

COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENTAL SCIENCES

Agricultural Sciences Bldg. (11), Room 211

Phone: 805.756.2161

<https://cafes.calpoly.edu>

Dean: Andrew J. Thulin

Associate Dean: Catherine Kleier

Associate Dean: Bill Hendricks

Associate Dean: James Prince

Academic Programs

Program name	Program type
Agribusiness	Minor
Agricultural Business	BS
Agricultural Communication	BS, Minor
Agricultural Education	MAGEd, Minor
Agricultural Leadership	Minor
Agricultural Science	BS
Agricultural Systems Management	BS
Agriculture	MS
Animal Science	BS
BioResource and Agricultural Engineering	BS
Crop Science	Minor
Dairy Industries	Minor
Dairy Science	BS
Environmental Earth and Soil Sciences	BS
Environmental Management and Protection	BS
Environmental Sciences and Management	MS
Environmental Soil Science	Minor
Equine Science	Minor
Event Planning and Experience Management	Minor
Fire Ecology and Wildfire Hazard Planning	Minor
Food Science	BS, Minor, MS
Forest and Fire Sciences	BS
Fruit Science	Minor
Geographic Information Systems for Agriculture	Minor
Indigenous Studies in Natural Resources and the Environment	Minor
Land Rehabilitation and Restoration Ecology	Minor
Landscape Horticulture	Minor
Meat Science and Processing	Minor
Military Science	Minor
Nutrition	BS, Minor, MS
Plant Protection	Minor
Plant Sciences	BS
Poultry Management	Minor
Rangeland Resources	Minor

Recreation, Parks and Tourism Administration	BS
Sustainable Agriculture	Minor
Water Engineering Specialization	MS
Water Science	Minor
Wine and Viticulture	BS

The College of Agriculture, Food and Environmental Sciences (CAFES) offers programs reflecting the growing diversity of choices available and skills required in modern agriculture, food, life and environmental sciences, and related professions.

Mission Statement

The College of Agriculture, Food and Environmental Sciences fosters teaching, scholarship and service in a Learn by Doing environment where students, faculty and staff are partners in discovery.

Learning Outcomes

All students who complete a program in CAFES should be able to:

- Demonstrate expertise in and the use of technology in their respective discipline.
- Demonstrate effective oral and written communication skills.
- Make choices based on an understanding of personal and professional ethics and respect for diversity of people and ideas.
- Recognize leadership principles and skills.
- Evaluate and solve problems using critical thinking.
- Demonstrate an appreciation for sustainability and global perspectives.

Student Life

Students take courses in their major field beginning with their first quarter of enrollment. This early exposure to their major provides them with specific knowledge to supplement that gained in other coursework in basic sciences, mathematics and the liberal arts. Moreover, it allows students to evaluate whether or not the curriculum selected is appropriate to their interests and abilities. Taking courses in the major throughout the academic program fosters personal contact with faculty and other students having common interests but varied backgrounds.

The students' early involvement in their major field, combined with the faculty's close contacts with schools, private industry, governmental agencies, and nonprofit organizations provide excellent opportunities for student internships during their junior or senior years. Other opportunities which enhance education, provide financial assistance, and help prepare students for the job market include enterprise projects, scholarships, study abroad, and work-study jobs.

CAFES faculty are experts in their disciplines, and are dedicated to teaching. They are eager to help students learn, are readily available for consultation and are proud of their close relationship with students.

College Advising

Academic Advising is provided to all students through the CAFES Advising Center and their major department in the college. This includes: Professional Academic Advisors, Faculty Advisors, and Peer Advisors. Academic Advising is designed to help students reach their educational and career goals; it is a shared task between an advisor and a student. Students are encouraged to meet with their advisors quarterly to plan their schedule, review curriculum information, discuss career

opportunities, and receive information on internships, enterprise projects and cooperative learning. The CAFES Advising Center provides guidance on university and college policies and procedures including course transfers, substitutions and other general information.

Peer Academic Mentoring

The Multicultural Agriculture Program (MAP) is available to provide academic and personal support to undergraduate students of all cultural backgrounds in the College of Agriculture, Food, and Environmental Sciences with a peer-based structure that cultivates student achievement and a sense of community.

College Clubs and Organizations

Student clubs are active in every department. The College's 52 clubs, many of which are affiliated with national professional organizations, provide an excellent forum for student and faculty interactions. Active club members may practice leadership skills, and attend national, state and local professional meetings, as well as participate in a variety of professional and social events.

Agricultural Lands and Outdoor Laboratories

Nearly 6,000 acres of on-campus agricultural production, processing and research land and facilities are available for student use at Cal Poly. These facilities provide students with unique opportunities for hands-on experiences which augment classroom instruction.

