

# COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENTAL SCIENCES

Agricultural Sciences Bldg. (11), Room 211

Phone: 805.756.2161

<https://cafes.calpoly.edu>

Dean: Andy Thulin

Executive Associate Dean: Richard A. Cavaletto

Associate Dean: Nanine Van Draanen

Associate Dean: James P. Prince

Assistant Dean: Russ Kabaker

## Academic Programs

Program name	Program type
Agribusiness	Minor
Agricultural and Environmental Plant Sciences	BS
Agricultural Business	BS
Agricultural Communication	BS, Minor
Agricultural Education	MAGEd, Minor
Agricultural Leadership	Minor
Agricultural Science	BS
Agricultural Systems Management	BS
Agriculture	MS, Credential
Animal Science	BS
BioResource and Agricultural Engineering	BS
Crop Science	Minor
Dairy Products Technology	MPS
Dairy Science	BS, Minor
Environmental Earth and Soil Sciences	BS
Environmental Soil Science	Minor
Environmental Management and Protection	BS
Equine Science	Minor
Event Planning and Experience Management	Minor
Food Science	BS, Minor
Forestry and Natural Resources	BS
Forestry Sciences	MS
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
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, life sciences, and related professions.

### Mission Statement

The College of Agriculture, Food and Environmental Sciences uses a learn by doing approach to prepare leaders in agriculture, food systems, natural resources, and life sciences who are equipped to address the diverse needs of society.

### 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.

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, 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.

Academic advising is provided to all students through Academic Advising Centers and their major department in the college. Each student is assigned a faculty advisor. 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. Academic advising centers and resources provide guidance on university and college policies and procedures including course transfers, substitutions and other general information.

Student clubs are active in every department. The College's 43 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, putting greens and turf research plots, 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 and 600 acre Valencia Creek forest in Santa Cruz County were generously donated by Al Smith, alumnus of Cal Poly's former Crop Science Department. These properties provide 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.

### **Experiential Learning**

Students have many opportunities to participate in experiential learning activities which exemplify Cal Poly's "learn by doing" philosophy. For example, more than 80 percent of CAFES classes include laboratories or activity sessions. Enterprise projects offer students practical experience in animal, plant, and food production, processing, and research. Some of these are financially backed by the Cal Poly Corporation and offer students entrepreneurial experiences similar to those found in private industry.

## **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.

### **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.

### **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.

### **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 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.

### **Laboratory Safety**

Students are required to meet sanitation and safety regulations in laboratories. These regulations are explained by the instructor at the first meeting of the class.

## **Graduate Programs**

Agricultural Sciences Bldg., Room 211

Phone: 805.756.2161

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

Associate Dean: James P. Prince

[jpprice@calpoly.edu](mailto:jpprice@calpoly.edu)

## **General Characteristics**

Graduate studies in the College of Agriculture, Food and Environmental Sciences (CAFES) allow the student to pursue either a professional program designed to enhance the competencies of agricultural educators, or an academic program of graduate-level scholarly activities and research in one of several specializations. Graduates are prepared for:

- professional-level positions with business and industry, government, and foreign service in agriculture and related fields;
- continued graduate work at other institutions.

## **Admission/Acceptance Requirements – MS Only**

- File an application for Graduate Admission via <https://www2.calstate.edu/apply> by the deadlines specified at <https://admissions.calpoly.edu/applicants/graduate/process.html>
- Submit Graduate Record Exam (GRE) General Test scores electronically to Institution Code: R4038
- Three Letters of Recommendation

## Prerequisites

For consideration as a graduate student, an applicant will have completed a bachelor's degree from an accredited college/university with a minimum grade point average of 2.75 in the last 90-quarter units. An applicant who meets these standards but lacks prerequisite coursework may be admitted as a conditionally classified student and must make up any deficiencies before advancement to classified graduate standing.

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), taken within the last 2 years with a minimum score of 550 (paper version), 213 (computerized version), or 80 (internet based). Submit scores electronically to Institution Code: 4038. This requirement does not apply if your country of citizenship is listed on Cal Poly Admissions website: <https://admissions.calpoly.edu/applicants/international/checklist.html>

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

## Degree Requirements

**Formal Study Plan.** Graduate students must file the formal study plan for the degree with the CAFES Graduate Coordinator no later than the end of the quarter in which the 12<sup>th</sup> unit of approved courses is completed. The formal program of study must include at least 45 units of committee-approved graduate coursework; at least half of the units required by the committee as reflected on the formal study plan must be at the 500 level. Students should refer to the course descriptions in this catalog for credit limitations of individual courses; for example, total credit for AG 500, Individual Study, is limited to six units.

