of life of various social classes; social mobility and its consequences for social structure.—I, II, III, (I, II, III.)

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 cultural issues at various levels of economic development. Major historical differences and major current trends. Emphasis either on highly industrialized countries or on less developed countries. GE credit: Wrt.—I, II, III, (I, II, III.)

143A. Urban Society (4)
Lecture—3 hours; discussion—1 hour or term paper or project (instructor's option). Prerequisite: course 1 or the equivalent. Theories of cities and origin. Analysis of the historical process of urbanization and of varying city types. Comparison of American and European experience of metropolitanization, counterurbanization, and neighborhood change. Consideration of competing forces that shape urban growth and change and competing visions of the urban future. Offered in alternate years.—II, (III.)

143B. Sociology of City Life (4)
Lecture—3 hours; discussion—1 hour or term paper or project (instructor's option). Prerequisite: course 1 or the equivalent; course 143A recommended. Critic dissection of the “loss of community” issue. Analysis of the organization of primary ties in the city, the nature and content of the learning of city skills. Offered in alternate years. GE credit: Wrt.—III.

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 development of the labor force and family farms. Analysis of issues including mechanization, migrant labor, corporate farming, and public resource policy. Offered in alternate years.—II.

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/agrarian change, class, status groups, international division of labor, sectoral shifts, international capital, informal economic networks, and processes among developing countries are analyzed within a comparative-historical framework. GE credit: Div. Wrt.—II, (II.)

145B. Gender and 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 socioeconomic change in the world with particular attention to the family, household and change and development of agriculture. Offered in alternate years. GE credit: Div. Wrt.—II.

146. Sociology of Religion (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Relationship between social structure and religious beliefs and practices of the major world religions. Religious innovators and institutionalization (churches, sects, cults). Secularization in the modern world and the rise of secular ideologues. Offered in alternate years. GE credit: SocSci, Div, Wrt.—I.

147. Sociological Perspectives on East Asia (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Preconceptions and concepts applied toward understanding East Asian society. Emphasis on the political structure, stratification, and economy in China and Japan. Analysis of historical and contemporary similarities and differences. Offered in alternate years.—III.

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 crowd panics, mass scares, collective protests, riots, revolutionary situations, ecstatic and revivalist gatherings, crazes, fads, and fashions.—III.

149. Religion and American Society (4)
Lecture—3 hours; class project. Historical, contemporary and future survey of religious traditions and organizations and their relation to U.S. social and cultural patterns. Civil religion, religious pluralism, minority and deviant communities, religious migration, U.S. religion as a social institution. Offered in alternate years. GE credit: Div, Wrt.—III.

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 criminalization process.—III, (I, III.)

151. The Criminal Justice System (4)
Lecture—3 hours, term paper or discussion—1 hour. Prerequisite: course 130 and upper division standing. Sociological analysis of the different components of the criminal justice system including the emergence and interpretation of criminal laws, the contemporary role of the court, criminal courts and correctional institutions.—II, (II.)

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 processing of the delinquent by formal agencies of control.—I, II, III, (I, II, III.)

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 organizational, institutional, and social psychological aspects.—II, (II.)

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 society as affecting judicial decision making and administration of justice. Lawyers as an occupational group. Legal reform.—I, III, (I, III.)

156. Social Movements (4)
Lecture—3 hours; discussion—1 hour or term paper or research project (instructor's option). Analysis of selective aspects of social movements: mobilization, forms of organization, ideology, recruitment, leadership, strategies and tactics, development, effects. Frequent use of sound and film materials. GE credit: SocSci, Div.—II, III, (II, III.)

157. Social Conflict (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Analysis of the causes, dynamics, and regulation of social conflict within and between various kinds of social groupings with particular reference to nonviolent methods of waging and regulating conflict.—II.

159. Sociology of Occupations (4)
Lecture—3 hours; discussion—1 hour or term paper or research project. Natural history of occupations; the institutional matrix of occupations; colleague and client relationships, occupational social controls; career lines, and occupational-related self definitions; occupational politics.—II, (II.)

160. Sociology of the Environment (4)
Lecture—3 hours; term paper. Prerequisite: upper division standing in Sociology recommended. Population, consumption, and urbanization. Basic social logics surrounding current problems of resource scarcity (environmental extractions) and excess wastes (environmental additions). Ways that society can change and organize itself to become more environmentally conscious and hence ecologically sustainable.—II.
170. Population (4) Lecture—3 hours; discussion—1 hour or term paper or research project. Introduction to the study of human population, including theories and statistical measures; social causes and consequences of population trends; changes in population structure; geographic distribution, migration, socio-psychological factors affecting fertility. GE credit: SocSci. —I, II, III.

171. Sociology of Violence and Inequality (4) Lecture/discussion—4 hours. Prerequisite: upper-division standing or consent of instructor. How systems of social inequality organize the practice of violence. Definitions of violence and issues affecting the social problem of violence. Analysis and comparison of different forms of violence associated with race, class, gender relations and social organization. —II, III.

172. Ideology of Class, Race and Gender (4) Lecture—4 hours. Examination of popular belief systems that accompany relations between social classes, whites and blacks, and men and women in the United States. History and attempt to justify each relationship, and is there ideological conflict or consensus between groups. GE credit: Div. Wrt. —I, II.

173. Sociology Through Literature (4) Lecture—4 hours; discussion—1 hour or term paper or research project. Introduction to analysis of literature as sociological data. Reading of numerous works on American and other societies by authors such as Steinbeck, Lewis, Dreiser, Schuberg, Orwell, etc. Offered in alternate years.

174. Sociology of the Jewish Experience (4) Lecture—3 hours; term paper or discussion—1 hour. Prerequisite: upper division standing required. The sociology of Jewish life, analyzing challenges to Jewish identity and community in the diaspora. Diversity within the Jewish community. Americanization, women, new immigrants, post-Holocaust Jewish identity, and Black-Jewish relations. Offered in alternate years. —III.

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.

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. Laboratory and historical case studies. Scientific and technical knowledge in institutional and organizational contexts. [Same course as Science and Technology Studies 176.]—I, II, III.

180A. Complex Organizations (4) Lecture—3 hours; discussion—1 hour or term paper or research project. Course 1, Economics 1A and 1B recommended. Develops a sociological approach to organizations theory. Designed to introduce sociological concepts, address the alternative psychodynamic models, and involve students in the practice of organizational analysis. —I, II, III.

180B. Complex Organizations (4) Lecture—3 hours; discussion—1 hour or term paper or research project. Course 180A or consent of instructor. Builds on concepts and skills developed in course 180A. 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. —II, III.

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, emphasizing voluntary associations and grassroots citizen groups. Topics treated include formation, decision making, strategies and tactics, factionalism and coalitions, effectiveness. Offered in alternate years. GE credit: Wrt. —III.

182. Experimental and Utopian Communities (4) Lecture—3 hours; discussion—1 hour. The social structure of intentional, experimental or utopian settlement and communal movements, including comparison with voluntary association, alternative models, and the development of community-based organizations in the United States. Offered in alternate years. —III.

183. Comparative Organizations (4) Lecture/discussion—3 hours; term paper. Prerequisites: course 180A or 180B; upper division standing. Examination of economic and political organizations of major industrial nations. Discussion of historical, cultural, social, and political institutions on an industrial patterns and practices, alternative theoretical models for explaining conceptual development. Offered in alternate years. —I, II.

184. 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 society. —I, II.

185. Sociology of Social Stratification in China (4) Lecture—3 hours; term paper. Prerequisite: upper division standing. Social and political systems and patterns of social stratification in relation to change and stability in China since 1949. Offered in alternate years. —I.

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.

190X. Seminar in Sociological Analysis (4) Seminar—3 hours; discussion—1 hour or term paper. Prerequisite: course 100 (former 165A) and senior standing. Workshop in contemporary sociological analysis, examination of topics in sociology. Emphasis on student participation in learning. May not be repeated for credit. Limited enrollment. —I, II, III.

191. Workshop in Contemporary Sociological Theory (4) Lecture—2 hours; workshop—1 hour; term paper. Prerequisite: course 100 (former 165A) and senior standing. Workshop in contemporary 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 and modern influences, concept formation, theory construction, and explanation. Not open for credit to students who have received credit for course 158B. —I, II.

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. Maximum of 4 units may be counted toward the major. (P/NP grading only.) —I, II, III, IV. —I, II, III, IV.

193. Workshop in Field Research (2) Lecture/discussion—2 hours. Prerequisite: course 46A. Course 192 recommended for two or 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 to students who have completed course 194AH. —I, II, III, IV. —I, II, III, IV.

194HA-194HB. Special Study for Honors Students (4-4) 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 direction of faculty adviser. (Deferred grading only pending completion of sequence.) —I, II, III.

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. —I, II, III, IV.

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.) —I, II.

198. Directed Group Study (1-5) Prerequisite: consent of instructor. (P/NP grading only.) —I, II, III, IV.

199. Special Study for Advanced Undergraduates (1-5) Prerequisite: open to seniors only. (P/NP grading only.) —I, II, III, IV.

Graduate Courses

201. Social Research (4) Lecture/discussion—3 hours; term paper. Prerequisite: graduate standing, or consent of instructor. Survey of sociological inquiry; taught as practice. Philosophy of social science; values and research; research agendas and research problem formulation; research process; explanation vs. interpretation; study design; concept formation, measurement, sampling, data acquisition, inference; rhetoric and presentation of findings. —I, II.

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 research in sociology, with an emphasis on multivariate regression analysis, as well as measurement theory and time series analysis. (S/U grading only.) —I, II.

207A-207B. Methods of Quantitative Research (4-4) Lecture—3 hours; paper. Prerequisite: course 106 or the equivalent. Principles of study design, examination of measurement, survey research methods and multivariate analysis. Course will stress actual practices of techniques. Students will carry out quantitative data analysis using packaged computer programs. (Deferred grading only, pending completion of sequence.) —I, II.

208. Topics in Advanced Quantitative Methods in Social Sciences (4) Seminar—3 hours; term paper. Prerequisite: course 206 or the equivalent and graduate standing. Analysis of the logic and application of an advanced statistical model; the 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 for credit when topic differs. Offered in alternate years. —I, II.

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 economics and political sociology and political economy. —I, II.

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer. 2007-2008 offering in parentheses

220. Deviance, Law, and Social Control (4) Seminar—3 hours; projects. Prerequisite: course 120 or consent of instructor. Report and discussion of literature on selected forms of deviance in relation to law and formal social control. Agency contacts and exploratory research projects. —(II.)

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 and sociological interpretation and application to educational policy. Topics include tracking, racial/ethnic achievement inequalities, school organization, and the immigrant experience. —(I.)

225. Cultural Sociology (4) Seminar—3 hours, term paper. Explores the varied ways in which culture is understood 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. —(I.)

226. Sociological Social Psychology (4) Seminar—3 hours; seminar paper — 1 hour. Prerequisite: graduate standing or consent of instructor. Advanced study of the varying approaches, methods, issues and topical concerns of sociological social psychology. Emphasis on both theoretical and empirical frameworks; recording, storing, retrieving, and writing sociological research papers. Focus on the current interest in the United States. Offered in alternate years.

230. Ethnic (Race) Relations (4) Lecture—3 hours; discussion—1 hour. Recent social science scholarship in such areas as teenage pregnancies, family planning, adoption, AIDS, and new reproductive technologies; focus on the current situation in the United States. Offered in alternate years.

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 contexts. Course covers theory, methodological issues, and relationship between theory and practice in alternate years. —(II.)

234. Gender, Family, and Society (4) Seminar—3 hours; seminar paper. Prerequisite: graduate standing or consent of instructor. Major theoretical traditions and concerns in family sociology and sociology of gender. Analysis of selected classical and contemporary works representative of functionalism, Marxism, psychoanalytic, feminist and critical theoretical approaches to these subjects (e.g., Engels, Parsons, Freud, Horkheimer, Goode, Lasch, Mitchell). Emphasis on macro and historical questions. —(III.)

242A-242B. Comparative Methods in Historical Sociology (4-4) Seminar—3 hours or 2 hours and paper. Prerequisite: graduate standing or consent of instructor. Comparative approaches to major historical phenomena such as nationalism, bureaucratization, feudalism, and capitalism; the relevance of psychology and sociological theories to historical interpretation; the verifiability of historically grounded hypotheses; the meaning of analogy, correspondence and causality. (II [as a 2-hour course]; deferred grading only, pending completion of sequence) — (I.) (II.) (III.)

243. Urban Society (4) Seminar—3 hours; term paper. Broad overview of the issues and concerns of the field of urban sociology with special emphasis on the human experience of urban living in contemporary, cross-cultural or historical settings. I. (I.)

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 interdependence in the global political economy. Offered in alternate years. —(I.)

248. Social Movements (4) Seminar—3 hours; term paper. Analysis of current issues in and contributions to the study of collective behavior and social movements; particular focus upon the strategies and tactics of social movements. —(III.)

254. Sociological Issues in Health Care (4) Seminar—3 hours; term paper. Prerequisite: open to graduate or professional students. Sociological perspectives and methods directed 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)—I.

255. Sociology of Law (4) Seminar—4 hours. Prerequisite: consent of instructor. Analysis of the nature of the legal process and the impact on social behavior. Will consider (1) nature and functions of law, (2) the organization and administration of law, and (3) the capacity of law to affect social behavior. —(II.)

265A. Classical Sociological Theory (4) Lecture—3 hours; discussion—1 hour. Introduces graduate students to the world 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.—(II.)

265B. Theory in Contemporary Sociology (4) Lecture—3 hours; discussion—1 hour. 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. —(II.)

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 fertility-related attitudes and behaviors, on less-developed countries, and on contemporary empirical studies.

280. Organizations and Institutions (4) Seminar—4 hours. Theory of formal organizations and bureaucracies. Methods of research in organizational and institutional studies. Historical and comparative analysis of political, religious, educational, military, and economic structure. —(III.)

290. Seminar (4) Seminar—3 hours; term paper. (S/U grading only.)

292A-292B. 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 documentary 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. (Deferred grading only, pending completion of sequence.) — (I. I.) (II.)

293. Proseminar in Sociology (2) Seminar—2 hours. Prerequisite: first-year Sociology graduate students only. 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)—(III.)

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.—I, 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 Courses

390A. The Teaching of Sociology (2) Lecture—1 hour; discussion—1 hour. Prerequisite: graduate standing. Practical instruction in teaching methods for qualitative and quantitative courses. Pedagogical issues involved in critical sociological analysis. (S/U grading only.)—I. (I.)

390B. The Teaching of Sociology (2) Lecture—1 hour; discussion—1 hour. Prerequisite: graduate standing. Practical instruction in preparing course syllabi, lectures and assignments for Associates-Instructors and others interested in college teaching. Discussion of pedagogical methods of teaching qualitative and quantitative courses. (S/U grading only.)—II. (II.)

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 Course

466. Research Paper Workshop (2) Workshop—1.5 hours; discussion—0.5 hours. Prerequisite: Master of Arts standing. A 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 Geology, on page 284; Soil Science, on page 447; Soils and Biogeochecmy (A Graduate Group), on page 449; and Soil and Water Science, on page 449.

Soil Science

[College of Agricultural and Environmental Sciences]

Faculty

See under the Department of Land, Air, and Water Resources, on page 320.

Major Programs. See the major in Soil and Water Science, on page 449.

Minor Program Requirements: The Department of Land, Air, and Water Resources, Soils and Biogeochecmy Program, offers a minor program in soil science. The minor is especially geared toward students in the environmental sciences, including Hydrologic Science, Environmental and Resource Sciences, Environmental Toxicology, Agricultural Management and Rangeland Resources, International Agricultural Development, Crop Science and Management, Environmental Biology and
Management, Environmental Horticulture and Urban Forestry, Geology, and Plant Biology.

**Soil Science**

- **107. Soil Physics**
  - Lecture—3 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 100, 118, and 120 or equivalent. Field-based soil studies in California ecosystems. Description and classification of soils; interactions among vegetation, pedology, and climate; and climate, physical, chemical, and biological processes; their role in land use. Limited enrollment.—(I.) Horwath

- **111. Soil Microbiology**
  - Lecture—3 hours; laboratory—3 hours. Prerequisite: Chemistry 1C and Biological Sciences 1C. Major groups of microorganisms in soil, their interactions, and their responses to environmental variables. Role of microorganisms in cycling of nutrients. Plant-microbe relationships. Transformations of organic and inorganic pollutants.—II. (III.) Scow

- **112. Soil Ecology (3)**
  - Lecture—2 hours; laboratory/discussion—2 hours. Prerequisite: Biological Sciences 1B, 1C, course 100. The biology and ecology of soil communities, emphasizing the role of food web and litter decomposition. Role of specific biota, ranging from microorganisms to earthworms. Applications to restoration, remediation, ecosystem science, and agriculture. GE credit: Wrt.—I. (I.) Jaffee

- **118. Soils in Land Use and the Environment (4)**
  - Lecture—3 hours; discussion—1 hour; one one-day field trip. Prerequisite: course 100 or consent of instructor. Soils are considered as elements in land use planning and environmental quality. Topics include: soil survey reports, remote sensing, land capability classification, soil erosion/conservation, waste disposal on soils and soil reclamation.—III. (III.) Singer

- **120. Soil Genesis, Morphology, and Classification (5)**
  - Lecture—4 hours; laboratory—3 hours (includes five one-day weekend field trips). Prerequisite: course 100; Geology 50 recommended. Recognition and description of soils; chemical, biological and physical processes of soil formation. Factors of soil formation. Interactions between soil in the diverse ecosystem. Introduction to soil classification. Practice using soil taxonomy. Practical experience describing soil properties in the field.—III. (III.) Southard

- **122. Organic Chemistry of Soil (3)**
  - Lecture—3 hours. Prerequisite: Chemistry 8A-8B; course 111; Biological Sciences 102, 103 or an equivalent course recommended. Metabolism of organic chemicals in soils, both natural and xenobiotic. Decomposition of organic matter. Kinetics of microbial processes in soil. Offered in alternate years.—(I.) Bledsoe

- **208. Soil-Plant Interrelationships (3)**
  - Lecture—3 hours. Prerequisite: course 100, Plant Biology 111B, or consent of instructor. Plant nutrient acquisition and use in soils; root systems and their growth in soils; mass flow and diffusion mechanisms in nutrient acquisition; models relating nutrient uptake to soil and plant characteristics; nutrient assimilation and crop quality. Offered in alternate years.—II. (III.) Zasoski

- **209. Physiology and Ecology of Mycorrhizal Symbioses (3)**
  - Lecture/discussion—3 hours. Prerequisite: Plant Biology 111 or consent of instructor; course 100 recommended. Structure, function and evolutionary development of mycorrhizal fungi and the root-fungus symbiosis. Emphasis on regulation of carbon and nutrient exchanges between host and symbiont. Course integrates mycorrhizal physiology and ecology in an ecosystem context. Offered in alternate years.—(I.) Southard

- **211. Advanced Soil Microbiology (3)**
  - Lecture—3 hours. Prerequisite: Chemistry 8A-8B, course 111; Biological Sciences 102, 103 or an equivalent course recommended. Application of microbial metabolism of organic chemicals in soils, both natural and xenobiotic. Decomposition of organic matter. Kinetics of microbial processes in soil. Offered in alternate years.—III. (III.) Scow

- **216. Physical Geochemistry (3)**
  - Lecture—3 hours. Prerequisite: course 102 or Chemistry 110A or Geology 115 and Mathematics 119. First half emphasizes equilibrium thermodynamics, including choices of standard states, ideal solutions, and the use of the Gibbs-Duhem relation. Second half covers geochemical kinetics including simple rate laws, transition state theory, solute diffusion, and experimental methods.—I. (I.) Southard

- **218. Soil Erosion and Conservation (3)**
  - Lecture—2 hours; discussion—1 hour. Prerequisite: graduate standing; courses 118, 120. Processes of soil erosion by wind and water in agricultural areas, and methods of soil conservation. Topics include: soil erosion, soil erosion control, riparian buffers, and soil conservation planning. Methods of predicting rates of soil erosion will be considered. Offered in alternate years.—II. (III.) Singer

- **219. Ecosystem Biogeochemistry (4)**
  - Lecture—3 hours; laboratory/discussion—2 hours. Prerequisite: introductory courses in ecology/biology and soils and recommended; undergraduates accepted with consent of instructor. Multidisciplinary 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 Ecology 219)—III. (III.) Dahlgren

- **220. 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 once for credit. Offered in alternate years.—(I.) Southard

- **222. Organic Chemistry of Soil (3)**
  - Lecture—3 hours. Prerequisite: Chemistry 8A, 8B, Mathematics 16A, 16B, course 100 or the equivalent. Structure and function of soil organic matter.
Soils and Biogeochemistry (A Graduate Group)

Louise E. Jackson, Ph.D., Chairperson of the Group

Soils and Biogeochemistry (A Graduate Group) offers programs of study and research leading to the M.S. and Ph.D. degrees. Soils and biogeochemistry focuses on study of the physical, chemical and biological processes that occur in soils of different landforms and ecosystems. The goal is to understand the chemical processes of mass and energy flow that control agricultural and natural ecosystem functions, productivity, and sustainability. These studies assess impacts and implications of natural processes and anthropogenic effects, such as climate change, on soil and ecosystem behavior and development. Examples include: pesticide and trace element adsorption on surfaces, mineral weathering, fate and transport of native and applied chemicals, soil microbial ecology, fate and emission of greenhouse gases; soil carbon sequestration, nutrient uptake and management; nutrient cycling in managed and wildland ecosystems; organic agriculture; bioavailability of toxics; soil erosion; conservation, ecosystem productivity and sustainability; and the study of soil evolution on the landscape. These studies are carried out within a framework of integrating applied chemical, physical, mathematical, and biological sciences.

Graduate Advisers, C.S. Bledsoe, K.M. Scow [Land, Air, and Water Resources]
Graduate Admissions Officer, Wendy K. Silk [Land, Air, and Water Resources], (530) 752-0686, wksilk@ucdavis.edu.

Soil and Water Science

(College of Agricultural and Environmental Sciences)

The Major Program

Soil and water science is concerned with the use and protection of our land and water resources. The major teaches students scientific principles for managing soil and water resources to benefit both agriculture, forestry and the environment.

The Program. Major programs include land use, soil survey, soil management and conservation, plant nutrition, biological technology, irrigation and drainage, water resources management, water quality, and related environmental problems; for example, the emphasis on water quality would include more than the minimum number of units of physical and biological sciences, while an emphasis in resource allocation and land-use planning would include more courses in the social, political, and economic areas.

Internships and Career Alternatives. Before they graduate, many students receive practical work experience through student internships with state and federal agencies, soil and plant labs, and growers. Students also have the opportunity to work on research projects with faculty members and to develop individual research or study topics. Graduates are qualified for managerial and technical positions with environmental and agricultural businesses. They are also prepared for positions in advising, planning, land appraisal, and research and teaching with private, government, and international organizations involved with soil and water development, use, and conservation. Some graduates also continue in master's and doctoral programs in soil science, hydrologic science, ecology, and plant physiology.

Spanish

(College of Letters and Science)

Emilio Beijel, Chairperson of the Department

Department Office. (Spanish and Classics), 616 Sproul Hall (530) 752-0835, http://spanish.ucdavis.edu

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer, 2007-08 offering in parentheses


B.S. Major Requirements: UNITS

English Composition Requirement .........4-12
See College requirement .................0-6
Communication 1 .....................4

Preparatory Subject Matter .............74

Soil Science 1A, 1B, 1C .................15
Chemistry 2A-2B-2C and a more advanced course ..................18
Agricultural Management and Rangeland Resources 21 or Engineering 5 or one Ecological course with adviser's approval ...........3
Economics 1A, 1B ..........................3
Geology 50 ...............................3
Mathematics 16A, 16B ......................6
Physics 7A-7B-7C ..........................12
Statistics 13, 100 or Agricultural Management and Rangeland Resources 120 .................................4
Additional physical sciences, biological sciences, and/or mathematics with approval of adviser .............................0

Breadth/General Education ..............15-33

Satisfaction of General Education requirement ..............................................6-24

At least one upper division course from each of the following areas, with approval of adviser:
1) resource management
2) environmental law
3) environmental economics and decision making .................................9

Depth Subject Matter .......................30

Soil Science 100 ............................4
Agricultural and Resource Sciences 100, 100L ..........................6
Additional upper division units in soil science and hydrologic science ........20

Restricted Electives ......................27

To supplement or expand areas of student interest selected with approval of adviser .................24
Special study or experience, 192 or 199 course in the major area .................3

Total Units for the Degree ...............180

Major Adviser, W. Horwath [Land, Air, and Water Resources]

Advising Center for the major is located in 1152 Plant & Environmental Sciences Building (530) 752-1669. Contact Marlyn Potters at mnpotters@ncsu.edu

Graduate Study. Graduate programs are available in Soils and Biogeochemistry as well as Hydrologic Sciences. Detailed information can be obtained from the Graduate Advisers and the Graduate Announcement. See also Graduate Studies, on page 97, in this catalog.

Courses. For specific courses of instruction in this major, see course listings under Atmospheric Sciences, Plant Science, Environmental and Resource Sciences, Soil Science, and Hydrologic Science.


Spanish

(College of Letters and Science)

Emilio Beijel, Chairperson of the Department

Department Office. (Spanish and Classics), 616 Sproul Hall (530) 752-0835, http://spanish.ucdavis.edu
Spanish

Faculty
Marta E. Allen, Ph.D., Associate Professor
Samuel G. Armistead, Ph.D., Professor
Emilio C. Bravo, Ph.D., Professor
Robert Blake, Ph.D., Professor
Travis Bradley, Ph.D., Assistant Professor
Cecilia Colombo, Ph.D., Associate Professor
Michael J. García, Ph.D., Assistant Professor
Linda Egan, Ph.D., Associate Professor
Cristina González, Ph.D., Professor
Robert Irwin, Ph.D., Associate Professor
Adrienne Moreau, Ph.D., Associate Professor
Christine Martinez-Cerzo, Assistant Professor
Almerinda Ojeda, Ph.D., Associate Professor
Linguistics
Ana Peluffo, Ph.D., Assistant Professor
Emeriti Faculty
Zunilda Gertel, Ph.D., Professor Emerita
Miguel González, Ph.D., Lecturer Emeritus
Didier T. Jaén, Ph.D., Professor Emeritus
Fabian A. Samaniego, M.A., Senior Lecturer Emeritus
Robert M. Scari, Ph.D., Professor Emeritus
Hugo J. Verani, Ph.D., Professor Emeritus
Affiliated Faculty
Francisco Alarcon, M.A., Lecturer
Norma López-Burton, M.A., Lecturer
The Major Program
The Spanish major program assures proficiency in all four language skills—speaking, understanding, reading, and writing—and acquaints students with the intellectual and cultural contributions of the Spanish-speaking world through a study of its language, literature, and traditions.

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. The upper division program gives students a solid foundation in the Spanish language, literature and culture, and Hispanic 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.

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:

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<tr>
<th>UNITS</th>
<th>Spanish Courses</th>
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<tbody>
<tr>
<td>4-37</td>
<td>Spanish 1, 2, 3, 21, 22, 23, and 24 = 0.33 or Spanish 31, 32, 33 = 0.15</td>
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<tr>
<td></td>
<td>Spanish 111N, 115, 116, 130, 131N, 134N, 150N, 151N, or 157</td>
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<tr>
<td>4</td>
<td>Spanish 117, 117N, 174, 176</td>
</tr>
<tr>
<td></td>
<td>Spanish 194H</td>
</tr>
</tbody>
</table>

One course in each of the following five areas:

- Spanish 100 = 4
- Spanish 111N, 115, or 116 = 4
- Spanish 130, 131N, or 134N = 4
- Spanish 150N, 151N, or 157 = 4
- Spanish 117, 117N, 174, or 176 = 4

Students planning to take Spanish 110 should do so at the beginning of the upper division sequence or concurrently with Spanish 100.

Seven elective courses to be chosen in consultation with the student's major adviser:

(a) Spanish literature
(b) Spanish-American literature
(c) Chicano/Latino literature
(d) Spanish linguistics
(e) Hispanic linguistics

Minimum GPA: 2.60

Total Units for the Major: 49-85

Major Advisers. Consult Department.

Minor Program Requirements:

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<th>UNITS</th>
<th>Spanish Courses</th>
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<tr>
<td>23-24</td>
<td>One course in each of the following five areas:</td>
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<tr>
<td></td>
<td>Spanish 100 = 4</td>
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<td></td>
<td>Spanish 111N, 115, or 116 = 4</td>
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<tr>
<td></td>
<td>Spanish 130, 131N, or 134N = 4</td>
</tr>
<tr>
<td></td>
<td>Spanish 150N, 151N, or 157 = 4</td>
</tr>
<tr>
<td></td>
<td>Spanish 117, 117N, 174, or 176 = 4</td>
</tr>
</tbody>
</table>

One upper division elective in Spanish.

Consla as a departmental adviser 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 may 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.

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. Students will earn 15-22 UC Davis units toward the Spanish major, minor, or foreign language requirement. Each program has an upper division course taught by the UC Davis Program Director focusing on history, culture, and society.

For more information, contact Dr. Colombe or see http://shorttermabroad.ucdavis.edu.

Teaching Credential Subject Representative. C. Colombe, see the Teaching Credential/M.A. Program on page 102.

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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. Students will earn 15-22 UC Davis units toward the Spanish major, minor, or foreign language requirement. Each program has an upper division course taught by the UC Davis Program Director focusing on history, culture, and society.

For more information, contact Dr. Colombe or see http://shorttermabroad.ucdavis.edu.
the supervision of UC Davis faculty. Not open for credit to students who have completed course 21 or 21S.

2V. Elementary Spanish (5)
Lecture/discussion—2 hours; web electronic discussion—3 hours. Prerequisite: course 1 or 1S. Continuation of course 1 or 1S in the areas of grammar and basic language skills. Hybrid format combining classroom instruction with technologically based materials. Not open to students who have taken course 2 or 2S. I, II, III, IV. (I, II, III, IV)

3. Elementary Spanish (5)
Lecture/discussion—5 hours; laboratory—1 hour. Prerequisite: course 2 or 2S. Completion of grammar sequence and continuing practice of all language skills using cultural texts. Not open for credit to students who have completed course 35—II, II, III. (I, II, III)

35. Elementary Spanish (5)
Lecture/discussion—5 hours; laboratory—1 hour. Prerequisite: course 2 or 2S. Completion of grammar sequence and continuing practice of all language skills using cultural texts. Offered in a Spanish speaking country under the supervision of UC Davis faculty. Not open for credit to students who have completed course 35—II, II, III. (I, II, III)

3V. Elementary Spanish (5)
Lecture/discussion—2 hours; web electronic discussion—3 hours. Prerequisite: course 2, 2S, or 2V. Completion of grammar sequence and continuing practice of all language skills using cultural texts. Hybrid format combining classroom instruction with technologically based materials. Not open to students who have taken course 3 or 3S. I—II, III, IV. (I, 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 control. Practice of everyday situations. Not open to native speakers or to upper division students. I, II, III.

21. Intermediate Spanish (5)
Lecture/discussion—5 hours; laboratory—1 hour. Prerequisite: course 3 or 3S. 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 21—II, II, III.

215. Intermediate Spanish (5)
Lecture/discussion—5 hours; laboratory—1 hour. Prerequisite: course 3 or 3S. 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—II, II, 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 concepts and further practice on composition. Development of all language skills through exercises and reading of modern texts. Not open for credit to students who have completed course 22—II, III.

225. 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 concepts and further practice on composition. Development of all language skills through exercises and reading of modern texts. Offered in a Spanish speaking country under the supervision of UC Davis faculty. Not open for credit to students who have completed course 22—II, III.

23. Spanish Composition I (4)
Lecture—3 hours; extensive writing. Prerequisite: course 22 or 22S. Development of writing skills by way of reading, discussion, and analysis of authentic materials, literary texts, and videos. Selective review of grammar. Composition, journals, individual and group projects. Not open for credit to students who have completed 23S. I—II, III, IV. (I, II, III, IV)

235. Spanish 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. Composition, journals, individual and group projects. Course is taught in a Spanish speaking country. Not open for credit to students who have completed course 23. I—II, III.

24. Spanish Composition II (4)
Lecture—3 hours; extensive writing. Prerequisite: course 23 or 23S. Development of advanced level writing skills, with particular emphasis on essay writing. Expository prose, essays, and research papers. Introduction to the analysis of literary genres. Compositions, journals and individual and group projects. Not open for credit to students who have completed course 24S. I—II, III, IV. (I, II, III)

245. Spanish Composition II (4)
Lecture—3 hours; extensive writing. Prerequisite: course 23 or 23S. Development of advanced level writing skills, with particular emphasis on essay writing. Expository prose, essays, and research papers. Introduction to the analysis of literary genres. Compositions, journals and individual and group projects. Course is taught in a Spanish speaking country. Not open for credit to students who have completed course 24. I—II, III.

28. Intermediate Spanish Conversation (2)
Discussion—3 hours. Prerequisite: course 8 or 22. Continuation of course 8. Designed to develop oral communication skills at a more advanced level. Practice in more complex situations. Former course 9. I—II, III, IV, (I, II, III)

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. Development of all language skills through reading of modern texts, presentation/discussion of major ideas, vocabulary expansion, and writing essays on topics discussed. Designed for students whose native language is Spanish. Former course 7B. I—II, III.

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 texts, presentation/discussion of major ideas, vocabulary expansion, and writing essays on topics discussed. Designed for students whose native language is Spanish. Former course 7C. I—II, III.