The campus farm includes a dairy, beef center, horse, sheep, swine and poultry units, horse training and show arenas, an animal nutrition center, meat processing center, veterinary clinic and rodeo facilities. Also available are irrigated and dryland fields for annual crops, orchards and vineyards, an irrigation demonstration field, erosion research facility, large-scale composting operation, hoop houses, arboretum, wholesale and retail nurseries, a wine lab, and greenhouses. Eleven acres of certified organic farmland support our organic farming program.

Other Labs and Special Facilities

Special facilities include several microcomputer laboratories, laboratories with modern equipment for soil-plant-water testing, engineering testing and manufacturing shops, complete food processing units for dairy products, meats, fruit and vegetables, and four biotechnology and embryology laboratories.

Santa Cruz County Properties

The 3,200 acre Swanton Pacific Ranch in Santa Cruz County was generously donated by Al Smith, alumnus of Cal Poly's former Crop Science Department. This property provides students with an opportunity to live and work on a commercial farm with forestry, watershed management, cattle and organic crop production activities. The lands also support a wide range of research topics for undergraduate and graduate students.

Enterprise Projects/Experiential Learning

Cal Poly students have the unique opportunity to gain hands-on experience in business enterprises or through work experience on campus. These experiences serve to strengthen students' academic studies, while at the same time providing the knowledge and skills that lead to a better understanding and appreciation for important production, managerial and marketing challenges employees face in the workplace.

Students participating in enterprise projects earn units that are reflected on their Cal Poly transcript.

Enterprise projects are available in various departments in the college.

In some projects, profits from enterprises will be shared among participating students, with a percentage also going to the department coordinating the activity. If an enterprise loses money, the department conducting the project absorbs the loss. This financial, risk-free opportunity provides students with great learning opportunities.

Research Programs

The college sponsors a 10-week Summer Undergraduate Research Program (SURP) to provide students the opportunity to experience undergraduate research projects on topics related to their programs or in which they have interest. Students work closely with faculty research leads and receive a stipend. The program is open to all undergraduate students in the college.

Courses

The courses offered in each undergraduate curriculum may be grouped into four areas:

Major

The major courses include a required cluster of courses in which the student expects to graduate. These courses constitute the core of specific preparation for the student's major field.

General Education

Courses are selected from the physical and life sciences, mathematics, communications, arts and humanities, and social, political, and economic institutions. These courses furnish the student with background and support for their academic program as well as providing cultural background for the students' intelligent participation in a complex world society.

Support

The support courses draw from courses in agriculture, life sciences, and closely allied fields which support and supplement the block of courses constituting the student's major.

Free Electives

Course selection from electives is designed to provide freedom for students to pursue interests of their choosing in any university department.

Recommended Preparation

In addition to pursuing the CSU mandated and Cal Poly recommended entrance requirements, high school and community college students are encouraged to participate in co-curricular activities as part of their preparation for admission to majors in Cal Poly's College of Agriculture, Food and Environmental Sciences. These activities could include, but are not limited to, FFA, 4-H, leadership roles in school clubs, meaningful work experience and community organizations.

Graduate Programs

Agricultural Sciences Bldg. 11, Room 211
Phone: 805.756.2161

<https://cafes.calpoly.edu/contact-graduate-programs> (<https://cafes.calpoly.edu/contact-graduate-programs/>)

Associate Dean: James P. Prince
jpprince@calpoly.edu

Admission

File an application for Graduate Admission via <https://calstate.edu/apply> (<https://calstate.edu/apply/>) by the deadlines specified at <https://admissions.calpoly.edu/applicants> (<https://www.calpoly.edu/admissions/>) or <https://grad.calpoly.edu/applicant/prospective-student.html>

- Submit Graduate Record Exam (GRE) General Test scores electronically to Institution Code: R4038
- Three Letters of Recommendation

Admission Requirements

For consideration as a graduate student, an applicant will have met the following requirements:

- Completed a four-year college course of study and hold an acceptable baccalaureate degree from an accredited college/university.
- Must have attained a minimum grade point average of 2.75 in the last 90-quarter units attempted.
- An applicant not meeting these academic standards, but who meets the basic university standard of a grade point average of 2.5 in the last 90 quarter units attempted may be considered for admission as a conditionally classified graduate student.

All applicants who do not speak and write English as their primary language are required to complete the Test of English as a Foreign Language (TOEFL), with a minimum score of 550, and the Test of Written English (TWE) with a minimum score of 4.5. Those opting to take the Computer Based TOEFL must present a score of 213 or above. <https://admissions.calpoly.edu/applicants/international/checklist.html>

Each program may list additional requirements for admission to the specific program.

Degree Requirements

- Submit **Working Formal Study Plan (WFSP) & Advancement to Candidacy Form** for the degree with the CAFES Graduate Coordinator no later than the end of the first quarter in the program.
- All candidates must meet the current Graduation Writing Requirement (<https://writingandlearning.calpoly.edu/content/gwr-information-postbaccalaureate-students/>) before submission of the WFSP
- Candidates must determine anticipated graduation date and culminating experience before submission of WFSP
- Submit the e-form, Application for Graduation one quarter prior to the quarter that you plan to graduate.
- Submit the **Final Formal Study Plan (FFSP)** during the first 3 weeks of the quarter in which you plan to graduate.
- Submit either a **Master's Thesis Approval Form** or a **Master's Exam Approval Form** once you have completed your culminating experience. This must be submitted by the last day of the quarter in which you intend to graduate.

