AGRICULTURAL AND ENVIRONMENTAL SCIENCES

GRADUATE PROGRAMS

- AGRICULTURAL AND ENVIRONMENTAL CHEMISTRY - AGRICULTURAL AND RESOURCE ECONOMICS - ANIMAL BIOLOGY
- ATMOSPHERIC SCIENCE - BIOLOGICAL SYSTEMS ENGINEERING - ECOLOGY - ENTOMOLOGY - FOOD SCIENCE - GEOGRAPHY
- HORTICULTURE AND AGRONOMY - HYDROLOGIC SCIENCES - INTEGRATIVE GENETICS AND GENOMICS - INTERNATIONAL AGRICULTURAL DEVELOPMENT - MATERNAL AND CHILD NUTRITION - MICROBIOLOGY - NUTRITIONAL BIOLOGY - PHARMACOLOGY AND TOXICOLOGY
- PLANT BIOLOGY - PLANT PATHOLOGY - POPULATION BIOLOGY - PUBLIC HEALTH SCIENCES - SOILS AND BIOGEOCHEMISTRY
- TRANSPORTATION TECHNOLOGY AND POLICY - VITICULTURE AND ENOLOGY

APPLICATION DEADLINES: gradstudies.ucdavis.edu/applicationdeadlines

AGRICULTURAL AND ENVIRONMENTAL CHEMISTRY
(530) 752-4516
agchem.ucdavis.edu
Ph.D., M.S.
Students study the chemical and biochemical aspects of foods, wine, fibers/polymers, pesticides, and environmental pollution. Research includes basic and applied problems in analytical, organic, physical, inorganic, or biological chemistry. Group research includes pesticide and toxicant chemistry, food/meat/dairy chemistry, fiber and polymer chemistry, and enzymatic reactions and fermentation chemistry.

AGRICULTURAL AND RESOURCE ECONOMICS
(530) 752-6185
agecon.ucdavis.edu/graduate-program
Ph.D., M.S., Joint M.S./M.B.A.
Students in this world-renowned program study the production, distribution, and consumption of food, fiber, and energy in both developed and less-developed countries. To address these issues, the program emphasizes the development and application of rigorous economic theory and quantitative methods. Graduates become leaders in understanding and improving government policy, market performance, environmental quality, the efficiency of natural resource use, and total income and its distribution. The program is rigorous and demanding, but the department fosters a working and social atmosphere in which students and faculty interact as colleagues.

ANIMAL BIOLOGY
(530) 752-2382
animalbiology.ucdavis.edu
Ph.D., M.S.
Animal biology encompasses the discipline-based studies of domesticated and wild animals and animal management systems. Understanding of the multifaceted aspects of organismal biology is a critical context for interpretation of molecular, cellular, and behavioral observations. Much of the innovative research in animal biology is at the intersection of two or more contemporary biological disciplines; this program was designed to train students for this reality. The program of study is individually tailored to meet student needs and includes a limited number of core courses to provide a foundational understanding of the animal as an integrated organism. Graduates then pursue more in-depth study in behavior, biochemistry, ecology, genetics, immunology, nutrition, physiology, reproduction and/or toxicology. Graduates pursue careers in academia, government, industry, and non-governmental organizations.

ATMOSPHERIC SCIENCE
(530) 752-1669
lawr.ucdavis.edu/graduate_atm.htm
Ph.D., M.S.
Atmospheric science is the study of the physics, chemistry and dynamics of the atmosphere and its interaction with the hydrosphere and the biosphere. Major emphasis is placed on the following fields: air quality meteorology, atmospheric chemistry, micrometeorology, biometeorology, climate dynamics, mesoscale meteorology, large-scale dynamics and numerical weather prediction.

BIOLOGICAL SYSTEMS ENGINEERING
(530) 752-0102
engineering.ucdavis.edu/graduate/bse
Ph.D., M.S., M.Eng., D.Eng.
The program stresses the use of engineering to efficiently produce, distribute and process biological products for energy, food, feed and fiber while conserving natural resources, preserving environmental quality, and ensuring the health and safety of people. Programs of study include: aquacultural engineering, bioprocess engineering, ecological systems engineering, energy systems engineering, environmental engineering, food engineering, forest and fiber engineering, health and safety engineering, machine systems engineering, postharvest engineering, sensor and control engineering, and soil and water engineering.

