College of Letters and Science

Program Office, 200 Social Sciences and Humanities Building (Undergraduate Education and Advising office); http://www.lc.ucdavis.edu/

Students

Committee in Charge
Karen L. Bales, Ph.D., Chairperson (Psychology)
Prabir Burman, Ph.D. (Statistics)
Jocelyn Sharlet, Ph.D. (Comparative Literature)
Rajiv R.P. Singh, Ph.D. (Physics)
John Terning, Ph.D. (Physics)

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 reaching 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 and professional objectives, including an indication of why the objectives cannot be met within existing majors, (2) a list of courses planned to complete the major, and (3) faculty adviser recommendations. The proposal will be reviewed and a decision provided the quarter of submittal. It is important that students carefully review the information in the Individual Majors Handbook; available at http://advising.ucdavis.edu/forms/default.aspx.

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). Principal Adviser: a member in a teaching department or program in the College of Letters and Science in the major field of emphasis. Secondary Adviser: a faculty member from a 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.

Quarter Offered: T-Fall, II-Winter, III-Spring, IV-Summer; 2015-2016 offering in parentheses

Quarter Offered:
Pre-Fall 2011 General Education (GE): ArtHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; DivDom-Domestic Diversity; Wrt-Writing Experience
Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences;


Integrative Genetics and Genomics (A Graduate Group)

Formerly Genetics

David Neale, Ph.D., Chairperson of the Group


Faculty

Steffen Abel, Ph.D., Professor Emeritus
(Plant Sciences)
Danika Bannasch, Ph.D., Professor
(VM: Population Health and Reproduction)
Diane Beckles, Ph.D., Associate Professor
(Plant Sciences)
David Begun, Ph.D., Professor
(Evolution and Ecology)
Craig Benham, Ph.D., Professor (Genome Center)
Alan B. Bennett, Ph.D., Professor (Plant Sciences)
Linda F. Bisson, Ph.D., Professor
(Viticulture and Enology)
Simeon Boyd, Ph.D., Associate Professor
(Pediatrics, M.I.N.D. Institute)
Siobhan M. Brady, Ph.D., Assistant Professor
(Plant Biology)
Anne B. Britt, Ph.D. Professor (Plant Biology)
Nadean Brown, Ph.D. Associate Professor
(Med Human Anatomy)
Sean Burgess, Ph.D. Professor
(Molecular and Cellular Biology)
Kenneth C. Burris, Ph.D., Professor
(Molecular and Cellular Biology)
Judy Callis, Ph.D., Professor
(Molecular and Cellular Biology Academic Senate Distinguished Teaching Award)
Luis G. Carvajal-Carmona, Ph.D., Assistant Professor
(Biochemistry and Molecular Medicine)
Frederic Chadin, Ph.D., Assistant Professor
(Molecular and Cellular Biology)
Hangwu Chen, Ph.D., Associate Professor
(Biochemistry and Molecular Medicine)
Roger Chetelat, Ph.D., Agronomist
(Plant Sciences)
Joanna Chiu, Ph.D., Assistant Professor
(Entomology)
Gitta L. Conker, Ph.D., Associate Professor
(Plant Pathology)
Luka Comai, Ph.D., Professor (Plant Biology)
Douglas Cook, Ph.D., Professor (Plant Pathology)
Gino A. Cortopassi, Ph.D., Professor
(Molecular and Cellular Biology)
Michael E. Dahmus, Ph.D., Professor Emeritus
(Molecular and Cellular Biology)
Abhaya Dandekar, Ph.D., Professor (Plant Sciences)
Sathyi Dandekar, Ph.D., Professor
(Microbiology and Immunology)
Mary Delany, Ph.D., Professor (Animal Science)
Bruce Draper, Ph.D., Assistant Professor
(Molecular and Cellular Biology)
Jorge Dubcovsky, Ph.D., Professor (Plant Sciences)
Jan Dvorak, Ph.D., Professor (Plant Sciences)
JoAnne Engebret, Ph.D., Professor
(Molecular and Cellular Biology)
Holly Ernest D.V.M., Ph.D., Associate Professor
(Population Health and Reproduction)
Bruce Faulk, Ph.D., Professor (Plant Pathology)
Thomas R. Falmusa, Ph.D., Professor
(Animal Science)
Nann A. Fangue Ph.D., Assistant Professor
(Wildlife, Fish and Conservation Biology)
Peggy Farnham, Ph.D., Adjunct Professor
(Medical Pharmacology)
Charles S. Gasser, Ph.D., Professor
(Molecular and Cellular Biology)
Paul Gepts, Ph.D., Professor (Plant Sciences)
Paramita Ghosh, Ph.D., Associate Professor
(Urology)
Robert L. Gilbertson, Ph.D., Professor
(Plant Pathology)