Thesis

A copy of the thesis or project report must be received and reviewed by the Thesis Editor in the Graduate Programs Office. Upon completion of any required corrections, the student submits the electronic thesis/project report to the DigitalCommons@CalPoly, a digital archive for the University. These steps must be completed before the degree is awarded.

Graduate Student Continuous Enrollment Policy

Effective Fall Quarter 2009, graduate students are required to maintain continuous enrollment from the time of first enrollment in a graduate program until completion of the degree. Continuous enrollment is defined as being enrolled during Fall, Winter, and Spring quarters each year. This requirement is not retroactive to terms prior to Fall 2009.

- All graduate students must be enrolled the quarter they graduate.
- A student may be required to enroll in the Summer quarter if Summer is the quarter of degree completion.
- The continuous enrollment requirement for graduate students applies to all graduate programs unless a program exemption has been approved.
- Students who fail to fulfill this continuous enrollment requirement will not be permitted to graduate, even if all degree requirements have been completed, until payment has been made for all quarters of non-enrollment.

Enroll

Students can maintain continuous enrollment by one of the following:

- Enrolling as a regular student
- Obtaining approval for an education or medical leave prior to the quarter when such a leave would begin
- Registering in a special course designated for this purpose, during quarters in which they are not regularly are enrolled.

Special Courses

- GS 597 is listed in the University catalog and is taken through Cal Poly Extended Education. GS 597 is a one-unit course offered credit/no credit; credits in GS 597 do not count toward meeting degree requirements
- As of Fall 2018, the GS 597 fee will be \$349 per unit. This new fee applies to students who matriculate as graduate students for the first time in Fall 2018 or later.
- Students who are matriculated in a graduate degree program prior to Fall 2018 will be charged \$289 per unit.

MS in Agricultural Education

Agricultural Education & Communication

Coordinator: Ann DeLay

Phone: 805.756.2803

Email: adelay@calpoly.edu

The Master of Agricultural Education program provides student with the opportunity to focus their graduate study in agricultural education, with an emphasis on preparing candidates for positions as teachers of agricultural education in public schools. The non-thesis degree has two tracks: (1) to provide practitioners with opportunities for professional development, requiring at least one year of successful high school or community college teaching for completion, (2) to provide agriculture credential candidates an opportunity to simultaneously complete the degree. Working with their advisor and graduate committee, students

generally complete project for coursework in the program to enhance their employment settings or assist them to become compliant with statewide standards in agricultural education. All students in the Master of Agricultural Education degree program are required to pass a written and oral comprehensive examination, scheduled during the final quarter of the program of study.

Degree Requirements and Curriculum (<https://catalog.calpoly.edu/collegesandprograms/collegeofagriculturefoodenvironmentalsciences/agriculturaleducationcommunication/masterofagriculturaleducation/>)

MS in Environmental Sciences and Management

Natural Resources Management and Environmental Sciences
Coordinator: Chris Surfleet
Phone: 805.756.6392
Email: csurflee@calpoly.edu

The Master of Science degree program in Environmental Sciences and Management (MSES) offers advanced study in a range of environmental science and management disciplines.

The purpose of the Master of Science in Environmental Sciences and Management program is to provide advanced education in management of the environment and natural resources. Advanced study in environmental science, management of the environment, quantitative and qualitative analysis, and communication is the core of the degree. The degree allows an emphasis in environmental policy, forest sciences, hydrology, soil science, and sustainability. Through the emphasis of study, students have flexibility in creating elective coursework to suit their professional goals. The culminating experience of the degree is a professional project or thesis that allows students to explore, seek solutions, or provide research on environmental challenges.

Additional Requirements:

- Students must have at least a 3.0 GPA in the final 90 quarter units of their undergraduate degree.
- Completion of 3 quarters or two semesters of any combination of chemistry, biology, ecology, physics, earth science, or atmospheric Science.
- Completes one quarter or one semester of Statistics and Calculus
- An applicant who lacks prerequisite coursework may be admitted as a conditionally classified student and must make up any deficiencies (12 unit limit) before advancement to classified graduate standing.
- Must have at least 3 letters of reference that can attest to the academic capabilities of the applicant.

Degree Requirements and Curriculum (<https://catalog.calpoly.edu/collegesandprograms/collegeofagriculturefoodenvironmentalsciences/naturalresourcesmanagementenvironmentalsciences/msenvironmentalsciencesmanagement/>)

MS in Food Science

Food Science and Nutrition
Coordinator: Amanda Lathrop
Phone: 805.756.2660
Email: lathrop@calpoly.edu

General Characteristics

The MS Food Science program is designed to prepare graduates for advancement, specialization, and leadership in food science careers. In addition, graduates will be prepared for further education in doctoral studies in food science and related fields. The MS Food Science program integrates the disciplines of chemistry, microbiology, product development and processing/engineering, to prepare qualified graduates for food-related careers in industry, government and academia.