ECOLOGY
(530) 752-6752
ecology.ucdavis.edu
Ph.D., M.S., Joint Ph.D. with San Diego State University
The graduate group in ecology is an interdisciplinary graduate program that offers students a combination of both basic and applied ecology within nine organized areas of emphasis, as well as a joint Ph.D. program working with faculty in the biology department at San Diego State University. With more than 100 faculty members, the GGE offers unparalleled diversity and depth in coursework and research opportunities in terrestrial, freshwater and marine systems. The GGE achieves excellence in graduate education. In the field of ecology/evolutionary biology, UC Davis has received the nation’s top ranking from U.S. News and World Report for research productivity, and a top five ranking from the National Research Council. The more than 1,000 GGE alumni include leaders in their fields in state and federal natural resource managing agencies, private conservation organizations, environmental consulting firms and biotech companies. In addition, GGE alumni are represented on the faculty of more than 85 universities worldwide.

ENTOMOLOGY
(530) 754-9506
entomology.ucdavis.edu/graduate
Ph.D., M.S.
The program emphasizes the integration of basic and applied aspects of entomology in solving problems in biology,
agriculture and the environment. Students can specialize in a diversity of areas such as biological control, economic entomology, pollination biology, insect chemical ecology, insect olfaction, insect demography, insect physiology, insect toxicology, integrated pest management, ecology and evolution, forensic entomology, medical entomology (human and animal health), and systematics.

**FOOD SCIENCE**  
(530) 752-3250  
foodscience.ucdavis.edu/graduate  
Ph.D., M.S.

Students study the application of biological, chemical, physical and behavioral sciences to the processing, preservation, quality evaluation, public health aspects, and utilization of foods. For the M.S., there are four areas of specialization: chemistry-biochemistry, microbiology, processing and sensory sciences. Individually designed programs are also accepted. For the Ph.D., there are three areas of emphasis: biochemistry/chemistry, microbiology/fermentation and sensory sciences.

**GEOGRAPHY**  
(530) 752-4119  
geography.ucdavis.edu  
Ph.D., M.A.

The Geography Graduate Program emphasizes spatial interactions between humans and the biophysical environment. Faculty interests include: landscape change and sustainable resource management; human and physical geography of diverse world environments; domestication and geographical dispersal of plants and animals; biogeography and climate change; accul- turation of indigenous peoples and immigrants; indigenous agrosystems, especially in tropical regions; women in development; and medical-nutritional geography. During the past several years, group faculty and graduate students have conducted research in the Caribbean; Central and South America; Western and Eastern Europe; Africa; Mediterranean lands and the Middle East; the former Soviet Union; East, Central, South and Southeastern Asia; and the American West and Southwest, especially California. Master's students develop professional competence in a topical and a regional specialization and in geographical information system skills. Ph.D. students develop refined skills in the acquisition, analysis and synthesis of information. They specialize in one major region and one topical subfield.

**HORTICULTURE AND AGRONYM**  
(530) 752-7738  
ggha.ucdavis.edu  
Ph.D., M.S.

The graduate group in horticulture and agronomy offers programs of study leading to the M.S. and Ph.D. degrees for students interested in the science and management of agricultural crops, including their ecology, physiology, genetics, and pest management, as well as the interaction of agricultural crops with the environment. These programs are designed to focus on a cropping system, such as agronomy, environmental horticulture, pomology, vegetable crops, viticulture and weed science. Within that cropping system, the student can specialize in one of a number of areas, including agroecology, biotechnology, breeding and crop improvement, crop physiology, crop production, floriculture, landscape horticulture, mineral nutrition, modeling, nursery production, pest management, plant growth and development, postharvest physiology, revegetation/restoration, and water relations. Research may be conducted within these areas with an applied or basic focus, but in association with a cropping system.

**HYDROLOGIC SCIENCES**  
(530) 752-1669  
hydscigrad.ucdavis.edu  
Ph.D., M.S.

The hydrologic sciences involve the physical, chemical, and biological processes that affect the circulation of water and solutes on Earth. The graduate group in hydrologic sciences offers numerous programs of study in hydrology, hydrogeology, vadose zone processes, hydrogeochemistry, river restoration, modeling, geographic information systems, water resources management, irrigation and drainage, and climate change, among others. Students with a background in hydrologic sciences, geology, geophysics, engineering, soil science, biology, chemistry, computer science, environmental science, fluid mechanics, mathematics and physics are strongly encouraged to apply for admission to the graduate program. Because of increasing demand for solutions to water and environmental problems such as water pollution and climate change, the job market for highly qualified hydrologic scientists is consistently strong in both the public and private sectors.

**INTEGRATIVE GENETICS AND GENOMICS**  
(530) 752-4863  
iggg.ucdavis.edu  
Ph.D., M.S.

Students in the integrative genetics and genomics graduate program have the opportunity to apply genomic, molecular, and classical genetic approaches to study model organisms, a broad range of native and agricultural species, humans, and companion animals. The program integrates genetic research across campus and unites over 100 faculty members from more than 25 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 the most applied aspects of integrative genetics and genomics.