David Gilchrist, Ph.D., Professor Emeritus
(Plant Pathology)
Thomas Glazer, Ph.D., Professor
(Cell Biology and Human Anatomy)
Thomas Gradziel, Ph.D., Professor (Plant Sciences)
Paul J. Hageman, Ph.D., Professor
(Biochemistry and Molecular Medicine)
Nobuko Hagiwara, Ph.D., Assistant Professor
(Cardiovascular Medicine)
John H. Harada, Ph.D., Professor (Plant Biology)
Academic Senate Distinguished Teaching Award
Stacey Harmer, Ph.D., Assistant Professor
(Plant Biology)
Dennis Hartigan, Ph.D., Assistant Professor
(Microbiology)
Wolf-Dietrich Heyer, Ph.D., Professor (Microbiology)
James Hildreth, Ph.D., Professor
(Molecular and Cellular Biology)
Russell Hovery, Ph.D., Associate Professor
(Animal Science)
Liping Huang, Ph.D., Assistant Adjunct Professor
(Nutrition)
Neil Hunter, Ph.D., Professor (Microbiology)
Clarence I. Kado, Ph.D., Professor Emeritus
(Plant Pathology)
Sree Kanthaswamy, Ph.D., Associate Adjunct Professor (Environmental Toxicology)
Daniel Kliebenstein, Ph.D., Associate Professor
(Plant Sciences)
Paul Knoepfler, Ph.D., Associate Professor
(Cell Biology and Human Anatomy)
Artym Kopp, Ph.D., Associate Professor
(Evolution and Ecology)
Ian Krol, Ph.D., Assistant Professor
(Molecular and Cellular Biology)
Stephen C. Kowalczykowski, Ph.D., Distinguished Professor (Microbiology)
Dieter Kuehn, Ph.D., Associate Professor
(Animal Science)
Hsing-Jien Kung, Ph.D., Professor
(Biochemistry and Molecular Medicine)
Michelle La Merrill, Ph.D., Assistant Professor
(Environmental Toxicology)
Kit Lam, Ph.D., Professor
(Felontology and Oncology)
Charles Langley, Ph.D., Professor
(Evolution and Ecology)
Gregory C. Lanzaro, Ph.D., Professor Pathology
Microbiology & Immunology
Janine LaSalle, Ph.D., Professor
(Microbiology and Immunology)
So-Ju Lin, Ph.D., Associate Professor (Microbiology)
Susan Lott, Ph.D., Assistant Professor
(Evolution & Ecology)
William Lucas, Ph.D., Professor (Plant Biology)
Shirley Luckhart, Ph.D., Professor
(Microbiology and Immunology)
Leslie A. Lyons, Ph.D., Professor
(Population Health and Reproduction)
Philip Mack, Ph.D., Associate Adjunct Professor
(Felontology and Oncology)
Julin Maloof, Ph.D., Professor (Plant Biology)
Ben May, Ph.D., Adjunct Professor
(Animal Science)
Juan F. Medrano, Ph.D., Professor (Animal Science)
Frederick J. Meyers, Ph.D., Ph.D., Professor
(Felontology and Oncology)
Richard Michelmore, Ph.D., Professor
(Plant Sciences)
Michael Miller, Ph.D., Assistant Professor
(Animal Science)
Maria Mudryj, Ph.D., Associate Professor
(Microbiology and Immunology)
Jean D. Murray, Ph.D., Professor (Animal Science)
Jeanette E. Natzle, Ph.D., Associate Professor
(Molecular and Cellular Biology)
David Neale, Ph.D., Professor (Plant Biology)
Jan Notha, Ph.D., Professor
(Felontology and Oncology)
Anita M. Oberbauer, Ph.D., Professor
(Animal Science)
Dan E. Parfitt, Ph.D., Pomologist (Plant Sciences)
Niels Pedersen, Ph.D., D.V.M., Professor
(VM: Medicine and Epidemiology)
Martin L. Privat, Ph.D., Distinguished Professor
(Microbiology)