Additional Requirements:

- Statement of purpose
- Curriculum Vitae
- Three letters of academic and/or professional recommendation

Degree Requirements and Curriculum (<https://catalog.calpoly.edu/collegesandprograms/collegeofagriculturefoodenvironmentalsciences/foodsciencenutrition/msfoodscience/>)

MS in Nutrition

Food Science and Nutrition
Coordinator: Scott Reaves
Phone: 805.756.2660
Email: sreaves@calpoly.edu

General Characteristics

The MS Nutrition program is designed to prepare graduates for advancement, specialization, and leadership in nutrition or healthcare careers. In addition, graduates will be prepared for further education in dietetic internships, professional schools, allied health professions, or doctoral studies in a number of academic areas including nutrition, public health, animal science, or other health science-based disciplines.

The interdisciplinary Graduate Group in Nutrition (GGN) allows students to work with faculty from several departments and to choose a research topic from a broad range of themes including human nutrition, animal nutrition, kinesiology, public health, or business.

Students may follow a suggested area of emphasis. Examples may include: Molecular Nutrition, Public Health Nutrition, or Health and Wellness. These would be compatible with the students interests and career goals. Students will complete coursework and a research-based thesis conducted under the supervision of a committee chair who must be a member of the GGN.

Additional Requirements

- Statement of purpose
- Three letters of academic and/or professional recommendation
- Introductory chemistry series (one year), organic chemistry (min one course), biochemistry and an introductory biology course
- FSN 328 Nutrient Metabolism I or FSN 331 Macronutrient Metabolism
- FSN 329 Nutrient Metabolism II or FSN 332 Micronutrient Metabolism and FSN 333 Nutrient Metabolism Lab

Degree Requirements and Curriculum (<https://catalog.calpoly.edu/collegesandprograms/collegeofagriculturefoodenvironmentalsciences/foodsciencenutrition/msnutrition/>)

MS Agriculture, Specialization in Animal Science

Animal Science
 Coordinator: Vincent Yeung
 Phone: 805.756.6154
 Email: ckyeung@calpoly.edu

The program provides students with an interdisciplinary, science-based program, where students develop basic scientific knowledge, apply that knowledge to a research project, then write and defend a thesis. Under the guidance of the advisor and thesis committee, an individual's coursework and research project is based upon the student interests and goals in Animal Science.

Additional Requirements:

Prospective students are required to:

- Submit a cover letter identifying interests, goals and experience relevant to the MS program, and
- Submit a resume.

MS Agriculture, Specialization in BioResource and Agricultural Systems

BioResource & Agricultural Engineering
 Coordinator: Greg Schwartz
 Phone: 805.756.2378
 Email: gschwa01@calpoly.edu

Students have the opportunity to focus their MS program on the application of bioresource and agricultural systems. Graduates will be prepared to enter a career in a variety of areas including production agriculture, consulting, regulatory compliance, equipment sales and technical support, etc.

Topics under the **bioresource** area may include:

- Agricultural and Food Processing Waste Management
- Renewable Energy

Topics under the **agricultural systems** area may include:

- California Production Agriculture and Food Systems
- Precision Agriculture
- Automation and Mechanization in Agriculture

The multidisciplinary nature of these programs will allow students to select electives in departments throughout the university with adviser approval.

MS Agriculture, Specialization in Crop Science

Horticulture and Crop Science
 Coordinator: Benjamin Hoover
 Phone: 805.756.6358
 Email: bkhoover@calpoly.edu

For students with undergraduate preparation in plant agriculture and/or plant science. Current research is focused primarily in applied fruit

crop physiology, vegetable breeding and physiology, sustainable fruit and vegetable production, viticulture, plant pathology, integrated pest management, and postharvest technology, including sustainable packaging and packaging safety. Thesis required.

MS Agriculture, Specialization in Dairy Products Technology

Animal Science
 Coordinator: Vincent Yeung
 Phone: 805.756.6154
 Email: ckyeung@calpoly.edu

A program for students who wish to use their academic preparation in food science and nutrition, dairy science, microbiology, chemistry, engineering, biochemistry and related fields to address research questions that impact the field of dairy food science and technology. The program requires the demonstration of strong analytical thinking, effective oral and written communication, and project management. Coursework and thesis experience are designed with flexibility to enhance and increase proficiency in scientific methods while enriching students' overall preparation to enter the workforce. Graduates enter research and development positions with major food companies, leadership positions in dairy food processing and other allied areas, or further graduate study for the Ph.D. degree. Students have the opportunity to work on funded research projects within the Dairy Innovation Institute, and interact with multidisciplinary teams of scientists throughout the world. International students are encouraged to apply.