98. Directed Group Study (1-5)
Prerequisite: consent of instructor and Department Chairperson. Primarily for lower division students. (P/NP grading only.)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)
110. Survey of Spanish Literature to 1700 (4)
Lecture—3 hours; term paper. Prerequisite: course 100. Survey of Spanish literature (narrative, poetry and drama) to 1700. Emphasis on the multicentric birth of the Spanish culture, the formation and growth of the Spanish language and letters through its written records and the literature of the early period. (Part of former courses 103A and 103B.)—I. (I.) Armistead, Martin

112N. Medieval and Renaissance Spanish Literature (4)
Lecture—3 hours; term paper. Prerequisite: course 100. Introduction to the study of the principal works and authors of Medieval and early 16th-century Spanish literature. (Part of former courses 112 and 103A.)—I. (I.) Armistead

113N. Golden Age Literature of Spain (4)
Lecture—3 hours; term paper. Prerequisite: course 100. Introduction to the principal authors and literary movements of the 16th and 17th-century Spain and Spanish American colonial literature. (Part of former courses 103B, 109 and 115.)—I. (I.) Martin

114N. Don Quijote (4)
Lecture—3 hours; term paper. Prerequisite: course 100. A critical reading of Don Quijote by Cervantes. Focused interpretations of important passages and characters in the context of the socio-cultural background of the period. Don Quijote as prototype for the modern novel. Offered in alternate years. (Former course 111.)—I. (I.) Armistead

115N. Spanish Romanticism (4)
Lecture—3 hours; project. Prerequisite: course 100. Romanticism as a philosophical concept, and as a literary movement in Spain, with emphasis on its distinctive, specific “Romantic” qualities and its literary expression in five leading authors of the early nineteenth century. (Former course 114.)—II. (II.) Egan, Bejel

136N. The Spanish Novel of the 19th Century (4)
Lecture—3 hours; term paper. Prerequisite: course 100. Realistic literature in Spain, focusing on Leopoldo Alas (Clarín), José María de Pereda and Benito Pérez Galdós. The unique characteristics of Spanish realism and its historical roots in Cervantes and the picaresque. (Former course 119.)—II. (II.) Egan

138. Twentieth-Century Spanish Fiction (4)
Lecture—3 hours; term paper. Prerequisite: course 100 or 131. Study of the main literary trends and authors of the modern Spanish novel and short story. Selected works by Vicente Aleixandre, Cela, Galdós, Herralde and others. Offered in alternate years. (Former course 120C.)—III. (III.) Altisent

140N. Modern Spanish Essay (4)
Lecture—3 hours; term paper. Prerequisite: course 130. Study of the major modern and contemporary Spanish prose. Selected works by Machado, Juan Ramón Jiménez, García Lorca, Guillén, Aleixandre, Hernán Díaz and others. Offered in alternate years. (Former course 120B.) GE credit: ArtHum, Div. —I. (I.) Altisent

141N. Introduction to Spanish Culture (4)
Lecture—3 hours; term paper. Prerequisite: course 24, 24S, or 33. Introduction to history, geography, culture and art of Spain. History, art, history of ideas, and everyday cultural manifestations. Introduction to critical reading and textual analysis. Not open for credit to students who have completed course 141S. GE credit: ArtHum, Div. —I. (I.) González, Martínez-Carazo

141S. Cinema in the Spanish-Speaking World (4)
Lecture—3 hours; film viewing—3 hours. Prerequisite: course 24 or 24S. 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 Spain, under the supervision of UC Davis faculty. Not open for credit to students who have completed course 148S. GE credit: ArtHum, Div. —II. (II.) Martín-Carazo

Lecture—3 hours; film viewing—3 hours. Prerequisite: course 24 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 Spain, under the supervision of UC Davis faculty. Not open for credit to students who have completed course 148S. GE credit: ArtHum, Div. —II. (II.) Martín-Carazo

150N. Survey of Spanish-American Literature to 1900 (4)
Lecture—3 hours; term paper. Prerequisite: course 100. Spanish American literature from prehispanic texts and the Chronicles of the Conquest to Romanticism and Modernism. Reading selections include fiction, poetry, drama and essays. (Former course 102A.) GE credit: ArtHum, Div. —II. (II.) Egan

151N. Survey of Spanish-American Literature 1900 to Present (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 100. Spanish-American literature from Modernism to the present. Reading selections include fiction, poetry, drama, and essays. (Former course 105B.) GE credit: ArtHum, Div. —I. (I.) Egan, Bejel

153. Spanish-American Short Story (4)
Lecture—3 hours; term paper. Prerequisite: course 100. The evolution of the Spanish-American short story during the 19th and 20th centuries. Emphasis on the contemporary period. Offered in alternate years. (Former course 128.)—I. (I.) Egan

154. Spanish-American Novel (4)
Lecture—3 hours; term paper. Prerequisite: course 100. The evolution of the Spanish-American novel during the 19th and 20th centuries. Emphasis on significant contemporary works. Offered in alternate years. (Part of former courses 108A and 108B.)—II. (II.) Egan

155. Mexican Novel (4)
Lecture—3 hours; term paper. Prerequisite: course 100. The evolution of the Mexican novel during the 19th and 20th centuries. Emphasis on the Mexican project and the alternative of the Revolution and significant contemporary works. (Former course 129.)—II. (II.) Egan

156. Darío, Modernism and Its Legacy (4)
Lecture—3 hours; term paper. Prerequisite: course 100. 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 Dario and other major Modernist writers. Offered in alternate years. (Former course 125.)—I. (I.) Egan

157. 20th Century Masters in Spanish-American Literature (4)
Lecture—3 hours; term paper. Prerequisite: course 100. Study of major 20th-century Spanish-American writers and their cultural and literary milieu. Offered in alternate years. (Part of former courses 127 and 138.)—III. (III.) Egan, Bejel
158. Spanish-American Poetry: From Vanguardismo to Surrealism and Beyond (4)
Lecture—3 hours; term paper. Prerequisite: course 100. Study of vanguardismo, surrealism, and more recent movements of 20th-century poetry. An in-depth analysis of the works of such major poets as Neruda, Vallejo, and Octavio Paz. Offered in alternate years. —(II.)

159. Special Topics in Spanish-American Literature and Culture (4)
Lecture—3 hours; term paper. Prerequisite: course 100 or 100S. Special topics in the study of Spanish-American literature and culture. Course 159 and 159S combined may be repeated twice for credit when topic differs.—I, II, III, (I, II, III) Egan

159S. Special Topics in Spanish-American Literature and Culture (4)
Lecture—3 hours; term paper. Prerequisite: course 100 or 100S. Special topics in the study of Spanish-American literature and culture. Offered in a Spanish-speaking country under the supervision of UC Davis faculty. Course 159S and 159 may be repeated twice for credit when topic differs.—III. (III.)

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 literatures written by women. American. Discussions in English of works by Matta de Turner, Avellaneda, Storni, Ocampa, Agustini, Mistral, Castellanos, and others. Offered in alternate years. GE credit: ArtHum, Div.—III. (III.) Peluffo

170. Introduction to Spanish American Culture (4)
Lecture—3 hours; term paper—1 hour. Prerequisite: course 24, 24S, or 33. Introduction to history, geography, and culture of Spanish 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 170S. GE credit: ArtHum, Div.—III. (III.) Bejel, Irwin, Lazzara, Peluffo

170S. Introduction to Spanish American Culture (4)
Lecture—3 hours; project. Prerequisite: course 24, 24S, or 33. Introduction to history, geography and culture of Spanish America. Multiple genres of cultural production and representation, with a focus on cultural diversity and regional difference. Introduction to critical reading and textual analysis. Offered in a Spanish-speaking country. Not open for credit for students who have completed course 170. GE credit: ArtHum. —III. (III.) Colombi

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, samba, cumbia, mariachi, salsa) as well as its implications in other musical genres. Taught in Spanish. Not open to students who have taken course 1715 or Music 127. [Same course as Music 171.]—I, III. (I, III.) Carazo

171S. 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, samba, mariachi, salsa, tonic) as well as its implications in other musical genres. Taught in Spanish and in a Spanish speaking country under the supervision of UC Davis faculty. Not open to students who have taken course 171 or Music 127.—II. (II.)

172. Mexican Culture (4)
Lecture—2 hours; discussion—1 hour or term paper. Prerequisite: course 24 or 33. The development of Mexican culture from the Aztec-Mayan era to the present. Study includes important periods such as the Conquest and Colonialism, the Independence movement, and changes from the Revolution to contemporary Mexico. Reading, lectures and discussions in Spanish. (Former course 135.) GE credit: ArtHum, Div.—III. (III.) Egan

173. Cinema and Latin American Culture (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 24, 24S, or 33. Understanding Latin American cultures through cinema. History and critical analysis of Latin American cinema in a national cinematic tradition. Comparative experiences in different parts of Latin America and/or a particular era. Conducted entirely in Spanish. May be repeated once for credit. GE Credit: ArtHum, Div.—Irwin

174. Chicano Culture (4)
Lecture—3 hours; term paper/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 manifestations. Conducted in Spanish. (Former course 124.) GE credit: ArtHum, Div.—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 [e.g., from pre-colombian times to present]. Sources studied 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 if content differs. GE credit: ArtHum, Div.—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 in the U.S. (e.g., Chicanos, Puerto Ricans, Cuban-Americans, Central Americans, and other Latinos. GE credit: ArtHum, Div.—III. (III.) Alarcón

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 literary or cultural studies. Independent research project. May be repeated one time for credit if content differs. Limited enrollment.—II. (II.) Alsent, Armstead, González, Martín, Martínez-Carazo

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 literary or cultural studies. Independent research project. May be repeated one time for credit if content differs. Limited enrollment.—III. (III.) Bejel, Egan, Irwin, Lazzara, Peluffo

191. Intro to Spanish in (1-12)
Independent study—3-36 hours. Prerequisite: course 23; junior standing; major in Spanish, Chicano Studies, or a related field. Internships in fields where Spanish language skills can be used and perfected (teaching, curriculum development, interpreting). May be repeated for credit for a total of 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, in topics that 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.)

197T. Tutoring in Spanish (1-4)
Tutorial—1-4 hours; term paper (or diachronic studies). May be repeated for credit when topic differs. —III. (III.)

199. Special Study for Advanced Undergraduates (1-5)
May be repeated for up to 6 units of credit (P/NP grading only.)

Graduate Courses

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. Focus on formalism, poststructuralism, socio-cultural discourses, and ideologization. —III. (III.) 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 Socio-ideological approaches. Emphasis on Postmodern and Neo-colonial discourse.—II. (II.)

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 Spanish phonemes and phonetic system from both linear and non-linear perspectives. Students will develop a clear understanding of what phonology is and the nature of Spanish phonology, as defined by modern linguistic analysis.—II. (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. (I.) Blake, Ojeda

207. History of the Spanish Language (4)
Seminar—3 hours; term paper. Prerequisite: Latin 1. (Former course 220A.)—I, III. (I, 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. (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.)—III. (III.)

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. (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. (Former course 220A.)—I, II, III. (I, II, III.)
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 twice for credit when topic differs. Offered in alternate years.—II, Armistead, 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 prosa and drama. May be repeated twice for credit when topic differs. Offered in alternate years.—II, Alisent, Armistead, 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. Major theoretical perspectives on the 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

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.) Armistead

253. Medieval Spanish Literature: Epic (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. An exploration of the medieval Spanish epic. Major theoretical perspectives on the genesis, diffusion, and character of the Medieval epic. Relationship of epic to ballad literature.—II. (II.) Armistead

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 Peninsular languages and in provencal, troubadour poetry, kharjas, villancicos, cantigas de amigo, and courtly lyric.—II, (II.) Armistead

255. Spanish Literature of the Early Renaissance (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Artistic development of the 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

256. Spanish Literature of the Renaissance and Golden Age: Poetry (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Extensive critical study of the main currents of Renaissance and Baroque Spanish poetry through its language structures, styles ("Culturanismo-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 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, Armistead

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.)

261. Contemporary Spanish Literature: Poetry (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Critical analysis of modern Spanish poetry from a wide spectrum of poetic currents.—I, (I.) Alisent

262. Contemporary Spanish Literature: Narrative (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Study of the 20th century novel and short story with emphasis on the avant-garde, existentialism, socialism, realism, and postmodern trends. May be repeated twice for credit when topic differs and with consent of instructor.—III, Alisent

263. Contemporary Spanish Literature: Drama (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. The Spanish theatrical production of the last 70 years.—I, (I.)

264. Contemporary Spanish Literature: Essay (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Development of Spanish-American literary periods and currents in narrative (novel, short story, and essay), from early Colonial times to the present. May be repeated twice for credit when topic differs. Offered in alternate years.—Egan, Bejei, Larsen

272. Critical Approaches to Spanish American Literature: Narrative (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Development of Spanish-American literary periods and currents in narrative (novel, short story, and essay), from early Colonial times to the present. May be repeated twice for credit when topic differs. Offered in alternate years.—Egan, Bejei, Larsen

273. Critical Approaches to Spanish American Literature: Poetry and Drama (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Development of Spanish-American literary periods and currents in poetry and drama, from early Colonial times to the present. May be repeated twice for credit when topic differs. Offered in alternate years.—Egan

274. Studies of a Major Writer, Period, or Genre in Spanish-American Literature (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Artistic development of a major Spanish-American 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.—I, (I.)

275. Colonial Literature (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Examination of pre-Hispanic and Colonial narrative, poetry, and theatre. Emphasis on historical, anthropological, and ethnographic approaches to Colonial discourse.—I, (I.)

276. Twentieth-Century Spanish-American Drama (4) Seminar—4 hours. Prerequisite: graduate standing or consent of instructor. Major Spanish-American dramatists from Florencio Sánchez to the present. Offered in alternate years. (Former course 240.)—I, (I.)

277. Spanish-American Novel, 1900-1950 (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Study of main trends and key authors in Spanish America in the first half of the 20th century. Offered in alternate years. (Former course 241A.)—I, (I.)

278. New Trends in Spanish-American Fiction (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Recent developments in Spanish-American narrative. Emphasis on innovative language and structure. Offered in alternate years. (Former course 241B.)—II, (II.)

279. Mexican Narrative (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Study of the evolution of Mexican narrative. Emphasis on the narrative of the Revolution and significant contemporary works. Offered in alternate years.—III, Egan

280. Spanish-American Short Story (4) Seminar—3 hours; term paper. Works by major writers with emphasis on 20th-century authors such as Quiroga, Borges, García Márquez, Cortázar, and Rufio. (Former course 243.)—II, (II.)

281. Spanish-American Women Writers (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Major Spanish-American female writers and their intellectual and literary milieu or study of a special topic, period, or genre. May be repeated for credit. Offered in alternate years.—(III.)

282. Dario and Modernism (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Study of poetry and prose of Spanish-American Modernism (1880-1916). Offered in alternate years. (Former course 245.)—I, (I.)

283. New Directions in Spanish-American Poetry (4) Seminar—3 hours; term paper. Offered in alternate years. (Former course 247.)—II, (II.)

284. The Spanish-American Essay (4) Seminar—3 hours; term paper. Major Spanish-American essayists from Sarmiento to Octavio Paz. Offered in alternate years. (Former course 248.)—III, (III.)

285. Multicultural Approaches to Cuban Literature and Culture (4) Seminar—3 hours; term paper. Prerequisite: graduate standing or consent of instructor. Study of main trends in Cuban literature. Emphasis on historical, geographic, social and cultural context (including music and film). Course taught in English with some readings in Spanish.—III, (III.) Bejei

298. Group Study (1-5) (S/U grading only.)

299. Research (1-12) (S/U grading only.)

Professional Courses

290. The Teaching of Spanish in College (4) Lecture—2 hours; discussion—2 hours. Prerequisite: graduate standing. Theoretical instruction in modern teaching methods and demonstration of their practical application. Required of graduate teaching assistants.—I, (I.) López-Burton

396. Teaching Assistant Training Practicum (1-3) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—I, II, III, (I, II, III.)
### Preparatory Subject Matter

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Statistics 20A, 20B, 20C</td>
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### Major Requirements

**B.S. Major Requirements:**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Computer Science 10 or 13</td>
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<tr>
<td>Computer Science 20 or 23</td>
</tr>
<tr>
<td>Statistics 20A, 20B, 20C</td>
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</table>

### Minor Program Requirements

**Minor Program Requirements:**

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<th>Course</th>
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<tr>
<td>Statistics 20A, 20B, 20C</td>
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### Preparation

**Preparation:**

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Mathematics 20 or 23</td>
</tr>
<tr>
<td>Statistics 20A, 20B, 20C</td>
</tr>
</tbody>
</table>

### Lower Division Courses

**10. Statistical Thinking (4):**

- Lecture—3 hours; discussion—laboratory—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 information in the media; emphasis is on understanding polls, unemployment rates, health studies; understanding probability, risk and odds. GE credit: SciEng or SocSci, Wrt.—III (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; independence; Bayes theorem; expectation; gambling problems; binomial, hypergeometric, Poisson, geometric, negative binomial and multinomial models; limit distributions; Markov chains. Applications in the social, biological, and engineering sciences. Offered in alternate years. GE credit: SciEng.

### Elementary Statistics (4):

- Lecture—1.5 hours; online lecture—5 hours.
- Prerequisite: two years of high school algebra or the equivalent in college.
- Descriptive statistics; basic probability concepts; binomial, normal, Student’s t, and chi-square distributions. Hypothesis testing and confidence intervals for one and two means and proportions. Regression. Not open for credit to students who have completed course 13V or higher. GE credit: SciEng.—I, II, III (II, III).

### Elementary Statistics (4):

- Lecture—1.5 hours; online lecture—5 hours.
- Prerequisite: two years of high school algebra or the equivalent in college.
- Descriptive statistics; basic probability concepts; binomial, normal, Student’s t, and chi-square distributions. Hypothesis testing and confidence intervals for one and two means and proportions. Regression. Not open for credit to students who have completed course 13 or higher. GE credit: SciEng.—I, II, III (II, III).

### Basic Statistical Analysis Through Computers (3):

- Lecture—3 hours.
- Prerequisite: Mathematics 16A or 21B; ability to program in high level computer language such as Pascal. Overview of probability modeling and statistical inference. Problem solution through mathematical analysis and computer simulation recommended as alternative to course 13 for students with some knowledge of calculus and computer programming. GE credit: SciEng.—II, III, (II, III).

### Directed Group Study (1-5):

- Prerequisite: consent of instructor. (P/NP grading only)

### Special Study for Undergraduates (1-5):

- Prerequisite: consent of instructor. (P/NP grading only)
Upper Division Courses

100. Applied Statistics for Biological Sciences (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: Mathematics 16B or the equivalent. Probability computation/modeling, estimation, hypothesis testing, contingency tables, ANOVA, regression, implementation of statistical methods using computer packages. Only two units credit allowed to students who have taken course 13 or 32. Not open for credit to students who have taken course 102. GE credit: Sci-Eng. —I, II, III. (I, II, III.)

101. Introduction to Probability Modeling and Statistical Inference (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: two years of high school algebra, and upper division standing. Introductory probability and statistics at a rigorous mathematical level. Rigorous probabilistic introduction to probability and parametric/nonparametric statistical inference with computing; binomial, Poisson, geometric, normal, and sampling distributions; computer analysis; probability density functions; sampling distributions, central limit theorem; properties of estimators, basic ideas of hypothesis testing, likelihood ratio tests, goodness-of-fit tests. General linear model, least squares estimates, Gauss-Markov theorem. Analysis of variance, F-test. Regression and correlation, multiple regression. Selected topics. —II. (II.)

111A. Introduction to Probability Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 21A, 21B, 21C, and 22A. Fundamental concepts of probability theory; discrete and continuous random variables, standard distributions, moments and moment-generating functions, laws of large numbers and the central limit theorem. Not open for credit to students who have taken Mathematics 131.—I, II, III. (I, II, III.)

111B-111C. Introduction to Mathematical Statistics (4-4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course 131A, or Mathematics 22A and 131. Sampling, methods of estimation, sampling distributions, confidence intervals, testing hypotheses, linear regression, analysis of variance, elements of large sample theory, and nonparametric inference.—III. (III.)

130. Mathematical Statistics: Brief Course (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 130A. Transformed random variables, large sample properties of estimates. Basic ideas of hypothesis testing, likelihood ratio tests, goodness-of-fit tests. General linear model, least squares estimates, Gauss-Markov theorem. Analysis of variance, F-test. Regression and correlation, multiple regression. Selected topics. —II. (II.)

130B. Mathematical Statistics: Brief Course (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 130A. Transformed random variables, large sample properties of estimates. Basic ideas of hypothesis testing, likelihood ratio tests, goodness-of-fit tests. General linear model, least squares estimates, Gauss-Markov theorem. Analysis of variance, F-test. Regression and correlation, multiple regression. Selected topics. —I. (I.)

131A. Introduction to Probability Theory (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Mathematics 21A, 21B, 21C, and 22A. Fundamental concepts of probability theory; discrete and continuous random variables, standard distributions, moments and moment-generating functions, laws of large numbers and the central limit theorem. Not open for credit to students who have taken Mathematics 131.—I, II, III. (I, II, III.)

131B-131C. Introduction to Mathematical Statistics (4-4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course 131A, or Mathematics 22A and 131. Sampling, methods of estimation, sampling distributions, confidence intervals, testing hypotheses, linear regression, analysis of variance, elements of large sample theory, and nonparametric inference.—III. (III.)

133. Mathematical Statistics for Economists (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 103 and Mathematics 16B, or the equivalents; no credit will be given to students majoring in Statistics. Probability, basic properties; discrete and 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 hypothesis testing (one-sample).—I. (I.)

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 T^2; simultaneous inference, one-way MANOVA; discriminant analysis; principal components; canonical correlation; factor analysis. Intensive use of computer analyses and real data sets.—III. (III.)

137. Applied Time Series Analysis (4)
Lecture—3 hours; term paper. Prerequisite: course 108 or the equivalent. Time series relationships, cyclical behavior, seasonal analysis, spectral analysis, coherence, filtering, regression, ARIMA and state-space models; Applications to data from economics, engineering, medicine using time series software.—III. (III.)

138. Analysis of Categorical Data (4)

141. Statistical Computing (4)
Lecture—3 hours; laboratory—1 hour. Prerequisite: course 130A or 131A, and one of courses 13, 32, 100, 102, or the course experience using computer programming; course 130B or 131B recommended. Use of computers in statistics. Numerical foundations of statistical procedures. Computation of probabilities and quantities; Random numbers. Monte Carlo methods and bootstrap. Methods for parametric statistical models. Graphical methods and exploratory data analysis. —II. (II.)

142. Reliability (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course 130B or 131B or consent of instructor. Stochastic modeling and inference for reliability systems. Topics include coherent systems, statistical failure models, notions of aging, maintenance policies and their optimization. Offered in alternate years.

144. Sampling Theory of Surveys (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course 130B or 131B. Simple random, stratified random, cluster, and systematic sampling plans; mean, proportion, total, ratio, and regression estimators for these plans; sample survey design, absolute and relative error, sample size selection, stratification; sampling with replacement; sources of error. Offered in alternate years. GE credit: Sci-Eng. —I. (I.)

145. Bayesian Statistical Inference (4)
Lecture—3 hours; laboratory—1 hour. Prerequisite: courses 130A and 130B, or 131A and 131B, or the equivalent. Subjective probability, Bayes Theorem, conjugate priors, non-informative priors, estimation, testing, prediction, empirical Bayes methods, properties of Bayesian procedures, comparisons with classical procedures; approximation techniques, Gibbs sampling, hierarchical Bayesian analysis, applications, computer implemented data analysis. Offered in alternate years.—(II.)

190X. Seminar (1-2)
Seminar—1-2 hours. Prerequisite: one of courses 13, 32, 100, 102, or 103. In depth examination of a special topic in a small group setting.

190Y. Internship in Statistics (1-12)
Internship—3-36 hours; term paper. Prerequisite: upper division standing and consent of instructor. Work experience in statistics. (P/NP grading only.)

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 a faculty adviser. (Deferred grading only, pending completion of sequence.)

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 Courses

205. Statistical Models for Research (4)
Lecture—3 hours; laboratory—1 hour. Prerequisite: course 106 or the equivalent. Topics in design of experiments include factorial designs, balanced and unbalanced experiments, random and mixed effects models, response surface methodology, nested design, repeated measures, cross-over design, analysis of covariance. Applications in engineering, biological sciences, medicine and environmental research. Offered in alternate years.—(III.)

222. Biostatistics: Survival Analysis (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course 131C. Incomplete data; life tables; nonparametric methods, parametric methods; accelerated failure time models; proportional hazards models, partial likelihood; advanced topics. (Same course as Biostatistics 222.) —I. (I.)

223. Biostatistics: Generalized Linear Models (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course 131C. Likelihood and linear regression; generalized linear model, Binomial regression; case-control studies; dose-response and bioassay; Poisson regression; Gamma regression; quasi-likelihood models; estimating equations; multi-variate GLMs. (Same course as Biostatistics 223.) —II. (II.)
and masking. Practical applications of widely-used
instructor. Basic statistical principles of clinical
statistical settings. (Same course as Biostatistics
measurements and longitudinal data in biostatistical and
Prerequisite: course/Biostatistics 222, 223 and
224. Analysis of Longitudinal Data (4)
applications relevant to the analysis of –omics data.
foundations. Topics include basic concepts in asymp-
thetical theory, decision theory (e.g. risk function, Bayes
Univariate and multivariate data analysis, analysis of variance, ARIMA
models, state-space models, Kalman filtering.
Offered in alternate years.—(III.)
238. Theory of Multivariate Analysis (4)
univariate or the equivalent; course 237A is a prerequi-
frequently-mentioned statistics chosen from weak
Bayesian methods in biostatistics. May be repeated
for credit with consent of adviser when topic differs.
Prerequisite: courses 131B, 131C, Mathematics 127A,
Bayes and minimax optimality, Bayes estimation, and
an overview of methods of point estimation.—I. (I.)
231A. Mathematical Statistics I (4)
second part of a three-quarter sequence on mathematical statistics. Emphasizes
large sample theory, e.g. asymptotics of MLE, likelihood ratio-test and Chi-square-test, CLT with applications in (generalized) linear models. Classical hypothesis testing, e.g. Neyman-Pearson theory, UMP (unbiased)-tests.—II. (II.)
231B. Mathematical Statistics II (4)
the same sample statistic, e.g. asymptotics of MLE, likelihood ratio-test and Chi-square-test, CLT with applications in (generalized) linear models. Classical hypothesis testing, e.g. Neyman-Pearson theory, UMP (unbiased)-tests.—II. (II.)
231C. Mathematical Statistics III (4)
Prerequisite: course 231A. Third part of three-quarter sequence on mathematical statistics. Emphasizes large sample theory of applications. Topics include statistical functionals (applications to L and M-estimation); resampling methods (jackknife, bootstrap); curve estimation (density, regression, failure rate); rank tests, and one instructor-selected topic.—III. (III.)
232A. Applied Statistics I (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 232A recommended, not required. Resampling, nonparametric and semiparametric methods, incomplete data analysis, divergence, bivariate 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 advisor. Not offered every year.—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, spatial analysis, bootstrap, statistical methods in high dimensions, reliability, spatial processes, inference for stochastic processes, 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. Not offered every year.—I, II, III.
252. Advanced Topics in Biostatistics (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: course 227, 223. Biostatistical methods and models selected from the following: genetics, bioinformatics and genomics; longitudinal or functional data; clinical trials and experimental design; analysis of environmental data; 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 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 once for credit. (S/U grading only)—I, II, III, IV.
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, IV.
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 applied topics, presented by members of the Graduate Group in Statistics and other guest speakers. (S/U grading only)—II, III.
298. Directed Group Study (1-5)
Prerequisite: graduate standing, consent of instructor.
299. Individual Study (1-12)
Prerequisite: consent of instructor. (S/U grading only.)—III. (III.)
299D. Dissertation Research (1-12)
Prerequisite: advancement to candidacy for Ph.D., consent of instructor. (S/U grading only)
Professional Course
300. 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 teaching. May be repeated for credit. (S/U grading only)—I. (I.)
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 clients. Students must be enrolled in the graduate program in Statistics or Biostatistics. May be repeated for credit with consent of graduate advisor. Not offered every year. (S/U grading only)—I, II, III, IV, V, VI.
Statistics (A Graduate Program)
Rudolph Beran, Ph.D., Chairperson of the Program
Program Office. 4118 Mathematical Sciences
(530) 752-2362; http://www.stat.ucdavis.edu
Faculty
Laurel Beckett, Ph.D., Professor (Public Health Sciences)
Rudolph Beran, Ph.D., Professor (Statistics)
Prabir Burman, Ph.D., Professor (Statistics)
Colin Cameron, Ph.D., Professor (Economics)
Surgical and Radiological Sciences

See Veterinary Medicine, School of, on page 469.

Technocultural Studies

[College of Letters and Science]
Douglas Kahn, Ph.D., Program Director

Program Office. Art Building, Room 316 (530) 752-9674; http://technoculture.ucdavis.edu

Committee in Charge
Glenda Drew, M.A. (Design)
Jesse Drew, Ph.D., Technocultural Studies
Francine Dyson, Ph.D. (Technocultural Studies)
Andy Jones, Ph.D. (English)
Douglas Kahn, Ph.D (Technocultural Studies)
Pablo Ortiz, D.M.A. (Music)
Bob Ostertag, Ph.D. (Technocultural Studies)
Simon Sadler, Ph. D (Art History)
Oliver Steadl, Ph.D. (Computer Science)
Kathryn Sylvia, M.F.A. (Design)

Faculty
Frances Dyson, Ph.D., Associate Professor
Douglas Kahn, Ph.D., Professor
Michael Neff, Ph.D., Assistant Professor
(Coordinate, Technocultural Studies)
Bob Ostertag, Ph.D., Associate Professor
Julie Wyman, MFA, Assistant Professor

Emeriti Faculty
Lynn Hershman, M.A., Professor Emerita

The Major Program
The 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. Although students must choose an emphasis in either critical studies or creative production, both emphases stress an integration of studies and production. 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, along with four one-unit technical skill courses enabling individuals to get to the flow and working in a complex, rapidly changing world.

General Education (GE) credit: ArtHum.

Preparatory Subject Matter

Technocultural Studies

Permission of the Chairperson

American Studies

Depth Subject Matter

Technocultural Studies

Production emphasis

Choose five from production based Technocultural Studies 101, 103, 104, 110, 111, 112, 121, 122, 123, 192, plus two units from Technocultural Studies 120, 150, 151, 152, 153, 154, 155, 158, 159, plus a four-unit class from another department or program relevant to the student's area of concentration, as approved by Technocultural Studies.

Studies emphasis

Choose five from production based Technocultural Studies 101, 103, 104, 110, 111, 112, 121, 122, 123, 192, plus five units from Technocultural Studies 120, 150, 151, 152, 153, 154, 155, 158, 159, plus a four-unit class from another department or program relevant to student's area of concentration, as approved by Technocultural Studies.

Total Units for the Major

Major Adviser. See Program office.

Courses in Technocultural Studies (TCS)

Lower Division Courses

1. Introduction to Technocultural Studies (4)
Lecture—3 hours; extensive writing. Contemporary developments in the fine and performing arts, media arts, digital arts, and literature as they relate to technocultural and scientific practices. GE credit: ArtHum. Ostertag/Drew

2. Critiques of Media (4)
Lecture/discussion—3 hours; term paper. Introduction to different forms of critical analysis of media, 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 photomontage through contemporary "culture-jamming" and alternative media networks. GE credit: ArtHum. —Dyson

3. Parallels in Art and Science (4)
Lecture—3 hours; term paper. Issues arising from historical and contemporary encounters between the arts and sciences, with emphasis on comparative notions of research, experimentation, and progress. GE credit: ArtHum.

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 reconstruction of the social and artistic possibilities of lost and obsolete media technologies. GE credit: ArtHum. Drew

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, demonstrations and literary fictions and journalistic accounts. GE credit: ArtHum. —Kahn

Quarter Offered: I-Fall, II-Winter, III-Spring, IV-Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Social-Cultural Diversity; Wrt=Writing Experience

Subject A

See University Requirements, on page 83.

Surgery

See Surgery (SUR), on page 370; and Surgical and Radiological Sciences (VSR), on page 478.

Subject A
122. Intermediate Sonic Arts (4)
Lecture/discussion—3 hours; laboratory—3 hours. Prerequisite: course 121, 170C, Techniques of recording, editing, mixing, and synthesis to combine voice, field recordings, and electronic signals. Incorporating live, recorded, and found sounds to create multimedia stories. Presentation of live performances, audio recordings, and sound installations. —Oster tag

123. Sight and Soundtrack (4)
Lecture/discussion—3 hours; laboratory—3 hours. Prerequisite: courses 7C, 170C. The use of sound to articulate, lend mood or subconsciously underscore visual, environmental or performative situations, combining music, voice, sound effects and other noises to create sound designs that enhance, alter or support action and movement. —Oster tag

150. Introduction to Theories of the Technoculture (4)
Lecture/discussion—3 hours; extensive writing. Major cultural theories of technology with emphasis on media, communications, and the arts. Changing relationships between technologies, humans, and culture. Focus on the evolution of modern technol ogy and their reception within popular and applied contexts. CE credit: ArtHum—Dyson

151. Topics in Virtuality (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 1. Social, political, economic, and aesthetic factors in virtual reality. Artificial environments, telepresence, and simulated experience. Focus on contemporary artists’ work and writing. —Dyson

152. New Trends in Technocultural Arts (4)
Lecture/discussion—3 hours; term paper. Current work at the intersection of the arts, culture, science, and technology including biological and medical sciences, computer science and communications, and artificial intelligence and digital media. —Hersh man

153. Concepts of Innovative Soundtracks (4)
Lecture/discussion—3 hours; term paper. Innovative and unconventional soundtracks in cinema, media arts, and fine arts. Introduction to basic analytical skills for understanding sound-image relationships. —Kahn

154. Outsider Machines (4)
Lecture/discussion—3 hours; term paper. Invention, adaptation and use of technologies outside the mainstream, commonsense, and the possible. Topics include machines as metaphor and embodied thought, eccentric customizing and fictional technolog ies. —Kahn

155. Introduction to Documentary Studies (4)
Lecture/discussion—3 hours; term paper. Recent evolution of the documentary. The personal essay film, found/ footage/appropriation work; non-linear, multi-media forms; spoken word; storytelling; oral history recordings; and other examples of document ary expression. —I. (I)

158. Technology and the Modern American Body (4)
Lecture/discussion—3 hours; term paper. Prerequisite: course 1 and either American Studies 1 or 5. The history and analysis of the relationships 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 American Studies 158] CE credit: ArtHum. —de la Pena

159. Media Subcultures (4)
Lecture/discussion—3 hours; term paper. Relationships between subcultural groups and media technologies. Media as an inceptive and persuasive force of subcultural activities. List-serv, Web sites, free radio, fan ‘zines, and hip-hop culture. CE credit: Div.—II. (II)

170A-E. Advanced Technocultural Workshop (1)
Seminar—1 hour. Prerequisite: course 7A or the equivalent. Workshops in advanced technocultural digital skills: (A) Digital Imaging; (B) Digital Video; (C) Digital Sound; (D) Web Design; (E) Topics in Digital Production.
Textiles and Clothing

(College of Agricultural and Environmental Sciences)
Susan B. Kaiser, Ph. D., Chairperson of the Division
Division Office, 129 Everson Hall
(530) 752-6650; http://textiles.ucdavis.edu

Faculty
You-La Huieh, Ph. D., Professor
Susan B. Kaiser, Ph. D., Professor
Ning Pan, Ph. D., Professor
Margaret H. Rucker, Ph. D., Professor
Gang Sun, Ph. D., Associate Professor
Emeriti Faculty
Stephen C. Jett, Ph. D., Professor Emeritus
Mary Ann Mattson, Ph. D., Professor Emeritus
S. Haig Zeronian, Ph. D., D.Sc., Professor Emeritus

Affiliated Faculty
Joan Chandler, M.S., Lecturer

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 market-place. 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 460.

The Program. The textiles and clothing major offers 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 courses, 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 studies in textiles, business, and other areas depending on their specific selections of restricted elective course work.