All candidates must meet the current Graduation Writing Requirement (<http://catalog.calpoly.edu/generalrequirementsbachelorsdegree/#generaleducationtext>). All Students are required to pass an oral comprehensive examination which is normally given during the final quarter of the program of study. A written comprehensive exam may also be required by the master's degree committee, but this is optional. For students in a thesis program the final oral comprehensive examination includes, but is not necessarily limited to, a defense of the thesis.

## Thesis

The thesis is based on independent, supervised research. Students should contact individual departments to determine the availability of funding support for their research. The final copy of the thesis must meet the standards explained in the "Manual of Instructions for the Preparation and Submission of the Master's Thesis or Master's Project" available from the Cal Poly Research and Graduate Programs Office. At least one course in statistical methods and/or experimental design is required of students in a thesis based curriculum.

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. All graduate students must be enrolled the quarter they graduate. Therefore,

a student graduating Summer quarter must be enrolled during the summer. Students can maintain continuous enrollment either by being enrolled as a regular student; obtaining approval for an education or medical leave prior to the quarter when such a leave would begin; or by registering in a special course designated for this purpose, during quarters in which they are not regularly enrolled. The special course GS 597 is taken through Cal Poly Extended Education. Credits in GS 597 do not count toward meeting degree requirements. 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. This requirement is not retroactive to terms prior to Fall 2009. For further information and a registration form, visiting the Extended Education (<http://www.extended.calpoly.edu>) website.

## MS Agriculture, Specialization in Animal Science

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. An individual's coursework and research project is focused based upon his or her interests and goals in Animal Science, and under the guidance of the advisor and thesis committee.

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 BioResource and Agricultural Systems

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

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

An applied program for students who desire to use their academic preparation in food science and nutrition, dairy science, microbiology, chemistry, engineering, biochemistry and related fields to address applied research questions of impact to the field of dairy 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. Students have opportunity to work on funded research projects of the Dairy Products Technology Center and interact with multidisciplinary teams of scientists from 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

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 Food Science

The program provides a variety of courses and research opportunities in the field of Food Science (FS). Research and problem-solving opportunities are available in food chemistry, food microbiology, food safety, sensory analysis, food processing, and food engineering. A thesis is required. Research areas vary with faculty expertise and interest; refer to Food Science and Nutrition Department and College of Agriculture, Food and Environmental Sciences web pages for more information on faculty research. Graduates are prepared for further study in doctoral programs or for responsible positions in food industries.

## MS Agriculture, Specialization in Irrigation

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

- B.S. or B.A. with proficiency in basic chemistry and math.

- Students must have successfully completed at least one undergraduate class in general irrigation, soil science, crop science, calculus, and hydraulics, plus be familiar with spreadsheets.

Students may complete prerequisite courses at Cal Poly if necessary.

## MS Agriculture, Specialization in Plant Protection Science

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 Soil Science

Provides graduate level knowledge and skills for soils interpretation and management, for teaching, or for continuation into a PhD program. Department facilities include modern instrumentation, laboratories, and a glasshouse. Students have access to several thousand acres of agricultural, forest, and range lands. Graduates meet educational requirements for professional certification by the American Registry of Certified Professionals in Agronomy, Crops, and Soils, and as Certified Professional Erosion and Sediment Control Specialists.

## MS Engineering, Specialization in Water Engineering

The College of Engineering and the BioResource and Agricultural Engineering Department jointly offer the Water Engineering Specialization under the M.S. Engineering. Please see College of Engineering (<http://catalog.calpoly.edu/collegesandprograms/collegeofengineering>) section of this catalog for more information.

## 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 (<http://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

*New program, effective Fall 2018*

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

Coordinator: Robert Flores

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 (<http://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:

Tom Mastin

Samantha Gill

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 (<http://catalog.calpoly.edu/collegesandprograms/collegeofagriculturefoodenvironmentalsciences/naturalresourcesmanagementenvironmentalsciences>) section.

## Land Rehabilitation and Restoration Ecology Minor

Natural Resources Management & Environmental Resources Department  
Bldg. 180, Room 515  
Phone: 805.756.1691

Coordinator: Chip Appel

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.

Each student is required to complete a hands-on rehabilitation or restoration field project that provides practical experience in recognizing, assessing, and treating a landscape disturbance. Before beginning the treatment phase, the student must prepare a written plan that includes a problem assessment, treatment design, anticipated outcome, and budget. This plan must be approved by the faculty advisor and the minor coordinator before land treatment begins. Project may be carried out individually or in small groups. Contact the minor coordinator for more details.

## 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, 85% of the developed water is used for irrigation. 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 the environment and water, the Water Science minor provides marketable skills.