Additional prerequisites: Prospective students are required to:

- submit a cover letter identifying interests, goals and experience relevant to the MS program, and
- submit a résumé.

MS Agriculture, Specialization in Environmental Horticulture Science

Horticulture and Crop Science
 Coordinator: Benjamin Hoover
 Phone: 805.756.6358
 Email: bkhoover@calpoly.edu

For students with undergraduate preparation in horticulture and/or plant science. Current research is focused primarily in applied plant physiology, nursery and potted plant production, sustainable landscape development and maintenance, and integrated pest management. Thesis required.

MS Agriculture, Specialization in Irrigation

BioResource & Agricultural Engineering
 Coordinator: Daniel Howes
 Phone: 805.756.2378
 Email: djhowes@calpoly.edu

The program requires the demonstration of strong analytical thinking, effective oral and written communication, and project management.

Additional prerequisites:

- B.S. in a technical field of agriculture or a B.A. with proficiency in basic chemistry, advanced algebra and trigonometry.
- Students must have successfully completed at least one undergraduate class in general irrigation, soil science, and crop science, plus be familiar with computer spreadsheet usage.
- Students may complete prerequisite courses at Cal Poly if necessary.

MS Agriculture, Specialization in Plant Protection Science

Horticulture and Crop Science
 Coordinator: Benjamin Hoover
 Phone: 805.756.6358
 Email: bkhoover@calpoly.edu

For students with undergraduate preparation in plant agriculture, plant science, biological sciences, and/or ecology. Current research is focused on pest biology, tritrophic interactions, invasive species, integrated pest management, biological control and plant disease management. Projects provide the opportunity to conduct field and/or laboratory experiments with corporate stakeholders for career enhancement. Curriculum and research allows students to develop more diverse or specialized skill sets for post-graduate employment and/or opportunity to obtain required coursework for state licensing. Thesis required.

MS Agriculture, Specialization in Water Engineering

BioResource & Agricultural Engineering
 Coordinator: Daniel Howes
 Phone: 805.756.2378
 Email: djhowes@calpoly.edu

The purpose of this degree is to prepare water engineers who can manage water resources with an interdisciplinary approach for agriculture, industry, and municipalities. The program focuses on water, water distribution, and water resources management. Students may elect to take elective courses to reinforce these areas or examine other areas such as water treatment, urban water planning, hydrology, etc.

Additional prerequisites:

- Students must have successfully completed at least one undergraduate class in general irrigation, soil science, surveying, and organic chemistry

Interdisciplinary Minors

Descriptions of minors listed below are interdisciplinary in nature involving more than one department and/or college. For additional details on minors not listed below click here (<https://catalog.calpoly.edu/programsaz/#minors>).

Agricultural Communication Minor

Brock Center for Agricultural Communication
 Agriculture Bldg. 10, Room 235
 Phone: 805.756.2892
 Coordinator: Megan Silcott

Completion of this interdisciplinary minor enhances students' ability to be successful in dynamic professions associated with the agricultural industry, including print journalism, broadcast journalism and public relations.

The minor is a cooperative effort between the College of Agriculture, Food and Environmental Sciences (CAFES) and the College of Liberal Arts (CLA). Students are advised by faculty members assigned to the Brock Center for Agricultural Communication. Student participation in the Cal Poly chapter of the national Agricultural Communicators of Tomorrow (ACT) is encouraged.

Agricultural Leadership Minor

Agricultural Education and Communication
 Bldg. 10, Room 10-244
 Phone: 805.756.2803

Coordinator: Department Head for Agricultural Education and Communication

This minor provides students with an opportunity to develop as leaders and individuals. The minor is designed for any student to become a more effective communicator, increase teamwork and leadership ability, and increase self-awareness. Courses provide opportunities for students to apply their leadership abilities in a "learn by doing" environment. Core classes provide an overview of leadership theory, followership, communication, teamwork, diversity, inclusion, and practical experiences.

Students will enhance their leadership abilities by participating in a practicum/experiential course that will challenge students to apply their leadership skills. Several degree programs at Cal Poly complement this minor by providing courses that will enhance any student's leadership capabilities.

Environmental Studies Minor

Please see the College of Science and Mathematics (<https://catalog.calpoly.edu/collegesandprograms/collegeofsciencemathematics/>) for more information on this interdisciplinary minor.

Geographic Information Systems for Agriculture Minor

BioResource and Agricultural Engineering
 Bldg. 08, Room 101
 Phone: 805.756.2378
 Coordinators: Samantha Gill and Tom Mastin

An interdisciplinary program sponsored by three departments in CAFES: BioResource and Agricultural Engineering, Natural Resources Management and Environmental Sciences, and Horticulture and Crop Science. New technologies of geographic information systems (GIS), global positioning systems (GPS), and orthophotography (uniform scale aerial photographs) are revolutionizing the management of resources. There are great employment opportunities for those who understand these technologies. Students interested in this minor may come from the following majors: forestry and natural resources, crop science, soil science, landscape architecture, agricultural systems management, bioresource and agricultural engineering, animal science or earth sciences. Students from any major are welcome to take this minor.