B.S. Major Requirements:

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<th>Units</th>
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<tbody>
<tr>
<td>English Composition Requirement .......... 4-12</td>
</tr>
<tr>
<td>See College Requirement............... 0-8</td>
</tr>
<tr>
<td>Communication 1 .......................... 4</td>
</tr>
<tr>
<td>Preparatory Subject Matter ................. 43-45</td>
</tr>
<tr>
<td>Agricultural Management and Rangeland Resources 21, Computer Science Engineering 15 or 30 .............. 34</td>
</tr>
<tr>
<td>Economics 1A-1B ............................ 10</td>
</tr>
<tr>
<td>Anthropology 2, Science and Society 1, Art History 1A, 1B, 1C, 1D .................. 4</td>
</tr>
<tr>
<td>Physics 1A or 10 .......................... 3-4</td>
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<td>Psychology 1 .............................. 4</td>
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<tr>
<td>Sociology 2 ............................. 4</td>
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<tr>
<td>Statistics 12 ........................... 4</td>
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<tr>
<td>Textiles and Clothing 6, 7, 8 ............ 12</td>
</tr>
<tr>
<td>Breadth/General Education ................ 6-24</td>
</tr>
<tr>
<td>Satisfaction of General Education requirement.</td>
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</tbody>
</table>

Select one of the following two options:

Marketing/Economics Option

Additional Preparatory Subject Matter for the option ........................................ 18-19
| Management 11A-11B ..................... 8 |
| Chemistry 10 or 2A ..................... 4-5 |
| Mathematics 16A-16B .................... 6 |
| Depth Subject Matter ..................... 57-58 |
| Agricultural and Resource Economics 100A-100B, 106, 136 .................. 16 |
| Statistics 101 .......................... 4 |
| Psychology 151 or 156, or Consumer Science 100 .............. 34 |
| Fiber and Polymer Science 110, Textiles and Clothing 107, 162-162L, 163-163L, 164, 165, 171, 173, 174 ........... 31 |
|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 77A, 77B, 143, Economics 101, 121A, 121B, 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, 156, Sociology 123, 126, 140, 141, 145, Textiles and Clothing 180A, 180B, 230, 293, with consent of instructor, and a maximum of 5 units in either Textiles and Clothing 192 or 199. |
|Unrestricted Electives ...................... 15-44 |

Textile Science Option

Additional Preparatory Subject Matter for the option ........................................ 19
| Chemistry 2A, 2B, 8A, 8B ............. 16 |
| Mathematics 16A ....................... 3 |
| Depth Subject Matter ..................... 52-53 |
| Fiber and Polymer Science 100, 161, 161L, Textiles and Clothing 107, 162L-162L, 163-163L, 164, 165, 171, 173, 174 ........... 34 |

Restricted Electives ......................... 16

Unrestricted Electives ....................... 17-46
| Total Units for the Degree ................ 180 |

Major Adviser. G. Sun
Advising Center for the major is located in 129B Everson Hall (530) 752-4417.

Minor Program Requirements:

The Division of Textiles and Clothing offers a minor program for non-majors interested in satisfying second career objectives. For acceptance into the program see the staff adviser in 133B Everson Hall.

Textiles and Clothing ......................... 18
| Courses selected from Fiber and Polymer Science 100, 110, 161, 161L, Textiles and Clothing 107, 162-162L, 163-163L, 164, 165, 171, 173, 174 ................... 14 |

Minor Adviser. G. Sun

Courses in Textiles and Clothing (TxC)

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 272.

Lower Division Courses

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: SocSci, Div—I, (B) Sun |
| 7. Style and Cultural Studies (4)
| Lecture/discussion—3 hours; discussion/laboratory—1 hour. The multiple and overlapping influences of gender, sexuality, ethnicity, and class on constructions of identity and community are explored through the study of style in popular culture and everyday life. Continuity and change in clothing and appearance styles are interpreted. GE credit: SocSci, Div—III, (B) Kaiser |

9. The Textile and Apparel Industries (4)
| Lecture—4 hours. Textile and apparel industries including fashion theory, production, distribution, and consumer satisfaction of textile goods. GE credit: SocSci, Div—I, (B) Rucker |

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) |
Upper Division Courses

107. Social and Psychological Aspects of Clothing (4)

162. Textile Fabrics (3)
Laboratory—3 hours. Prerequisite: course 6. Properties of fabrics as related to serviceability, comfort, and appearance. GE credit: SciEng—III. (III.) Pan

163L. 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. —III. (III.) Pan

163T. Textile Coloration and Finishing (3)
Lecture—3 hours. Prerequisite: course 6. Polymer Science 110, or Chemistry 88. 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. —III. (III.) Sun

163T. 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. May be repeated for credit. —III. (III.) Sun

164. Principles of Apparel Production (3)
Lecture—3 hours. Prerequisite: course 6 or 8. Overview of characteristics, technology, processes, and research in apparel manufacturing industries including study of government statistics, material utilization and fabrication, mechanization, management, and production engineering. —II. (II.) Chandler

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, texturing, yarn formation, weaving, weaving preparation, weaving and knitting, tufting and fabric finishing.

171. Clothing Materials Science (4)
Lecture—3 hours; laboratory/discussion—3 hours. Prerequisite: course 6. Properties of fabrics, as related to serviceability, comfort, and appearance. GE credit: SciEng—III. (III.) Reiff

173. Principles of Fashion Marketing (3)
Lecture—3 hours. Prerequisite: course 8, Economics 1A, Agricultural and Resource Economics 113 or 130. Study of basic elements of fashion marketing including philosophy and objectives, organization, merchandising, pricing, promotion and personnel. Offered in alternate years. —III. Rucker

174. Introduction to World Trade in Textiles and Clothing (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 6. Structure of the global fiber/textile/apparel complex and its distribution patterns with an overview of trade, economic and technological factors that are changing these industries and their markets. GE credit: SocSci, Div. —II. (II.) Rucker

180A-180B. Introduction to Research in Textiles (2-5)
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.) —I, II, III. (I, II, III)

192. Internship in Textiles and Clothing (1-12)
laboratory—3-36 hours. Prerequisite: consent of instructor. Work-related 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 Courses

230. Behavioral Science Concepts in Textiles (3)
Lecture—3 hours. Prerequisite: course 107, upper division or graduate course in statistics (e.g., Agricultural Management and Rangeland Resources 120) and one in a behavioral science (e.g., Psychology 145). Examination of theories and research concerning relationships between clothing and human behavior with emphasis on research techniques, including methods of measuring clothing variables. Offered in alternate years. —I. Kaiser

290. Seminar (1)
Seminar—1 hour. Critical review of selected topics of current interest in textiles. (S/U grading only) —I, II, III.

290C. Research Conference (1)
Research conference—1 hour. May be repeated for credit. —(III.)

290R. Research Conference (1)
Research conference—1 hour. Critical review of selected topics of current interest in textiles. (S/U grading only) —I, II, III.

299. Research (1-12)
(S/U grading only)

Professional Course

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only) —I, II, III.

397. Introduction to Research in Textiles (2-5)
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.) —I, II, III. (I, II, III)

99. Special Study for Lower Division Students (1-5)
(P/NP grading only)

Faculty

Sarah Pia Anderson, Professor
Larry Bogad, Ph.D., Associate Professor
Della Davidson, M.A., Associate Professor
David Grenke, Associate Professor
John Iacovelli, M.F.A., Professor
Peter Lichtenfels, Professor
Jade McCutcheon, Ph.D., Assistant Professor
Maggie Morgan, M.F.A., Assistant Professor
Thomas Munro, Professor
Jon Rossini, Ph.D., Assistant Professor
Barbara Sellers-Young, Ph.D., Professor
Peggy Shannon, Professor
Darrell F. Winn, M.A., Lecturer

Emeriti Faculty

Bobbie J. Bolden, M.A., Senior Lecturer Emerita
Ruby Cohn, Ph.D., Professor Emerita
Harry C. Johnson, M.A., Professor Emeritus
William E. Kleb, D.F.A., Professor Emeritus
Robert K. Sarlo, Ph.D., Professor Emeritus
Alan A. Stambusky, Ph.D., Professor Emeritus

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, dance, performance, and production. Students build significant skills in specific areas as well as achieving a broad knowledge of theatre, dance and film.

Productions and Facilities. Each year's schedule includes undergraduate festivals in theatre, dance, and film; opportunities to work with professional directors and choreographers in three main stage productions; and a performance project and established scripts developed by M.F.A students. These productions take place on our prosenium (Main), thrust (Wyatt), black box (Arena), performance studio (University Club) stages as well as in the Mondavi Center's 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. Major Requirements:

Theatre Emphasis

UNITS
Preparatory Subject Matter…………………..33
Dramatic Art 20, 24, 25, 26…………………..14
Dramatic Art 21A or 14…………………..4
Choose 4 units from Dramatic Art 21B, 40A, 40B, 41B, 99, 544 African American and African Studies 51 or courses in other departments with departmental approval……………………………..4
Dramatic Art 30…………………..11
Participation in at least two of the following areas: acting/dance; directing/choreography; playwriting; stage management/dramaturgy; design/studio; technical production; and crew assignments for a minimum of two productions which may include stage management, fly crew, stage running crew, props, running crew, lighting board operator, focus spot operator, sound board operator, costume running crew, dresser, makeup

Depth Subject Matter………………………..45-47
Dramatic Art 136A, 136B, 136C……………12
One course from Dramatic Art 124A, 124B, 124C, 124D……………………………..4
One course from Dramatic Art 150, 154, 155, 155A, 159……………………………..4
One course from Dramatic Art 121A, 121B, 122A, 122B, 141, 143……………………………..3-4
One course from Dramatic Art 126, 127A, 127B, 140A, 160A……………………………..4
A minimum of 10 units chosen from the following: Dramatic Art 121A, 121B, 122A, 122B, 124A, 124B, 124C, 124D, 125, 126, 127A, 127B, 130, 140A, 141, 143,
Theatre and Dance

150, 154, 155A, 159, 160A, 160B, 170, 256

Dramatic Art 180 .................................9

Participation in University Theatre in at least two of the following areas: acting/dance; directing/choreography; playwriting/stage management; dramaturgy; design/studio/technical production; and crew assignments for a minimum of one production which may include stage management, fly crew, stage running crew, props, running crew, lighting board operator, follow spot operator, sound board operator, costume running crew, dresser, makeup.

Total Units for the Major.....................78

Dance Emphasis

Preparatory Subject Matter ....................28

Dramatic Art 14, 24, 26 ..........................11


Choose 19 units from African American and African Studies 35, 142, 142, 143, 143, 145, 155, 155C, 159, Music 107A, Native American Studies 125 ..........................19

Dramatic Art 124C, 126B ..........................7

Total Units for the Major.......................73

Major Adviser:

Minor Program Requirements:

Dramatic Art ..........................22

One course from Dramatic Art 20, 21A, 24, 25, 26, 34 ..........................3-4

Two courses chosen from Dramatic Art 156A, 156B, 156C ..........................8


Dramatic Art 180 .................................5

Participation in University Theatre in at least two of the following areas: acting/dance; directing/choreography; playwriting/production/management; dramaturgy; design/studio/technical production; and crew assignments for a minimum of one production which may include stage management, fly crew, stage running crew, props, running crew, lighting board operator, follow spot operator, sound board operator, costume running crew, dresser, makeup.

Transfer Students. As described above, all students completing a major in Dramatic Art must participate in dramatic productions, including work in at least three of the following four areas: acting/dance; design, studio (scenic, costume, lighting, painting, props, sound); directing/playwriting/stage management. Such experience gained prior to transfer to UC Davis may count toward partial satisfaction of this requirement; transfer students should see the major adviser for an evaluation of your previous experience. While in residence at UC Davis, transfer students are required to participate in a minimum of five dramatic productions and that participation must include work in at least three of the four areas specified above, as well as running crew.

Guest Artists. The Granada Visiting Artists Program brings distinguished professional artists to the campus each year, to be in residence for a quarter. These working professional artists interact closely with students in the classroom and rehearsal halls and provide them excellent pre-professional experiences of theater practice.

Graduate Study. The Department of Dramatic Art offers programs of study and research leading to the M.F.A. (acting, directing, design, choreography) and Ph.D. (performance and culture) degrees. Detailed information may be obtained by contacting the Graduate Adviser.


Courses in Dramatic Art (DRA)

Lower Division Courses

1. Theatre, Performance and Culture (4)

Lecture—3 hours; discussion—1 hour. Introductory investigation of the nature of performance, moving from performance theory to consideration of various manifestations of performance including theatre, film and media, performance art, dance, sports, rituals, political and religious events, and other "occasions." Not open to students who have completed course 15. GE credit: ArtHum, Div. Wrt.—Bogad, Hunter, Rossini.

15. Theatre, Performance and Culture (4)

Lecture—3 hours; discussion—1 hour. Introductory investigation of the nature of performance, moving from performance theory to consideration of various manifestations of performance including theatre, film and media, performance art, dance, sports, rituals, political and religious events, and other "occasions." For Short Term Programs Abroad. Not open to students who have completed course 1. Not offered every year. GE credit: ArtHum, Div. Wrt.—McCutch- eon

10. Introduction to Acting (3)


14. Introduction to Contemporary Dance (4)

Lecture—3 hours; laboratory—3 hours. Introduction to basic issues and methods in contemporary dance. Focus on preparing the student for dancing and dance-making through basic techniques of improvisation and composition. Consideration of dance as a cultural practice.—I, II, III. (I, II, III.)

20. Introduction to Dramatic Art (4)

Lecture—3 hours; discussion—1 hour. Understanding and appreciation of both the distinctive and collaborative contributions of the playwright, actor, director, and designer to the total work of dramatic art. Study of plays from the major periods of dramatic art in their cultural contexts. GE credit: ArtHum.

21A. Fundamentals of Acting (4)

Lecture—2 hours; laboratory—4 hours. Prerequisite: course 20. Physical and psychological resources of the actor. Experience in individual and group contact and communication, theatre games, advanced improvisation, sound and movement dynamics. Viewing of theatre productions. Limited to those planning to major in Dramatic Art.—I, II. (II)

21B. Fundamentals of Acting (4)

Lecture—2 hours; laboratory—4 hours. Prerequisite: course 21A and consent of instructor. Theory and practice of acting with emphasis on character analysis, interpretation, and development. Acting in a student-directed project. Viewing of theatre productions. Limited to those planning to major in Dramatic Art.

24. Visual Aspects of Dramatic Art (4)

Lecture—3 hours; laboratory—2 hours. Understanding and appreciation of the visual aspects of dramatic art: theatre architecture, scenery, lighting, costume, and makeup.

25. Technical Aspects of Dramatic Art (3)

Lecture—3 hours. Technical principles of dramatic production emphasizing the three areas of scenic, costume and lighting studios. Subjects covered include basic tools, materials and equipment, production practices; and the interdisciplinary and collaborative nature of dramatic production.

26. Performing Arts Production Management (3)

Lecture—3 hours. Theoretical study of performing arts administration and backstage operations from audition through performance, including production scheduling, production management, stage management, technical direction, audience control, box office, promotion, safety, accommodations for persons with disabilities and emergency procedures.—Winn

30. Theatre Laboratory (1-5)

Prerequisite: 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 up to 11 units. —I, II, III. (I, II, III.)

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 a general overview of modern dance history. May be repeated once for credit with consent of instructor.

40B. Intermediate Modern Dance (2)

Laboratory/discussion—4 hours. Prerequisite: course 40A. Modern dance techniques. Basic anatomy, dance terminology and a general overview of modern dance history. May be repeated once for credit with consent of instructor.

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 a general overview of jazz dance history. May be repeated once 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 a general overview of jazz styles of historically significant jazz choreographers and leading contemporary jazz choreographers. May be repeated once for credit with consent of instructor.

42A. Beginning Ballet (2)

Laboratory/discussion—4 hours. Prerequisite: course 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 once for credit with consent of instructor.

42B. Intermediate Ballet (2)

Laboratory/discussion—4 hours. Prerequisite: course 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 once for credit with consent of instructor.

44A. Beginning Hip Hop Dance (2)

Laboratory/discussion—4 hours. Prerequisites: Intermediate 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 once 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 focusing on exploring body isolations and intricate rhythmic techniques, complex dance combinations, advanced across the floor sequences. May be repeated once for credit.

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Social-Cultural Diversity; Wrt=Writing Experience
92. Internship in Dramatic Art (1-12) 
Prerequisite: consent of instructor and department chairperson; lower division 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. I, II, III, IV.

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 Courses

111S. Representation and Identity in Culture and Cinema (4) 
Lecture/discussion—2 hours; film viewing—4 hours. Issues of personal and collective identity via study of film narratives from different cultures. Reflection of dominant cultural identities in film. Taught in Australia. GE credit: ArtHum, Div, Wrt.—McCutcheon

115. Advanced Study of Major Film Makers (4) 
Lecture/discussion—3 hours; film viewing—2 hours. Prerequisite: course 1.5. Analysis of the contribution of selected creators. Study of diverse aesthetic theories of the cinema and their application to selected films. May be repeated for credit when different film creator studied.

121A. Advanced Acting: Mask, Myth, and Traditions (4) 
Lecture/lab—6 hours. Prerequisite: course 218 and consent of instructor. Theory and practice of acting focused on the performance skills necessary to diverse plays. Specific concentration on language as vocal and physical metaphor. Offered in alternate years.

121B. Advanced Acting: Comedy from Farce to Manners (4) 
Lecture/lab—6 hours. Prerequisite: courses 218, 121A and consent of instructor. Theory and practice of acting in comic plays. Specific issues addressed will be comic characterization, physical manner. Offered in alternate years.

122A. Advanced Acting: Realism (4) 
Lecture/lab—6 hours. Prerequisite: course 218 and consent of instructor. The issues of Stanislavski realism are explored through selected plays. Script analysis using improvisation and emotional scoring. Offered in alternate years.

122B. Advanced Acting: Non-Realism (4) 
Lecture/lab—6 hours. Prerequisite: courses 218, 122A and consent of instructor. Exploration of the acting techniques needed to perform a non-realist style of theatre. Offered in alternate years.

124A. Principles of Theatrical Design: Scenery (4) 
Lecture/seminar—4 hours. Prerequisite: course 24 or consent of instructor. Scene design processes, working drawings, sketching techniques, scale models, materials and materials of scenery construction.

124B. Principles of Theatrical Design: Scenery (4) 
Lecture—4 hours. Prerequisite: course 24 or consent of instructor. Analysis of plays in terms of costume design, execution of designs for modern and period plays. —Munn

124D. Principles of Theatrical Design: Costume (4) 
Lecture—4 hours. Prerequisite: course 24 or consent of instructor. Source materials for theatrical costumery, selecting fabrics, elements of design, analysis of plays in terms of costume design, execution of designs for modern and period plays. —Morgan

124E. Costume Design for Film (4) 
Lecture/discussion—4 hours. Prerequisite: course 24 or 124D or consent of instructor. Theory and practice of the art and business of film costume design. Script analysis, research, developing designs concepts, budgeting, and current production practices and methods. Execution of designs for period and contemporary films. Viewing of current films. —Morgan

125. Scenic Painting: Studio (4) 
Lecture—2 hours; studio—3 hours; laboratory—3 hours. Prerequisite: upper division standing in Dramatic Art, Art Studio, or Design, or course 24 or 23, or consent of instructor. Techniques, practices and materials. Course satisfies production requirement in studio category. May be repeated once with consent of instructor. Offered in alternate years.

126. Principles of Performing Arts Stage Management (3) 
Lecture/discussion—2 hours; laboratory—3 hours. Prerequisite: course 20, 24, 25, 26 or the equivalent or consent of director. Introduction to the practices and management principles for theatre, dance, musical theatre, music, and concerts. The dynamic role of the stage manager in the performing arts, upper-management team. —Winn

127A. Principles of Directing (4) 
Lecture—2 hours; laboratory—4 hours. Prerequisite: courses 21A, 26, two of 156A, 156B, 156C, or consent of instructor. The director’s creative approach to the play and to its staging.

127B. Principles of Directing (4) 
Lecture—2 hours; laboratory—4 hours; rehearsal. Prerequisite: course 127A and consent of instructor for non-majors. The director’s creative approach to the actor.

128. Principles of Theatre Sound (3) 
Lecture/discussion—2 hours; laboratory—3 hours. Fundamentals of sound, sound equipment, and sound design as used in modern theatre and other performance venues. Assembly, setup, and operation of basic theatre sound reinforcement system, recording system, and theatrical playback system. —Jacobson

130. Approaches to Theatrical Design: Practice and Theory (4) 
Seminar—2 hours; studio—4 hours. Prerequisite: upper division standing in Dramatic Art, Art Studio or Design. Advanced scenic design study in specific areas including: research, design styles and concepts, new materials and techniques, photography, projections, computer technology, spectacle and special effects, and alternative theatre forms and genres. Course satisfies Dramatic Art production requirement in Design. Offered in alternate years.

140A. Dance Composition (4) 
Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 40A, 41A, and 42A, or consent of instructor. Introduction to the craft of choreography. Students will compose phrases and present movement ideas. Offered in alternate years. (P/NP grading only.)—Grenke

140B. Dance Composition (4) 
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 140A. Continuation of the study of choreography, focusing on the development of group choreography: duets, trios, quartets and group work, form, and accompaniment. —Grenke

140C. Dance Composition (4) 
Lecture—3 hours; laboratory—3 hours. Prerequisite: courses 140A, 140B. Continuation of study of choreography focusing on specific movements for specific groups. The relation between dance and allied mediums of music, dance, costumes and lighting. Students conceptualize a choreographic issue and explore it through creation of short dance studies. —Davidson

141. Introduction to the Fundamentals of Movement (3) 
Lecture/discussion—3 hours. Introduction to fundamentals of movement that combine intellectual and kinesthetic understanding of the body’s skeletal and muscular systems. Explorations based on theories of body mind specialists Feldenkrais, Barteneff and Swiegard as well as the eastern discipline of Yoga.

142. History of Modern Dance (5) 
Lecture—3 hours; laboratory—3 hours; extensive writing. The Modern Dance tradition in the U.S., focusing on its theoreticalizations of individual and social identity. Students will write and choreograph analyses of principle dances in this tradition. Offered in alternate years.

143. Dance and Movement Studio (1-4) 
Lecture/lab—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. Offered as needed for stage productions. May be repeated for credit for a total of 8 units.

144. Introduction to Traditional Chinese Physical Culture (4) 
Lecture/discussion—4 hours. Traditional Chinese Wushu practices, exploration of its unique practice in dance laboratory conditions. Integration of practice with conceptual analysis; contemporary social, educational and artistic applications. —Hunter

145. Directed Choreography Projects (4) 
Lecture/lab—discussion—4 hours. Prerequisite: courses 140A, 140B, 140C or consent of instructor. Conceptualization, creation, casting, rehearsing, and concert presentation of complete dances, with students integrating elements of technique, movement and directing the on-stage rehearsals. —Grenke

146A. Professional Track Modern Dance I (3) 
Laboratory/discussion—6 hours. Prerequisite: courses 40B, 146A, and 146B, consent of instructor. Continuation of course 146B. Time as a theatrical device, sustaining movement and non-movement, phrasing, musicality. May be repeated twice for credit.—Grenke

146B. Professional Track Modern Dance II (3) 
Laboratory/discussion—6 hours. Prerequisite: courses 40B and 146A, consent of instructor. Professionally oriented performance training. Rigorous, consistent training regimen based on traditional modern dance technique. Breath and voice, skeletal and muscular placement, movement from the center, action technique, movement intention. May be repeated twice for credit.—Grenke

146C. Professional Track Modern Dance III (3) 
Lecture/discussion—6 hours. Prerequisite: courses 40B, 146A, and 146B, consent of instructor. Continuation of course 146B. Time as a theatrical device, sustaining movement and non-movement, phrasing, musicality. May be repeated twice for credit.—Grenke

150. American Theatre and Drama (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, Winn

1515. Australian Performance and Culture (4) 
Lecture/discussion—2 hours; seminar—2 hours. Australian performance and theatre practices as a product of its culture of origin. Relationships between art and society. Taught in Australia. GE credit: ArtHum.—McCutcheon

154. Asian Theatre and Drama: Contexts and Forms (4) 
Lecture/discussion—4 hours. Prerequisite: upper division standing. Selected Asian plays and performance forms in their cultural and artistic contexts; myth, ritual and the theatre; performance training, visual presentation of the text; political theatre; inter-
155. Representing Race in Performance (4) Lecture—4 hours. Examination of how "race" is represented and performed in American culture. Course will feature different subheadings such as "African American Theatre" or "Asian Americans on Stage." May be repeated once for credit when topic differs. Offered in alternate years. GE credit: ArtHum, Div, Wrt. —Sellers-Young

155A. African American Dance and Culture in the United States, Brazil and the Caribbean (4) Lecture/discussion—4 hours. A comparative study of the African American dance forms 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 African American and African Studies 155A.) Offered in alternate years.

155B. Ancient and Contemporary Greek Theatre and Dance (6) Discussion/lab—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, C, and Div. —Sellers-Young

156A. History of Theatre and Dance: Ancient to 1650 (4) Lecture—4 hours. Overview of theatre and dance as it has come to be recognized in ancient societies through 1650. Topics covered include Greek, Indian, Aztec, Roman, Japanese (Noh), through the Renaissance. GE credit: ArtHum, Div, Wrt. —I. [1]

156B. History of Theatre and Dance: 1650-1900 (4) Lecture—4 hours. Overview of theatre and dance between 1650 and 1900. Dance and theatre are related to the specific social and political organizations of court society in 17th and 18th century France, Germany and England, and to Japanese society. GE credit: ArtHum, Div, Wrt.

156C. History of Theatre and Dance: The Twentieth Century (4) Lecture—4 hours. Overview of theatre and dance in the twentieth century. Although largely focused on Western theatrical practices, the relationship between East and West performance practices will be studied. Contemporary Japanese theatre will be included. GE credit: ArtHum, Div, Wrt.

156D. Theatre History through Shakespeare (4) Lecture—4 hours. 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 once for four units of credit. GE Credit: ArtHum, Div, Wrt. —Hunter

156AN. Performance Analysis (4) Laboratory/discussion—3 hours; discussion—1 hour. Prerequisite: course 1, course 20 or consent of instructor. Analysis of performance on the stage, in the street, in everyday life, ritual, and in politics. Satire, irony, creative protest and performance. Social movements, gender, and performance as tactical intervention. GE Credit: ArtHum, Div, Wrt. —Bograd

156BN. Theatre in History and Place: Local, National and Global Conditions for Production (4) Laboratory—3 hours; discussion—1 hour. Prerequisite: course 1, course 20 or consent of instructor. Exploration of local, national and global issues in theatre production, with special attention to historical, social and political contexts for performance. GE Credit: ArtHum, Div, Wrt. —Hunter

156CN. Modern Aesthetic Movements in Performance (4) Laboratory/discussion—3 hours; discussion—1 hour. Prerequisite: course 1, course 20 or consent of instructor. Study of important movements in performance, especially theatre and dance from realism to the present. Primarily applicable to Western traditions though others may be studied. GE Credit: ArtHum, Div, Wrt. —Rossini

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 issues as well as historical and performance context texts. 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—4 hours. Examination of the "New Theatre"—its experimental and innovative nature since the 1960s. Dance, film, stage, performance art and public acts of a performative nature. Not open for credit to students who have completed course 159S. —Ill. (III.) McCutcheon

159S. Contemporary Experimental Performance, Theatre and Drama (4) Seminar—4 hours. Prerequisite: two courses in Dramaic Art or related courses in other departments; course 156A prerequisite for 156B or consent of instructor. Analysis of dramatic structure; preparation of scenarios; the composition of plays.

170. Media Theatre (3) Lecture—1 hour; rehearsal—2 hours; performance—1 hour. Prerequisite: upper division standing in Dramatic Art, Music, Art Studio, Design, Computer Science, or Engineering. Computer Science, or consent of instructor. New media and application of theatre design and performance. Emphasis on collaborative process in relationship to integration of emerging technologies and formation of new theatrical works. Development of collaborative performance through lecture, demonstration, improvisation and experimentation. May be repeated once for credit.

180. Theatre Laboratory (1-5) Prerequisite: upper division course and 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.)

192. Internships in Theatre and Dance (1-12) Internship—3-36 hours. Theatre production experience in creative, management, or administration areas: Experience in galleries, performance sites, or theatre/dance/physical theatre companies. May be repeated for credit for a total of 12 units. Not open to students who have completed course 192S. (P/NP grading only.)

192S. Internships in Theatre and Dance (1-12) 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, Renaissance, Shakespearean, Jacobean, early 17th century. Design projects include script analysis, research of period style, fashion, character development, costume construction, design concept, presentation skills. —I. (I.) Iacovelli, Morgan, Munn

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, Renaissance, Shakespearean, Jacobean, early 17th century. Design projects include script analysis, research of period style, fashion, character development, costume construction. Presentation skills. —I. Iacovelli, Morgan, Munn

224B. Seminar in Theatrical Design: Mid 17th Century to 1900 (4) Seminar—2 hours; project—2 hours. Prerequisite: graduate standing; course 224A or consent of instructor. Study focusing primarily on one discipline: scenic, costume or lighting design. Periods covered: Caroline, Restoration 18th century opera and ballet, 19th century drama. Design projects include script analysis, research of period style, fashion, character development, design concept, presentation skills. —I. (I.) Iacovelli, Morgan, Munn

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. Study focusing primarily on one discipline—scenic, costume or lighting design. 20th century genres covered: Realism, Brecht, Musi
234D. Seminar in Theatrical Design: Contemporary Approaches (4) Seminar—2 hours; project—2 hours. Prerequisite: graduate standing; course 224A, 224B, and 224C 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. Shakespeare, modern dance, concept plays and musicals. Script and character analysis for design in performance, research, design projects. —I. (II) Iacovelli, Munn

224E. Seminar in Theatrical Design: Advanced Concepts (4) Seminar—2 hours; project—2 hours. Prerequisite: graduate standing; course 224A, 224B, and 224C 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. —II. (III) Iacovelli, Morgan, Munn

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 five times for credit. —I, II, III (I, II, III) Iacovelli, Morgan, Munn

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 directorial concepts for production of selected non-realistic plays—Greek to the present; emphasis on textual analysis. Offered in alternate years.

229. Special Problems in Directing (5) 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 for credit.

250. Seminar in Costume (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 physical circumstances under which they were produced. Offered in alternate years.

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. Innovative theories 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 consideration of various tempi from music and movement.

253. Approaches to Collaboration (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: graduate standing. Exploration of different approaches to collaboration among artists in different media and their influence on the creative process. —I

254. Performing Identities/Personae (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: graduate standing. Historical and contemporary theories of constructing stage identities. Discussion and project collaborations based on theories. Questions of identity related to ethnicity, gender or sexual orientation.

255. Composition in the Arts (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: graduate standing. Examine manner in which specific elements utilized by actors, dancers, directors, choreographers, and designers are combined or 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 once for credit.

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 Theater," "Race and Gender in Performance." May be repeated five times for credit.

265A. Theory of Dramatic Art: Modes of Production Seminar—3 hours; term paper. Introduces students to literature of theatrical practice, cultural and aesthetic theory, as related to practical stage performance.

265B. Theory of Dramatic Art: Signification and the Body (4) Seminar—3 hours; term paper. Introduces students to analysis of the body in performance, drawing on theoretical models from various fields.

265C. Theory of Dramatic Art: Technologies of Difference (4) Seminar—3 hours; term paper. Introduces students to theory, practice of staging social and cultural difference.

265D. Theory of Dramatic Art (4) Seminar—3 hours; term paper. Theory and aesthetic principles of dramatic art as a fine art. Offered in alternate years. (Former course 265.)

280. Theatre Laboratory (1-12) Advanced practice in acting, directing, playingwriting, and technical theatre. May be repeated for credit. —I, II, III (II, III, III) Iacovelli, Morgan, Munn

298. Group Study (1-5) Prerequisite: consent of instructor.

299. Individual Study (1-12) (S/U grading only)

299D. Dissertation Research (1-12) (S/U grading only)

Professional Course

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing. May be repeated for credit. (S/U grading only) —I, II, III (II, III)

Professional Course

413. Stage Make-up (1) Lecture/laboratory—2 hours. Prerequisite: consent of instructors. Approved for graduate degree credit. Lectures, demonstrations, and practical work in aspects of theatrical makeup.
Graduate Adviser. This page contains information about graduate study, preparation, courses, and admissions.

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 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 intelligently-controlled transportation systems) 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 courses in civil, mechanical, and 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 a 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, one more in the alternate track, plus electives. Master’s degrees require a minimum of 36 quarter units and doctoral degrees require a minimum of 54 units. M.S. Plan I students may replace up to 6 units of regular course work with research (course 299) units. At least two thirds of all credits must be at the graduate level.

Graduate Adviser. P.L. Mohktarian

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 the following courses: 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: Transportation Survey Methods (TTP 200), Research Methods in Environmental Engineering (ESP 278), Design and Analysis of Engineering Experiments (BS 265), Experimental Design and Analysis (AGR 205), Engineering Experimentation and Uncertainty Analysis (MAE 207), or Statistical Methods for Research (STA 205).

M.S. and Ph.D. students take one in the area of Economic Analysis from the following: Transportation Economics (ECN 145), Microeconomic Analysis (ARE 204), Economic Analysis of Resource and Environmental Policies (ARE 276), Environmental Economics (ARE 276), or Infrastructure Economics (ECI 268). M.S. students take one and Ph.D. students take two in the area of Transportation Models and Quantitative Methods from the following: Discrete Choice Analysis of Travel Demand (ECI 254), Urban Traffic Management and Control (ECI 256), Transportation-Air Quality: Theory and Practice (ECI 269), Applied Statistical Methods: Regression Analysis (STA 108), Applied Statistical Methods: Analysis of Variance (STA 106), Analysis of Categorical Data (STA 138), Design and Analysis of Engineering Experiments (EBS 265), Multivariate Systems and Modeling (AGR 206), Applied Econometrics (ARE 256), or Psychological Data (PSC 204A, B, C, or D).

Integration and Breadth core courses: Ph.D. students take ITS Seminars (TTP 298), Transportation Orientation Seminar (TTP 282), Leadership, Professionalism, and Ethics Seminar (TTP 283), and Research (TTP 299).

Planning and Policy Courses. Approved courses in this area include the following; additional courses may be added upon approval by the Chairperson:

- Agricultural and Resource Economics, 100B, 136, 144, 175, 176, 204, 275, 276
- Anthropology 104N, 127, 211, 222
- Civil and Environmental Engineering, 165, 258, 268
- Civil and Environmental Engineering/Environmental Science and Policy 163
- Communication 170
- Community and Regional Development, 162, 240, 245
- Ecology 212
- Economics 145
- Education 222
- Engineering 250
- Environmental Horticulture 110
- Environmental Science and Policy 163, 167, 168A, 171, 179, 212A
- Geography 155
- History 172
- Landscape Architecture 180, 181, 201, 220
- Management 240, 251, 252, 293
- Political Science 187, 208
- Psychology 151
- Sociology 141, 143A, B
- Transportation Technology and Policy 200, 210, 220, 281, 282, 283, 292, 298

Technology Courses. Approved courses in this area include the following; additional courses may be added upon approval by the Chairperson:

- Agricultural Management and Rangeland Resources 132, 198
- Applied Science Engineering-Davis 115, 116
- Atmospheric Science 116, 270
- Biological Systems Engineering 216, 265
- Civil and Environmental Engineering 149, 153, 161, 162, 179, 189, 242, 256, 257, 269, 282
- Computer Science Engineering 168
- Environmental and Resources Science 131, 186
- Electrical and Computer Engineering 207
- Landscape Architecture 198
- Mechanical Engineering 134, 161, 163, 188, 217, 218, 226, 234, 236, 258, 298

Other Courses. Approved courses in this area include the following; additional courses may be added upon approval by the Chairperson:

- Agricultural and Resource Economics 106, 252, 253, 254, 255, 256
- Agronomy 205, 206
- Anthropology 138
- Civil and Environmental Engineering 153, 254

Courses in Transportation Technology and Policy (TTP)

Graduate Courses

200. Transportation Survey Methods (4)

Lecture—4 hours. 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 completed Civil and Environmental Engineering 255.—I, II, III. Mokhtarian, Sperling

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) Mokhtarian, Sperling

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).—II. (III) Sperling

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 through lecture or laboratory, or a combination of both. May be repeated for credit. (S/U grading only).—I, II, III. (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)

299. 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)

299. Group Study (1-5)

Discussion—1-5 hours. Prerequisite: consent of instructor. (S/U grading only)

299. Research (1-12)

Discussion—1-12 hours. Prerequisite: consent of instructor. (S/U grading only)
UC Davis Short-Term Programs Abroad

UC Davis Summer Abroad is a study-abroad program unique to the Davis campus. A UC Davis faculty-led program, Summer Abroad offers multiple programs each year in various countries and specializations. Participants remain registered UC Davis students while abroad and receive UC Davis units for coursework taken abroad. Financial aid and scholarships apply. Students may participate in Summer Abroad as early as their freshman year, or as late as their senior year or after graduation.

