

PLANT SCIENCES (BS)

Offered at: San Luis Obispo Campus

The Plant Sciences Department at Cal Poly offers students an opportunity not just to learn, but to learn-by-doing. Our students benefit from a broad spectrum of opportunities ranging from hands-on experiences in our fields, groves, nurseries, and greenhouses to real world application through internships and other collaborations with our industry partners. We also excel in providing a foundational plant science background and instilling a passion for plants, as we produce the next generation of leaders in plant sciences.

Students in this major begin with core courses that provide a thorough introduction to the various concentrations. Each concentration, in turn, has required courses and electives, which may be shared by other concentrations. In their first year, students explore curricular and professional opportunities to enable them to choose a concentration. In consultation with professional and faculty advisors, students have the flexibility to select electives within the concentrations according to their career goals and interests.

Internships are readily available to students and are highly recommended. Interns are typically placed with private industry or public facilities across the United States but may also take place in foreign countries.

Program alumni are employed nationally and internationally and are often leaders in their industries. Many pursue careers in research and development or go on to attend graduate school in related fields. Graduates of the department are in great demand. Typically there are more internship and job opportunities than there are students and graduates to fill them.

Concentrations

Fruit and Crop Science

Offered at: San Luis Obispo Campus

The Fruit and Crop Science concentration provides students with detailed knowledge of the production of tree fruits and nuts, small fruits, vegetables and other row crops, and forages. The concentration details key factors influencing the growth, development, and productivity of these crops (e.g., site selection, cultivar selection, field and plant establishment, pest management, harvesting, and postharvest handling). The concentration also focuses on ongoing and newly emerging specialty industries and concerns such as beekeeping, food safety, plant breeding and biotechnology, integrated (sustainable) pest management, and precision agriculture.

Environmental Horticultural Science

Offered at: San Luis Obispo Campus

This concentration offers students a comprehensive preparation for positions in the nursery, turf, greenhouse, landscape, and floriculture industries, including public horticulture. Graduates are employed as business owners, growers, managers, researchers, educators, arboreta and botanical garden directors, landscape contractors and designers, landscape management professionals, pest control advisors, and park and green space managers. The curriculum stresses production and marketing of nursery plants, fresh flowers, and flowering and foliage plants, landscape contracting, design, installation and management, turf installation and management, integrated (sustainable) pest management, and horticultural education, native plant restoration, green roofs and walls, and the public display of plants.

Plant Protection Science

Offered at: San Luis Obispo Campus

Approximately one-third of the world's food crops are destroyed each year by insects, rodents, diseases and other pests. Finding ways to reduce these losses is the challenge of the plant protection specialist. In this concentration, students learn a broad range of pest management subjects including entomology, plant pathology, and weed control, all of which employ the integrated (sustainable) pest management approach, which seeks to provide acceptable pest management that minimizes environmental, social, and economic impacts. Students develop an understanding of crop production principles, ecology, biotechnology, pesticide toxicology and environmental science. Employment opportunities continue to grow for those holding professional licenses, and this concentration prepares students to take the California Pest Control Advisor (PCA) and Certified Crop Advisor (CCA) license exams.

Program Learning Objectives

1. Demonstrate technical competence in their concentration by identifying the majority of globally important food, and/or ornamental plants and demonstrating applications of theoretical sciences to their production, maintenance and post-harvest handling.
2. Effectively evaluate and adapt basic cultural practices, economic uses, and environmental interactions in the production of food, fiber, or ornamental plants.
3. Assess and implement appropriate sustainable growing and/or horticultural design practices based on region and microclimate, especially as they relate to water, soil and other natural resources.

4. Make informed and ethical decisions regarding environmental, social, and economic impacts of horticultural and agricultural activities and will contribute to their professions' continued relevancy by identifying, evaluating and responding to changing public perceptions, governmental regulations and industry challenges.
5. Practice a range of complex problem-solving exercises and excel in diagnosing and resolving plant health issues in outdoor and enclosed plant production systems.
6. Organize, synthesize, evaluate, and reconfigure information about complex, multivariate, living systems to gain new insights and communicate their findings to multiple stakeholder groups clearly, scientifically, and ethically.

Degree Requirements and Curriculum

In addition to the program requirements listed on this page, students must also satisfy requirements outlined in more detail in the Minimum Requirements for Graduation (<https://catalog.calpoly.edu/academic-standards-policies/general-requirements-bachelors-degree/>) section of this catalog, including:

- 40 units of upper-division courses
- 2.0 GPA
- Graduation Writing Requirements (GWR)
- U.S. Cultural Pluralism (USCP)

Note: No Major, Support or Concentration courses may be selected as credit/no credit. In addition, no more than 12 units of cooperative or internship courses can count towards your degree requirements.