Indigenous Studies in Natural Resources and the Environment Minor

An interdisciplinary minor sponsored by the departments of Natural Resources Management and Environmental Sciences and Ethnic Studies. For more information, see the Natural Resources Management and Environmental Sciences (<https://catalog.calpoly.edu/collegesandprograms/collegeofagriculturefoodenvironmentalsciences/naturalresourcesmanagementenvironmentalsciences/>) section.

Land Rehabilitation and Restoration Ecology Minor

Natural Resources Management & Environmental Resources Department
Bldg. 180, Room 516
Phone: 805.756.2971
Coordinator: Yamina Pressler

Students completing the minor gain skills in recognizing, assessing, and treating disturbed lands for numerous purposes, including erosion and sediment control, water quality improvement, habitat restoration, and aesthetic enhancement. They develop proficiency in plant identification and selection, soil properties and processes, and ecological principles, and also learn to set criteria and judge the feasibility, prudence, efficiency, and effectiveness of rehabilitation efforts.

Rangeland Resources Minor

Animal Science
Bldg. 10, Room 141
Phone: 805.756.2419
Coordinator: Marc R. Horney

This interdisciplinary minor prepares students for careers in the science and management of semi-arid grasslands, shrublands, and savannas. This is an entry point into a wide range of careers in extensive agriculture (range and pasture-based livestock production), and environmental conservation - including wildlife and natural resource management. Students will learn purposes for and methods of assessing the health and productivity of rangeland ecosystems, and how to manage the herbivorous animals that depend on them. Coursework in the minor will give students an understanding of the interactions of plants, animals, water, soil and landscape features in these ecosystems. This minor will help prepare students for careers with land and wildlife management agencies at the state and federal level, and conservation organizations, as scientists, resource specialists, and managers. It can also strengthen a graduate's opportunities in the private sector as agricultural or environmental consultants, ecologists, wildlife biologists, wildland managers, ranch managers, and other natural resource management specialists. Completion of this minor meets the basic educational requirements for California Certified Rangeland Manager (CRM) licensing program (<http://casrm.rangelands.org/HTML/certified.html>).

Sustainable Agriculture Minor

Horticulture and Crop Science
Bldg. 11, Room 238
Phone: 805.756.2870
Coordinator: Ashraf Tubeileh

Students approach modern agricultural problems from a holistic perspective, emphasizing agricultural planning integrated with ecological principles. Through experience in sustainable agricultural practices, students learn about a farm/ranch in the context of an agro-ecosystem: a system whose processes and relationships can be manipulated to allow production with fewer adverse environmental impacts and external inputs. Students develop knowledge and skills involving holistic management, crop production, and adaptive decision-making in a hands-on environment. The minor is available to all Cal Poly students.

Water Science Minor

BioResource and Agricultural Engineering
Bldg. 08, Room 101
Phone: 805.756.2378
Irrigation Emphasis Coordinator: Franklin Gaudi

Natural Resources Management and Environmental Sciences
Bldg. 180, Room 518
Phone: 805.756.2743
Water Policy/Watershed Management Emphasis Coordinator: Christopher G. Surfleet

The minor emphasizes one of three areas of study: irrigation, water policy, or watershed management. In California, approximately 45% of available water is used for crop irrigation, 45% for environmental purposes, and 10% for urban use (CA Water Plan). Irrigation water use and management have tremendous impacts upon ground water quality, power usage, crop yields, surface water supplies and quality, drainage problems, and water availability for transfer to urban uses. For students interested in environmental assessment and protection of water resources, the watershed management and policy areas provide land use planning and management skills for meeting water regulations and law. For students wanting background in water resources the Water Science minor provides marketable skills.

AG Courses

AG 200. Special Problems for Undergraduates. 1-2 units

Term Typically Offered: F, W, SP

CR/NC

Prerequisite: Consent of rodeo coach/instructor.

Individual investigation, research, studies, or surveys of selected problems. Total credit limited to 4 units, with a maximum of 2 units per quarter. Credit can only be used to satisfy free electives. Credit/No Credit grading only.

AG 210. Agricultural Leadership Experience. 1 unit

Term Typically Offered: F, W, SP

Participation in activities that promote personal growth and leadership development, including team work, cooperation, communication, problem solving, time management, and organization. Support CAFES in recruitment, public awareness, educational programs, campus tours, fundraising, and youth career development events. The Class Schedule will list topic selected. Total credit limited to 2 units. 1 activity.

AG 212. Leadership Practice: Poly Royal Rodeo. 3 units

Term Typically Offered: SP

CR/NC

Prerequisite: Consent of Instructor.

Application of the management and operations of the Poly Royal Rodeo event taking place during Open House at Cal Poly. Principles and procedures in planning, organizing, financing, promoting, and managing a major collegiate rodeo and the rodeo industry are discussed. Credit/No Credit grading only. 1 lecture, 2 activities.