**INTERNATIONAL AGRICULTURAL DEVELOPMENT**  
(530) 752-4839  
idad.ucdavis.edu  
M.S.

This interdisciplinary graduate group provides students with knowledge and skills to implement, facilitate, and manage programs that enhance agricultural development, resource management, and rural life, particularly in developing and less-industrialized regions of the world. The program provides both breadth and depth components. The required breadth components provide students with an understanding of international development issues related 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. The depth component is acquired through a student's area of specialization. These may include agricultural and resource economics, agricultural engineering, agronomy, animal science, anthropology, aquaculture, avian sciences, community development, ecology, economics, entomology, environmental design, environmental toxicology, food science, gender, geography, horticulture, nutrition, plant pathology, plant biology, plant protection and pest management, political science, pomology, preventive veterinary medicine, range
science, sociology, soil science, sustainable agriculture, vegetable crops, viticulture, and water science. In addition to the Master of Science, the program offers a Certificate in Development Practice. This program is available to registered students in any UC Davis graduate program and includes coursework in international development, energy production and use in developing countries, entrepreneurship, human nutrition, and a development practicum.

**MASTER OF PUBLIC HEALTH**

(See PUBLIC HEALTH SCIENCES)

**MATERNAL AND CHILD NUTRITION**

(530) 757-8734
extension.ucdavis.edu/nutrition

M.A.S.

During the last decade, the need for nutrition specialists in public health and maternal and child health programs has increased, along with the recognition that low birth weight, diabetes, and childhood overweight and obesity are important national health concerns. There is also an increasing demand for lactation specialists, as greater numbers of women choose to breast-feed their infants. In response, private and public health agencies have focused on improving the nutrition of mothers and children. The UC Davis Master of Advanced Study in Maternal and Child Nutrition Program is designed to provide a strong scientific background in these topics, and to train professionals to design, implement, and evaluate nutrition intervention programs for mothers and children from a wide variety of cultural, ethnic, and social backgrounds.

**MICROBIOLOGY**

(530) 752-0262
myhs.ucdmc.ucdavis.edu/web/microbiology-graduate-group

Ph.D., M.S.

Although an M.S. degree may be obtained while pursuing a Ph.D. degree, only Ph.D. applications will be accepted.

The microbiology graduate group offers interdisciplinary, interdepartmental training leading to the Ph.D. The program combines academic and experimental training in modern molecular approaches to microbiological problems. The group is composed of more than 60 faculty members from 24 departments. Areas of research span fundamental, applied, and pathogenic microbiology, including bacterial and viral pathogenesis, eukaryotic microbiology, microbial genomics and genetics, microbial physiology and development, microbial ecology and environmental microbiology, cancer biology, and bioengineering and bioremediation. During the first year, they complete core courses and a series of laboratory rotations, and then begin their dissertation research. Additional elective courses and seminars are part of the second year curriculum. All students receive financial support.

**PLANT BIOLOGY**

(530) 752-2981
pbi.ucdavis.edu

Ph.D., M.S.

The graduate program offers training in the breadth of plant biology and in specialized topics represented by the following four research areas: cell and developmental biology; environmental and integrative biology; molecular biology, biochemistry and genomics; and systematics and evolutionary biology. This framework allows students to conduct research on plants through the disciplines of anatomy, biochemistry, biophysics, biotechnology, cell biology, developmental biology, evolutionary biology, genetics, genomics, molecular biology, morphology, paleobotany, pathology, physiology, population biology, proteomics, systematics, systems biology, and weed science. UC Davis has one of the largest groups of plant biologists of any institution internationally. Graduate students have the opportunity to carry out research in basic and/or applied sciences in the labs of more than 60 faculty members, spanning three colleges and nine departments.

**NUTRITIONAL BIOLOGY**

(530) 754-7684
ggnb.ucdavis.edu

Ph.D., M.S.

The great diversity of research interests represented by the faculty members allows students to choose from a wide variety of themes: nutritional biochemistry, animal nutrition, nutrition and development, nutrient bioavailability, human/clinical nutrition, nutrition and behavior, nutritional energetics, community nutrition, 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, and nutrition education.

**PHARMACOLOGY AND TOXICOLOGY**

(530) 752-4516
pxt.ucdavis.edu

Ph.D., M.S.