Academic Focus. Students of any major can participate in Summer Abroad. All programs are approximately four weeks in length, and are led by UC Davis faculty members. Students may also earn units through an internship component for some programs. All programs allow students to experience the program country’s unique culture through co-curricular activities, such as day-trips to surrounding areas, museum tours, and theater visits.

Students can earn 8-12 quarter units through 2-3 courses taken abroad. Students may be able to apply earned units towards their major, minor, or General Education requirements.

Summer Abroad courses can apply specifically towards the Global and International Studies minor. The minor is designed for students who intend to focus their interest in global and international studies in either the Arts and Humanities or the Social Sciences.

In preparation for Summer Abroad, students are urged to take Education Abroad Program 90X or 190X, which examine issues of study abroad.

UC Davis Washington Center

Emily O. Goldman, Ph.D., Director and Associate Professor

UC Davis Washington Center
1608 Rhode Island Avenue NW, Third Floor
Washington, D.C. 20036
(202) 974-6351

Information.

UC Davis Washington Center On-Campus Office Internship and Career Center
South Hall, 2nd Floor
(530) 754-5718

http://washingtonprogram.ucdavis.edu

The UC Davis Washington Center began operations in the 1990-91 academic year. It offers students and faculty new and expanded opportunities in the nation’s capital to enrich their education and research. Its principal activities are an undergraduate academic internship program, fellowships and internships for graduate and professional school students, fellowships and research grants for faculty, and conferences and workshops organized by UC Davis faculty. The University of California Washington Center resides in an 11-story, state of the art facility in downtown D.C. The center houses the academic and residential programs for undergraduate, faculty, and graduate students participating in the UC Davis Washington Center, as well as those from other UC campuses.

Undergraduate Academic Internship Program

The UC Davis Washington Center undergraduate program is open to students from all majors at UC Davis who have completed 89-9 units towards graduation. Students earn 15 units of academic credit, continue to be registered as full-time students, and fulfill university residency requirements. A GPA of at least 3.000 is recommended for admission although not required. Applications are also evaluated based on overall relevant experience, a written statement, letters of recommendation and personal interviews.

The Undergraduate Academic Internship Program runs 11 weeks each fall, winter, and spring quarter. It has three principal components:

- **Internship.** 7 units: Students work three to four days per week as interns in Congress, Federal agencies, interest groups, trade associations, research institutions, the media, museums or in other organizations related to policy, politics, science and culture and geared to the interests and objectives of individual students.

- **Research Seminar.** 4 units: This is the core academic component of the program. Each student writes a 20-25 page research paper in consultation with UC Davis faculty and graduate fellows. To complete the assignment, students take advantage of the many unique research resources in Washington, DC.

- **Elective Seminar Course.** 4 units: Each student also enrolls in one upper division seminar course taught at the Washington Center. These courses vary each quarter, and are a mix of political science, international relations, history, 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. UC Davis course equivalencies are established each quarter.

Courses are taught by UC Davis faculty in residence, faculty from the UCLA, UC Santa Barbara, UC Santa Cruz, UC San Diego, UC Berkeley, UC Irvine and UC Riverside programs, or visiting faculty from the Washington area.

Financial aid eligibility is maintained, and the aid package can be adjusted to reflect the additional costs of the program. Some additional financial awards also are offered directly by the Washington Center, including the University of California President’s Washington Scholarship, Joyce and Norman Well Scholarships, and the Blanche and Frank Goldstein Building Bridges Award.

Students reside at the UC Washington Center facility, convenient to public transportation. Arrangements are made to cover health services and other aspects of student life. The program also includes many educational, cultural and historical activities in the Washington area.

**Summer Program.** The UC Davis Washington Center also operates an 11-week Summer Program. The Summer Program has a credit or non-credit option. The credit option allows students to earn 7 units of academic credit, in addition to working at an internship. Students pay the summer sessions rate per credit hour plus an application fee. The non-credit internship has a program fee of $200. Both options allow students to participate in many educational, cultural, historical and social activities. Some financial assistance is more limited than for the academic year programs.

The Washington Center also has positions during the academic year for graduate students as Graduate Fellows; combination of a predoctoral research fellowship and a teaching assistantship, and Graduate Summer Internships.

University Writing Program

[College of Letters & Science]

http://writingprogram.ucdavis.edu

Committee in Charge

John Boe, Ph.D. (University Writing Program)
Elizabeth Davis, Ph.D. (University Writing Program)
Gary Finney, Ph.D. (Comparative Literature, German)
Ines Hernandez-Avila, Ph.D. (Native American Studies)
Jay Meckling, Ph.D. (American Studies)
Sandra M. Murphy, Ph.D. (Education)
Via Ramanathan, Ph.D. (Linguistics)
David A. Robertson, Ph.D. (English)
Evan Watkins, Ph.D. (English)
Karl F. Zender, Ph.D. (English)

Affiliated Faculty

Cynthia J. Bates, M.A., Lecturer
Mary E. Bly, M.A., Lecturer
John Boe, Ph.D., Lecturer, Academic Federation
Excellence in Teaching Award
Marlene B. Clarke, Ph.D., Lecturer
Mardena E. Creek-Mitchell, Ph.D., Lecturer
Elizabeth Davis, Ph.D., Lecturer
Pamela Demory, Ph.D., Lecturer
Aliki Dragona, Ph.D., Lecturer
Dale B. Flynn, Ph.D., Lecturer
Laurie Glover, Ph.D., Lecturer
Gary S. Goodman, Ph.D., Lecturer
Jared Haynes, M.A., Lecturer, Academic Federation
Excellence in Teaching Award
Donald B. Johns, Ph.D., Lecturer, Academic Federation
Excellence in Teaching Award
Andy Jones, Ph.D., Lecturer
Pamela J. Major, Ph.D., Lecturer
James McLay, Ph.D., Lecturer

Courses in UC Davis Washington Center (WAS)

Upper Division Courses

175. Health Policy and Health Politics (4)
Seminar—3 hours; extensive writing or discussion—1 hour. Following the model of a Congressional sub-committee, identification of four salient health policy issues for study, research, and development of model policies to address them. (Same course as Epidemiology and Preventive Medicine 175W) GE credit: SocSci; Wrt—I, III; Winter

187. Gun Violence (4)
Lecture/discussion—4 hours. Gun violence, viewed from the perspectives of criminality and public health. Topics include personal and societal contributing factors and critical assessment of potential solutions. Offered in alternate years. — III; Winter

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 research project. (Same course as Political Science 193W) GE credit: Wrt—I, II, III, I, II, III; Goldman

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 Wash-ington Center Programs coordinated with internships. Research draws on resources uniquely available in Washington, DC. Summer preparation of extensive paper. (Same course as Political Science 193W) GE credit: Wrt—I, II, III, I, II, III; Goldman

Quarter Offered:
I=Fall, II=Winter, III=Spring, IV=Summer, 2007/2008 offering in parentheses

General Education (GE) credit: ArtHum—Arts and Humanities, SciEng—Science and Engineering, SocSci—Social Sciences, Div—Social-Cultural Diversity; Wrt—Writing Experience

UC Davis Short-Term Programs Abroad 467
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 UWP also administers the English Composition Examination, an alternative essay of exemplary student writing, Prized Writing, and a journal for writing instructors, The Writing in the Disciplines Workshop Program. 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.

Courses in University Writing Program (UWP)

Lower Division Courses

1. Expository Writing (4)
   Lecture/discussion—4 hours. Prerequisite: completion of Subject A requirement. Composition, the essay, paragraph structure, diction, and related topics. Frequent writing assignments will be made. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 1.—I, II, III. (I, II, III.)

2. Style in the Essay (4)
   Lecture/discussion—4 hours. Prerequisite: course 1 or English 3 or the equivalent. Style, language, and structure in the essay. Instruction in analyzing style, developing a written voice, revising sentences, developing effective paragraphs and arguments, and writing with force and clarity. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 18.—I, II, III. (I, II, III.)

3. Writing Research Papers (4)
   Lecture/discussion—4 hours. Prerequisite: course 1 or English 3 or the equivalent. Development of skills in critical reading, analysis, documentation, and writing needed for research-based assignments. Instruction provided in formulating research topics and in preparing drafts. Reading and writing assignments may focus on a single theme. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 18.—I, II, III. (I, II, III.)

92. Internship in Writing (1-12)
   Internship—3-36 hours. Prerequisite: course 1 or English 3 in at least two classes where students can practice their skills. May be repeated for credit for a total of 12 units. Not open for credit to students who have completed English 92. [P/NP grading only.]

98. Directed Group Study (1-5)
   Prerequisite: course 1 or English 3. Not open for credit to students who have completed English 98. [P/NP grading only.]

99. Special Study for Undergraduates (1-5)
   Not open for credit to students who have completed English 99. [P/NP grading only.]

Upper Division Courses

101. Advanced Composition (4)
   Lecture/discussion—3 hours. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Instruction for students in all disciplines in advanced principles of expository writing. Focus on writing tasks that are characteristic of the undergraduate academy. Assignments provide practice in a variety of modes of writing: narrative, analysis, explanation, argument, critique. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 101.—I, II, III. (I, II, III.)

102A. Writing in the Disciplines (4)
   Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent; concurrent enrollment in a specified subject in a subject-matter discipline, acceptance into a specified major, or consent of instructor. Advanced instruction in the elements of expository writing, with special emphasis on their application to writing projects in a specified academic discipline. May be repeated one time for credit if taken with a different subject-matter course. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 102A.—I, II, III. (I, II, III.)

102B. Writing in the Disciplines: Biological Sciences (4)
   Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent, 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 the discipline of biology. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 102B.—I, II, III. (I, II, III.)

2. Writing in History (4)
   Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent, upper division standing. Open to majors in a historical science or to students concurrently enrolled in an upper division course accepted for the major. Advanced instruction in writing in the discipline of history. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 102C.—II. (II.)

102D. Writing in International Relations (4)
   Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent, 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 the discipline of international relations. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 102D.—II. (II.)

102E. Writing in Engineering (4)
   Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent, upper division standing. Open to upper division students in the College of Engineering and to student enrolled in an upper division engineering or computer science course. Advanced instruction in writing in the discipline of engineering. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 102E.—I, II, III. (I, II, III.)

102F. Writing in Food Science and Technology (4)
   Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent, upper division standing. Open to majors in food science and technology or to students concurrently enrolled in an upper division course accepted for the major. Advanced instruction in writing in the discipline of food science and technology. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 102F.

102G. Writing: Bioregion (4)
   Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent, upper division standing. Open to majors in Land, Air, and Water Resources, Nature and Culture, Wildlife, Fish, and Conservation Biology or concurrent enrollment in an upper division course that focuses to some extent on the bioregion (e.g., botany, geology, or literature of California). Advanced instruction in writing in those disciplines that focus on the intertwined human and non-human communities of the Putah and Cache Creek watersheds in which the university is located. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 102G.

104A. Writing in the Professions: Business Reports and Technical Communication (4)
   Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent, upper division standing. Instruction in advanced principles of critical thinking, argumentation, and style, with special emphasis on their application to situations in the legal profession. Suitable for students planning careers in law, business, administration, or management. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 104A.—I, II, III. (I, II, III.)

104B. Writing in the Professions: Journalism (4)
   Lecture/discussion—3 hours. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Instruction in advanced principles of critical thinking, argumentation, and style, with special emphasis on their application to situations in the legal profession. Suitable for students planning careers in law, business, administration, or management. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 104B.—I, II, III. (I, II, III.)

104C. Writing in the Professions: Legal Research (4)
   Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Advanced instruction in writing non-fiction for magazines and newspapers, including problems of style and language. Special emphasis on conducting research, interviewing, analyzing markets, and writing query letters. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 104C.—I, II, III. (I, II, III.)

105B. Writing in the Professions: Elementary and Secondary Education (4)
   Lecture/discussion—3 hours. Prerequisite: course 1 or English 3 or the equivalent and upper division standing. Advanced instruction in writing in a variety of modes of writing. Special emphasis on their application to topics related to teaching and issues in contemporary American education. Strongly recommended for teaching credential candidates. GE credit: Wrt [cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously]. Not open for credit to students who have completed English 105B.—I, II, III. (I, II, III.)
104E. Writing in the Professions: Science (4)
Lecture/discussion—3 hours. Prerequisite: course 1 or English 3 or the equivalent and upper division or graduate science curriculum. Advanced instruction in writing abstracts, research proposals, scientific papers, other forms of scientific communication and in presenting data graphically. Primarily for students engaged in or planning careers in basic or applied research. GE credit: Wrt (cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously). Not open for credit to students who have completed English 104E.—I, II, III. (I, II, III.)

104F. Writing in the Health Profession (4)
Lecture/discussion—3 hours; extensive writing. Prerequisite: course 1 or English 3 or the equivalent and upper division, advanced standing. Advanced instruction in several forms of expository writing common in the health professions, focusing on topics related to health, disability, disease and emphasizing effective communication between the writer and different audiences. Suitable for students planning careers in such health professions as medicine, dentistry, physical therapy, genetic counseling, and optometry. GE credit: Wrt (cannot be used to satisfy a college or university composition requirement and GE writing experience simultaneously). Not open for credit to students who have completed English 104F.—I, II, III. (I, II, III.)

192. Internship in Writing (1-12)
Internship—3-36 hours. Prerequisite: course 1 or English 3. Internships in fields where students can practice their skills. A maximum of 4 units is allowed toward the major in English. May be repeated for credit for a total of 12 units. Not open for credit to students who have completed English 192. (P/NP grading only.)

197T. Tutoring in Writing (1-5)
Tutoring—1-5 hours. Prerequisite: upper division standing and consent of chairperson. Leading of small voluntary discussion groups affiliated with one of the department’s regular courses. Does not fulfill requirement for major. May be repeated for credit for a total of 8 units. Not open for credit to students who have completed English 197T. (P/NP grading only.)

197C. Community Tutoring in Writings (1-4)
Tutoring—1-4 hours. Prerequisite: upper division standing and a major in English, consent of chairperson. Leading of small voluntary discussion groups affiliated with one of the department’s regular courses. Does not fulfill requirement for major. May be repeated for credit. Not open for credit to students who have completed English 197C. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: one course from courses 1, English 3, 5F, or 3P. Not open for credit to students who have completed course 198. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Not open for credit to students who have completed English 199. (P/NP grading only.)

Graduate Courses
298. Directed Group Study (1-5)
Not open for credit to students who have completed English 298. (P/NP grading only.)

299. Individual Study (1-12)
Not open for credit to students who have completed English 299. (S/U grading only.)

Professional Courses
390. Theory and Practice of University-Level Composition Instruction (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing; appointment as Teaching Assistant in the Composition Program. Examination of current theories about the teaching of writing and their practical application to undergraduate writing courses at UC Davis. Not open for credit to students who have completed English 390. (S/U grading only.)—I, II, III. (I, II, III.)

392. Teaching Expository Writing (2)
Discussion—2 hours. Prerequisite: graduate standing, appointment as Teaching Assistant in the Composition Program; completion of course 390 or the equivalent. Discussion of problems related to teaching expository writing at the university level, with special emphasis on teaching reading and writing skills and responding to student papers. (S/U grading only.)—I, II, III. (I, II, III.)

396. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. Not open for credit to students who have completed English 396. (S/U grading only.)—I, II, III. (I, II, III.)

Urban Planning
See Environmental Science and Policy, on page 262.

Urology
See Medicine, School of, on page 345.

Vegetable Crops
See Plant Sciences, on page 419.

Veterinary Medicine, School of
Bennie I. Osburn, D.V.M., Ph.D., Dean of the School
John R. Pascoe, B.V.Sc., Ph.D., Executive Associate Dean
Jan E. Ilkiw, B.V.Sc., Ph.D., Associate Dean—Academic Programs
Susan V. Hildebrand, D.V.M., Associate Dean—Academic Programs
K. C. Kent Lloyd, D.V.M., Ph.D., Associate Dean—Research and Graduate Education Programs
Bradford F. Smith, D.V.M., D.V.M., Associate Dean—Clinical Programs; Director, Veterinary Medical Teaching Hospital
James S. Cullor, D.V.M., Ph.D., Director, Veterinary Medicine Teaching and Research Center, Tulare
David W. Hird, D.V.M., M.P.V.M., Ph.D., Director, Master of Preventive Veterinary Medicine Program
Donald J. Klingborg, D.V.M., Assistant Dean—Public Programs; Director, Veterinary Extension
School Office: Rooms 101–142 Surge IV (530) 752-1360; http://www.vetmed.ucdavis.edu
Faculty
Verena K. Alford, D.V.M., Ph.D., Associate Professor of Clinical Dermatopathology (Pathology, Microbiology, and Immunology)
Mark L. Anderson, D.V.M., Ph.D., Professor of Clinical Diagnostic Pathology (Pathology, Microbiology, and Immunology)
John A. Angelastro, Ph.D., Associate Professor (Molecular Biosciences)
David V. Angelatos, D.V.M., Ph.D., Assistant Professor (Medicine and Epidemiology)
Alexander A. Ardans, D.V.M., M.S., Professor
[Medicine and Epidemiology]
Barry A. Ball, D.V.M., Ph.D., Professor
[Population Health and Reproduction]
Danika L. Bannasch, D.V.M., Ph.D., Assistant Professor
[Population Health and Reproduction]
Bradd C. Barr, D.V.M., Ph.D., Professor of Clinical Diagnostic Pathology
[Pathology, Microbiology, and Immunology]
Stephen W. Barthalm, D.V.M., Ph.D., Professor
[Pathology, Microbiology, and Immunology]
Nicole Baumgarth, D.V.M., Ph.D., Associate Professor
[Pathology, Microbiology, and Immunology]
Patrick C. Blanchard, D.V.M., Ph.D., Professor
[Clinical Diagnostic Pathology (Medicine and Epidemiology)]
Robert H. BonDurant, D.V.M., Professor
[Population Health and Reproduction]
Walter M. Boyce, D.V.M., Ph.D., Professor
[Pathology, Microbiology, and Immunology]
Aaron C. Brault, Ph.D., Assistant Professor
[Pathology, Microbiology, and Immunology]
Robert J. Broanan, D.V.M., Ph.D., Assistant Professor (Surgical and Radiological Sciences)
Michael L. Bruss, D.V.M., Ph.D., Professor (Anatomy, Physiology, and Cell Biology)
Alan R. Buckpitt, Ph.D., Professor (Molecular Biosciences)
Barbara A. Byrne, D.V.M., Ph.D., Assistant Professor (Pathology, Microbiology, and Immunology)
Tim E. Carpenter, Ph.D., Professor (Molecular Biosciences)
James T. Case, D.V.M., Ph.D., Professor of Clinical Diagnostic Medicine (Medicine and Epidemiology)
Bruce R. Charlton, D.V.M., Ph.D., Assistant Professor of Clinical Diagnostic Microbiology (Population Health and Reproduction)
Richard P. Chin, D.V.M., Associate Professor of Clinical Diagnostic Veterinary Medicine (Population Health and Reproduction)
Bruno B. Chomel, D.V.M., Ph.D., Professor (Population Health and Reproduction)
Mary M. Christopher, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Dean O. Cliver, Ph.D., Ph.D., Professor (Population Health and Reproduction)
Alan J. Conley, D.V.M., Ph.D., Professor (Population Health and Reproduction)
Patrick A. Conrad, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
George L. Cooper, D.V.M., M.S., Associate Professor of Clinical Diagnostic Pathology (Pathology, Microbiology, and Immunology)
Gino A. Cortopassi, Ph.D., Professor (Molecular Biosciences)
Larry D. Cowgill, D.V.M., Ph.D., Professor (Medicine and Epidemiology)
Rocio M. Crespo, D.V.S., M.S., B.V.Sc., M.A., Associate Professor (Pathology, Microbiology, and Immunology)
James S. Cullor, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)
Peter J. Dickinson, B.V.Sc., Ph.D., Assistant Professor (Surgical and Radiological Sciences)
Holly B. Errett, D.V.M., Ph.D., Assistant Professor in Residence (Population Health and Reproduction)
Thomas B. Farver, Ph.D., Professor (Population Health and Reproduction)
Andrea J. Fascetti, V.M.D., Ph.D., Associate Professor (Molecular Biosciences)
Edward C. Feldman, D.V.M., Professor (Medicine and Epidemiology)
Janet E. Foley, M.S., D.V.M., Ph.D., Associate Professor (Medicine and Epidemiology)
Larry D. Galuppo, D.V.M., Associate Professor (Surgical and Radiological Sciences)
Ian A. Gardner, B.V.Sc., M.S., M.P.V.M., Ph.D., Professor (Medicine and Epidemiology)
Jeanne W. George, D.V.M., Associate Professor of Clinical Pathology (Pathology, Microbiology, and Immunology)
Lisle W. George, D.V.M., Ph.D., Professor (Medicine and Epidemiology)
Laurel J. Gerstwhin, D.V.M., Ph.D., Professor (Pathology, Microbiology, and Immunology)

Upper Division Courses

170. Ethics of Animal Use (4) Lecture—3 hours; discussion—1 hour. Prerequisite: any basic course in composition or speech. Ethical issues relating to animal use in contemporary society. Integration of philosophical theories with scientific evidence only.—I, II, III, IV, IV. (I, II, III, IV) [Clv, Wrt.] 192.

192. Internship in Veterinary Science (1-12) Discussion/laboratory—3-36 hours; final report. Prerequisite: upper division standing, approval of the second-year student in veterinary medicine. Supervised work experience in veterinary medicine. (P/NP grading only.) Iklik

228. Group Study (1-5) Prerequisite: consent of instructor. (S/U grading only.) Learning and living in small groups. (Deferred grading only, pending completion of sequence. S/U grading only.)—I, II, III, IV, IV. (I, II, III, IV) [Ilik, Wrt.] 230.

230. Research (1-12) Prerequisite: consent of instructor. (S/U grading only.) Individual study of selected topics. (Deferred grading only, pending completion of sequence. S/U grading only.)—I, II, III, IV, IV. (I, II, III, IV) [Ilik, Wrt.] 230.

Professional Courses

400A. Freshman Doctoring (2.5) Lecture—18 sessions; discussion—2 sessions; workshop—5 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine and consent of instructor. Introduction to the “art” of veterinary medicine, focusing on essential skills such as communication, teamwork, leadership, conflict management, stress management and financial management. Emphasis on practical application of these skills to be able to function efficiently and effectively in practice, academia, industry, government or other career. (S/U grading only.)—I. (I.) Klingborg, Timmons 400B. Sophomore Doctoring (2.3) Lecture—13 sessions; discussion—4 sessions; project—1 hour; laboratory—5 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine; consent of instructor. Further development of technical skills that will prepare students for lifelong learning and successful veterinary practice management. Emphasis will be on hands-on learning and application. (Deferred grading only, pending completion of sequence. S/U grading only.)—I, II, III, IV. (I, II, III, IV) [Ilik, Wrt.] 400.

400. Ilik 401A. The Normal Anatomy of the Canine Locomotor System (3.4) Lecture—16 sessions; laboratory—18 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine. Normal canine anatomy of bones, joints, muscles, ligaments, tendons, nerves and vessels of the vertebral column and limbs, musculoskeletal physiology and biomechanics.—I. (I.) Meyers 401B. The Normal Anatomy of the Canine Head (1.7) Lecture—7 sessions; laboratory—8 sessions; discussion—2 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine. Normal canine anatomy with comparison to other species of bones, joints, muscles, ligaments, tendons, nerves and vessels of the head including the eye and ear.—II. (II.) Plopper 402. Structure and Function of the Cardiovascular and Respiratory Systems (4.5) Lecture—42 sessions; laboratory—13 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine or consent of instructor. Integrated view of cardiovascular and respiratory anatomy and physiology. (Deferred grading only, pending completion of sequence.)—I, II, III, IV. (I, II, III, IV) [Ilik, Wrt.] 402.

402.

403. Physiological Chemistry (3.9) Lecture—32 sessions; discussion—7 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine and consent of instructor. Biochemical principles used to analyze problems and to evaluate metabolic relationships important in animal health and pathology. Integrative approach, emphasizing controls of major metabolic pathways, molecular basis of gene expression, tumorigenesis and signal transduction.—I. (I.) Cortaldo 405. Veterinary Parasitology (3.6) Lecture—26 sessions; laboratory—10 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine. Biological and clinical aspects of parasites and the diseases they cause in animals.—I, II, III, IV. (I, II, III, IV) [Ilik, Wrt.] 406. Principles of Behavior (0.7) Lecture—7 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine. Approved for graduate degree credit. Overview of animal behavior with relevance to veterinary medicine.—I. B. Hart 407. Principles and Techniques of Operative Surgery and Anesthesia (2.4) Lecture—24 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine; course 426. Introduction to operative and anesthetic skills and foundation in the importance of regional anatomy in the planning and conduct of surgical practice.—I. (I.) Gregory, Iklik 407L. Principles and Techniques of Surgery and Anesthesia Laboratory (1.4) Laboratory—14 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. Introduction to surgical anatomy, operative and anesthetic skills. (Deferred grading only, pending completion of sequence. S/U grading only.)—I, II, III, IV. (I, II, III, IV) [Ilik, Wrt.] 408. Nutrition and Nutritional Diseases in Animals (2.9) Lecture—27 sessions; laboratory—2 three-hour sessions. Prerequisite: first-year standing in the School of Veterinary Medicine. Approved for graduate degree credit. Principles and their application to the solution of nutritional disorders of animals.—I, II, III, IV. (I, II, III, IV) [Ilik, Wrt.] 409. Epidemiology (1.7) Lecture—11 sessions; discussion—6 session. Prerequisite: first-year standing in School of Veterinary Medicine. Approved for graduate degree credit. Introduction to epidemiology and its applications in veterinary medicine.—I. (I.) Kass 412. Fundamentals of Zoonoses (1.1) Lecture—11 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine or consent of instructor. Major zoonotic infections transmitted mainly by domestic animals, especially pets and particularly in North America. A short review of symptoms in animals and humans, epidemiology, diagnostic tests, treatment and prevention will be presented for each animal species and each infection or infestation. Some zoonotic diseases, subject to USDA rules and regulations, will be studied in more detail (i.e., rabies, brucellosis, tuberculosis, avian chlamydiosis).—II, III, Ilik 413. Veterinary Food Safety (1.3) Lecture—13 sessions; discussion—6 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine; consent of instructor. The food system and diseases transmitted by food. Topics include sources of contamination, sanitation of processing in food safety, and the role of veterinarians in pre-harvest food safety and in food protection in general.—II, III, Ilik
414A. Principles of Veterinary Pharmacology and Toxicology (2.5) Lecture—12 sessions; laboratory—4 sessions; laboratory—1 session. Prerequisite: second-year standing in the School of Veterinary Medicine.

Introduction to the principles of pharmacology and toxicology. Pharmacokinetics, pharmacodynamics and chemotherapeutics of bacterial, neoplastic, fungal, and viral diseases. —I. (I.) Buckspit

414B. Veterinary Pharmacology (2.5) Lecture—23 sessions; discussion—2 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine; consent of instructor. Basic principles for the use of drugs affecting the autonomic and central nervous systems as well as compounds affecting the musculoskeletal system. —II (II.)

414C. Veterinary Toxicology (1.9) Lecture—16 sessions; discussion—2 sessions; laboratory—1 session. Prerequisite: second-year standing in the School of Veterinary Medicine; consent of instructor. Development of clinical skills by learning procedures that are important to the practice of veterinary medicine in a variety of species in both a laboratory and a clinical environment. (Deferred grading only, pending completion of sequence. S/U grading only) I, II, III, (I, II, III) Nelson

415B. Sophomore Clinical Skills (1.2) Lecture—1 session; lab—11 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine and consent of instructor. Development of clinical skills by learning procedures that are important to the practice of veterinary medicine in a variety of species in both a laboratory and clinical environment. (Deferred grading only, pending completion of sequence. S/U grading only) I, II, III, (I, II, III) Nelson

415C. Junior Clinical Skills (1.9) Lecture—1 session; lab—18 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine and consent of instructor. Development of clinical skills by learning procedures that are important to the practice of veterinary medicine in a variety of species in both a laboratory and clinical environment. (Deferred grading only, pending completion of sequence. S/U grading only) I, II, III, (I, II, III) Nelson

419. Virology (2.7) Lecture—19 sessions; laboratory—8 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine or consent of instructor. Introduction to the classification, morphology, and the strategy of replication of animal viruses, covering the molecular pathogenesis of animal viruses at the cellular level with emphasis on agents of infectious diseases of domestic animals. —I. (I.) Yilma

420. Immunology (3) Lecture—21 sessions; laboratory—9 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine. Approved for graduate degree credit. Concepts of immunology. Emphasis is on the principles of vaccination, responses to pathogenic agents, and the mechanisms of hypersensitivity and autoimmune reactions. —III (III.) Gershvin

421. Principles of Neurosciences (2.7) Lecture—22 sessions; laboratory—5 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine. An introduction to normal neurobiology, neuroanatomy and neurophysiology, to enable students to engage in studies of neurologic disorders and clinical neurology. —II (II.) LeCouteur

422. Veterinary Ophthalmology (1.9) Lecture—7 sessions; laborator y—2 sessions. Prerequisite: third-year standing in School of Veterinary Medicine. The eye and related structures. Basic anatomy and physiology with clinically relevant aspects emphasized. Presentation of clinical appearance of common pathological changes. Specific diseases frequently encountered in clinical practice, including signs, causes, diagnostic approach, and treatment philosophy. —II. (II.) Hollingsworth

425. Veterinary Genetics (1.8) Lecture—10 sessions; discussion—10 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine or consent of instructor. Introduction to veterinary genetics as preparation to recognize breeds; assess a pedigree; explain coat color inheritance; distinguish Mendelian from non-Mendelian patterns; interpret results of "various laboratory tests." Explain to a layperson how diseases or traits are attributed to a gene or gene defect; "appreciate breaking genetics/biotechnology news." —III (III.) Lyons

426. Principles of Veterinary Anesthesiology and Critical Care Patient Care (1.7) Lecture—15 sessions; laboratory—2 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine. Basic principles of veterinary anesthesiology including techniques of monitoring and management of animals under anesthesia. —II. (II.) Steffey

427. Cell and Tissue Structure and Function (3.3) Lecture—24 sessions; laboratory—9 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine. Relationship between structure and function of animal tissues, emphasizing the molecular and cellular processes that integrate normal physiological activities of cell division, differentiation and locomotion. Microscopic anatomy and organization of cells and extracellular molecules to form specialized differentiated tissues. —I. (I.) Tablin

430. Principles of Radiography and Radiologic Interpretation (3.6) Lecture—24 sessions; laboratory—2 sessions; discussion—10 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine and consent of instructor. Physical principles of x-ray production and x-ray matter interactions as they pertain to diagnostic medical imaging and radiation safety. Principles of radiologic interpretation. Principles of ultrasound physics and interpretation. (Deferred grading only, pending completion of sequence) I, II, III, (I, II, III) Winer

431. Endocrinology (1.8) Lecture—17 sessions; laboratory—1 session. Prerequisite: first-year standing in the School of Veterinary Medicine. The structure and function of endocrine glands and how hormones and cytokines influence physiological processes. —III (III.) LeFebvre

432. Structure and Function of the Gastrointestinal and Mammary Systems (3.2) Lecture—22 sessions; laboratory—10 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine. Basic understanding and correlation of the structure and function of the gastrointestinal and mammary systems. Multiple species’ differences examined. —II (II.) Bruss

433. Veterinary Oncology (1.2) Lecture—12 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine. Relationships between pathology, hematology, cytology, immunology, and the causative relationships of neoplastic diseases in animals. —I. (I.) Kent

434. Basic Veterinary Hematology (2) Lecture—14 sessions; laboratory—6 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine. The study of blood cells, the morphology of bone marrow and hematopoietic cells, the morphology and function of blood cells and the activities of hemostasis. —III (III.) Vernay

435. Veterinary Clinical Pathology (3.3) Lecture—22 sessions; laboratory/discussion—11 sessions. Prerequisite: second-year standing in School of Veterinary Medicine. The principles, selection, use, interpretation, and limitations of laboratory tests used for the diagnosis and monitoring of disease in animals. —II (II.) Ciencia

436. Veterinary Ethics and Law (1.2) Discussion—12 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine. Ethical and legal issues critical to successful and ethical veterinary practice. Processes through which ethical and legal questions are approached and resolved. Background reading materials and discussions are supplemented with problem-based learning. —I. (I.) Femel

437. Veterinary Ethics and Law (2) Lecture—16 sessions; discussion—4 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine or consent of instructor. Ethical and legal issues critical to successful and ethical veterinary practice. Processes through which ethical and legal questions are approached and resolved. Reading and discussions supplemented with problem-based learning. —III (III.) Tennenbaum

440. Veterinary Neurology (2.7) Lecture—21 sessions; laboratory—6 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. Integrated study of the relationship between microanatomy, neurochemistry, neurophysiology, and the clinical manifestations and diagnosis of neurological diseases, and the use of the various neurodiagnostic aids. —I. (I.) LeCouteur

441. Clinical Endocrinology (1.5) Lecture—12 sessions; discussion—3 sessions. Prerequisite: third-year standing in School of Veterinary Medicine or consent of instructor. A correlated review of common endocrinologic disorders affecting the dog and cat. —II (II.) Feldman

446. Veterinary Reproduction (4) Lecture—30 sessions; laboratory—10 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine. Structural, functional, pathophysiological, and clinical aspects of reproduction in animals. —II. (II.) Conley

447. Introduction to Public Veterinary Practice and Foreign Animal Diseases (1) Lecture—10 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine or consent of instructor. Overview of the importance of foreign animal diseases and the veterinary responsibilities associated with the prevention, detection and reporting of these diseases in the United States. —I. (I.) Smith

451. Veterinary Bacteriology and Mycology (4.9) Lecture—34 sessions; laboratory—15 three-hour sessions. Prerequisite: second-year standing in the School of Veterinary Medicine. Approved for graduate degree credit. Introduction to the bacterial and fungal agents of animal diseases. Specifically, each microorganism will be discussed with respect to overall significance to animal disease; structural and functional aspects including morphology, cellular composition, and products of medical interest. —I. (I.) LeFebvre

452. General Pathology (3.1) Lecture—18 sessions; laboratory—13 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine. Approved for graduate degree credit. Basic principles of disease and in particular the fundamental mechanisms responsible for creating a disease situation. Illustrations of how the application of general pathological principles is used to determine disease pathogenesis and prognosis. —I. (I.) Mohr

459. Systemic Pathology (5.8) Lecture—44 sessions; laboratory—14 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine or consent of instructor. Basic understanding of the pathobiology of major organ systems relevant to a variety of animal species. Emphasis on mechanisms of injury, patterns of repair, response to injury and on balance between damage and repair. —II. (II.) Moore
460. Fundamentals of Clinical Orthopedics (4)
Lecture—10 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine and consent of instructor. Fundamental concepts of veterinary orthopedics, including differentials of bone disease, diagnostics for bone disease, bone biomechanics, principles of fracture repair, applied joint anatomy, principles of joint disease, applied tendon and ligament anatomy, and principles of tendon and ligament disease.—I. (I.) MacDonald

470B-470C. VMTH Techniques (3.4)
Clinical activity—34 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. Clinical training in veterinary medicine with assignments in the teaching hospital and with clinical diagnostic facilitaes of the Veterinary Medical Teaching Hospital, discussions regarding client relations and experience with advanced techniques to prepare students for the senior clinical year. (Deferred grading only, pending completion of sequence. S/U grading only.)—I, II, III, IV. (I, II, III, IV.) Smith

480. Senior Clinic (15)
Clinical activity—60 hours. Prerequisite: fourth-year standing in School of Veterinary Medicine. Integration of knowledge and development of clinical judgment and skills in the diagnosis, treatment, and prevention of animal disease. (Deferred grading only, pending completion of sequence. S/U grading only.)—I, II, III, IV, V, VI, VII, VIII, IX, X, XI Smith

Departmental Courses
Anatomy, Physiology and Cell Biology (APC)
Upper Division Courses
100. Comparative Vertebrate Organology (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Biological Sciences 1A and 1B. 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.)—I. (I.) Werner

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 Courses
284. Ruminant Nutrition and Physiology (3)
Lecture—27 sessions; laboratory—3 sessions. Prerequisite: second-year standing in School of Veterinary Medicine. Basic and applied aspects of ruminant nutrition and physiology, nutritional and metabolic disorders of ruminants.—II. (II.) Bruss

285. Histology of Cells, Tissues and Organs (2)
Lecture—1 hour; laboratory—3 hours. Prerequisite: course 100 or the equivalent; Statistics 13. Stereological estimation of volume, surfaces and lengths of organs/components; estimation of number of cells in an organ or tissue, their volumes, products and gene expression. Practical application of stereology and avoidance of most common biases of histological measurements. Offered in alternate years.—Hyde

286. Basics of Microscopy and Cellular Imaging (2)
Laboratory—1 hour; lecture—2 hours. Prerequisite: graduate standing; consent of instructor. 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. (II.) Van Winkle

290. Seminar (1)
Seminar—1 hour. Discussion and critical evaluation of advanced topics and current trends in research. (P/N grading only.)—I, II, III, IV, V, VI, VII, VIII, IX, X, XI

291. Topics in Biology of Reproductive System (1)
Seminar—1 hour. Prerequisite: graduate standing and consent of instructor. Topics concerning structure and function of reproductive system. Possible topics include: lung growth, pulmonary reaction to toxicants, 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, IV, V, VI, VII, VIII, IX, X, XI Hyde, Wu, Pinkerton

292. Topics in Neuroscience Research (1)
Seminar—1 hour. Prerequisite: graduate standing and consent of instructor. Students will examine current topics in research literature, as well as evaluate rationale, methods, results, interpretation of data, and relevance of studies. Possible topics include pain, autonomic nervous system, neuroendocrinology, neurotransmitter regulation of gene expression, neuroendocrine-immune interactions, stress. (S/U grading only.)