AG 243. Theory and Practice of Rodeo. 2 units

Term Typically Offered: F, SP

CR/NC

Beginning skills in the event areas of rodeo. Areas include saddle bronc, bareback, and bull riding; calf, team, and breakaway roping; steer wrestling, goat tying, and barrel racing. Total credit limited to 4 units. Credit/No Credit grading. 2 activities.

AG 315. Principles of Organic Crop Production. 4 units

Term Typically Offered: TBD

2020-21 or later: Upper-Div GE Area B

2019-20 or earlier catalog: GE Area B5, B6, or B7

Sustainability Focused

Prerequisite: Junior standing; completion of GE Area A with grades of C- or better; and completion of GE Areas B1 through B4, with a grade of C- or better in one course in GE Area B4 (GE Area B1 for students on the 2019-20 or earlier catalogs).

Origins, application, regulation and technology of organic crop production. Theoretical and practical issues surrounding organic crop production from a cross-disciplinary perspective. Topics include the history of the organic movement; current regulation and certification; and field management practices and technologies. Features industry guest lecturers. Field trip required. 3 lectures, 1 activity. Crosslisted as AG/PLSC 315. Fulfills GE Area Upper-Division B (GE Areas B5, B6, or B7 for students on the 2019-20 catalog). Formerly AEPS/AG 315.

AG 330. Cal Poly Land: Nature, Technology, and Society. 4 units

Term Typically Offered: TBD

2020-21 or later: Upper-Div GE Area B

2019-20 or earlier catalog: GE Area B5, B6, or B7

Sustainability Focused

Prerequisite: Junior standing; completion of GE Area A with grades of C- or better; one course from GE Area B1 (GE Area B4 for students on the 2019-20 or earlier catalogs); one course from GE Area B2; and one course in GE Area B4 with a grade of C- or better (GE Area B1 for students on the 2019-20 or earlier catalogs).

Scientific investigation of the natural features of the Cal Poly landscape and their transformations by land management technology. Environmental, economic, social, and political effects of agriculture, resource extraction, construction technology. Educational, land-use, long term planning issues. 4 lectures. Crosslisted as AG/ISLA/SCM/UNIV 330. Fulfills GE Area Upper-Division B (GE Areas B5, B6, or B7 for students on the 2019-20 catalog).

AG 339. Internship in Agriculture. 1-12 units

Term Typically Offered: F, W, SP

CR/NC

Prerequisite: Consent of internship instructor.

Selected students will spend up to 12 weeks with an approved agricultural firm engaged in production or related business. Time will be spent applying and developing production and managerial skills and abilities. One unit of credit may be allowed for each full week of completed and reported internship. Credit/No Credit grading.

AG 350. The Global Environment. 4 units

Term Typically Offered: TBD

2020-21 or later: Upper-Div GE Area B

2019-20 or earlier catalog: GE Area B5, B6, or B7

Sustainability Focused

Prerequisite: Junior standing; completion of GE Area A with grades of C- or better; and completion of GE Areas B1 through B4, with a grade of C- or better in one course in GE Area B4 (GE Area B1 for students on the 2019-20 or earlier catalogs).

Interdisciplinary investigation of how human activities impact the Earth's environment on a global scale. Examination of population, resource use, climate change, and biodiversity from scientific/technical and social/economic/historical/political perspectives. Use of remote sensing maps. Sustainable solutions. Course may be offered in classroom-based, online, or hybrid format. 4 lectures. Crosslisted as AG/EDES/ENGR/GEOG/ISLA/SCM/UNIV 350. Fulfills GE Area Upper-Division B (GE Areas B5, B6, or B7 for students on the 2019-20 catalog).

AG 360. Holistic Management. 4 units

Term Typically Offered: F, W, SP

2020-21 or later: Upper-Div GE Area B

2019-20 or earlier catalog: GE Area B5, B6, or B7

Sustainability Focused

Prerequisite: Junior standing; completion of GE Area A with grades of C- or better; completion of GE Areas B1 through B4, with a grade of C- or better in one course in GE Area B4 (GE Area B1 for students on the 2019-20 or earlier catalogs).

Application of holistic management, a goal-oriented, value-driven framework for making ecologically, economically, and socially sound decisions. Holistic approach to management, especially of land-based resources, aimed toward greater biodiversity and sustainability. 3 lectures, 1 laboratory. Crosslisted as AG/ASCI 360. Fulfills GE Area Upper-Division B (GE Areas B5, B6, or B7 for students on the 2019-20 catalog).

AG 400. Special Problems for Advanced Undergraduates. 1-2 units

Term Typically Offered: F, W, SP

CR/NC

Prerequisite: Consent of rodeo coach/instructor.

Individual investigation, research, studies, or surveys of selected problems. Total credit limited to 4 units, with a maximum of 2 units per quarter. Credit/No Credit grading only.