Code	Title	Units
MAJOR COURSES		
PLSC 1101	Orientation to Plant Sciences	1
PLSC 1120 & 1120L	Principles of Plant Sciences and Principles of Plant Sciences Lab	3
PLSC 1124	Plant Propagation	3
PLSC 3304	Introduction to Plant Breeding	3
PLSC 3313	Agricultural Entomology	3
PLSC 3321	Weed Biology and Management	4
PLSC 3323	Plant Pathology	3
PLSC 3351	Experimental Techniques and Analysis	3
PLSC 4410	Crop Physiology	3
PLSC 4461	Senior Project I	1
PLSC 4462	Senior Project II	1
Concentration		
(See list of Concentrations below)		37
SUPPORT COURSES		
BOT 1121	General Botany (5B & 5C) ¹	4
BRAE 3340	Irrigation Water Management (Upper-Division 2/5) ¹	3
CHEM 1120	Fundamentals of Chemical Structure and Properties (5A) ¹	4
MATH 1006	College Algebra (2) ¹	3
SS 1120	Introductory Soil Science	4
SS 2221	Soil Health and Plant Nutrition	4
STAT 1110	Applied Statistical Concepts and Methods	3
GENERAL EDUCATION (GE)		
(See GE program requirements below)		30
FREE ELECTIVES		
Free Electives		0
Total Units		120

¹ Required in Major or Support; also satisfies General Education (GE) requirement.

Concentrations

Fruit and Crop Science

Code	Title	Units
REQUIRED COURSES		
PLSC 1132	Introduction to Fruit Crop Production	4
PLSC 1150	California Row Crop Production	4
PLSC 2244	Precision Farming	3
PLSC 3360	Advanced Fruit Crop Production	4
PLSC 4420	Organic Crop Production Systems	3
Enterprise Course		
PLSC 2205 or PLSC 3333	Orchard and Vegetable Enterprise Project Greenhouse Vegetable Production	2
Approved Electives		
Select from the following: ¹		17
Select any AGB or ECON courses ²		
Select any BRAE courses ²		
Select any CHEM or MICRO courses ²		
Select any SPAN courses ²		
FSN 2245	Elements of Food Safety	
PLSC 1175	Beekeeping	
PLSC 2200	Special Problems for Undergraduates ²	
PLSC 2232/WVIT 2233	Basic Viticulture	
PLSC/WVIT 3331	Advanced Viticulture - Fall	
PLSC 3333	Greenhouse Vegetable Production	
PLSC 3337/WVIT 3332	Advanced Viticulture - Spring	
PLSC 3339	Internship in Plant Sciences ³	
PLSC/SS 3444	Climate Smart Agriculture	
PLSC 4400	Special Problems for Advanced Undergraduates ²	
PLSC 4406	Advanced Weed Management	
PLSC 4421	Postharvest Technology	
PLSC 4427	Disease and Pest Control Systems for Ornamental Plants	
PLSC 4428	Advanced Plant Pathology	
PLSC 4431	Integrated Pest Management for Insects	
PLSC 4441	Biological Control for Pest Management	
PLSC 4450	Current Issues in the Strawberry Industry	
SS 3321	Soil Morphology	
WVIT 4414	Grape Pest Management	
Total Units		37

¹ A minimum of 9 units must be taken at the 3000-4000 level.

² A maximum of 3 units may count towards Approved Electives.

³ A maximum of 4 units may count towards Approved Electives.

Environmental Horticultural Science

Code	Title	Units
REQUIRED COURSES		
PLSC 1123	Introduction to Sustainable Site Horticulture	3
PLSC 2234	Introduction to Plant Materials	3
PLSC 3301	Horticultural Production Techniques	3
PLSC 3332	Sustainable Site Design and Systems	3
PLSC 3334	Advanced Plant Materials	3
PLSC 3340	Principles of Greenhouse Environments	3

PLSC 4427	Disease and Pest Control Systems for Ornamental Plants	4
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Approved Electives

Select from the following:	15
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Select any AGB or ECON courses ¹

Select any BRAE courses ¹

Select any CHEM or MICRO courses ¹

Select any SPAN courses ¹

PLSC 2200	Special Problems for Undergraduates ¹
PLSC 2212	Environmental Horticulture Enterprise Project
PLSC 2225	Floral Design
PLSC 3333	Greenhouse Vegetable Production
PLSC 3339	Internship in Plant Sciences ²
PLSC 4400	Special Problems for Advanced Undergraduates ¹
PLSC 4420	Organic Crop Production Systems
PLSC 4425	Arboriculture
PLSC 4428	Advanced Plant Pathology
PLSC 4437	Sustainable Landscape Management
PLSC 4441	Biological Control for Pest Management
PLSC 4450	Current Issues in the Strawberry Industry

Total Units	37
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¹ A maximum of 3 units may count towards Approved Electives.