298. Group Study (1-5)
Prerequisite: student in School of Veterinary Medicine or consent of instructor. Group study in selected areas of the clinical sciences. (S/U grading only.)

299. Research (1-12)
(S/U grading only.)

Professional Courses
410. Husbandry, Feeding and Management of Captive Animals (2)
Lecture—20 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine; consent of instructor. Introduction to husbandry dynamics as a prerequisite for preventive health programs in zoos, aquaria, vivaria, and other environments for exotic pets and wild animals.—II. (II.) Tell

412. Laboratory Animal Medicine (2)
Lecture—20 sessions. Prerequisite: second- and third-year standing in School of Veterinary Medicine; consent of instructor. Major diseases, medical management and husbandry of captive non-human primates. Offered in alternate years. (S/U grading only.)—III. (III.) Tell

413. Medical Primatology (2)
Lecture—20 sessions. Prerequisite: second- and third-year standing in School of Veterinary Medicine; consent of instructor. Major diseases, medical management and husbandry of captive non-human primates. Offered in alternate years. (S/U grading only.)—III. (III.) Tell

415. Management and Diseases of Captive Wildlife (2.0)
Lecture—20 sessions. Prerequisite: second or third-year standing in School of Veterinary Medicine or consent of instructor. Introduction to the roles of a zooological veterinarian and the most common topics encountered. Emphasis on taxonomy, husbandry, preventive medicine and the most common diseases seen in common captive wildlife species.—I. (I.) Wack

416. Diseases of Fish (2.1)
Lecture—18 sessions; laboratory—3 sessions. Prerequisite: second- or third-year standing in the School of Veterinary Medicine or consent of instructor. Etiology, pathology, diagnosis, treatment and prevention of diseases of fish. Preventive management of diseases in aquaculture and aquaria. Offered in alternate years.—III. (III.) Heldrick

417. Companion Avian Medicine (2)
Lecture—20 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine or consent of instructor. Diseases, diagnostics, medical management and surgery of psittacine species. Avian nutrition, husbandry, and management.—II. (II.) Tell

Veterinary Medicine, School of...
419. Companion Exotic Small Animal Medicine and Surgery (3.4)
Lecture—10 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine or consent of instructor. The etiology, clinical presentation, diagnostic evaluation, treatment, prevention and control of medical diseases of small exotic mammals, amphibia and reptiles.—I. (I.) Hawkins

424. Shelter Medicine (1)
Seminar—10 sessions. Prerequisite: first-, second-, or third-year standing in the School of Veterinary Medicine; consent of instructor. Shelter medicine is a newly emerging specialty in veterinary medicine building on the clever solutions and experience of hundreds of shelter veterinarian, managers, techni-
cians, rescue volunteers, shelter owners, and others, who have learned their skill in the trenches. (S/U grading only)—III. (III.) Hurley

427. Introduction to Food Animal Herd Health Medicine (1.9)
Lecture—7 sessions; laboratory—2 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine, course 463A and 463B (concurrently) or consent of instructor. Introduction to current problem solving concepts, approaches, and issues addressed in subsequent food animal medi-
cine courses; contexts for developing problem solv-
ing skills through onsite, field investigation of herd and flock health issues. (S/U grading only)—I. (I.) Hoar

428. Food Animal Surgery (1.6)
Lecture—16 sessions. Prerequisite: third-year stand-
ing in the School of Veterinary Medicine and con-
sent of instructor. Selected topics in surgical diseases of food animals. (S/U grading only)—III. (III.) Smith

428L. Food Animal Surgery Laboratory (0.8)
Laboratory—8 three-hour sessions. Prerequisite: third-year standing in School of Veterinary Medicine, course 428 (concurrently). Representative surgeries of food animals performed by groups of students. Limited enrollment. (S/U grading only)—III. (III.) Smith

429A. Sheep Herd Health (1)
Lecture—10 sessions. Prerequisite: third-year stand-
ing in the School of Veterinary Medicine, course 463A, 463B, 427, course 463C concurrently, or consent of instructor. The application of problem-solv-
ing and epidemiological methods to sheep diseases and their control.—II. (II.) Lane

429B. Beef Herd Health (1)
Lecture—10 sessions. Prerequisite: Third-year stand-
ing in the School of Veterinary Medicine, course 463A, 463B, 427, course 463C concurrently, or consent of instructor. The application of problem-solving meth-
ods to diseases of grazing beef cattle and their con-
trol.—II. (II.) Hoar

429C. Swine Herd Health (1)
Lecture—10 sessions. Prerequisite: third-year stand-
ing in the School of Veterinary Medicine, course 463A, 463B, 427, course 463C concurrently, or consent of instructor. The application of problem-solv-
ing and epidemiologic methods to swine diseases and their control.—II. (II.) Gardner

430. Raptor Medicine and Rehabilitation (2)
Lecture—20 sessions. Prerequisite: first-, second- or third-year standing in the School of Veterinary Medicine. Biology, behavior, parasites, diseases, toxins, iatrogenic conditions, diagnostics, treatments, nurs-
ing, housing, nutrition, rehabilitation and release techniques for eagles, owls, and other native Cali-
fornia raptors.—III. (III.) Tell

432. Medical and Husbandry Procedures for Raptors (1)
Laboratory—1 hour. Prerequisite: first-, second-, or third-year standing in the School of Veterinary Medicine or consent of instructor. Serves as student treat-
manship lab for the Raptor Center providing hands-on experience with handling, restraint and treatment for ill and injured birds with the goal of rehabili-
tation and release back into their native habitat. May be repeated once for credit with consent of instructor.—I, II, III, (I, II, III.) Tell

446. Small Animal Reproduction (1)
Lecture—7 sessions; discussion—1 session; labora-
tory—2 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine. Approved for graduate degree credit. Provides a complete description (history, physical examination, labora-
tory abnormalities, etc.) of the common abnormalities associated with the genital tract of male and female dogs and cats.—III. (III.) Feldman

450. Small Animal Clinical Immunology (1.7)
Lecture—17 sessions. Prerequisite: second- or third-
year standing in the School of Veterinary Medicine; consent of instructor. Review of the basic mecha-
nisms of immunologic diseases in small companion animals and a description of common immunologic diseases organized by body system, including clini-
cal presentation, diagnosis and treatment.—III. (III.) Sykes

454, International Veterinary Medicine Baja California Fieldwork (2)
Fieldwork—40 hours. Students in the School of Vet-
 erinary Medicine or consent of instructor. Livestock diseases responsible for limiting trade across the U.S./Mexico border are extended to ranchers, and how veterinarians are educated in Mexico. Offered during Spring break. (S/U grading only)—III. (III.) Hodd

455. Beginning Veterinary Spanish (2)
Lecture/discussion—13 hours. Prerequisite: first, sec-
ond, third-year or MPVM standing in the School of Veterinary Medicine. Preparation to converse with clients (e.g., companion animal owners) and live-
stock managers in Spanish in clinical settings. (S/U grading only)—II. (II.) Hodd

456. Intermediate Veterinary Spanish (1)
Discussion—10 sessions. Prerequisite: first, second,
third-year or MPVM standing in the School of Veteri-
nary Medicine. May be repeated two times for credit. Presentations on veterinary-related topics in Spanish by native speakers and others and discus-
sion to prepare students to converse with clients (e.g., companion animal owners and livestock man-
gers) in Spanish. (S/U grading only)—III. (III.) Hodd

461A. Small Animal Medicine—Level I (3.6)
Lecture—32 sessions; lab—4 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine; consent of instructor. Fundamental prin-
ciples, clinical manifestations, diagnostic methods and therapeutic approaches to the medical diseases of dogs and cats. Course is a core option for the professional veterinary student interested in prepara-
tion for advanced courses in small medical diagnoses and therapeutics.—III. (III.) Johnson

461B. Small Animal Medicine—Level I (3.3)
Lecture—33 sessions. Prerequisite: third-year stand-
ing in the School of Veterinary Medicine and com-
pletion of course 461A, if Small Animal Medicine is your core or consent of instructor. Continuation of fundamental principles, clinical manifestations, diag-
nostic methods, and therapeutic approaches to the medical diseases of dogs and cats.—I. (I.) Marks

461C. Small Animal Medicine—Level I (3.7)
Lecture—37 sessions. Prerequisite: third-year stand-
ing in the School of Veterinary Medicine, course 461A, 461B (Small Animal core only), or consent of instructor. Continuation of fundamental prin-
ciples, clinical manifestations, diagnostic meth-
ods and therapeutic approaches to the medical dis-
esases of dogs and cats.—II. (II.) Marks

462. Small Animal Medicine, Level II (2)
Discussion—20 sessions. Prerequisite: course 461A,
461B, 461C, third-year standing in the School of Veterinary Medicine, or consent of instructor. Empha-
sis on differential diagnosis of non-infectious diseases of dogs and cats. Emphasis on problem-solving skills.—III. (III.) Irthke

463A. Food Animal Medicine, Level I (3.6)
Lecture—36 sessions. Prerequisite: second-year stand-
ing in the School of Veterinary Medicine. Fund-
amentals of food animal medicine presented in a lecture format with integrated case discussion to illus-
trate the context and application of material presented and to promote development of problem-
solving skills.—III. (III.) Smith

463B. Food Animal Medicine, Level I (3.4)
Lecture—34 sessions. Prerequisite: third-year stand-
ing in the School of Veterinary Medicine and com-
pletion of course 463A, if Food Animal Medicine is your core; consent of instructor. Fundamentals of food animal medicine with integrated case discus-
sions to illustrate the context and application of material presented and to promote development of problem-solving skills.—II. (II.) Geoge

463C. Food Animal Medicine, Level I (3.3)
Lecture—31 sessions; laboratory—2 sessions. Prere-
quisite: third-year standing in the School of Veteri-
nary Medicine (and courses 463A, if) Food Animal Medicine is fulfilling your core requirement). Contin-
uation of the fundamentals of food animal medicine with integrated case discussions to illustrate the con-
text and application of material presented and to promote development of problem-solving skills.—II. (II.) Geoge

464A. Equine Medicine, Level I (3.2)
Lecture—28 sessions; laboratory—4 sessions. Prere-
quisite: third-year standing in the School of Veteri-
nary Medicine or consent of instructor. The etiology, pathophysiology, epidemiology, clinical presenta-
tion, diagnostic evaluation, treatment, prevent-
ion, and control of important infectious and noninfectious diseases of horses. Emphasis on problem-
based approach to differential diagnosis.—II. (II.) Wilson

464B. Equine Medicine, Level I (3.7)
Lecture—33 sessions; discussion—2 sessions. Prere-
quisite: third-year standing in the School of Veteri-
nary Medicine and completion of course 464A (Equine Medicine core), or consent of instructor. Continuation in instruction in the etiology, pathology, epidemiology, clinical presentation, diagnostic eval-
uation, treatment, prevention, and control of impor-
tant infectious and non-infectious diseases of horses. A problem-based approach to differential diagnosis is emphasized.—II. (II.) Sperle

465. Advanced Equine Medicine, Level II (3.5)
Lecture—36 sessions. Prerequisite: third-year stand-
ing in the School of Veterinary Medicine; courses 464A, 464B, and 464C; consent of instructor. An approach to commonly encountered problems in horses held as individuals and farm settings. Devel-
opment of problem-solving skills related to the medi-
cal management of horses and their problems.—III. (III.) Watson

465L. Advanced Equine Medicine Level II Laboratory (0.8)
Laboratory—8 sessions. Prerequisite: third-year stand-
ing in the School of Veterinary Medicine and course 464A,B,C. Clinical presentation and instruc-
tion in treatment of the medical aspects of equine practice. (S/U grading only)—III. (III.) Watson

466. Equine Critical Care (2)
Lecture—10 sessions; discussion—10 sessions. Prere-
quisite: course 464A, 464B, or consent of instructor. third-year standing in the School of Veteri-
nary Medicine. Focus on common equine emergen-
cies and their initial life-support management strategies. Rational approach to diagnosis and man-
amag ment of emergency and critically ill equine patients in clinical practice. Pathophysiology of Sys temic Inflammatory Response Syndrome (SIRS), Multiple Organ Dysfunction Syndrome (MODS), and critical illness.—III. (III.) Magdalen

468. Advanced Feline Medicine (2) Lecture—20 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. Consent of instructor. Fundamental principles, clinical manifestations, diagnostic methods, and therapeutic approaches to medical diseases of cats. Diseases unique to cats, decreasing whose clinical presentations and diagnostic evaluations are fundamentally different in cats versus dogs.—III. (III.) Westropp

481. Clinical Rounds (1) Discussion—10 sessions. Prerequisite: first- or second-year standing in the School of Veterinary Medicine. Consent of instructor. Discussion of selected small and large animal cases from the Veterinary Medical Teaching Hospital. May be repeated once for credit. (S/U grading only)—I, II, (I, II) Smith

486. Equine Clinical Neonatology (1) Discussion—10 sessions. Prerequisite: first-year standing in the School of Veterinary Medicine. Discussion of methods of equine neonatal intensive care and disease pathophysiology in a case format. (S/U grading only)—III. (III.) Madigan

487. Comparative Bio-Medical: Form and Function (2) Lecture—20 sessions. Prerequisite: first-, second-, or third-year standing in the School of Veterinary Medicine. Comparative biology approach and concepts for non-traditional animal species; alternative pets, zoos, rehabilitation centers, wildlife, aquaculture, laboratory animals, and non-human primates. (S/U grading only)—II. (II) Larsen

493. Seminar in Veterinary Medicine (1) Seminar—2 hours. Prerequisite: professional standing, resident in Veterinary Medical Teaching Hospital. Students given by the faculty of the School of Veterinary Medicine in topics relating directly to the practice of clinical medicine and surgery. Residents will assist in the presentation of seminar material. May be repeated for credit. (S/U grading only)—I, II, III, (I, II, III)

494. International Programs Seminar (1) Seminar—10 sessions. Prerequisite: first-, second-, or third-year standing or MPVM standing in the School of Veterinary Medicine; consent of instructor. Discussion by veterinarians around the world of aspects of veterinary medicine in their countries and regions, ranging from livestock to wildlife medicine to companion animal medicine. May be repeated twice for credit. (S/U grading only)—II. (II) Hird

Molecular Biosciences (VMB)

Lower Division Course

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)

Upper Division Courses

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 of Molecular Biosciences. Internships supervised by a member of the faculty. (P/NP grading only)

199. Special Study for Undergraduates (1-5) (P/NP grading only)

Graduate Courses

247. Natural Toxins (2) Lecture—2 hours. Prerequisite: organic chemistry, Biological Sciences 102 and 103, or consent of instructor. Toxicity and metabolism of natural toxins with emphasis on the toxic plants present in the western United States. General pathways of metabolism plus the relationship between chemical properties and biological activity of natural toxins are discussed. Offered in alternate years.—III.

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 pathway of toxicants and drug metabolism, enzymology and molecular aspects of P450 and flavin monooxygenases, hydrolases and phase 2 transferases and experimental approaches for metabolism studies. Offered in alternate years.—II. Buckpitt

254. Toxicology of the Respiratory System (3) Lecture—2 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. Buckpitt

260. Toxicologic Pathology (3) Lecture—3 hours. Prerequisite: Pharmacology and Toxicology 201, 202, and 203. Provide introduction to organ system toxicology; provide understanding of pathogenesis and significance of chemically induced tissue injury in the various organs of the body. Offered in alternate years.—II.

Professional Courses

397T. Tutoring in Molecular Biosciences (1-5) Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. 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)—II, III, (I, II, III)

Group Study (1-5) (S/U grading only)—II, III, IV) (II, III, IV)

Research (1-12) (S/U grading only)

475. Diagnosis and Treatment of Food Animal and Equine Poisoning (2) Lecture—20 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. Clinical systematic approach to poisoning problems in livestock, horses and other ruminant livestock emphasizing diagnosis and treatment, including poisonous plants.—II. Mount
Seminar—1 hour. A discussion of the current topics in animal virology. May be repeated for credit. [S/U grading only].—I, II, III, IV. (I, II, III, IV.) Marthas, Miller

292A. Seminar in Animal Virology I (1)
Seminar—1 hour. A discussion of the current topics in animal virology. May be repeated for credit. [Same course as Microbiology 296A. (S/U grading only).]—I, II, III, IV. (I, II, III, IV.) Marthas, Miller

292B. Surgical Pathology Conference I (1)
Discussion—1 hour. Prerequisite: graduate student standing and consent of instructor. Diagnosis and discussion of current surgical pathology cases based on clinical records and microscopic study. May be repeated for credit. [S/U grading only].—I, II, III, IV. (I, II, III, IV.) Munson

293A. Seminar in Infectious Diseases I (1)
Seminar—1 hour. Prerequisite: current enrollment in health science professional school or graduate standing in biological sciences. Discussion of current topics and cases of infectious diseases. May be repeated one time for credit if topic differs. [S/U grading only].—I, II, III, IV. (I, II, III, IV.) Byrne

293B. Necropsy and Surgical Pathology I (2-4)
Laboratory—6-12 hours. Prerequisite: graduate student standing and consent of instructor. Responsible diagnostic casework. Performance of necropsies, slide reading, and case reporting. May be repeated for credit. [S/U grading only].—I, II, III, IV. (I, II, III, IV.) Munson

296. Microbiological Diagnosis I (2-5)
Laboratory—5-14 hours; discussion—1 hour. Prerequisite: laboratory course in veterinary or medical microbiology or equivalent. Offered by Chief of Microbiology, VM Teaching Hospital. Laboratory diagnosis of infectious diseases involving case work at the VM Teaching Hospital. [S/U grading only].—I, II, III, IV. (S/U grading only).—I, II, III, IV. (I, II, III, IV.) Byrne

298. Group Study I (1-5)
Prerequisite: consent of instructor. [S/U grading only]

299. Research I (1-12)
Prerequisite: graduate standing and consent of instructor. [S/U grading only]

Professional Courses

418. Health and Disease in Terrestrial Wildlife (2)
Lecture—20 sessions. Prerequisite: first-, second-, or third-year standing in the School of Veterinary Medicine or consent of instructor. Ecology and epidemiology of disease in free-ranging terrestrial wildlife. Offered in alternate years. [S/U grading only].—II. Ziccardi

419. Field Techniques for Assessment of Wildlife and Ecosystem Health (2)
Fieldwork—7 sessions. Prerequisite: Medicine and Epidemiology 2948; first-, second-, or third-year or MPVM standing in the School of Veterinary Medicine or consent of instructor. Introduction to the concepts and technical skills necessary to conduct field studies pertaining to wildlife/ecosystem health. Emphasis on Southern California ecosystem. [S/U grading only].—II. (I, II, III.) Ziccardi

475. Diagnostic Medicine of Domestic Animals (2)
Discussion—2 hours. Prerequisite: second-year standing in the School of Veterinary Medicine or consent of instructor. An integrated, problem oriented, approach to diagnosis of animal infectious diseases through the use of morphologic, clinical pathology and anatomic pathology. Participants organize assigned cases for presentation to the class in a grand rounds format with presentations by small groups composed of students who act as either a moderator, microbiologist, clinical pathologist or pathologist. [S/U grading only].—III. (I, II, III.) Wilson

476. Comparative Pathology of Non-Mammalian Vertebrates (2)
Lecture—20 sessions. Prerequisite: second- or third-year standing in the School of Veterinary Medicine or consent of instructor, Medicine and Epidemiology 410; 457. Mechanisms of disease in non-mammalian vertebrates (fish, birds, reptiles, amphibians, and invertebrates). May be repeated for credit. [S/U grading only].—I, II, III, IV. (S/U grading only).—I, II, III, IV. (I, II, III, IV.) Wilson

Graduate Courses

202. Sampling in Health-Related Research (3)
Lecture—3 hours. Prerequisite: Preventive Veterinary Medicine 403 or the equivalent; consent of instructor. A very thorough coverage of simple random sampling, stratified sampling, cluster sampling, systematic sampling and other sampling methods applied extensively in epidemiology and other health-related disciplines. Emphasis on application of the sampling methods. Offered in alternate years. —II. Farver

203. Multivariate Biostatistics (3)
Lecture—3 hours. Prerequisite: Preventive Veterinary Medicine 403 or 404, or the equivalent; consent of instructor. Multivariate procedures covered are principal component analysis, factor analysis, Two-group and k-group multivariate ANOVA, multivariate regression, Two-group and k-group discriminant analysis and repeated measures analysis, cluster analysis, and canonical analysis. Emphasis is on application of procedures. Offered in alternate years. —II. Farver

210A. Analytic Epidemiology I: Case Control Studies (3)
Lecture—2 hours, laboratory/discussion—3 hours. Prerequisite: Statistics 120B and Preventive Veterinary Medicine 403 or the equivalent or consent of instructor. Theory and practice of epidemiologic
data analysis. Topics include confounding, stratification, matching, interaction, and logistic regression. Same course as 220A. (II.) Wolpert

210B. Analytic Epidemiology II: Cohort Studies (3)
Lecture/discussion—3 hours. Prerequisite: course 210A. Theory and practice of epidemiologic data analysis. Methods covered include rates, rate standardization, cohort analysis, Poisson regression, and survival/ failure-time methods. (Same course as Epidemiology 210B.) (II.) Wolpert

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. —II. (II.) Cheol

213. Food Safety (1)
Lecture—10 sessions. Prerequisite: graduate standing or consent of instructor. Food-borne disease hazards in production and the consumer; types of food-borne illness; measures for prevention of food-borne disease and enhancement of food safety. —III. (III.) Chiver

214. Vector-borne Infectious Diseases: Changing Patterns (2)
Lecture/discussion—2 hours. Prerequisite: consent of instructor. Vector-borne infectious diseases especially as they relate to changing patterns associated with climate change and population movement. [Same course as Entomology 214.] —I. (I.) Cheol

216A. Immunodiagnostic Techniques (2)
Lecture—10 sessions; laboratory—10 sessions. Prerequisite: MPVM student or consent of instructor. Applications of serologic techniques for diagnosis of animal diseases.

216B. Research Methods in Avian Immunology (2)
Discussion—1 hour, laboratory—3 hours. Prerequisite: laboratory immunology background or consent of instructor. Laboratory techniques used in the study of avian immune systems and pathogenesis of avian disease.

220. Avian Medicine (3)
Lecture—3 hours. Prerequisite: second-year standing or MPVM standing in the School of Veterinary Medicine or graduate standing or consent of instructor. Instruction on the methods of prevention of the major diseases of domestic poultry. —III. (III.) Wakenell

222. Avian Immunology (3)
Lecture—3 hours. Prerequisite: basic immunology course or consent of instructor. Normal structure of the avian immune system, quick review of basic immunology, comparison between mammalian and avian immune systems and generation of immune responses, immunodiagnosics and vaccination. —III. (III.) Wakenell

225. Preventive Avian Medical Practice (3)
Lecture—3 hours. Prerequisite: first, second, third-year, or MPVM standing in the School of Veterinary Medicine or consent of instructor. Economic structure of the poultry industry, commercial production systems, methods of preventive avian medical services within these industries. Specific prevention, eradication programs pertaining to diseases of economic importance are covered. Environmental, OSHA, regulatory and agricultural issues. —III. (III.) Wakenell

231. Pathophysiology of Mammalian Reproductive Processes (3)
Lecture—3 hours. Prerequisite: fourth-year standing in School of Veterinary Medicine or consent of instructor. Physiological and pathological aspects of reproductive failure in mammals concerning gonadal function, fertilization, implantation, prena- tal mortality, neonatal mortality, environmental factors, and environmental hazards. —I. (I.) Cheol

232. Advanced Reproductive Biology (3)
Lecture—1.5 hours; discussion—1.5 hours. Prerequi- site: consent of instructor. Examination of the reproductive system, the male, the non-pregnant female and the pregnant or senescent female. Offered in alternate years. —III. (III.) Coley

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; regression for cohort and case-control studies, Poisson regression, survival-time methods. (Same course as Master of Public Health 266.) —III. (III.) Kass

290A. Seminar (1)
Seminar—1 hour. Discussion of current topics in ani- mal reproduction and medicine, as well as presenta- tion of research findings by graduate students and faculty. May be repeated for credit. (S/U grading only.) —I., II., III., (II., III.) Bell

290B. Current Topics in Avian Medicine (1)
Seminar—1 hour. Prerequisite: consent of instructor. Topics from the current literature in avian medicine will be assigned to students for discussion and inter- pretation. May be repeated for credit. —II., III., (II., III.) Wakenell

292. Current Topics in Reproduction (1)
Seminar—1 hour. Prerequisite: consent of instructor. Discussion of current scientific literature in reproduc- tion, as well as presentation of research findings by graduate students and faculty. (S/U grading only.) —I., II., III., (II., III., III.) Wakenell

298. Group Study (1-5)
Research (1-12)

Professional Courses

406. Human-Animal Interactions in Veterinary Science (1)
Lecture—9 sessions; laboratory—1 session. Prerequi- site: first-, second-, or third-year standing in the School of Veterinary Medicine. Human relationships with companion animals, and, secondarily, on food, laboratory, and wild animals from the perspectives of veterinarians and their clients’ needs. Emphasis on the benefits of companion animals for human mental and physical well-being, the role of animals in the human life cycle, cultural traditions in keeping animals, and types of specialized and more typical relationships with animals. —II. (II.) Hart

408. Behavior and Biology of Mice as Domestic Animals (1)
Lecture—10 sessions. Prerequisite: first, second, or third-year standing in the School of Veterinary Medi- cine, or graduate standing in psychology, animal sci- ence, animal behavior, or consent of instructor. Laboratory mouse biology and welfare, including the development and purposes of specialized strains of mice, constraints for their care and environmental enrichment, legislation and regulation, and the human benefits of mice. —I. (I.) Hart

420. Zoones of Non-Human Primates (2)
Lecture—20 sessions. Prerequisite: second- or third-year standing in the School of Veterinary Medicine and consent of instructor. Epidemiological, clinical, and biological features of zoones of non-human primates. Emphasis given to major zoones which are threatening to human health and their treatment and prevention. Focus also on management of non-human primates in research, zoological gardens and in the wild. Offered in alternate years. —I. (I.) Cheol

429D. Dairy Herd Health Management Laboratory (0.6)
Laboratory—6 sessions. Prerequisite: third-year standing in School of Veterinary Medicine; course 429D concurrently or consent of instructor. Practical systems for delivering veterinary services to dairy farms with emphasis on disease prevention and improved herd perfor- mance. —III. (III.) Moore

429E. Dairy Goat Herd Health (1)
Lecture—10 sessions. Prerequisite: Medicine and Epidemiology 427, 463A, 463B, 463C, third-year standing in School of Veterinary Medicine, or con- sent of instructor. The application of problem-solving and epidemiologic methods to dairy goat diseases and their control. —II. (III.) Rowe

432. Reproductive Technology in Mammals and Birds (0.8)
Lecture—15 sessions; discussion—3 sessions. Prereq- uisite: first-year standing in the School of Veterinary Medicine or consent of instructor. Introductory course in the application of technology to the repro- ductive process in mammals and birds. Emphasis on domestic animals, but basic treatment of the normal reproductive mammals also discussed. Exposure of students to some of the “sexier” aspects of population/reproduction management. (S/U grading only.) —III. (III.) BonDurant

432L. Reproductive Technology in Mammals and Birds, Laboratory (0.2)
Laboratory—2 sessions. Prerequisite: course 432 concurrently, first-year standing in the School of Vet- erinary Medicine. Laboratory demonstrations and exercises in gamete freezing, thawing, and han- dling; artificial insemination of cattle; artificial insemin- ation and other applications of reproductive technology in small ruminants. (S/U grading only.) —III. (III.) BonDurant

440. Ruminant Clinical Nutrition (1.9)
Lecture—19 sessions. Prerequisite: Veterinary Medi- cine 408, second- or third-year standing in the School of Veterinary Medicine or consent of instruc- tor. Nutritional related disorders in ruminants with a herd basis approach. Nutritionally related disorders that affect modern cattle production. Emphasis on understanding the problems and their prevention and management through nutritional management. —II. (III.) Santos

442. Equine Theriogenology (2)
Lecture—20 sessions. Prerequisite: third-year stand- ing in School of Veterinary Medicine; consent of instructor. Discussions of abnormal conditions and physiologic function in equine reproduction with emphasis on methods of diagnosis and interpreta- tion of clinical and laboratory findings associated with the abnormalities. —I. (I.) Ball

442L. Equine Theriogenology Laboratory (1.0)
Laboratory—10 sessions. Prerequisite: third-year standing in School of Veterinary Medicine, consent of instructor. Hands-on diagnosis and implementa- tion of techniques related to reproductive examina- tion of horses. Routine and current procedures performed on the farm. Designed to maximize the opportunity for assessment of abnormal conditions and physio- logic anatomy, the diagnosis and interpretations of physiologic conditions and for becoming comfort- able in performing the various routine procedures. I. (I.) Ball

445. Food Animal Theriogenology and Reproductive Performance (2)
Lecture—20 sessions. Prerequisite: third-year stand- ing in the School of Veterinary Medicine or consent of instructor. Physiological, pathological, and management factors affecting the reproductive health and performance of food animals, with emphasis on dairy, beef cattle, and sheep. Minor
emphasize on swine and goats. Assessment of, and intervention strategies for, herd reproductive performance.—II. (II.) Beckett

445L. Food Animal Theriogenology Laboratory (1)
Laboratory—10 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine, course 445A, consent of instructor. Botanical and gynecological diagnosis and treatment for food animals; breeding soundness examination of males; analysis and comparison of computerized semen records; and embryo technology. (S/U grading only)—II. (II.) BonDurant

446A. Food Animal Reproduction (1)
Lecture—6 sessions, laboratory—4 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine. Approved for graduate degree credit. Conditions affecting the reproductive system in the cow, sow, ewe, and goat, with emphasis on symptomatology, pathophysiology, treatment, control, prevention, and herd health applications.—III. (III.) Kowe

446B. Equine Reproduction (1)
Lecture—6 sessions, laboratory—4 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine. Graduate degree credit. Discussion of special problems of equine reproduction with emphasis on methods of diagnosis and interpretation of clinical and laboratory findings.—III. (III.) Ball

446C. Non-Domestic Reproduction (1)
Lecture—10 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. Follows course 446A. Information relating to reproduction in non-domestic animals, birds, and reptile species. Concepts relating to the evaluation of reproductive status, diagnosis of infertility, assisted reproduction and contraception will be presented.—III. (III.) BonDurant

450. HACCP and Risk Assessment in Pre- and Post-Harvest Food Safety (3)
Lecture/discussion—3 hours. Prerequisite: a first-year course in microbiology or food science or consent of instructor. Application of the Hazard Analysis Critical Control Point (HACCP) system in the food industry, for regulatory agencies; and in the pre-harvest area of food production. Development of HACCP plans. (S/U grading only)—II. (II.) Olver

452. On-Farm Food Safety/Veterinary Public Health (2)
Lecture—20 sessions. Prerequisite: Master's of Preventive Veterinary Medicine students or consent of instructor. Information regarding regulations and responsibilities responsible for ensuring food safety, pathogens that may be on the farm and cause public health concerns, management systems that affect animal health, and key topics in regulatory health relating to animal agriculture.—III. (III.) Cullor, Chomel