AG 410. Advanced Agricultural Leadership Experience. 1 unit

Term Typically Offered: F, W, SP

Prerequisite: AG 210.

Activities that promote personal growth and development from a leadership perspective. Special attention on recruiting, organizing, and engaging volunteers. Teambuilding, cooperation, communication, problem solving, time management, and organization skills are emphasized. Guiding students in serving others in major student activities. The Class Schedule will list topic selected. Total credit limited to 2 units. 1 activity.

AG 412. Advanced Leadership Practice: Poly Royal Rodeo. 3 units

Term Typically Offered: W

CR/NC

Prerequisite: Consent of instructor.

Management and oversight of Poly Royal Rodeo during Cal Poly Open House. Proficiency in problem-solving as leaders and as a team. Discuss principles and procedures in planning, organizing, financing, promoting, and managing a major collegiate rodeo and the rodeo industry. Field trip may be required. Credit/No Credit grading only. 1 lecture, 2 activities.

AG 413. Committee Management: Poly Royal Rodeo. 2 units

Term Typically Offered: SP

Prerequisite: AG 412.

Continuation of AG 412. Oversight of volunteers, committee members and interacting with event attendees. Emphasis on leadership, problem solving and building a new management team. Annual evaluation of events and planning for future events while successfully mentoring new students. Field trip may be required. 1 lecture, 1 activity.

AG 452. Issues Affecting California Agriculture. 4 units

Term Typically Offered: W

Prerequisite: Junior standing.

Interactive seminars with speakers from government and industry covering policy and regulations affecting California agriculture. Students develop an understanding of agricultural policy and work in teams to develop a public presentation and position paper on a significant issue. Field trip to Sacramento required. 4 seminars.

AG 485. Cooperative Education Experience. 6 units

Term Typically Offered: TBD

CR/NC

Prerequisite: Sophomore standing and consent of instructor.

Part-time work experience in business, industry, government, and other areas of student career interest. Positions are paid and usually require relocation and registration in course for two consecutive quarters. Formal report and evaluation by work supervisor required. No major credit allowed; total credit limited to 12 units. Credit/No Credit grading only.

AG 495. Cooperative Education Experience. 12 units

Term Typically Offered: TBD

CR/NC

Prerequisite: Sophomore standing and consent of instructor.

Full-time work experience in business, industry, government, and other areas of student career interest. Positions are paid and usually require relocation and registration in course for two consecutive quarters. Formal report and evaluation by work supervisor required. No major credit allowed; total credit limited to 24 units. Credit/No Credit grading only.

AG 500. Individual Study. 1-6 units

Term Typically Offered: F, W, SP

Prerequisite: Consent of department head, graduate advisor and supervising faculty member.

Advanced independent study planned and completed under the direction of a member of the college faculty. Total credit limited to 6 units.

AG 539. Graduate Internship in Agriculture. 1-9 units

Term Typically Offered: F, W, SP

Prerequisite: Consent of internship instructor.

Application of theory to the solution of problems of agricultural production or related businesses in the field. Analyze specific management problems and perform general management assignments detailed in a contract between the student, the firm or organization, and the faculty advisor before the internship commences. Degree credit limited to 6 units.

AG 581. Graduate Seminar. 1 unit

Term Typically Offered: W, SP

CR/NC

Prerequisite: Graduate standing or consent of instructor.

Advanced topics in agriculture and natural resources. Group study of current research and industry trends. Invited speakers covering a variety of topics. Total credit limited to 3 units. 1 hour seminar.

AG 585. Cooperative Education Experience. 6 units

Term Typically Offered: TBD

CR/NC

Prerequisite: Graduate standing and consent of instructor.

Advanced study analysis and part-time work experience in student's career field; current innovations, practices, and problems in administration, supervision, and organization of business, industry, and government. Must have demonstrated ability to do independent work and research in career field. Total credit limited to 9 units. Credit/No Credit grading only.

AG 595. Cooperative Education Experience. 12 units

Term Typically Offered: TBD

CR/NC

Prerequisite: Graduate standing and consent of instructor.

Advanced study analysis and full-time work experience in student's career field; current innovations, practices, and problems in administration, supervision, and organization of business, industry, and government. Must have demonstrated ability to do independent work and research in career field. Total credit limited to 9 units. Credit/No Credit grading only.

AG 598. Reading and Conference. 1-12 units

Term Typically Offered: F, W, SP

CR/NC

Prerequisite: Graduate standing and instructor consent.

Systematic development of an agricultural thesis research project including literature searches, reports and experimental design. Repeatable for up to 12 units. Credit/No Credit grading only.

AG 599. Thesis. 1-9 units

Term Typically Offered: F, W, SP

Prerequisite: Graduate standing and consent of instructor.

Systematic research of a significant problem. Thesis will include problem identification, significance, methods, data analysis, and conclusion.

Students must enroll every quarter in which facilities are used or advisement is received. Degree credit limited to 6 units.