## AG Courses

**AG 200. Special Problems for Undergraduates. 1-2 units**  
CR/NC

Term Typically Offered: F, W, SP

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: W

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. 1 lecture, 2 activities.

**AG 243. Theory and Practice of Rodeo. 2 units**

CR/NC

Term Typically Offered: F, W, SP

Prerequisite: Consent of rodeo coach/instructor.

Beginning through advanced skills in the event areas of college rodeo.

Areas include saddle bronc, bareback, and bull riding; calf, team, and breakaway roping; steer wrestling, goat tying, and barrel racing. Minimum of 10 hours of laboratory per week. Total credit limited to 8 units. Credit/No Credit grading. Enrollment limited to those qualified to compete in intercollegiate rodeo.

**AG 254. Introduction to Agricultural Leadership. 2 units**

Term Typically Offered: SP

Orientation to leadership development in agriculture and related settings. Principles and techniques for developing leadership skills, including exploration of personal characteristics, technical skills, interpersonal influence, commitment, goals, and power necessary for effective leaders. Issues facing leaders in agriculture. 2 lectures.

**AG 315. Organic Crop Production. 4 units**

GE Area F

Term Typically Offered: SP

Prerequisite: Junior standing and completion of GE Area B.

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. 3 lectures, 1 activity. Crosslisted as AEPS/AG 315. Fulfills GE Area F.

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

GE Area F

Term Typically Offered: TBD

Prerequisite: Junior standing; completion of GE Area A with a grade of C- or better; and completion of GE Area B.

Scientific investigation of the natural features of the Cal Poly landscape and their transformations by land management technology. Analysis of the environmental, economic, social, and political effects of agriculture, resource extraction, and construction technology on that landscape. Emphasis on the educational, land-use, and long term planning issues of technology presented by this case study. 4 lectures. Crosslisted as AG/ISLA/UNIV 330. Fulfills GE Area F.

**AG 339. Internship in Agriculture. 1-12 units**

CR/NC

Term Typically Offered: F, W, SP

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**

GE Area F

Term Typically Offered: F

Prerequisite: Junior standing; completion of GE Area A with a grade of C- or better; and completion of GE Area B.

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. 4 lectures. Crosslisted as AG/EDES/ENGR/GEORG/ISLA/SCM/UNIV 350. Fulfills GE Area F.

**AG 360. Holistic Management. 4 units**

GE Area F

Term Typically Offered: F, W, SP

Prerequisite: Junior standing and completion of GE Area B.

Application of holistic management, a goal-oriented, value-driven framework for making decisions that are ecologically, economically, and socially sound. Impact of technology and other tools on ecosystem processes. Holistic approach to management, especially of land-based resources, aimed toward greater biodiversity and sustainability. Not open to students with credit in AG 450. 3 lectures, 1 laboratory. Crosslisted as AG/ASCI 360. Fulfills GE Area F.

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

CR/NC

Term Typically Offered: F, W, SP

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

Prerequisite: AG 212.

Management and oversight of AG 212 and Poly Royal Rodeo. Emphasis on becoming proficient in working as leaders and as a team with a focus on problem-solving. Annual evaluation of events and planning for the following year's event while successfully mentoring new students. 1 lecture, 2 activities.

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

Term Typically Offered: SP

Prerequisite: AG 412.

Continued management of the Poly Royal Rodeo during Open House. Oversight of volunteers and committee members as well as interacting with attendees of the event. Emphasis on leadership and problem solving while working toward building a new management team. 1 lecture, 1 activity.

**AG 450. Applied Holistic Management. 4 units**

Term Typically Offered: F, W, SP

Prerequisite: One GE Area B2 course and junior standing.

Application of holistic management, a goal-oriented, value-driven framework for making decisions that are ecologically, economically, and socially sound. Impact of technology and other tools on ecosystem processes. Holistic approach to management, especially of land-based resources, aimed toward greater biodiversity and sustainability. Not open to students with credit in AG/ASCI 360. 3 lectures, 1 laboratory.

**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 454. Agricultural Leadership Capstone. 2 units**

Term Typically Offered: W

Prerequisite: AGED 404 and senior standing.

Culminating leadership experience. Appraise strengths and areas of personal growth, analyze effective strategies in leading others, examine collegiate experiences, and construct a leadership philosophy integrating the research-based leadership theory, skills and traits explored. 1 lecture, 1 activity.

**AG 485. Cooperative Education Experience. 6 units**

CR/NC

Term Typically Offered: TBD

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**

CR/NC

Term Typically Offered: TBD

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**

CR/NC

Term Typically Offered: W

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**

CR/NC

Term Typically Offered: TBD

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**

CR/NC

Term Typically Offered: TBD

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**

CR/NC

Term Typically Offered: F, W, SP

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.