457. Veterinary Business Management (2)
Lecture—10 sessions. Prerequisite: first, second-, third-, or fourth-year standing in School of Veterinary Medicine or consent of instructor. Information essential to the successful management of a veterinary practice. Topics include basic accounting, medical recordkeeping, money management, business and personal finances, and ethical considerations. (S/U grading only)—III. (III.) Klingborg

483. Pet Loss Support Hotline and End of Life Issues (2)
Discussion/laboratory—3.6 hours. Prerequisite: first, second-, or third-year standing in the School of Veterinary Medicine. Training and experience in addressing end-of-life issues for companion animals, including hospice, decision-making and pet loss support. Pet loss hotline callers who are anticipating or experiencing the end of a relationship with a beloved companion animal. Communication skills, especially supportive listening, and referral to community resources. (S/U grading only)—I, II, III, (I, II, III.) L. Hart

Preventive Veterinary Medicine (MPM)

Professional Courses

402. Medical Statistics I (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: enrollment in the MPVM program in the School of Veterinary Medicine or consent of instructor. Statistics in clinical, laboratory and population medicine: graphical and tabular presentation of data; probability; binomial; Poisson, normal, t-, F- and Chi-square distributions; statistical nonparametric methods; simple linear regression and correlation; life tables. Microcomputer applications of statistical procedures in population medicine.—IV. (IV.) Farver

403. Medical Statistics II (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: course 402 or equivalent. Continuation of course 402. Analysis of variance in biomedical sciences; nonparametric methods; multiple regression; biomedical applications of statistical methods. Microcomputer applications to reinforcement principles that are taught in lecture.—I. (I.) Farver

404. Medical Statistics III (4)
Lecture—3 hours; laboratory—2 hours. Prerequisite: course 402 or equivalent. Consent of instructor. Analysis of time dependent variation and trends, analysis of multivariable frequency tables; logistic regression; survival analysis selecting the best regression equation; biomedical applications.—II. (II.) Farver

405. Principles of Epidemiology (4)
Lecture—4 hours. Prerequisite: course 402 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, II, III. (I, II, III.) Hird

405L. Epidemiology Laboratory (1)
Laboratory—10 hours. Prerequisite: course 405 may be taken concurrently with grade of C or better, course 412 with grade B- or better. A 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. Emphasis on epidemiological methods introduced in course 405. Data sets provided.—I. (I.) Case

406A. Applied Epidemiologic Problem Solving (3)
Lecture—1.5 hours; discussion—0.9 hours; laboratory—1.8 hours. Prerequisite: course 405. (S/U grading only.—I, II, III, IV. (I, II, III, IV.) Hird

408A, 408B. Veterinary Research: Planning and Reporting (2)
Lecture—20 sessions. Prerequisite: Master's of Preventive Veterinary Medicine (MPVM) standing in the School of Veterinary Medicine, course 402 or Statistics 102 (with a grade of B- or better), course 405 and 412, or equivalent courses (may be taken concurrently), and ability to use commercial software in statistical and graphical applications, or consent of instructor. Planning, critical analysis, ethics, and written and oral communication of veterinary research.—I. (I.) Thumford

408B. Veterinary Research: Planning and Reporting (2)
Lecture—10 sessions. Prerequisite: consent of instructor; course 408A. Planning, critical analysis, ethics, and written and oral communication of veterinary research.—II. (II.) Thumford

412. Introduction to Information Management (3)
Lecture—10 sessions; laboratory—20 sessions. Prerequisite: consent of instructor; Master's of Preventive Veterinary Medicine (MPVM) students; intermediate computer skills using word processing, spreadsheet, and presentation software. Emphasis on data quality and design of data applications. Introduction to information management. Emphasis on data quality and design of data applications. Specific topics include the library fundamentals and online resources for project management, data collection, organization, storage, analysis and communication. Limited enrollment.—IV. (IV.) Sischo

426. Applied Epidemiologic Problem Seminar (1)
Laboratory—3 hours. Prerequisite: grade of C or better in course 405L. Integration of epidemiologic and statistical methodology in a problem-solving approach to contemporary animal population health issues. Data validation and manipulation; descriptive statistical analysis using spreadsheets, database management, and Epi Info software. Builds on skills learned in courses 405L and 406L.—II. (II.) Gardner

Surgical and Radiological Sciences (SRS)

99. Special Study for Undergraduates (1-5)
(S/U grading only.)—I, II, III, IV. (I, II, III, IV.) Bibb

Upper Division Course

199. Special Study for Advanced Undergraduates (1-5)
(S/U grading only.)—I, II, III, IV. (I, II, III, IV.) Bibb

Graduate Courses

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only.)—I, II, III, IV. (I, II, III, IV.) Bibb

298. Group Study (1-5)
Prerequisite: consent of instructor. (S/U grading only.)—I, II, III, IV. (I, II, III, IV.) Bibb

296. Small Animal Radiology Case Discussions (1)
Seminar—1 hour. Prerequisite: first or second year standing in the School of Veterinary Medicine or consent of instructor. The role of diagnostic radiology in the clinical setting and student interpretation of radiographs. May be repeated once for credit. (S/U grading only.)—I, II, III, Hornof

298. Group Study (1-5)
Prerequisite: consent of instructor. (S/U grading only.)—I, II, III, Hornof

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only.)—I, II, III, IV. (I, II, III, IV.) Bibb

Professional Courses

400. Equine Radiographic Anatomy (1)
Autotutorial—1 hour. Prerequisite: first, second-, or third-year standing in the School of Veterinary Medicine. Self-study of the radiographic anatomy displayed on the standard radiographic projections of the musculoskeletal system of the horse. (S/U grading only.)—I, II, III, IV. (I, II, III, IV.) Wisner

401. Small Animal Radiology Case Discussions (1)
Discussion—10 sessions. Prerequisite: first, second-, or third-year standing in the School of Veterinary Medicine. The role of diagnostic radiology in the clinical setting and student interpretation of radiographs. May be repeated one time for credit. (S/U grading only.)—I, II, III, IV. (I, II, III, IV.) Wisner

General Education (GE) credit: Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; Div=Social Cultural Diversity; Wrt=Writing Experience

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer; 2007-2008 offering in parentheses
402. Large Animal Radiology Case Discussions (1)
Discussion—10 sessions. Prerequisite: first, second, or third-year standing in the School of Veterinary Medicine. The role of diagnostic radiology in the clinical setting and student interpretation of radiographs. May be repeated for credit. (S/U grading only)—I, II, III, IV, I, II, III, IV, Wisner

404A. Small Animal Radiology (2.9)
Lecture—17 sessions; discussion—12 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine and consent of instructor. Registration in course 404A is required at the beginning of both winter and spring quarters for this two quarter course. Students may audit the course, but retrospective auditors after the examination has been administered at the end of each quarter are not allowed. Course 404A is required for students who intend to rotate through the Small Animal Radiology Service during their senior year. Introduction to radiographic interpretation as it relates to musculoskeletal, thoracic, and abdominal disorders of small animals. Assignment of unknown cases as practice in interpreting radiographic patterns described in lecture. (Deferred grading only, pending completion of sequence.)—II, III, IV, Pollard

404B. Large Animal Radiology (1.6)
Lecture—12 sessions; discussion—4 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine and consent of instructor. Radiographic manifestations of common equine orthopedic, upper airway and thoracic diseases. Comparative abnormalities in non-equine large animal patients. Equine and other large animal radiographic pattern recognition and differential diagnosis generation based on the identified pattern. ( Deferred grading only, pending completion of sequence.)—II, III, IV, Pollard

405. Advanced Small Animal Abdominal Ultrasound (2.2)
Lecture—12 sessions; discussion—6 sessions; laboratory—4 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. The use of ultrasound for the diagnosis of common clinical diseases in both the abdomen and thorax. Examination techniques of the thorax and the abdomen covered in the laboratory sessions and examples of the abnormal presented in discussion. —II, III

406. Small Animal Diagnostic Ultrasound (1.1)
Lecture—7 sessions; discussion—1 session; laboratory—1 session. Prerequisite: second-year standing in the School of Veterinary Medicine. Ultrasound imaging physics, artifacts, machine controls, techniques of abdominal scanning and basic ultrasonographic anatomy and technique. Lab assignments reinforce topics covered in lecture and provide hands on ultrasound experience. —I

407R. Comparative Dentistry and Oral Surgery (2)
Discussion—2 sessions; lecture—2 hours. Prerequisite: residents in the Veterinary Medical Teaching Hospital; graduate students, veterinarians enrolled in training programs leading to board-certification in veterinary dentistry, AVDC Diplomates and dentists with consent of instructor. Review of current literature pertaining to comparative oral biology, surgery and medicine and related basic sciences; half of sessions based on topics assigned by course leader while other half consist of critical reviews of recent papers chosen by the participants. May be repeated once for credit. (S/U grading only)—I, II, III, IV, I, II, III, IV, Verstraete

409. Known Case Conference (1.5)
Discussion—10 sessions. Prerequisite: DVM degree and consent of instructor. Approved for graduate degree credit. Film review of current VMTH Teaching Hospital proven cases. Intended for radiology residents with background in diagnostic radiology. May be repeated for credit. (S/U grading only)—I, II, III, IV, I, II, III

411R. Small Animal Orthopedics Conference (0.9)
Discussion—9 sessions. Prerequisite: house officers at the Veterinary Medical Teaching Hospital or completion of D.V.M. or equivalent. Graduate students with permission of instructor. Discussion of current cases and literature pertaining to small animal orthopedics. (S/U grading only)—I, II, III, IV, I, II, III, Kapatin

413. Small Animal Dentistry (2.4)
Lecture—19 sessions; discussion—5 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. Introduction to the principles of oral examination, pathophysiology and treatment of peri-odontitis, exodontics, basic oral soft tissue surgery dental emergencies, orthodontics, developmental and regressive odontodystonias, pre-odontics, advanced periodontal therapy, oral med-icine and advanced oral surgery. (S/U grading only)—I, Vertstrate

417. Small Animal Dentistry Lab (0.3)
Lab—3 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine; concurrent enrollment in course 413; consent of instructor. Principles of oral examination, oral radiography, routine peri-odontal treatment and dental extraction techniques. (Deferral grading only, pending completion of sequence. S/U grading only)—I, II, III, IV, Verstraete

415. Lameness in Dogs (1.4)
Lecture—13 sessions; laboratory—1 session. Prereq-uisite: third-year standing in the School of Veterinary Medicine; consent of instructor. Discussion of lame-ness examination and detailed descriptions of com-mon congenital and acquired disorders that cause lameness in dogs. Discussion of methods to diag-nose and treat.—III, III, HacKim

416. Equine Ultrasonology (1.0)
Lecture—8 sessions; discussion—2 sessions. Prereq-uisite: third-year standing in the School of Veterinary Medicine and consent of instructor. Familiarize students with ultrasonographic diagnostic methodology and with ultrasonologic features of common diseases of the major equine organ systems. —III, III, Whitcomb

416L. Equine Ultrasonology Lab (0.4)
Laboratory—4 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine, concurrent enrollment in course 416 and consent of instructor. Familiarize students with ultrasonographic diagnostic methodology and with ultrasonologic features of common diseases of the major equine organ systems. —III, III, Maggs, Whitcomb

423. Diagnostic Ophthalmology (1.5)
Lecture—15 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine or consent of instructor; successful completion of Veterinary Medicine 422. Thorough review of fundamentals of ophthalmology; commonly encountered diseases of the eyes. —II, III, Maggs

424. Case Studies in Veterinary Oncology (1)
Lecture—10 sessions. Prerequisite: second-year standing in the School of Veterinary Medicine and consent of instructor. The internal medicine subspecialty of oncology. Clinical considerations and basic tenets of tumor biology. (S/U grading only) —I, II, Theon

425R. Veterinary Cancer Biology: Clinical Applications (1)
Seminar—10 sessions. Prerequisite: resident in the Veterinary Medical Teaching Hospital or consent of instructor, course 433. Survey of contemporary literature regarding the clinical management of important tumors in domestic animals and focus on diagnosis and treatment. (S/U grading only) —I, II, Kent

426R. Veterinary Cancer Biology: Mechanisms of Disease (1)
Seminar—10 sessions. Prerequisite: resident in the Veterinary Medical Teaching Hospital or consent of instructor, course 433. Survey of contemporary literature regarding the biology of cancer with particular reference to mechanisms underlying tumorgenesis in domestic animals. (S/U grading only) —I, II, III, Kent

431R. Advanced Veterinary Neurology/Neurosurgery (2)
Seminar—4 hours. Prerequisite: graduate clinical student (resident) in the Veterinary Medical Teaching Hospital and consent of instructor. Lectures/discus-sions/literature reviews of diagnosis and medical/surgical treatment of neurological diseases of ani-mals. Relevant neurologic and neurosurgical topics from human medicine will be addressed. May be repeated for credit up to 12 times for 24 units of credit. (S/U grading only)—I, II, III, IV, I, II, III, IV, LeCoteur

432R. Graduate Veterinary Neurosurgery Seminar (1.5)
Lecture/laboratory—15 sessions. Prerequisite: small animal surgery residency program or the neurology/neurosurgery residency program in the School of Veterinary Medicine. Graduate students and resi-dents in other disciplines with consent of instructor. Overview of the diagnosis and treatment of neuro-logical disease in small animals with an emphasis on neurosurgery. Laboratory sessions allow residents to develop familiarity with anatomical landmarks and the neurosurgical skills necessary to perform a vari-ety of neurosurgical procedures. May be repeated for credit. (S/U grading only)—I, II, III, IV, LeCoteur

450. HACCP & Risk Assessment in Pre and Postharvest Food Safety (3)
Lecture/discussion—3 hours. Prerequisite: first, second, third-year or MPVM standing in the School of Veterinary Medicine; Master’ of Public Health stu-dents advanced undergraduate students from other schools and consent of instructor. Application of the Hazard Analysis-Critical Control Point (HACCP) system in the food industry, for regulatory purposes and in the preharvest area of food production. Development of HACCP plans. (S/U grading only) —II, I, Cliver, Hajmeier

450R. Veterinary Ophthalmology Slide Review (1)
Discussion—1 hour. Prerequisite: resident in Veteri-nary Medical Teaching Hospital. Lecture/laboratory on the field of veterinary ophthalmology. (S/U grading only) —I, II, III, Maggs, Hallingsworth

451R. Veterinary Ophthalmology Literature Review (1)
Discussion—1 hour. Prerequisite: resident in Veteri-nary Medical Teaching Hospital. Lecture/laboratory on the field of veterinary ophthalmology. (S/U grading only) —I, II, III, Maggs, Hallingsworth

460. Emergency and Critical Patient Care (2)
Lecture—20 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. Introduction to the essential and practical concepts of care for emer-gency and critically ill patients. —III, Haskins

461. Management of Small Animal Musculoskeletal Trauma (1.6)
Lecture—16 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine and Veteri-nary Medicine 460. Introduction to principles of small animal orthopedic surgery including: orthope-dic anatomy and traumatic musculoskeletal frac-ture evaluation, fracture management, traumatic joint disease and traumatic muscle and tendon disease. —III, III, Haskins

461L. Small Animal Orthopedic Surgery Laboratory (0.4)
Laboratory—4 sessions. Prerequisite: course 461 concurrently, third-year standing in the School of Vet-erinary Medicine. Hands-on experience in applica-tion of external coaptation techniques and ultrasonographic features of common diseases of the major equine organ systems. —II, III, IV, Maggs, Hallingsworth
462. Radiographic Diagnosis: Small Animal (1)
Lecture—1 session; discussion—9 sessions. Prerequisite: course 404A, third-year standing in the School of Veterinary Medicine. Small animal radiographic case studies. Presentation and discussion of assigned cases before knowing the actual diagnosis. (S/U grading only.)—III. (III.) Gregory

463. Surgical and Anesthetic Considerations in Small Animal Soft Tissue Surgery (2.2)
Lecture—22 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. Pathophysiology and surgical treatment of selected soft tissue diseases.—III. (III.) Gregory

464R. Principles of Veterinary Radiation Oncology (2)
Lecture—2 hours. Prerequisite: house officers in the Veterinary Medical Teaching Hospital. Graduate students or veterinary students with consent of instructor. Principles and practice of veterinary radiation therapy. Topics include physical methods of radiation therapy, biological effects of therapeutic radiation and applications in veterinary patients. (S/U grading only.)—I. (I.) Theron

465R. Biology and Practice of Veterinary Radiation Oncology (2)
Lecture—2 hours. Prerequisite: house officers in the Veterinary Medical Teaching Hospital. Graduate students or veterinary students with consent of instructor. Principles and practice of veterinary radiation therapy. Topics include physical methods of radiation therapy, biological effects of therapeutic radiation and applications in veterinary patients. (S/U grading only.) Offered in alternate years.—II. (II.) Theron

466. Large Animal Applied Anesthesiology (1.5)
Lecture—1.5 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine or consent of instructor. Applied clinical anesthesiology. Special techniques and considerations for anesthetizing a variety of species including horses, swine, ruminants, camels, and large non-domestic species.—II. (II.) Brosnan

467. Small Animal Anesthesiology (2)
Lecture—20 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. The safe clinical administration of anesthetic drugs to small animals. Clinical applications, indications and contraindications, methods of use of common anesthetic drugs and techniques will be discussed.—I. (I.) Ikik

468. Equine Lameness and Radiology (4)
Lecture—20 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. Principles for the clinical evaluation and radiographic interpretation of lameness disorders of the fore- and hindlimbs of horses. Radiographic methods used in large animal radiography and the latest techniques for managing and treating equine lameness. Anatomy and pathology of some areas of the musculoskeletal system.—III. (III.) MaxDover

468L. Equine Lameness and Radiology Laboratory (1.1)
Laboratory—11 sessions. Prerequisite: course 468 concurrently. Third-year standing in School of Veterinary Medicine. Emphasis on clinical gait evaluation, and various diagnostic strategies for localizing lameness disorders in the fore- and hindlimbs of horses. Radiographic films from clinical cases. Clinical evaluation and treatment of lameness disorders of the foot. Equine chiropractic and acupunture therapy.—III. (III.) Galuppo

469. Equine Surgery (3)
Lecture—30 sessions. Prerequisite: third-year standing in the School of Veterinary Medicine. Appropriate methods of diagnosis for surgical diseases, providing an understanding of different treatment options, and develop a framework for establishing a prognosis for the disease considering particular uses of horses.—II. (II.) Snyder

469L. Equine Surgery Laboratory (1.4)
Laboratory—8 sessions; discussion—6 sessions. Prerequisite: course 469 concurrently, third-year standing in School of Veterinary Medicine. Common equine surgical procedures and other techniques useful in equine practice. (S/U grading only.)—II. (II.) Snyder

470R. Equine Surgery Journal Discussion (1)
Discussion—1 hour. Prerequisite: course 471R concurrently. Resident in Veterinary Medical Teaching Hospital or consent of instructor. Current veterinary literature and other related topics in preparation for board certification in the American College of Veterinary Surgeons. Critical evaluation of journal articles for content, methodology and statistical methods. (S/U grading only.)—I, III, IV. (I, II, III, IV) Galuppo

471R. Equine Surgery Case Management Conference (1)
Discussion—1.5 hours. Prerequisite: course 470R concurrently. Resident in Veterinary Medical Teaching Hospital or consent of instructor. Discussion of soft tissue, orthopedic and lameness clinical disorders that focus on pathophysiology of disease, appropriate treatment options, and evaluation of prognosis. Simulation of mock oral examination for the American College of Veterinary Surgeons board examination. (S/U grading only.)—I, II, III, IV. (I, II, III, IV) Galuppo

472R. Clinical Soft Tissue Surgery Conference (1)
Discussion—1 hour. Prerequisite: open to students with D.V.M. or equivalent degree who are residents in specialty training. Graduate students in a resident discipline with consent of instructor. Review current medical literature and discuss presentation, diagnosis and treatment of small animal surgical conditions. Review the morbidity and mortality of clinical cases and provide mock examinations in preparation for ACVS specialty boards. May be repeated for credit. (S/U grading only.)—I, II, IV. (I, II, III, IV) Kyle

491R. Anesthesia/Critical Care Basic Science Management Conference (1.2)
Discussion—12 sessions. Prerequisite: resident in the Veterinary Medical Teaching Hospital or consent of instructor. Physiology, pharmacology and clinical practice as it relates to anesthetic management of veterinary patients. May be repeated three times for credit. (S/U grading only.)—I, II, III. (I, II, III) Pyepod

493R. Anesthesia/Critical Care Case Management Conference (1.2)
Discussion—12 sessions. Prerequisite: resident in the Veterinary Medical Teaching Hospital or consent of instructor. Discussion of VMTH case material to illustrate specific medical problems and their preventive and corrective management as it pertains to anesthesia and critical care. May be repeated three times for credit. (S/U grading only.)—I, II, III. (I, II, III) Pyepod

Viticulture and Enology

(College of Agricultural and Environmental Sciences)

James A. Wolpert, Ph.D., Chairperson of the Department

Department Office. 1023 Wickson Hall
(530) 752-0380, http://wine.ucdavis.edu

Faculty

Douglas O. Adams, Ph.D., Associate Professor
Linda F. Bisson, Ph.D., Professor
David E. Block, Ph.D., Associate Professor

(Viticulture and Enology, Chemical Engineering)
Roger B. Boulton, Ph.D., Professor

(Viticulture and Enology, Chemical Engineering)
Susan E. Ebeler, Ph.D., Professor

Hildegarte Heymann, Ph.D., Professor
Mark A. Matthews, Ph.D., Professor
David A. Mills, Ph.D., Associate Professor
David R. Smart, Ph.D., Assistant Professor
M. Andrew Walker, Ph.D., Professor
Andrew L. Waterhouse, Ph.D., Professor
Larry E. Williams, Ph.D., Professor

Emeriti Faculty

L. Peter Christensen, Cooperative Extension Specialist, Emeritus
W. Mark Kliewer, Ph.D., Professor Emeritus
Ralph E. Kunkee, Ph.D., Professor Emeritus
Lloyd A. Lider, Ph.D., Professor Emeritus
Carole P. Meredith, Ph.D., Professor Emerita
Ann C. Noble, Ph.D., Professor Emerita
Harold P. Olmo, Ph.D., Professor Emeritus
Charles S. Ough, D.S. Emeritus
Vernon L. Singleton, Ph.D., Professor Emeritus
Academic Senate Distinguished Teaching Award

Affiliated Faculty

Matthew W. Fidelibus, Ph.D., Assistant Specialist in Cooperative Extension
James T. Lapley, Ph.D., Adjunct Associate Professor
James A. Wolpert, Ph.D., Specialist in Cooperative Extension

The Major Program

The Viticulture and Enology major provides an interdisciplinary education in the biological and physical sciences 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 preparatory courses with a grade of C- or higher and with a combined grade point average of at least 10.00 for similar courses taken at community college or these and all other preparatory courses in addition, students’ overall GPA must be 2.50 or higher. All courses must be taken for a letter grade.

Biological Sciences 1A, 1B, 1C ………… 5 units
Chemistry 2A, 2B, 2C, 8A ………… 17 units
Mathematics 16B ………… 3 units
Physics 1A, 1B or 1A ………… 4.6 units

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 required upper division courses and may thus delay graduation. Some courses may be available at UC Davis during Summer Session.

Chemistry 88 ………… 4 units
Mathematics 16B ………… 3 units
Biological Sciences 1C ………… 5 units

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 management, quality control and research. Additionally they may work in related fields such as pest management, nursery production and analytical services.

B.S. Major Requirements:

English Composition Requirement ………… .0-8

See College requirement. ………… .0-8

Breadth/General Education ………… 24

See General Education requirement.
Preparatory Subject Matter .......................... 41-51
(Continued)
Biological Sciences 1A, 1C .................................. 10
Chemistry 2A, 2B ........................................ 15
Chemistry 8A, 8B .......................................... 6
Agricultural Management and Rangeland Resources 21 or equivalent and adviser approval ...................................................... 0.3
Mathematics 1A-1B ........................................ 6
Physics 1A, 1B or 7A ....................................... 4.6
Viticulture and Enology 2, 3, or equivalent and adviser approval .......... 0.5
Depth Subject Matter .................................. 53-54
(Continued)
Biological Sciences 102, 103 ................................ 6
Microbiology 102, 102L .................................... 7
Agricultural Management and Rangeland Resources 120 or Statistics 100 or 106 ......................................................... 1
Viticulture and Enology 101A, 101B, 101C, 110, 118 ........................................ 15
Viticulture and Enology 123, 124, 125, 126, 128, 135 and in consultation with the adviser, choose 3 of the following courses: 123L, 124L, 125L, 126L, 128L. If more than 3 are taken, the extra courses will count as restricted electives in Area B. 2-122
Restricted Electives ..................................... 28
(Continued)
In consultation with adviser, choose 28 units from three of the following five areas. At least 12 units must be from one of the following areas: (A) Plant Science and Microbiology; (B) Food Science and Microbiology; or (C) Economics and Business.
(A) Plant Science area: Applied Biological Systems Technology 142, 143, 147, 175, 180, Atmospheric Science 133, Biological Sciences 101, Entomology 110, Hydrologic Science 110, 117, 124, Molecular and Cellular Biology 126, nematology 110, Plant Biology 111, 112, 123, 142, 143, 146, 154, 157, 158, 160, 171, 172, 175, 180, Pathology 120, Plant Science 100, 102, 109, 118, Viticulture and Enology 111.
(B) Food Science and Microbiology area: Biological Sciences 101, Food Science and Technology 102A, 102B, 104, 108, 109, 110A, 110B, 127, Microbiology 140, 140L, 150, 155L, Viticulture and Enology 140.
(C) Economics and Business area: Agricultural and Resource Economics 100A, 112, 113, 118, 130, 140, 150, Economics 1A, 1B, Management 11A, 118, Viticulture and Enology 111, 130
(D) Language area: 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:
French 20, 21, 22, 23, 28, German 6, 11, 20, 21, 22, Italian 4, 5, Spanish 8, 21, 22, 28, 31, 32, 33.
Courses taught in English will not count as restricted electives in this major.
(E) Internship area: A maximum of 8 units of Viticulture and Enology 190X, 199, 198, 199, 290 or 298 may be counted as restricted electives by prior arrangement with adviser. May be increased to 12 units in exceptional circumstances.
Unrestricted Electives .................................. 16-37
Total Units for the Degree .............................. 180
Major Adviser: M. Matthews
Related Major Programs: Food Science and Technology Management and Rangeland Resources, and Crop Science.
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 Chemistry (A Graduate Group), on page 123, Engi-
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. Students will evaluate wines and model systems using discrimination tests, ranking, descriptive analysis and time-intensity analysis. Data analyzed by appropriate statistical tests and results interpreted in extended weekly lab reports.—I, III. 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, microbiology, horticulture, and agriculture and agronomy. Principles of equilibria and rates of physical and chemical reactions in wines; treatment of unstable compounds in wines; chemical analysis of wine, fermentation, ion exchange, refrigeration, filtration, and membrane processes; and protein, polysaccharide, tannate, oxidative, and color stabilities.—II, I. 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 science, viticulture and enology majors, or graduate students in food science, agricultural and environmental chemical, microbiology or by consent of instructor. Practical application of principles of equilibria and rates of physical and chemical reactions to wine stability.—II, I. 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.—II, I. Mills

128L. Wine Microbiology Laboratory (2) Laboratory—4 hours. Prerequisite: course 123, 124, and 128 (may be taken concurrently), Microbiology 102 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.—II, I. Mills

130. Management, Marketing, and Economics of the California Wine Industry (9) Lecture—24 hours; lecture/discussion—4 hours; fieldwork—8 hours. Prerequisite: course 124. Introduction to management, marketing and economics of wine in the United States with particular emphasis on California. Reviews market segmentation, pricing, marketing strategies and explores alternative strategies for grape acquisition, production, brand development, distribution, and social policy formation. GE credit: Writ.

135. Wine Technology and Winery Systems (5) Lecture—3 hours; discussion/lab—2 hours. Prerequisite: course 124. Process technologies and process systems that are used in modern commercial wineries: laboratory, problem solving sessions, and possible field trips. Includes grape preparation and fermentation equipment; post-fermentation processing equipment; winery utilities, cleaning systems, and waste treatment.—III. Block

140. Distilled Beverage Technology (3) Lecture—3 hours. Prerequisite: Chemistry 88B; Food Science and Technology 110A. Distillation principles and processes; technology of brandy, whiskey, rum, vodka, gin, and other distilled beverages; characteristics of raw materials, fermentation, distillation, and aging. Offered in alternate years.—III. Boulton

181. Readings in Enology (1) Discussion—1 hour. Prerequisite: course 3. Critical evaluation of selected monographs in enology. Discussion leadership rotates among the students. May be repeated three times for credit. (P/NP grading only)—III. Matthews

186. Fermentation Science (3) Lecture—3 hours. Prerequisite: Microbiology 102. Biological Sciences 101. Basic principles of fermentation science and biotechnology with emphasis on industrial fermentation processes that generate useful products including fermented food and beverages, pharmaceutics, fine chemicals, and other gene products.

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 specific winemaking topic chosen for the quarter. Discussion with the speaker hosted by the faculty member(s) in charge. May be repeated for credit up to 3 times. (P/NP grading only)—III, III.

192. Internship (1-12) Internship—3-36 hours. Prerequisite: completion of 84 units. Work experience related to Fermentation Science (Enology) or Plant Science (Viticulture) majors. Internships must be approved and supervised by a member of the department or major faculty, but are arranged by the student. (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 Courses

200. Introduction to Scientific Methods (2) Lecture/discussion—1 hour; term paper. Prerequisite: graduate standing or consent of instructor. Processes involved in conducting scientific research. Topics include conducting literature review, formulating hypotheses, analyzing and reporting results. Annotated bibliography and written and oral research proposal.

210. Grape Development and Composition (4) Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 102, 103. The anatomy, physiology and biochemistry of grape berry development, with emphasis on the development of grape composition relevant to winemaking. Offered in alternate years.—III. Adams, Polito

215. Sensometrics (3) Lecture—3 hours. Prerequisite: Food Science and Technology 117 or the equivalent course 125 and 125L or Food Science and Technology 107A or 107B. Experimental design and statistical analysis, including multivariate analysis, for both sensory and instrumental data in enology and food-related studies.—I. Heymann

216. Vineyard Establishment and Development (4) Lecture/discussion—3 hours; fieldwork—3 hours; term paper. Prerequisite: courses 101A, 101B, 101C, and one of courses 115 or 116, and course 118 or consent of instructor. Soil Science 100, Atmospheric Science 133 and Agricultural and Resource Economics 140 recommended. Application of plant, meteorological, soil, water, and economic sciences to vineyard establishment and development. Preparation of a comprehensive study to determine the viticultural and economic feasibility of a given location, such as raisin, table, or wine grape production.—I. Smart

219. Natural Products of Wine (3) Lecture—3 hours. Prerequisites: courses 123 and 124, or natural products background and consent of instructor. Structure, occurrence, and changes due to wine production to the natural compounds found in wine. Chemicals with a sensory impact will be emphasized, including flavonoids and other pheno- lics, terpenes and norisoprenoids, pyrazines, alcohol volatiles and other wine constituents.—I. Waterhouse

220. Secondary Nutrients, Chemistry (3) Lecture—2 hours; discussion—1 hour. Prerequisite: Chemistry 88B. Introduction to phytotoxins with possible health or nutritional effects. Focus on chemical structure, reactivity and occurrence in foods, including phenolics, glucosinolates, carotenoids and fiber. Students will give oral reports.

231. Instrumental Analysis of Must and Wine (4) Lecture—2 hours; laboratory—3 hours; discussion—1 hour. Prerequisite: course 123 or Food Science and Technology 107B, Biological Sciences 102, Chemistry 107E or 115T recommended. Open to upper division students in Fermentation Science, Viticulture and Enology, or graduate students in Food Science, Agricultural and Environmental Chemistry or Viticulture and Enology. Research and practice of instrumental analysis of wines and musts. Emphasis on the principles of analytical techniques (e.g., CE, GC, HPLC, Mass Spectrometry) and factors determining correct choice of instrumental method.—II, III. Ebeler

224. Advances in the Science of Winemaking (3) Lecture—3 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. Heymann

225. Advanced Sensory Analysis of Wines (3) Lecture/discussion—2 hours; laboratory—4 hours. Prerequisite: courses 124 and 125 (or Food Science and Technology 107A) 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.—III. 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 site. 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 science disciplines and critical evaluation of special topic area. Intended to develop skills in critical evaluation of scientific publications. May be repeated for credit. (S/U grading only)—II, III. Bisson

290. Seminar (1) Seminar—1 hour. Prerequisite: consent of instructor. (S/U grading only)—I, II, 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)—I, II, III, IV.

291. Advanced Viticulture (2) Lecture/discussion—2 hours. Prerequisite: course 110, 116, 124, 125; course 126 strongly recommended. Critical evaluation of scientific and popular literature on selected topics of current interest that relate viti-
Viticulture and Enology (A Graduate Group)
and professors/researchers who teach and/or conduct research in academic institutions.

**B.S. Major Requirements:**

**Written/Oral Expression**

8

- University Writing Program 1……………...……………...4
- Communication 1……………..……………...……………...4

Above requirements simultaneously satisfy the College requirements.

**Preparatory Subject Matter**

47-53

- Biological Sciences 1A, 1B, 1C 15
- Chemistry 2A, 2B, 3A, 3B 16
- Mathematics 16A, 16B 6
- Physics 1A, 1B, 2A, 2B, 7C 6-12
- Statistics 100, 102, or Agricultural Management Resources 120………………….4

**Breadth/General Education**

6-24

Satisfaction of General Education requirement.

**Depth Subject Matter**

49-61

Students graduating with this major are required to attain at least a C average (2.000) in all courses taken at the university in depth subject matter.

<table>
<thead>
<tr>
<th>Environmental Science and Policy</th>
<th>Evolution and Ecology</th>
<th>Evolution and Ecology</th>
<th>Biological Sciences</th>
<th>Neurobiology, Physiology, and Behavior</th>
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<tr>
<td>100, 111, 111L, 120, 120L, or Evolution and Ecology 134, 134Al</td>
<td>12-13</td>
<td>12-13</td>
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**Written/Oral Expression**

8

- University Writing Program 1……………...……………...4
- Communication 1……………..……………...……………...4

Above requirements simultaneously satisfy the College requirements.

**Options**

1. **Fisheries Science:** Complete Wildlife, Fish, and Conservation Biology 102, 102L, 120, 120L, and 121. Complete one of the following options:
   - Opt 1: Environmental Science and Policy 116 or Evolution and Ecology 115; complete one course from a and one course from b:
     - a: Environmental Toxicology 101, 112A, 112B recommended, or 138;
     - b: Pathology, Microbiology, and Immunology 101, Medical Microbiology 115 or 116.
   - Opt 2: Biological Sciences 102, 103, or Animal Biology 102, 103; complete one course from a and one course from b:
     - a: Entomology 116, Evolution and Ecology 112-112L, or Environmental Science and Policy 151;

2. **Pathological Ecology:** Complete Wildlife, Fish, and Conservation Biology 157.

3. **Physiological Ecology:** Complete Wildlife, Fish, and Conservation Biology 121 and 130 and either Biological Sciences 102, 103 or Animal Biology 102, 103. Choose two courses from Neurobiology, Physiology, and Behavior 126, 127, 128, 140, or 141.