Integrative Genetics and Genomics (A Graduate Group)
Carlos F. Quiros, Ph.D., Professor (Plant Sciences)
Kathryn L. Radke, Ph.D., Professor Emeritus (Animal Sciences)
Bruce Rannala, Ph.D., Professor (Evolution and Ecology)
Raymond Rodriguez, Ph.D., Professor (Molecular and Cellular Biology)
Pamela C. Ronald, Ph.D., Professor (Plant Pathology)
Alan Rose, Ph.D., Project Scientist (Molecular and Cellular Biology)
Leslie Rose, Ph.D., Associate Professor (Molecular and Cellular Biology)
Jeffrey S. Ross, Ph.D., Assistant Professor (Plant Sciences)
Pablo J. Ross, Ph.D. Assistant Professor (Animal Science)
John Roth, Ph.D., Distinguished Professor (Plant Sciences)
Benjamin Sacks, Ph.D., Assistant Adjunct Professor (Population Health and Reproduction)
Carl W. Schmid, Ph.D., Professor Emeritus (Molecular and Cellular Biology)
David Segel, Ph.D., Associate Professor (Pharmacology and Toxicology)
Michael F. Selain, Ph.D., Professor (Biochemistry and Molecular Medicine)
Barbara L. Shacklett, Ph.D., Associate Professor (Microbiology and Immunology)
Frank Sharph, Ph.D., Professor (Neurology)
Douglas Shaw, Ph.D., Professor (Plant Sciences)
Justin B. Siegel, Ph.D., Assistant Professor (Biochemistry and Molecular Medicine)
Neelima Sinha, Ph.D., Professor (Plant Biology)
Dina S. St. Clair, Ph.D., Professor (Plant Sciences)
Daniel Starr, Ph.D., Assistant Professor (Molecular and Cellular Biology)
Venkatesan Sundaresan, Ph.D., Professor (Plant Biology)
Michael Syvanen, Ph.D., Professor (Microbiology and Immunology)
Thomas Tai, Ph.D., Associate in AES (Plant Sciences)
Flora Tassone, Ph.D., Professor (Biochemistry and Molecular Medicine)
Larry R. Teuber, Ph.D., Professor (Plant Sciences)
Maria Torres Penedo, Ph.D., Associate Research Geneticist (Veterinary Genetics Laboratory)
Alison Van Eenennaam, Ph.D., Cooperative Extension Specialist (Animal Science)
M. Andrew Walker, Ph.D., Professor (Viticulture and Enology)
Craig H. Warden, Ph.D., Professor (Pediatrics)
Valerie Williamson, Ph.D., Professor (Nematology)
Reen Wu, Ph.D., Professor (Physical/DIRECT Care Med)
Lifeng Xu, Ph.D., Assistant Professor (Microbiology)
Ebenzer Y. Yamaoh, Ph.D., Professor (Medical Anesthesiology)
John I. Yoder, Ph.D., Professor in Plant Sciences (Konstantinos Zarkalis, Ph.D., Assistant Professor (Pathology and Laboratory Medicine)
Mark A. Zern, Ph.D., Professor (Internal Med: Transplant)
Chengji Zhou, Ph.D., Associate Professor (Cell Biology and Human Anatomy)
Huijuan Zhou, Ph.D., Assistant Professor (Animal Science)

Graduate Study. The Graduate Group in Genetics offers programs of study and research leading to the M.S. and Ph.D. degrees. Students in the Genetics graduate program have the opportunity to apply genetic, molecular and classical genetic approaches to study model organisms, a broad range of native and agricultural species, humans, and companion animals. The group integrates genetic research across campus and involves over 100 faculty members from more than 50 departments spanning the College of Biological Sciences, the College of Letters and Science, the College of Agricultural and Environmental Sciences, the School of Medicine, and the School of Veterinary Medicine. Students experience an unsurpassed breadth of research and instructional opportunities from the most fundamental to applied aspects of genetics. For additional information regarding the program, contact the group coordinator 5307524863.

Courses in Genetics (GGG)

Graduate
201A. Advanced Genetic Analysis (5) Lecture—discussion—5 hours. Prerequisite: Biological Sciences 101, Statistics 100 or the equivalent, graduate standing or consent of instructor. Emphasis on the techniques and theory of genetic analysis and the application of computer methods to address problems in population genetics, gene mapping, and the development of new genetic techniques. (I, III)

201B. Genomics (5) Lecture—discussion—5 hours; discussion—2 hours. Prerequisite: course 201A, 210C or the equivalent. Prokaryotic and eukaryotic genomes. Experimental and analytical methods of data collection and analysis; the generation, storage, and use of genetic data in life sciences. (I, III)

201C. Molecular Genetic Mechanisms in Disease (4) Lecture—discussion—4 hours. Prerequisite: Biological Sciences 101 or the equivalent. The integration of modern bioinformatics and computational approaches to study model organisms and the research and the theory and mechanics of data analysis. Structural, functional, and comparative genomics. Related issues in bioinformatics. (I, III)

210D. Quantitative and Population Genetics (5) Lecture—5 hours. Prerequisite: course 201A or consent of instructor. Basic concepts of quantitative and population genetics including gene and genotypic frequencies, multiple factor hypothesis, phenotypic and genotypic values, heritability, selection, genetic variation, the detection of quantitative trait loci and evolution in populations. Experimental and analytical methods. (I, III, IV)

205. Molecular Genetics Laboratory (5) Laboratory—15 hours. Prerequisite: Biological Sciences 101 or the equivalent. Introduction to molecular genetics laboratories. Individual research problems. Students will conduct experiments in molecular genetics laboratories. (I, III, IV)

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 quantitative genetics to molecular biology as it relates to animals. (I, 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 alternate years. (II, IV)

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, III)

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. Topics include scientific conduct, manuscript preparation, grant writing, seminar presentations, and time management. Emphasis on responsible conduct of scientific investigators. (S/U grading only.)—I, II, III, IV

200. 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, formulating 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

299. Research (1-12) (S/U grading only)

Professional
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, formulating 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

See Design, on page 219.