The Pharmacology and Toxicology Graduate Group is an interdisciplinary program that combines coursework and experimental training in modern approaches to pharmacological and toxicological problems. The group is comprised of more than 80 faculty members from the School of Veterinary Medicine, School of Medicine, College of Agricultural and Environmental Sciences, and the College of Biological Sciences. Areas of research span fundamental and translational research in a broad spectrum of areas within pharmacology and toxicology, including cardiovascular pharmacology, cancer therapeutics, neuropharmacology, drug discovery and design, neurotoxicology, pulmonary toxicology and environmental toxicology. Students complete core courses in pharmacology and toxicology and carry out research rotations during their first year of study. All Ph.D. students receive financial support.

**PLANT PATHOLOGY**

(530) 754-9506
plantpathology.ucdavis.edu/graduate_program

Ph.D., M.S.

The department offers study in plant pathology, including emphasis on diseases caused by viruses, bacteria, fungi, and nematodes. Graduate students may specialize in the physiology, biochemistry, and molecular biology of plant pathogens or host-pathogen interactions; the biology and ecology of plant pathogens; epidemiology and modeling of plant diseases; and the diagnosis and control of plant diseases, including chemical, biological and integrated methods of control.

**POPULATION BIOLOGY**

(530) 752-1274
eve.ucdavis.edu/eve/pbg

Ph.D., M.S.

Although an M.S. degree may be obtained while pursuing a Ph.D. degree, only Ph.D. applications will be accepted.

The program concentrates on population biology as the broad discipline that blends ecology, evolution, population genetics and systematics into a unified field. The course curriculum consists of first-year core courses, seminars, and advanced courses
in population biology, mathematics, and
statistics, chosen in consultation with a
guiding committee. Area specializations
range from paleontology and systematics
to community ecology, genomics, and
molecular population genetics.

PUBLIC HEALTH SCIENCES
(530) 754-4992
mph.ucdavis.edu
M.P.H., Ph.D. (Pending approval)
The public health sciences programs
include instruction in epidemiology, bio-
statistics, environmental and occupational
health, health services and administration,
and social and behavioral science, and
they prepare students for an expanding
range of professional opportunities and
roles in public health and medicine.
The Master of Public Health program is
designed for people interested in disease
prevention and community health. The
program’s mission is to develop the public
health leaders of the future by providing a
high-quality master’s degree curriculum in
partnership with the public health commu-
nity. The Ph.D. in public health sciences is
designed to create graduates who will be
experts in generating and disseminating
new knowledge about health and disease
prevention and effective programs in
public health. The doctoral students in
this program will be educated in research
design, implementation and analysis
as well as public health practice. These
programs promote a practical public
health focus through a historically strong
partnership with federal, state, and local
public health communities, including the
California Department of Public Health.

SOILS AND BIOGEOCHEMISTRY
(530) 752-1669
soils.ucdavis.edu
Ph.D., M.S.
The soils and biogeochemistry graduate
program focuses on the study of physical,
chemical and biological processes that
occur in the soils of different landforms
and ecosystems. These studies assess
the impacts and implications of natural
processes and anthropogenic effects, such
as climate change, on soil and ecosystem
behavior and development. Topics 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 through
managed and wildland ecosystems;
organic agriculture; bioavailability of toxic
substances; 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. The soils and
biogeochemistry program offers a unique
opportunity to learn about soil processes in
the diverse regions of California, and their
role in agricultural, forest, coastal, desert,
and urban ecosystems.

TRANSPORTATION TECHNOLOGY
AND POLICY
(530) 752-0247
engineering.ucdavis.edu/ttp
Ph.D., M.S.
The transportation technology and policy,
or TTP, program is an interdisciplinary grad-
uate group designed to meet the world’s
growing need for highly qualified, thought-
ful and dedicated leaders in sustainable
transportation. Our students come from a
variety of disciplines and can pursue either
a technology or policy track. The curricu-
lum includes courses in civil engineering,
mechanical engineering, environmental
engineering, economics, policy sciences,
statistics, travel behavior, management,
technology assessment and environmental
studies. The TTP degree gives students the
tools and ability to pursue leadership roles
in government, academia, nongovernmen-
tal organizations and industry.

VITICULTURE AND ENOLOGY
(530) 752-3250
vengg.ucdavis.edu
M.S.
The M.S. program offers advanced studies
in viticulture and enology, ranging from the
genetics, physiology and biochemistry of
grapevines; the chemistry, microbiology
and sensory science of wines; and the
chemical and process engineering of
winemaking. Research topics can vary;
examples include the molecular biology
of grapevines, bacteria or yeast; the
grape and wine chemistry associated with
fermentation and aging; and the correlation
of analytical and sensory analyses.