4. **Wildlife Damage Management:** Complete Wildlife, Fish, and Conservation Biology 152, Agricultural Management and Rangeland Resources 105, Evolution and Ecology 104 and choose one course from Nature and Culture 140 or Veterinary Medicine 170.

5. **Wildlife Biology:** Complete Wildlife, Fish, and Conservation Biology 100 or 101-101L, Wildlife, Fish, and Conservation Biology 151, and two courses from Evolution and Ecology 114, Wildlife, Fish, and Conservation Biology 110L or 111L; and
   - a: Choose one course from Plant Biology 102, 108, 117, 119, 124, 178, 178B, Evolution and Ecology 117; and
   - b: Choose one course from Agricultural Management and Rangeland Resources 130, Environmental Science and Policy 155, Environmental Horticulture 160, Wildlife, Fish, and Conservation Biology 135, 156, or 157; and
   - c: Choose two courses from Environmental Science and Policy 121, Wildlife, Fish, and Conservation Biology 136, 152, 153, 154, or 158.

6. **Population Dynamics:** Mathematics 16C (17A-17B-17C or 21A-21B-21C recommended), Statistics 108, Environmental Science and Policy 121, Engineering 6, and one additional upper division statistics course beyond the Depth Subject Matter requirement [e.g. Statistics 104, 106b; note that Statistics 100, 102 do not fulfill this野生动物distribution course requirement].

7. **Individualized:** Students may, with prior approval of their adviser and the curriculum committee, design their own individualized specialization. Such a specialization will consist of four-six courses with a common theme.

**Unrestricted Electives**

0-62

**Total Units for the Degree (minimum)**

180

**Major Adviser:** D. W. Anderson

Students transferring to Davis from another institution or new students declaring the major of Wildlife, Fish, and Conservation Biology must consult the Master Adviser so that their program can be evaluated and a faculty adviser assigned. See the receptionist in 1028 Academic Surge Building or telephone (530) 752-6586.

**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, with relevance and application to all life forms.

**Units**

Wildlife, Fish, and Conservation Biology 21-30

Wildlife, Fish, and Conservation Biology 100, 151, either 154 or 155, and choose one course from 110, 111, or 120 15

Two to four upper division elective courses chosen from the Wildlife, Fish, and Conservation Biology curriculum, excluding WFC 190, 191, 192, 198, and 199 5-16

**Minor Adviser:** D. W. Anderson

**Graduate Study:**

Graduate students in Wildlife, Fish, and Conservation Biology are active members of several graduate programs, including the Ecology, Population Biology, and Animal Behavior graduate groups. Students interested in graduate studies should contact Graduate Studies, on page 97, in this catalog.

**Courses in Wildlife, Fish, and Conservation Biology (WFC)**

**Lower Division Courses**


Lecture—3 hours; discussion—1 hour. Introduction to the ecology and conservation of vertebrates. Complexity and severity of world problems in conserving biological diversity. GE credit: SciEng, Div. Wrt.—III. (I.) Moyle, Kelt

11. **Introduction to Conservation Biology (3)**

Lecture—3 hours. Introduction to conservation biology and background to the biological issues and controversies surrounding loss of species and habitats for students with no background in physical sciences. GE credit: SciEng, Wrt.—III. (III.) Caro

92. **Internship (1-6)**

Internship—3-18 hours. Prerequisite: lower division standing 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.)

**Upper Division Courses**

100. **Field Methods in Wildlife, Fish, and Conservation Biology (4)**

Lecture—2 hours; laboratory—3 hours; fieldwork—3 hours. Prerequisite: Evolution and Ecology 101, 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. —III. (III.) Anderson, Earle, Kel, Van Vuren

101. **Field Research in Wildlife Ecology (2)**

Lecture/discussion—2 hours. Prerequisite: one upper division course in each of entomology, statistics, animal behavior, mammalogy, and herpetology and consent of instructor. Field research in ecology of wild vertebrates in terrestrial environments; formulation of testable hypotheses, study design, introduction to research methodology, oral and written presentation of results. Limited enrollment. Offered in alternate years. GE credit: Wrt.—I. Anderson, Earle, Kel, Van Vuren

Quarter Offered: I—Fall, II—Winter, III—Spring, IV—Summer; 2007-2008 offering in parentheses.

General Education (GE) credit: ArtHum=Arts and Humanities, SciEng=Science and Engineering, SocSci=Social Sciences, Div=Social Cultural Diversity; Wrt=Writing Experience
101L. Field Research in Wildlife Ecology: Laboratory (4)
Lecture/discussion—2 hours; field work—15 hours. Prerequisite: consent of instructor, course 101 (may be taken concurrently), and one upper division course in each of ecology, statistics, and ornithology, mammalogy, or herpetology. Field research in ecology of wild vertebrates in terrestrial environments; testing ecological hypotheses through field research, application of research methodology, supervised independent research projects. Held between Labor Day and fall quarter. Limited enrollment. Offered in alternate years.—I. Anderson, Eadie, Keith, Van Vuren

102L. Field Studies in Fish Biology (1)
Lecture/discussion—1 hour. Prerequisite: upper division course in each of ecology, aquatic biology, fish biology, and statistics, and consent of instructor. Emphasis on theory of quantitative fish capture methods. Lecture/discussion—1 hour. Prerequisite: course 102, upper division course in each of ecology, aquatic biology, fish biology, and statistics, and consent of instructor. Field investigations of fish biology are emphasized including quantitative capture methods and individual research projects on ecology, behavior, physiology or population biology of fishes. Offered in alternate years.—III. Mayle, Cech

102L. Field Studies in Fish Biology: Laboratory (6)
Fieldwork—15 hours; laboratory—12 hours; discussion/laboratory—3 hours. Prerequisite: course 102, upper division course in each of ecology, aquatic biology, fish biology, and statistics, and consent of instructor. Field investigations of fish biology are emphasized including quantitative capture methods and individual research projects on ecology, behavior, physiology or population biology of fishes. Limited enrollment. Offered in alternate years.—I. (II.) Elliott-Fisk

110. Biology and Conservation of Wild Mammals (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, Evolution and Ecology 101 or Environment, Science and Policy 100. Origins, evolution, diversification, and geographical and ecological distributions of mammals. Morphological, physiological, reproductive, and behavioral adaptations of mammals to their environment.—III. (III.) Kelt

110L. Laboratory in Biology and Conservation of Wild Mammals (2)
Laboratory—6 hours. Prerequisite: course 110 (may be taken concurrently) and consent of instructor. Laboratory exercises in morphological anatomy, taxonomy, reproduction, and adaptations of wild mammals to different habitats. Limited enrollment.—III. (III.) Kelt

111. Biology and Conservation of Wild Birds (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C, and Evolution and Ecology 101. Phylogeny, distribution, migration, reproduction, population dynamics, and conservation of wild birds. Emphasis on adaptations to environments, species interactions, management, and conservation.—I. (II.) Anderson, Eadie

111L. Laboratory in Biology and Conservation of Wild Birds (2)
Laboratory—6 hours. Prerequisite: course 111 (may be taken concurrently) and consent of instructor. Laboratory exercises in bird species identification, anatomy, physiology or population biology of birds. Field investigations of bird species in wild environments, with emphasis on conservation of wild birds. Limited enrollment.—I. (II.) Anderson, Eadie

120. Biology and Conservation of Fishes (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1B. Evolution, ecology, and conservation of marine and freshwater fishes.—I. (I.) Moyle

120L. Laboratory in Biology and Conservation of Fishes (1)
Laboratory—3 hours. Prerequisite: course 120 (may be taken concurrently). Morphology, taxonomy, conservation, and identification of marine and freshwater fishes with emphasis on California species. Limited enrollment.—I. (I.) Moyle

121. Physiology of Fishes (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: upper division courses in nutrition and physiology or consent of instructor. Comparative physiology, growth, reproduction, behavior, and energy relations of fishes. GE credit: SciEng, Wrt.—II. (II.) Cech

122. Population Dynamics and Estimation (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: 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, change-in-ratio, etc.), mathematical models of populations (e.g., Leslie matrix, logistic, dynamic pool, stock-recruitment); case histories.—III. (III.) Botaford

130. Physiological Ecology of Fishes (4)
Lecture—4 hours. Prerequisite: course 110, 111, or 120; Neurobiology, Physiology, and Behavior 101; and Evolution and Ecology 101. Animal functions, adaptations, and ecological energetics of fishes. Nutrition, metabolism, and productivity are emphasized as patterns of relationships for understanding the distribution of fishes and endotherms and in time and space. Not offered every year.—II. (II.)

136. Ecology of Waterfowl and Game Birds (3)
Lecture—2 hours; laboratory—3 hours; field trip. Prerequisite: courses 111 and 111L or the equivalent. Detailed examination of distribution, behavior, population dynamics, and management of waterfowl and upland game birds. Offered in alternate years.—II. (II.) Eadie

141. Behavioral Ecology (4)
Lecture—3 hours; film viewing—1 hour. Prerequisite: Evolution and Ecology 101. Basic theories underlying the functional significance of behavior, and the role of ecological constraints. Supporting empirical evidence taken mainly from studies of wild vertebrates. Offered in alternate years.—II. Coro

151. Wildlife Ecology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences, 1A, 1B, 1C or the equivalents; course 110L or 111L recommended. Ecology of wild vertebrates, including habitat selection, spatial organization, demography, population growth and regulation, competition, predation, and community dynamics, set in the context of human-caused degradation of environments in North America.—I. (I.) Van Vuren

152. Ecological Management of Problem Wildlife (3)
Lecture—3 hours. Prerequisite: Biological Sciences 1A, 1B, 1C or the equivalents; course 110L or 111L recommended. Review of various forms of environmental pollution in relation to fish and wildlife, the effects and mechanisms of pollutants, effects on individuals and systems, laboratory and field ecotoxicology, examples, case histories, philosophic/management considerations. Offered in alternate years. GE credit: SciEng, Wrt.—II. Van Vuren

153. Wildlife Ecotoxicology (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: introductory courses in organic chemistry, ecology, and physiology, or consent of instructor; Environmental Toxicology 101 or the equivalent. Effects of various forms of environmental pollution on fish and wildlife, the effects and mechanisms of pollutants, effects on individuals and systems, laboratory and field ecotoxicology, examples, case histories, philosophic/management considerations. Offered in alternate years. GE credit: SciEng, Wrt.—II. Anderson

154. Conservation Biology (4)
Lecture—3 hours; term paper (will be one or more book reviews). Prerequisite: Evolution and Ecology 101 or Environmental Studies 100 or the equivalent. An introduction to conservation biology and background to the biological issues and controversies surrounding loss of species and habitats.—I. (I.) Woodroffe

155. Habitat Conservation and Restoration (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: introductory ecology course; course 154 and Environmental Horticulture 160 recommended. Analysis of the characteristics of wildlife and fish habitats, the conservation of habitats, and restoration. GE credit: SciEng, Wrt.—I. (II.) Elliott-Fisk

156. Plant Geography (4)
Lecture—3 hours; laboratory—3 hours; term paper. Field trips will be substituted for some in-lab activities. Prerequisite: Environmental Studies 100 or Evolution and Ecology 101; course work in organismal biology, physical geography, and soil geography recommended. Overview of coastal ecosystems, physical and biological elements and processes, and coastal zone dynamics, fish dynamics, bird and brushy shorelines, estuaries, dunes and coastal watersheds. Discussion of the role of historical factors and conservation, restoration, and management approaches. Not offered every year.—II. Elliott-Fisk

158. Infectious Disease in Ecology and Conservation (3)
Lecture—3 hours; laboratory/coursework—3 hours. Prerequisite: Evolutionary Ecology 101 or Environmental Science and Policy 100 or Veterinary Medicine 409 or the equivalent. Introduction to the dynamics and control of infectious diseases in wildlife, including zoonotic diseases and those threatening endangered species. Basic epidemiological models and their applications. Role of scientists in developing disease control policies. Offered in alternate years.—III. Woodroffe

190. Departmental Research Seminar (1)
Seminar—1 hour. Prerequisite: upper division standing in the biological sciences. Reports and discussions of recent advances related to wildlife and fisheries biology. May be repeated for credit up to 3 times. (P/NP grading only.)—I, II, III

191. Museum Science (2)
Lecture—1 hour; laboratory—5 hours. Prerequisite: upper division standing and consent of instructor. Principles and methods required to preserve and present biological specimens for research, teaching collections, and museum display. Offered in alternate years. (P/NP grading only.)—II. Engels

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.)

195. Field and Laboratory Research (3)
Laboratory—6 hours; discussion—1 hour. Prerequisite: Biological Sciences 110L, 111L, or 120; Evolution and Ecology 101 or the equivalent; and consent of instructor. Critique and practice of research methods applied to field and/or laboratory environments of wild vertebrates. Students work independently or in small groups to design experimental protocols, analyze data, and report their findings. May be repeated twice for credit.—I, II, III, IV

197. Tutoring in Wildlife and Fisheries (1-5)
Prerequisite: major in Wildlife, Fish, and Conservation Biology 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.)
223. Conservation Biology and Animal Behavior (3)
Lecture—1 hour. 5 hours; discussion—1 hour. Prerequisites: 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 recommended. Possible basis for population models, evaluation of simple ecological models, current population models with age, size and stage structure, theoretical basis for management and exemplary case histories. Emphasis on development and use of realistic population models in ecological research. Not offered every year. —II. Botsford

290. Seminar (1-3)
Seminar—1 hour. Prerequisite: consent of instructor. Seminar devoted to a highly specific research topic in any area of wildlife or fisheries biology. Special topic selected for a quarter will vary depending on interests of instructor and students. (S/U grading only)—II, III. (II, III, III)

291. Seminar in Aquatic Ecology (2)
Seminar—2 hours. Prerequisite: graduate standing in biology. Presentation and analysis of assigned topics in emphasizing fish, fisheries and aquatic conservation. Offered in alternate years. (S/U grading only)—III. (II, III, III)

292. Physiology of Fishes Seminar (1)
Seminar—1 hour. Prerequisite: graduate standing and at least two courses in physiology, consent of instructor. Seminar devoted to current topics concerning the physiological functioning of fishes. May be repeated for credit. (S/U grading only)—II, III. (II, III, III)

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 for credit. (Same course as Animal Behavior 294) Offered in alternate years. —II, I.

295. Seminar in Wildlife Ectoecology (3)
Seminar—2 hours, term paper. Prerequisite: graduate standing in biology. Presentation and analysis of assigned and searched research papers on transport, reservoir, and effects of environmental contaminants on wildlife-associated ecosystem components, especially at individual/population levels. Specific subjects vary each offering. Offered in alternate years. (S/U grading only)—II, Anderson

297. Supervised Teaching in Wildlife and Fisheries Biology (1-3)
Tutorial—3 to 9 hours. Prerequisite: meet qualifications for teaching teaching in undergraduate courses in Wildlife, Fish, and Conservation Biology. Weekly conferences with instructor; evaluations of teaching; preparing for and conducting demonstrations, laboratories, and discussions; preparing and grading examinations. May be repeated for a total of 6 units when a different course is tutored. (S/U grading only.)

Wine Production

Food Science and Technology, on page 275; Microbiology, on page 372; and Viticulture and Enology, on page 480.

Women and Gender Studies

Women's Studies

Women and Gender Studies

[College of Letters and Science]
Anna K. Kuhn, Ph.D. Program Director
Program Office, 2222 Hart Hall
(530) 752-4686; http://www.ucdavis.edu/wgsssite/index.html
Committee in Charge
Gayatri Gopinath, Ph.D. (Women and Gender Studies) Wendy Ho, Ph.D. (Asian American Studies, Women and Gender Studies)
Sudai Joseph, Ph.D. (Anthropology, Women and Gender Studies) Susan Kaiser, Ph.D. (Textiles and Clothing, Women and Gender Studies) Karen Kaplan, Ph.D. (Women and Gender Studies, Cultural Studies) Anna K. Kuhn, Ph.D. (Women and Gender Studies) Luz Menzi, Ph.D. (Women and Gender Studies) Kimberly D. Nettles, Ph.D. (Women and Gender Studies)
Judith Newton, Ph.D. (Women and Gender Studies) Leslie Rabine, Ph.D. (Women and Gender Studies) Juvana Maria Rodriguez, Ph.D. (Women and Gender Studies)
Margaret Swain, Ph.D. (Center for Gender and Global Issues, Women and Gender Studies)
Faculty
Gayatri Gopinath, Ph.D., Associate Professor Wendy Ho, Ph.D., Associate Professor [Asian American Studies, Women and Gender Studies] Susan Kaiser, Ph.D., Professor [Textiles and Clothing, Women and Gender Studies] Ann K. Kuhn, Ph.D., Professor [Asian American Studies, Women and Gender Studies] Luz Menzi, Ph.D., Assistant Professor Kimberly D. Nettles, Ph.D., Assistant Professor Judith Newton, Ph.D., Professor Leslie Rabine, Ph.D., Professor Juvana Maria Rodriguez, Ph.D., Associate Professor Margaret Swain, Ph.D., Associate Professor
The Major Program
Women's Studies is an interdisciplinary major founded on the premise that gender is a historically variable construction that centrally shapes the historical experience and everyday lives of women as well as men. Women's Studies also assumes that gender, race, class, sexual and national identities are constructed in relation to one another. The intersections of these categories of experience as well as the history of debates over these categories means in an important strand of the Women's Studies curriculum. Women's Studies at UC Davis is particularly rich in faculty doing comparative, cross-cultural work on women and gender. Among the faculty offering courses for the major are scholars working on women and gender in Africa, the Americas, China, Europe, Japan, India, various countries of the Middle East, Southeast Asia, and the United States.

The Program. Perhaps the most exciting, albeit challenging, aspects of the Women and Gender Studies Program is that students can pursue their particular academic interests and design their course of study accordingly. In devising their program of study, students will draw on courses in African American and African Studies, American Studies, Anthropology, Asian American Studies, Chicana/o Studies, Comparative Literature, English, French, German, History, Italian, Linguistics, Native American Studies, Political Science, Psychology, Sociology, Spanish, Textiles and Clothing, and other related disciplines.

In addition to offering a broad array of courses that deal with gender, race, class, ethnicity, and sexuality, the Women and Gender Studies Program affords interested students the opportunity to earn internship credits and conduct independent research as well as take advantage of the Honors Thesis option.

Students design a program of study in consultation with an advisor 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 discipline such as Political Science, History, English, Sociology, Comparative Literature or Ethnic Studies.

Career Alternatives. A degree in Women's opens possibilities for future employment. The WGS Program introduces students to relevant social issues, fosters critical thinking, and encourages social advocacy; it also hones their verbal and writing skills. It prepares students for entrance into graduate programs in the Humanities or Social Sciences. 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 or family-related issues. Students who plan to do practical work in counseling, clinical psychology, social services, or political science will also find Women's Studies to be a helpful undergraduate major. Those who wish to do graduate level research in such fields as history, literature, ethnic studies, philosophy, sociology, anthropology, economics, political science, French, German, Italian, comparative literature, dramatic art, education, English, and Spanish will also benefit from a strong undergraduate background in women's history, feminist social theory, and a feminist understanding of narrative and cultural representation.

Increasingly, corporations, colleges and universities, insurance companies, and personnel firms are hiring specialists in women and gender studies as consultants. Current state and federal agencies need people who have special understanding for the problems that women face in society, industry, and the professions. Educational institutions need specialists to develop and administer women's studies programs, women's centers, and other organizations designed specifically to study and assist women.

Women's Studies

A.B. Major Requirements:

UNITS
Preparatory Subject Matter...................... 20
Two courses from Women's Studies 20, 50, 60, 70 ......................... 8
Three courses selected from the following: African American and African Studies, American Studies 1, 2, 15, American Studies 1E, 1F, Anthropology 2, 20, 21, Art History 1, Asian American Studies 1, 2, Chicana/o Studies 10, 50, Classics 15, Comparative Literature 12, Dramatic Art 1, English 30A or 30B, 45, 46A or 46B, 46C, History 72A, 72B, Humanities 10, Native American Studies 1, 10, Nature and Culture 1, Political Science 7,
Minor Program Requirements:

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<thead>
<tr>
<th>REQUIREMENTS</th>
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<td>Women's Studies</td>
<td>24</td>
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**Women's Studies Courses**

- **Women's Studies 20, 50, 60, 70 or 80**: Choose one from Anthropology 139, Asian American Studies 112, Chicana/o Studies 111, 122, 131, Native American Studies 134, 180, Sociology 134, 172, Women's Studies 160, 180.

**Graduate Study**

The Women's Studies Program offers a designated emphasis in Feminist Theory and Research for students enrolled in the Ph.D. programs of twelve other affiliated departments. See Feminist Theory and Research, on page 272.

**Courses in Women's Studies (WMS)**

**Lower Division Courses**

- **20. Cultural Representations of Gender (4)** Lecture/discussion—4 hours. Prerequisite: one course specified for the Women's Studies major.
- **22. 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, Colombia, Cuba, Ethiopia, India, Iran, Korea, New Zealand, and the U.S. GE credit: ArtHum, Div, Wrt.—II. (II.) Kuhn, Men.
- **50. Introduction to Women and Gender Studies (4)** Lecture—3 hours; discussion—1 hour. Interdisciplinary introduction surveys and integrates anthropological, artistic, cultural studies, historical, legal, literary, philosophical, psychological, scientific, and sociological perspectives on the study of gender and its relationship to race, sexuality, class, and other aspects of social experience. GE credit: ArtHum or SocSci, Div, Wrt.—II. (II.) Kuhn.

**Thematic track**

In consultation with a Women's Studies adviser, choose three courses from a thematic cluster (for example, Gender and Race in the United States; The Cultural Representations of Gender; Feminist Film Theory and Production; Gender and Public Policy; Gender and Global Issues; Gender and Autobiography; The Body, Theory and Representation; Sexualities; Gender and Science). Other clusters may be developed in consultation with a Women's Studies adviser.

**Total units for the major**

**Major Adviser**

All Women's Studies majors and minors must consult with a faculty adviser, individually, at least once each academic year.

**Minor Adviser**

All Women's Studies majors and minors must consult with a faculty adviser, individually, at least once each academic year.

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 as course American Studies 139.) GE credit: SocSci, Div, Wrt.—(II.) Gopinath, Kaplan, Rodriguez

140. Topics in Gender and Cinematic Representation (4)
Lecture/discussion—4 hours. Prerequisite: one course specified for the Women's Studies major. A multicultural study of contemporary trends in masculinity and femininity in the economic, social, and political forces that have shaped them. Topics may include men's movements, ethnic nationalism, masculinities, and images of masculinity in popular culture. GE credit: ArtHum or SocSci, Div.—III. Newton, Ho

160. Representations of Women of Color in Cinema (4)
Lecture/discussion—3 hours; film viewing—3 hours. Prerequisite: course 20 or another film course. The representations of women of color in commercial and independent film. The evolution of a feminist filmmaking and media Web site for publishing research and creative tiles and clothing. GE credit: ArtHum, Div.—(III.) Meno, Rodriguez

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. An examination of film 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 twice when topic differs. Offered in alternate years. GE credit: ArtHum, Div.—II. Gopinath

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 development, video ethnography; video journals; alternative representations of fashion and women's bodies. Fundamentals of camera and microphone operation, interviewing techniques, and editing. May be taken twice for credit if topic differs. Not offered every year. GE credit: ArtHum, Div.—Gopinath, Kuhn, Rodriguez

170. Queer Studies (4)
Lecture/discussion—4 hours. Prerequisite: course 20, 250, or one course of 170 or consent of instructor. Study of queer sexualities, identities, theories, practices. Alternative sexualities as historical, social, and cultural constructions in intersections with race, gender, class, and national politics. Examination of the construction of sexual norms and the regulation of sexuality through history, theory and expressive cultural forms. GE credit: ArtHum or SocSci, Div, Wrt. Not offered every year.—Gopinath, Rodriguez

178A-F. 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, socio-economic, and historical contexts. The intertwining of language, identity, migration, politics, transnationalism, and national and transnational networks of postcolonial women writers. GE credit: ArtHum, Div, Wrt.—(I) Gopinath, Ho, Joseph, Rabine, Newton, Rabine, Rodriguez

178B. Women of Color Writing in the United States (4)
Lecture/discussion—4 hours. Prerequisite: course 20 or 50. Examination of the role of women of color in the United States, including their socio-economic, cultural and historical contexts. GE credit: ArtHum, Div.—II. Ho

182. Globalization, Gender and Identity (4)

187. Gender and Social Policy (4)
Lecture/discussion—4 hours. Prerequisite: course 50. Examination of the role of gender in the creation and implementation of social policies. GE credit: PolSci, Div.—II. Joseph

189. Special Topics in Women and Gender Studies (4)
Lecture/discussion—4 hours. Prerequisite: one course from the Women's Studies program. In-depth exploration of a women's studies topic related to the research interests of the instructor. May be repeated once for credit when topic differs. Not offered every year.—I. Gopinath, Ho, Joseph, Kaiser, Kuhn, Meno, Newton, Rabine, Rodriguez, Swain

190. Senior Seminar (4)
Seminar—4 hours. Prerequisite: senior standing and consent of instructor. Seminar on Women's Studies majors, which focuses on current issues in feminist theory and research related to the research interests of the instructor. May be repeated once for credit when topic differs. Not offered every year.—I. Gopinath, Mah, Kaiser, Rabine, Rodriguez

191. Capstone Seminar (4)
Seminar—4 hours. Prerequisite: course 104 or Textiles and clothing 107, and course 194HA, course 199, or Textiles and Clothing 199, or consent of instructor. Review, completion, and presentation of senior research projects. Creation of a university-wide media Web site for publishing research and creative projects. GE credit: Wrt.—II. (III.) Kaiser, Rabine

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 director. Supervised internship and study in positions/institutional settings dealing with gender-related problems or issues. May be repeated for credit. (P/NP grading only.)—I, II, III. (I, II, III.) Swain

194HA-194HB. Senior Honors Project in Women's Studies (4-6)
Independent study—12 hours. Prerequisite: senior standing, Women's Studies major, and adviser's approval. In consultation with an adviser, students complete a substantial research paper or significant creative project on a Women's Studies topic. (Deferred grading only, pending completion of seminar.)

195. Thematic Seminar in Women's Studies (4)
Seminar—4 hours. Prerequisite: two courses specified for women's studies major. Group study of a topic, issue or area in feminist theory and research involving intensive reading and writing. May be repeated for credit when topic differs. Limited enrollment. GE credit: ArtHum or SocSci, Div.—II. (I, II.) Gopinath, Hochberger

1971W. Women's Writing in the United States (1-4)
Tutoring—3-12 hours. Prerequisite: upper division standing and consent of instructor. 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.)

199. Special Study for Advanced Undergraduate Students (1-5)
Prerequisite: upper division standing; consent of instructor. (P/NP grading only.)

Graduate Courses

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.) Gopinath, Kaplan, Kuhn, Meno, Newton, Rodriguez

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 the interdisciplinary investigation of a problem or question chosen by the instructor(s). May be repeated for credit when subject area differs.—II. (II.) Gopinath, Newton, Swain

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.—(II.) Gopinath, Ho, Joseph, Kaiser, Kuhn, Meno, Newton, Rabine, Rodriguez, 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; historical and political perspectives on masculinity. GE credit: Wrt.—II. (II.) Gopinath, Rabine, Rodriguez

Quarter Offered: I=Fall, II=Winter, III=Spring, IV=Summer. 2007-2008 offering in parentheses

General Education (GE) credit: ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Social-Cultural Diversity; Wrt—Writing Experience
299. Special Study for Graduate Students
(1-12)
(S/U grading only.)

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.)

Professional Course
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.)

Zoology
See Evolution and Ecology, on page 268.
GENERAL EDUCATION OPTIONS/COURSES
### TOPICAL BREADTH ASSIGNED SUBJECT AREAS FOR MAJORS AND MINORS

#### ARTS & HUMANITIES

**Majors**
- African American and African Studies
- American Studies
- Art History
- Art Studio
- Asian American Studies (Humanities emphasis)
- Chicana/Chicano Studies (Cultural emphasis)
- Chinese
- Classical Civilization
- Comparative Literature
- Design
- Dramatic Art
- English
- Film Studies
- French
- German
- History
- Italian
- Japanese
- Landscape Architecture
- Medieval and Early Modern Studies
- Music
- Native American Studies
- Philosophy
- Pre-Landscape Architecture
- Religious Studies
- Russian
- Spanish
- Technocultural Studies
- Women's Studies

**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 (Arts and Humanities Emphasis)
- Greek
- History
- Italian
- Japanese
- Jewish Studies
- Landscape Restoration
- Latin
- Medieval and Early Modern Studies
- Medieval Studies
- Music
- Native American Studies
- Philosophy
- Religious Studies
- Russian
- Sexuality Studies
- Social and Ethnic Relations
- Spanish
- Women's Studies

#### SCIENCE & ENGINEERING

**Majors**
- Agri Mgmt & Rangeland Resource
- Animal Biology
- Animal Science
- Animal Science & Management
- Anthropology (B.S. degree only)
- Applied Mathematics
- Applied Physics
- Atmospheric Science
- Avian Sciences
- Biochemistry and Molecular Biology
- Biological Sciences
- Biotechnology
- Cell Biology
- Chemistry
- Clinical Nutrition
- Computer Science
- Crop Science and Management
- Engineering (all majors)
- Entomology
- Environ Biology & Mgmt
- Environ Hort & Urban Forestry
- Environmental & Resource Sci
- Environmental Toxicology
- Evolution, Ecology & Biodiversity
- Exercise Biology
- Fiber and Polymer Science
- Food Science
- Genetics
- Geology
- Hydrology
- Mathematical and Scientific Computation
- Mathematics
- Microbiology
- Natural Sciences
- Nature and Culture
- Neurobiology, Physiology, and Behavior
- Nutrition Science
- Physics
- Plant Biology
- Psychology (B.S. degree)
- Soil & Water Science
- Statistics
- Viticulture & Enology
- Wildlife, Fish & Conservation Bio

**Minors**
- Agri Computing & Info Systems
- Agric Entomology & Bee Biology
- Agricultural Entomology
- Agricultural Systems & Envir
- Animal Science
- Anthropology (Evolutionary emphasis)
- Apiculture
- Applied Computing & Info Systems
- Atmospheric Science
- Avian Sciences
- Biological Sciences
- Chemistry
- Community Nutrition
- Computer Science
- Engineering (all majors)
- Entomology
- Environmental Geology
- Environmental Horticulture
- Environmental Toxicology
- Exercise Biology
- Fiber and Polymer Science
- Fungal Biology & Ecology
- Geographic Information Systems
- Geographic Studies
- Geology
- Geophysics
- Hydrologic Science
- Hydrology
- Insect Ecology
- Insect Ecology & Evolution
- Mathematics
- Medical-Veterinary Entomology
- Nature and Culture
- Nematology
- Nutrition Science
- Nutrition and Food
- Physics
- Plant Biology
- Precision Agriculture
- Quantitative Biology and Bioinformatics
- Science and Society
- Soil Science
- Statistics

#### SOCIAL SCIENCES

**Majors**
- Anthropology (A.B. degree)
- Asian American Studies (Social Science emphasis)
- Chicana/Chicano Studies (Social/Policy Studies emphasis)
- Communication
- Community Development
- Contemporary Leadership
- East Asian Studies
- Economics
- Environ Policy Analy & Plan
- Human Development
- Intern'l Agri Devlopmt
- International Relations
- Linguistics
- Managerial Economics
- Political Science
- Political Science-Public Service
- Pre-Managerial Economics
- Psychology (A.B. degree)
- Science & Technology Studies
- Sociology
- Sociology-Organizational Studies
- Textiles & Clothing

**Minors**
- Aging and Adult Development
- Agri & Managerial Econ
- Anthropology (General emphasis)
- Anthropology (Sociocultural emphasis)
- Communication
- Community Development
- Contemporary Leadership
- East Asian Studies
- Economics
- Education
- Energy Policy
- Environ Policy Analy & Plan
- Environmental Policy Analysis
- Global and International Studies (Social Science emphasis)
- History & Philosophy of Science
- Human Development
- Intern'l Agri Devlopmt
- Latin American and Hemispheric Studies
- Linguistics
- Linguistics for Language Teachers
- Managerial Economics
- Middle East/South Asia Studies
- Political Science
- Psychology
- Science and Society
- Sociology
- Technology Management
- Textiles & Clothing
- War-Peace Studies
### General Education Courses/Options

**General Education Courses**

**Topical Breadth**

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.

#### Arts & Humanities

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*This course is offered Fall 2006.*

*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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General Education Courses/Options

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Women's Studies 137 † ....................D
Women's Studies 138 † ....................D
Women's Studies 158 † ....................D
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Women's Studies 164 .......................D
·Women's Studies 165 † ....................D
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·Women's Studies 195 † ....................D

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Agric Mngt & Range Resources 121
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·Animal Science 2 ..............................
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Animal Science 42 ............................
·Animal Science 104
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·Animal Science 120
·Animal Science 123
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Anthropology 15 ..............................D
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·Anthropology 151 ............................
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·Entomology 153 ...............................
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·Entomology 158 † ............................
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Environ & Resource Science 8 † ......

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Environ & Resource Science 60 .......
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Environ & Resource Science 121 .....
·Environ & Resource Science 131 .....
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·Environmental Toxicology 20 ..........
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·Geology 36 .......................................
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concurrently)...................................
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·Geology 115 † ..................................
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Nutrition 115 ...................................
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Nutrition 120BN † ...........................D
Nutrition 127
Philosophy 13 † ...............................

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Philosophy 30 † ...............................
Philosophy 31 †
·Philosophy 32 † ...............................
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·Philosophy 108 † .............................
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·Science and Society 5 † ....................
·Science and Society 7 † ....................
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·Science and Society 10 † ..................
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Wild, Fish & Conserv Biol 153 .......
Wild, Fish & Conserv Biol 155 .......
·Wild, Fish & Conserv Biol 156 .......

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·American Studies 10 † .....................D W

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·American Studies 110 † ...................D W
·American Studies 120 † ...................D W

American Studies 30 † .....................D W

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Afr Am & Afr Std 80 ........................D
Afr Am & Afr Std 110 ......................D
Afr Am & Afr Std 133 ......................D
Afr Am & Afr Std 145A ...................D
Afr Am & Afr Std 145B ....................D
Afr Am & Afr Std 165 ......................D
Afr Am & Afr Std 180 † ...................D
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·Agricult & Res Econ 15 ...................D
·Agricult & Res Econ 115A ...............D
·Agricult & Res Econ 115B
·Agricult & Res Econ 120
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American Studies 1C † .....................D
·American Studies 1E † .....................D
American Studies 5 † .......................