² A maximum of 4 units may count towards Approved Electives.

Plant Protection Science

Code	Title	Units
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REQUIRED COURSES

PLSC 4406	Advanced Weed Management	4
PLSC 4427	Disease and Pest Control Systems for Ornamental Plants	4
PLSC 4428	Advanced Plant Pathology	3
PLSC 4431	Integrated Pest Management for Insects	3
PLSC 4441	Biological Control for Pest Management	3

Enterprise course

Select from the following:	2
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PLSC 2205	Orchard and Vegetable Enterprise Project
PLSC 2212	Environmental Horticulture Enterprise Project
PLSC 3333	Greenhouse Vegetable Production

Approved Electives

Select from the following:	18
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Select any AGB or ECON courses ¹

Select any BRAE courses ¹

Select any CHEM or MCRO courses ¹

Select any SPAN courses ¹

FSN 2245	Elements of Food Safety
PLSC 1132	Introduction to Fruit Crop Production
PLSC 1150	California Row Crop Production
PLSC 1175	Beekeeping
PLSC 2200	Special Problems for Undergraduates ¹
PLSC 2232/WVIT 2233	Basic Viticulture
PLSC 2244	Precision Farming
PLSC/WVIT 3331	Advanced Viticulture - Fall
PLSC 3333	Greenhouse Vegetable Production

PLSC 3337/WVIT 3332	Advanced Viticulture - Spring
PLSC 3339	Internship in Plant Sciences ²
PLSC 3360	Advanced Fruit Crop Production
PLSC/SS 3444	Climate Smart Agriculture
PLSC 4400	Special Problems for Advanced Undergraduates ¹
PLSC 4421	Postharvest Technology
PLSC 4450	Current Issues in the Strawberry Industry
WVIT 4414	Grape Pest Management

Total Units
37
¹ A maximum of 3 units may count towards Approved Electives.

² A maximum of 4 units may count towards Approved Electives.

General Education (GE) Requirements

- 43 units required, 13 of which are specified in Major and/or Support.
- If any of the remaining 30 Units is used to satisfy a Major or Support requirement, additional units of Free Electives may be needed to complete the total units required for the degree.
- See the complete GE course listing (<https://catalog.calpoly.edu/academic-standards-policies/general-requirements-bachelors-degree/#generaleducationtext>).
- A grade of C- or better is required in one course in each of the following GE Areas: 1A (English Composition), 1B (Critical Thinking), 1C (Oral Communication), and 2 (Mathematics and Quantitative Reasoning).

Lower-Division General Education

Area 1	English Communication and Critical Thinking	
1A	Written Communication	3
1B	Critical Thinking	3
1C	Oral Communication	3
Area 2	Mathematics and Quantitative Reasoning	
2	Mathematics and Quantitative Reasoning (3 units in Support) ¹	0
Area 3	Arts and Humanities	
3A	Arts	3
3B	Humanities: Literature, Philosophy, Languages other than English	3
Area 4	Social and Behavioral Sciences (Area 4 courses must come from at least two different course prefixes.)	
4A	American Institutions (Title 5, Section 40404 Requirement)	3
4B	Social and Behavioral Sciences	3
Area 5	Physical and Life Sciences	
5A	Physical Sciences (3 units in Support) ¹	0
5B	Life Sciences (3 units in Support) ¹	0
5C	Laboratory (may be embedded in a 5A or 5B course) (1 units in Support) ¹	0
Area 6	Ethnic Studies	
6	Ethnic Studies	3

Upper-Division General Education

Upper-Division 2/5	Mathematics and Quantitative Reasoning or Physical and Life Sciences (3 units in Support) ¹	0
Upper-Division 3	Arts and Humanities	3
Upper-Division 4	Social and Behavioral Sciences (Area 4 courses must come from at least two different course prefixes.)	3

Total Units
30
¹ Required in Major or Support; also satisfies General Education (GE) requirement.

Coming soon