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American Studies 130 † ...................D
American Studies 132 † ...................D
American Studies 133 ......................D
American Studies 139 ......................D
·American Studies 151 † ...................D
American Studies 152 † ...................D
American Studies 153 † ...................D
American Studies 154 † ...................D
American Studies 155 † ...................D
American Studies 156 † ...................D
·American Studies 157 † ...................D
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·Animal Science 148 ..........................
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·Anthropology 3 ................................D
Anthropology 4 ................................D
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Anthropology 131 ............................D
·Anthropology 20 ..............................D
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·Anthropology 24 ..............................D
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Anthropology 100
Anthropology 101 ............................D
·Anthropology 102 ............................D
Anthropology 104N .........................D
·Anthropology 105 ............................
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Anthropology 117 ............................D
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Anthropology 128A .........................D
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Anthropology 139AN .......................D
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Anthropology 140A .........................D
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Anthropology 141A .........................D
Anthropology 141B ..........................D
·Anthropology 142 ............................D
Anthropology 143A .........................D
Anthropology 143B ..........................D
·Anthropology 144 ............................D
Anthropology 145 † .........................D
Anthropology 146 ............................D
Anthropology 147 ............................D
Anthropology 148A .........................D
Anthropology 148AS ........................D
Anthropology 148B ..........................D
Anthropology 148C .........................D
Anthropology 149A .........................D
Anthropology 149B ..........................D
·Anthropology 170 ............................D
Anthropology 171 ............................
Anthropology 172 ............................D
Anthropology 173 ............................D
Anthropology 176 ............................D
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Anthropology 184
·Asian American Studies 1 ................D
·Asian American Studies 2 ................D
Asian American Studies 3 ................D
·Asian American Studies 100 ............D
·Asian American Studies 110 ............D
·Asian American Studies 111 ............D
·Asian American Studies 112 † .........D
Asian American Studies 114 ............
Asian American Studies 140 ............D
Asian American Studies 150B ..........D

• This course is offered Fall 2006.
* 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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<th>General Education Courses/Options</th>
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**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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* This course is offered Fall 2006.
* 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 is offered Fall 2006.
* 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 Courses/Options

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.

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</tr>
</tbody>
</table>

* This course is offered Fall 2006.
† 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).
This course is offered Fall 2006.

* 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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This course is offered Fall 2006.

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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].
<table>
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<th>General Education Courses/Options</th>
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<tr>
<td>Textiles &amp; Clothing 7</td>
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<td>Textiles &amp; Clothing 107</td>
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<tr>
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<td>Viticulture &amp; Enology 90X</td>
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</table>

* This course is offered Fall 2006.
* 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

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</th>
<th>Institutions</th>
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<tbody>
<tr>
<td>Atmospheric Science 5 [or 10]</td>
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<tr>
<td>Environmental and Resource Sciences 60</td>
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<td>Human Development 117</td>
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<tr>
<td>Agricultural and Resource Economics 15</td>
<td>SocSci, Div, Wrt</td>
</tr>
<tr>
<td>Science and Society 1 [or Fiber and Polymer Science 110]</td>
<td>SciEng or SocSci, Div, Wrt</td>
</tr>
<tr>
<td>International Agricultural Development 10 [or Community &amp; Regional Development 1]</td>
<td>SocSci, Div, Wrt</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</th>
<th>Institutions</th>
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<tbody>
<tr>
<td>Wildlife, Fish and Conservation Biology 10</td>
<td>SciEng, Div, Wrt</td>
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<tr>
<td>Plant Biology 11</td>
<td>SciEng, Wrt</td>
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<td>Science and Society 105</td>
<td>SciEng, Wrt</td>
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<tr>
<td>Textiles and Clothing 7</td>
<td>SocSci, Div, Wrt</td>
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<tr>
<td>Community and Regional Development 2</td>
<td>SocSci, Div, Wrt</td>
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<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.

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<thead>
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<th>Food and Fiber</th>
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<tbody>
<tr>
<td>Animal Science 1 [or Plant Biology 12]</td>
<td>SciEng, Div, Wrt</td>
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<tr>
<td>Nutrition 10 and Nutrition 11 [or Food Science and Technology 10]</td>
<td>SciEng or SocSci</td>
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<td>Science and Society 1 [or Community &amp; Regional Development 1]</td>
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<td>Viticulture and Enology 3—3W cancelled</td>
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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 option 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.

<table>
<thead>
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<th>Changing Agriculture Theme Option</th>
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<td>Entomology 110</td>
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<td>Plant Biology 12</td>
<td>SciEng, Div, Wrt</td>
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<tr>
<td>Agricultural and Resource Economics 15</td>
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<tr>
<td>Environmental &amp; Resource Sciences 121*</td>
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</tr>
<tr>
<td>Science and Society 2 [or Community &amp; Regional Development 1]</td>
<td>SciEng or SocSci, Wrt</td>
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**RESIDENCE FOR TUITION INFORMATION**

**Tuition Fee for Nonresident Students**

If you have not been living in California with intent to make it your permanent home for more than one year immediately before the residence determination date for each term in which you propose to attend the University, you must pay a nonresident tuition fee in addition to all other fees. The residence determination date is 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.

**Law Governing Residence**

The rules regarding residence for tuition purposes at the University of California are governed by the California Education Code and implemented by Standing Orders of the Regents of the University of California. Under these rules, 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; see **Who is a Resident?**, below.

**Who is a Resident?**

If you are an adult student (18 years of age or older) you may establish residence for tuition purposes in California if: (1) you are a U.S. citizen; (2) you are a permanent resident or other immigrant; or (3) you are a nonimmigrant who is not precluded from establishing a domicile in the U.S. Nonimmigrants who are not precluded from establishing a domicile in the U.S. include those who hold visas of the following types: A, E, G, H-1, H-4, I, K, L, N, NATO, O-1, O-3, R, or V. To establish residence you must be physically present in California for more than one year and you must have come here with the intent to make California your home as opposed to coming to this state to go to school. Physical presence within the state solely for educational purposes does not constitute the establishment of California residence, regardless of the length of your stay. You must demonstrate your intention to make California your home by severing your residential ties with your former state of residence and establishing those ties with California. Evidence of intent must be dated one year before the term for which you seek resident classification. If these steps are delayed, the one-year durational period will be extended until you have demonstrated both presence and intent for one full year. Effective Fall 1993, if your parents are not residents of California you will be required to be financially independent in order to be a resident for tuition purposes; see **Requirement for Financial Independence**, below.

Your residence cannot be derived from your spouse, registered domestic partner, or your parents.

**Requirement for Financial Independence**

You will be considered “financially independent” if one or more of the following applies: (1) you are at least 24 years of age by December 31 of the calendar year for which you are requesting resident classification; (2) you are a veteran of the U.S. Armed Forces; (3) you are a ward of the court or both parents are deceased; (4) you have children or other legal dependents other than a spouse or registered domestic partner; (5) you are married or in a registered domestic partnership, or a graduate student or a professional student, and you were not claimed as an income tax deduction by your parents or any other individual for the tax year immediately preceding the term for which you are requesting resident classification; or (6) you are a single undergraduate student and you were not claimed as an income tax deduction by your parents or any other individual for the two tax years immediately preceding the term for which you are requesting resident classification, and you can demonstrate self-sufficiency for those years and the current year. Note: Graduate or professional school students who are employed at UC Davis 49% or more (or awarded the equivalent in University-administered funds; e.g., fellowships, grants, stipends) during the term for which classification as a resident is requested are exempt from the financial independence requirement.

**Establishing Intent to Become a California Resident**

Indications of your intent to make California your permanent residence can include the following: registering to vote and voting in California elections; designating California as your permanent address on all school and employment records, including military records if you are in the military service; obtaining a California driver’s license or, if you do not drive, a California Identification Card; obtaining California vehicle registration; paying California income taxes as a resident, including taxes on income earned outside California from the date you establish residence; establishing a California residence in which you keep your personal belongings; and licensing for professional practice in California. The absence of these indicia in other states during any period for which you claim residence can also serve as an indication of your intent. Documentary evidence is required and all relevant indications will be considered in determining your classification. Your intent will be questioned if you return to your prior state of residence when the University is not in session.

**General Rules Applying to Minors**

If you are an unmarried minor (under age 18), the residence of the parent with whom you live is considered to be your residence. If you have a parent living, you cannot change your residence by your own act, by the appointment of a legal guardian, or by the relinquishment of your parent’s right of control. If you lived with neither parent, your residence is that of the parent with whom you last lived. Unless you are a minor alien present in the U.S. under the terms of a nonimmigrant visa which precludes you from establishing domicile in the U.S., you may establish your own residence when both your parents are deceased and a legal guardian has not been appointed. If you derive California residence from a parent, that parent must satisfy the one-year durational residence requirement.

**Specific Rules Applying to Minors**

1. **Deceased Parents.** You may establish your own residence if both of your parents are deceased and a legal guardian has not been appointed for you.

2. **Divorced/Separated Parents.** You may be able to derive California resident status from a California resident parent if you move to California to live with that parent on or before your 18th birthday. If you begin residing with your California parent after your 18th birthday, you will be treated like any other adult student coming to California to establish residence.
3. Parent of Minor Moves From California. You may be entitled to resident status if you are a minor U.S. citizen or eligible alien whose parent(s) was a resident of California who left that state within one year of the residence determination date if: (1) you remained in California after your parent(s) departed; (2) you enroll in a California public postsecondary institution within one year of the time your parent(s) depart and establish residence elsewhere; and (3) once enrolled, you maintain continuous attendance in that institution. Financial independence will not be required in this case.

4. Self-Support. You may be entitled to resident status if you are a U.S. citizen or eligible alien, a minor, and can prove the following: (1) you lived in California for the entire year immediately preceding the residence determination date; (2) you are self-supporting and were self supporting the entire year preceding the residence determination date; and (3) you intend to make California your permanent home.

5. Two-Year Care and Control. You may be entitled to resident status if you are a U.S. citizen or eligible alien and you have lived continuously with an adult who is not your parent for at least two years prior to the residence determination date. The adult with whom you are living must have been responsible for your care and control for the entire two-year period and must have been residing in California during the one year immediately preceding the residence determination date.

Exemptions from Nonresident Tuition

1. Member of the Military. If you are a member of the U.S. military stationed in California on active duty, unless you are assigned for educational purposes to a state-supported institution of higher education, you may be exempt from the nonresident tuition fee. You must provide the residence deputy on campus with a statement from your commanding officer or personnel officer stating that your assignment to active duty in California is for educational purposes. The letter must include the dates of your assignment to the state.

2. Spouse, Registered Domestic Partner, or Other Dependents of Military Personnel. You are exempt from payment of the nonresident tuition fee if you are a spouse, a registered domestic partner, a natural or adopted child or stepchild who is a dependent of a member of the U.S. military stationed in California on active duty. If you are enrolled in an educational institution and the member of the military is transferred on military orders to an active duty duty, you may retain this exemption.

3. Child, Spouse, or Registered Domestic Partner of Faculty Member. To the extent funds are available, if you are an unmarried dependent child under age 21 the spouse, or the registered domestic partner of a member of the University faculty who is a member of the Academic Senate, you may be eligible for a waiver of the nonresident tuition fee. Confirmation of the faculty member's membership on the Academic Senate must be secured each term this waiver is granted.

4. University Employment Outside of California. You may be entitled to resident classification if you are a full-time University employee, or the unmarried dependent child, the spouse, or the registered domestic partner of a full-time University employee who is assigned to work outside of the state of California (e.g., Los Alamos National Laboratory and the University of California Washington D.C. Center). The University employee's employment status must be ascertained each term.

5. Child, Stepchild, Spouse, or Registered Domestic Partner of Deceased Public Law Enforcement or Fire Suppression Employee. You may be entitled to a waiver of the nonresident tuition fee if you are the child, the stepchild, the spouse, or the registered domestic partner of a deceased public law enforcement or fire suppression employee who was a California resident at the time of his or her death and who was killed in the course of fire suppression or law enforcement duties.

6. Dependent Child of a California Resident. A student who has not been an adult resident of California for more than one year and who is the dependent child of a California resident who has been a resident for more than one year immediately prior to the residence determination date may be entitled to resident classification until the student has resided in California for the minimum time necessary to become a resident so long as continuous attendance is maintained at an institution.

7. Native American Graduate of BIA School. You are eligible for an exemption from the nonresident fee if you are a graduate of a California school operated by the Federal Bureau of Indian Affairs and you enroll at one of the University of California campuses. Currently, Sherman Indian High School in Riverside is the only California high school operated by the BIA.

8. Employee of a California Public School District. A student holding a valid credential authorizing service in California public schools and employed by a school district in a full-time certificate position may be exempt from nonresident tuition.

9. Student Athlete in Training at U.S. Olympic Training Center, Chula Vista. An amateur athlete in training at the U.S. Olympic Training Center in Chula Vista may be exempt from nonresident tuition until s/he has resided in California for the minimum time necessary to become a resident.

10. Graduate of California High School. A student who attended high school in California for three or more years (9th grade included) and graduated from a California high school (or attained the equivalent) may be exempt from nonresident tuition.

11. Surviving Spouse, Registered Domestic Partner, or Dependent Child of a California Resident Killed in the September 11, 2001 Terrorist Attacks. An undergraduate student who is the surviving spouse, registered domestic partner, or dependent child of a California resident killed in the September 11, 2001 terrorist attacks on the World Trade Center, the Pentagon Building or the crash of United Airlines Flight 93, may be exempt from nonresident tuition and mandatory system-wide fees. Eligible students must meet the financial need requirements for the Cal Grant A program.

12. Recipient of a Congressional Medal of Honor or the Child of a Recipient of the Congressional Medal of Honor. An undergraduate student who is a recipient of a Congressional Medal of Honor or who is the child of a recipient of the Congressional Medal of Honor may be exempt from nonresident tuition and mandatory system-wide fees. The recipient of the Medal of Honor must be a California resident at the time of his or her death. The student may not be older than 27 and the student's annual income may not exceed the national poverty level.
Temporary Absence

If you are a nonresident student who is in the process of establishing a residence for tuition purposes and you return to your former home during non-instructional periods, your presence in the state will be presumed to be solely for educational purposes and only convincing evidence to the contrary will rebut this presumption; a student who is in the state solely for educational purposes will NOT be classified as a resident for tuition purposes regardless of the length of his or her stay. If you are a student who has been classified as a resident for tuition purposes and you leave the state temporarily, your absence could result in the loss of your California residence. The burden will be on you (or your parents if you are a minor) to verify that you did nothing inconsistent with your claim of a continuing California residence during your absence. Steps that you (or your parents) should take to retain a California residence include:

1. Continue to use a California permanent address on all records; educational, employment, military, etc.
2. Satisfy California resident income tax obligations. Note: If you are claiming California residence, you are liable for payment of income taxes on your total income from the date you establish California residence. This includes income earned in another state or country.
3. Retain your California voter's registration and vote by absentee ballot.
4. Maintain a California driver's license and vehicle registration. If it is necessary to change your driver's license and/or vehicle registration while you are temporarily residing in another state, you must change them back to California within the time prescribed by law.
5. Maintain active bank accounts.

Classification to Resident Status

If you are classified as a non-resident student and you wish to be classified as a resident, you should file your petition at least three weeks before the first day of instruction for the quarter for which you seek resident status. Late petitions will not be accepted.

Incorrect Classification

If you were incorrectly classified as a resident, you are subject to reclassification and to payment of all nonresident tuition fees 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.

Time Limitation Providing Documentation

If additional documentation is required for either an initial residence classification or reclassification but is not readily accessible, you will be allowed until the end of the applicable term to provide it. Please remember that you are liable for payment of fees when they are due. Petitioning for a change of status does not alter the fee payment deadline.

Inquiries and Appeals

Inquiries regarding residence requirements, determination and/or recognized exceptions should be directed to the Residence Deputy.

UNIVERSITY POLICY ON NONDISCRIMINATION, SEXUAL HARASSMENT, 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 (pregnancy includes pregnancy, childbirth and medical conditions related to pregnancy or childbirth), disability, age, medical condition (cancer-related), ancestry, marital status, citizenship, sexual orientation, or status as a Vietnam-era veteran or special disabled veteran. The University also prohibits sexual harassment. This nondiscrimination policy covers admission, access and treatment in University programs and activities.

Inquiries regarding the University's student-related nondiscrimination policies may be directed to Director, Student Judicial Affairs, (530) 752-112

Sexual Harassment. Sexual harassment is prohibited by law and by university policy and is not condoned by UC Davis (Policy 380-12 at http://manuals.ucdavis.edu/ppm/380/380-12.htm). The Sexual Harassment Education Program (530) 752-2255 provides information and assists in resolving complaints of sexual harassment informally. Students may also use formal and informal grievance procedures to resolve complaints of alleged sexual harassment or other illegal discrimination (Policy 280-05 at http://manuals.ucdavis.edu/ppm/280/280-05.htm). Students should seek assistance as soon as possible (time limits apply to filing formal complaints) and may receive informal counseling and/or referrals by contacting the Sexual Harassment Education Program, the Office of Student Judicial Affairs, the ASUCD Student Advocacy Office, Counseling & Psychological Services, or the Women’s Resources and Research Center. Formal complaints may be filed with the vice chancellor or dean of the school or college in which the alleged discrimination or harassment occurred.

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 that are 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:
To review their own student records within 45 days after the student submits a written request for access to the Registrar or other department having possession of the records to be reviewed. That office will make arrangements for access and notify the student when and where the records may be reviewed. If the records are maintained by 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.

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, including of the right to a hearing and hearing procedures.

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:

1. Disclosure of “directory” or “public” information including the student's name; local and/or permanent address(es); e-mail addresses and telephone number(s); dates of attendance; major; grade level; enrollment status (undergraduate/graduate. Full 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, and the name, weight and height of participants on ICA teams. Such information may be published in a student directory.

   a. To prevent disclosures of telephone numbers and/or addresses, students must submit a written request to the Registrar by the tenth day of instruction. To prevent disclosure of their e-mail address, students must follow instructions at [https://computingaccounts.ucdavis.edu/](https://computingaccounts.ucdavis.edu/), and then select “Change your directory information.”

   b. Students may designate as confidential and withhold all information about themselves by filing a request with the Registrar. If all information is designated confidential, no information about a student can be disclosed without the student's written consent (except as otherwise permitted by law and policy) including verifying student status, awards, or any degrees earned.

2. 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).

Parental/guardian information is confidential. It is used by UC Davis only for notification of events, ceremonies, awards and development or in case of an emergency involving the student. For more information, see University of California Policies Applying to Disclosure of Information from Student records and UC Davis Policy and Procedure Manual Section 320-21.

Questions about these rights and requirements should be referred to Student Judicial Affairs, (530) 752-1128. Students can file complaints regarding alleged violations of privacy rights with the Office of 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. Disclosure of social security number is mandatory. In compliance with state law, Social security numbers are confidential and are not used as student identifiers.

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 jmbeeman@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, 985 Atlantic Avenue, Suite 100, Alameda, CA 94501, (310) 749-9001, 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, American Assembly of Collegiate Schools of Business, American Association for Accreditation of Laboratory Animal Care, American Bar Association, American Chemical Society. American Dietetic Association, American Society of Landscape Architects, Association of American Law Schools, Association of American Medical Colleges, Commission of Teacher Credentialing, Computer Science Accreditation Commission, Council on Education and Public Health, and the Council on Education of the American Veterinary Medical Association.

Students interested in reviewing the accreditation documents may do so by scheduling an appointment with the Office of the Provost in Mrak Hall.


**THE BOARD OF REGENTS**

Governance of the University is entrusted to a corporation called The Board of Regents. Of the individuals composing the board, 18 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 have delegated 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 have delegated authority for the organization of the University to the president. Robert C. Dynes is president and head of the Universitywide administration. Authority for the administration of each campus has been delegated to a chancellor.

**THE REGENTS OF THE UNIVERSITY OF CALIFORNIA**

*Regents Ex Officio*

Arnold Schwarzenegger  
**Governor of California and President of the Regents**

Cruz M. Bustamante  
**Lieutenant Governor of California**

Fabian Núñez  
**Speaker of the Assembly**

Jack O’Connell  
**State Superintendent of Public Instruction**

Richard Rominger  
**President of the Alumni Associations of the University of California**

Eric G. Julline  
**Vice President of the Alumni Associations of the University of California**

Robert C. Dynes  
**President of the University**

*Appointed Regents*

Current term expires on March 1 of year indicated.

Richard C. Blum, 2014  
Russell Gould, 2017  
Judith L. Hopkinson, 2009  
Eddie Island, 2017  
Odessa P. Johnson, 2012  
Joanne C. Kozberg, 2010  
Sherry L. Lansing, 2010  
Monica Lozano, 2013  
George M. Marcus, 2012  
John J. Moores, 2009  
Gerald L. Parsky, 2008  
Norman J. Pattiz, 2014  
Peter Preuss, 2008  
Frederick Ruiz, 2016  
Leslie Tang Schilling, 2013  
Paul Watcher, 2016  
Adam Rosenthal, June 30, 2005  
**Student Regent**

Clifford Brunk, September 1, 2006  
**Faculty Representative**

John B. Oakley, September 1, 2007  
**Faculty Representative**

**Principal Officers of the Regents**

James E. Holst  
**General Counsel**

Marie N. Berggren  
**Interim Treasurer**

Leigh Trivette  
**Secretary**

**ADMINISTRATIVE OFFICERS OF THE UNIVERSITY**

Robert C. Dynes  
**President of the University**

Wyatt R. (Rory) Hume  
**Acting Provost and Senior Vice President—Academic Affairs**

Vacant  
**Senior Vice President—Business and Finance**

Bruce B. Darling  
**Senior Vice President—University Affairs**

W.R. Gomes  
**Vice President—Agriculture and Natural Resources**

Lawrence C. Hershman  
**Vice President—Budget**

William H. Gurtner  
**Vice President—Clinical Services Development**

Winston C. Doby  
**Vice President—Student Affairs**

Anne C. Broome  
**Vice President—Financial Management**

Wyatt R. (Rory) Hume  
**Vice President—Health Affairs**

Admiral S. Robert Foley; Retired, U.S. Navy  
**Vice President—Laboratory Management**

Julius Zelmanowitz  
**Vice Provost—Academic Initiatives**

Lawrence B. Coleman  
**Vice Provost—Research**

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**Chancellor at Berkeley**

Larry N. Vanderhoef  
**Chancellor at Davis**

Michael V. Drake  
**Chancellor at Irvine**

Albert Carnesale  
**Chancellor at Los Angeles**

Carol Tomlinson-Keasey  
**Chancellor at Merced**

France A. Córdova  
**Chancellor at Riverside**

Marye Anne Fox  
**Chancellor at San Diego**

J. Michael Bishop  
**Chancellor at San Francisco**

Henry T. Y. Yang  
**Chancellor at Santa Barbara**

Denice D. Denton  
**Chancellor at Santa Cruz**
ADMINISTRATIVE OFFICERS—UC DAVIS

Chancellor
Larry N. Vanderhoef, Ph.D.
Chancellor Emeritus
Theodore L. Hullar, Ph.D.
Vice Chancellors
Virginia S. Hinshaw, Ph.D.
Provost and Executive Vice Chancellor
Stan Nosek, M.S.
Vice Chancellor—Administration
Barry M. Klein, Ph.D.
Vice Chancellor—Research
John Meyer, M.P.A.
Vice Chancellor—Resource Management and Planning
Judy K. Sakaki, Ph.D.
Vice Chancellor—Student Affairs
Beverly “Babs” Sandeen, Ph.D.
Interim Vice Chancellor—University Relations

Vice Provosts
Barbara A. Horwitz, Ph.D.
Vice Provost—Academic Personnel
Peter Yellowlees, M.D.
Interim Vice Provost—Information and Educational Technology
Fred Wood, Ph.D.
Interim Vice Provost—Undergraduate Studies
William B. Lacy, Ph.D.
Vice Provost—University Outreach and International Programs

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Sally P. Springer, Ph.D.
Associate Chancellor
Maril R. Stratton, M.A.
Associate/Assistant Vice Chancellors/Provost
Rahim Reed, M.P.A., J.D.
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Senior Associate Vice Chancellor—Human Resources and Risk Management and Special Advisor to the Chancellor
Karen Hull
Associate Vice Chancellor—Business Services
Maurice Hollman
Associate Vice Chancellor—Facilities Operations and Maintenance
J. Michael Allred, M.B.A.
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Associate Vice Chancellor—Research
Deb Niemeier, Ph.D.
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Associate Vice Chancellor—Student Affairs
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Associate Vice Chancellor—University Relations; Development
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Associate Vice Provost—University Outreach
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Assistant Executive Vice Chancellor

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Acting Assistant Vice Chancellor—Alumni Relations/ Executive Director—CAAA
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Assistant Vice Chancellor—Budget Resource Management and Institutional Planning and Analysis
Robert Segar, M.L.A.
Assistant Vice Chancellor—Campus Planning
Richard F. Keller, B.A.
Assistant Vice Chancellor—Capital Resource Management
Marjorie M. Dickinson, B.A.
Assistant Vice Chancellor—Government and Community Relations
Lisa Lapin, B.A.
Assistant Vice Chancellor—University Communications
J. Leon Washington, M.A.
Assistant Vice Chancellor—Student Affairs; Enrollment and Academic Support
Grисelda Castro
Assistant Vice Chancellor—Student Affairs; Student Life

University Librarian
Marilyn J. Sharrow, M.A.L.S.
Registrar
Frank Wada, M.A.

Directors
Tom C. Compton, J.D.
Executive Director, Campus Unions and Campus Recreation
Greg Warzecka, M.S.
Director, Athletics
Michelle Fanula, M.D.
Director, Cowell Student Health Center
Lora Jo Bossio, M.A.
Director, Financial Aid
Bob Smiggen, M.B.A.
Director, Student Housing
Pamela L. Burnett
Director, Undergraduate Admissions and Outreach Services
Barbara Sellers-Young, Ph.D.
Executive Director, Mondavi Center/University Cultural Programs

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James MacDonald, Ph.D., Executive Associate Dean
Lovell Jarvis, Ph.D., Associate Dean—Human Sciences
Michael Parrella, Ph.D., Associate Dean—Agricultural Sciences
Randal J. Southard, Ph.D., Associate Dean—Environmental Sciences
Annie King, Ph.D., Associate Dean—Undergraduate Academic Programs

College of Biological Sciences
Kenneth C. Burtis, Ph.D., Interim Dean
Carol Erickson, Ph.D., Executive Associate Dean—Graduate Studies and Research
Steven Theg, Ph.D., Interim Associate Dean—Undergraduate Academic Programs

College of Engineering
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Bruce White, Ph.D., Associate Dean—Academic Personnel and Planning
Karen McDonald, Ph.D., Associate Dean—Research and Graduate Studies
Gary E. Ford, Ph.D., Associate Dean—Undergraduate Studies

College of Letters and Science
__________, Interim Dean—Division of Humanities, Arts, and Cultural Studies
Winston Ko, Ph.D., Dean—Division of Mathematical and Physical Sciences
Steven M. Sheffrin, Ph.D., Dean—Division of Social Sciences
Fred E. Wood, Ph.D., Associate Dean—Undergraduate Education

School of Education
Harold Levine, Ph.D., Dean
Sharon Dugdale, Ph.D., Associate Dean
Appendix

Graduate School of Management
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Richard P. Castanias, Ph.D., Associate Dean-Academic Affairs

Graduate Studies
Jeffery Gibeling, Ph.D., Dean
Edward Caswell-Chen, Ph.D., Associate Dean for Graduate Programs
Sharman O'Neill, Ph.D., Associate Dean for Research Programs

School of Law
Rex R. Perschbacher, J.D., Dean
Kevin Johnson, J.D., Associate Dean—Academic Affairs
Hollis L. Kulwin, J.D., Assistant Dean—Student Affairs
Adam Talley, Assistant Dean Administration

School of Medicine
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Ann Bonham, Ph.D., Executive Associate Dean-Research and Education
Thomas Nesbitt, M.D., M.PH., Executive Associate Dean-Administration/Clinical Outreach
Frederick Meyers, M.D., Senior Associate Dean-Academic Affairs
Lars Berglund, M.D., Ph.D., Associate Dean-Clinical Research
Fitz-Roy Curry, Ph.D., Associate Dean-Research
Lydia Howell, M.D., Associate Dean-Academic Affairs
Michael Wilkes, M.D., Ph.D., Vice Dean-Medical Education
Amerish Bera, M.D., Assistant Dean-Admissions and Outreach
Ralph de Vere White, M.D., Assistant Dean-Cancer Services
Faith Fitzgerald, M.D., Assistant Dean-Humanities and Bioethics
Jesse Joad, M.D., Assistant Dean-Faculty Development and Diversity
Vijaya Kumari, M.B.B.S., Ph.D., Assistant Dean-Curricular Affairs
James Nuovo, M.D., Assistant Dean-Graduate Medical Education
Brian O'Neill, M.D., Assistant Dean-Veterans Affairs
John Owings, M.D., Assistant Dean-Student Affairs

School of Veterinary Medicine
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John R. Pascoe, B.V.Sc., Ph.D., Executive Associate Dean
Jan E. Ilkiw, B.V.Sc., Ph.D., Associate Dean—Academic Programs
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Susan Hildebrand, D.V.M., Associate Dean—Student Programs
Kent K. C. Lloyd, D.V.M., Ph.D., Associate Dean—Research and Graduate Education
Bradford P. Smith, D.V.M., Associate Dean—Clinical Programs and Director—Veterinary Medical Teaching Hospital
Donald J. Klingborg, D.V.M., Associate Dean—Veterinary Extension and Public Programs Director—Center for Continuing Professional Education
David W. Hird, D.V.M., Ph.D., M.P.V.M., Director, Masters of Preventive Veterinary Medicine Program

UC Davis Extension
Dennis Pendleton, Ph.D., Dean
Appendix

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 13 percent of graduates who had not decided on a career field at the time of the survey.

Field of Study, Percentage finding work in field of choice

Agricultural Sciences, 78
Biological Sciences, 74
Engineering, 86
Environmental Sciences, 83

Humanities, Arts and Cultural Studies, 68
Human Sciences, 75
Mathematical and Physical Sciences, 68
Social Sciences, 60

Total, 72

1 Source: A 2003 survey of June 2002 graduates conducted by Student Affairs Research and Information.
2 Fields of Study are groups of related undergraduate majors as organized into UC Davis colleges or divisions.

RETENTION DATA AND GRADUATION RATES AT UC DAVIS

Freshmen*

(Retention and graduation rates through Summer 2005 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 Enrolled One 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>1993</td>
<td>3,114</td>
<td>90.6%</td>
<td>29.8%</td>
<td>67.9%</td>
<td>81.9%</td>
</tr>
<tr>
<td>1994</td>
<td>3,182</td>
<td>89.2%</td>
<td>30.5%</td>
<td>65.6%</td>
<td>78.2%</td>
</tr>
<tr>
<td>1995</td>
<td>3,245</td>
<td>88.8%</td>
<td>31.7%</td>
<td>68.4%</td>
<td>80.5%</td>
</tr>
<tr>
<td>1996</td>
<td>3,685</td>
<td>91.1%</td>
<td>37.6%</td>
<td>72.6%</td>
<td>83.5%</td>
</tr>
<tr>
<td>1997</td>
<td>3,526</td>
<td>89.7%</td>
<td>37.6%</td>
<td>71.0%</td>
<td>80.5%</td>
</tr>
<tr>
<td>1998</td>
<td>3,616</td>
<td>89.6%</td>
<td>38.7%</td>
<td>72.2%</td>
<td>81.3%</td>
</tr>
<tr>
<td>1999</td>
<td>3,817</td>
<td>90.1%</td>
<td>42.0%</td>
<td>74.7%</td>
<td>83.9%</td>
</tr>
</tbody>
</table>

Transfer Students

(Retention and graduation rates through Spring 2000 for all undergraduates transferring to UC Davis as juniors.)

<table>
<thead>
<tr>
<th>Fall Quarter of Initial Enrollment:</th>
<th>Number of Students**</th>
<th>Percent Enrolled One 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>1993</td>
<td>1,409</td>
<td>88.6%</td>
<td>36.7%</td>
<td>69.7%</td>
<td>78.4%</td>
</tr>
<tr>
<td>1994</td>
<td>1,689</td>
<td>88.3%</td>
<td>37.1%</td>
<td>70.1%</td>
<td>77.6%</td>
</tr>
<tr>
<td>1995</td>
<td>1,726</td>
<td>85.4%</td>
<td>36.1%</td>
<td>67.4%</td>
<td>77.1%</td>
</tr>
<tr>
<td>1996</td>
<td>1,634</td>
<td>86.7%</td>
<td>40.4%</td>
<td>72.8%</td>
<td>78.6%</td>
</tr>
<tr>
<td>1997</td>
<td>1,631</td>
<td>85.1%</td>
<td>39.9%</td>
<td>70.9%</td>
<td>76.9%</td>
</tr>
<tr>
<td>1998</td>
<td>1,541</td>
<td>88.4%</td>
<td>46.1%</td>
<td>75.0%</td>
<td>80.9%</td>
</tr>
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<td>1999</td>
<td>1,390</td>
<td>89.6%</td>
<td>49.1%</td>
<td>76.7%</td>
<td>83.4%</td>
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Retention is defined as enrollment at the 3rd week census point of the fall term 1 year from initial fall term.

Graduation is define as having received degree from UC Davis (does not include students who transferred to another institution to complete their degree).

*Retention and graduation tracking limited to students enrolled full-time in their initial term of enrollment.

**Students excluded from these counts include those who are now deceased or participated in any of the following: Military Service, Foreign Service, Religious Mission.

Source: Student Affairs Research & Information, UC Davis (March 2006)

AVERAGE YEARLY SALARY OFFERED TO GRADUATES WITH BACHELOR’S, MASTER’S, AND DOCTORATE DEGREES

Field of Study: Average Yearly Salary

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<th>Field of Study</th>
<th>Bachelor’s</th>
<th>Master’s</th>
<th>Doctorate</th>
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<tr>
<td>Engineering</td>
<td>$51,053</td>
<td>$58,329</td>
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<td>Humanities/Social Sciences</td>
<td>$30,828</td>
<td>$34,990</td>
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1 Source: 2005-2006 National Salary Survey data provided by the National Association of Colleges and Employers.
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The University of California, Davis, makes a difference in the lives of people every day.

We are fueled by our learning, energized by discovery.

Our tradition of engagement guides all that we do.

We are a collaborative community united by a vision of making the world a better place.

The campus’s breadth of academic and outside-the-classroom programs, commitment to providing an attentive and research-enriched education, determination to address society’s needs and consideration of campus community members as family are truly distinctive.

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1. How many academic majors are there to choose from at UC Davis?
   - A. 61
   - B. 103
   - C. 84

2. How many community service hours did UC Davis students, faculty and staff volunteer in 2004?
   - A. 294,151 hours
   - B. 147,075 hours
   - C. 52,302 hours

3. Where does UC Davis’ research funding rank among U.S. public universities, according to the National Science Foundation?
   - A. 43rd
   - B. 12th
   - C. 28th

4. What is the mean annual salary of UC Davis alumni?
   - A. $32,300
   - B. $65,200
   - C. $93,100

5. How many students does the UC Davis Internship and Career Center place annually?
   - A. 515
   - B. 2,245
   - C. 6,300

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ANSWERS:

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In government, business and academia:

- 1. C. 593,100 in 2004, twice the California average.
- 2. A. 12th
- 3. C. 28th
- 4. C. $93,100 in 2004, twice the California average.
- 5. C. 6,300

UC Davis is a leader in interdisciplinary study and in your colleges, here.

ANSWERS: