PLANT SCIENCES, BACHELOR OF SCIENCE

College of Agricultural & Environmental Sciences

The Major Program

The Plant Sciences major is designed for students who are interested in a scientific understanding of how plants grow and develop in managed agricultural ecosystems and how plant products are utilized for food, fiber and environmental enhancement. Advances in science and technology have provided new insights and options for using plants to address the issues associated with providing renewable food, fiber and energy resources for a growing global population while minimizing adverse impacts on the natural environment. Graduates in Plant Sciences are able to apply their skills and knowledge to a diverse range of agricultural and environmental goals or pursue advanced degrees in plant sciences.

The Program

The curriculum provides depth in the biological and physical sciences and a sound understanding of how plants obtain and utilize resources from their environment to sustain their growth and development. The influences of genetics, management systems and environmental inputs on crop development and productivity are emphasized along with the postharvest preservation and marketing of plant products. Students will develop an area of specialization with options in Crop Production, Plant Genetics & Breeding, or Postharvest Biology & Technology. An Individual option is also available to match specific subject matter or career goal interests in the plant sciences. All students gain practical experience through a combination of practical laboratory courses and internships. Students may also pursue an Honors thesis in their senior year.

Lead Faculty Advisor

Daniel Potter (https://www.plantsciences.ucdavis.edu/people/daniel-potter/)

Advising for the major is located in 1220 Plant & Environmental Sciences; plsadvising@ucdavis.edu. For more information, see Undergraduate Advising.

Career Alternatives

Graduates from this program are prepared to pursue a wide range of careers, including various technical and management positions in agricultural & business enterprises, farming, or consulting; public, private & non-profit agencies; Cooperative Extension; international development; teaching; or agricultural & environmental journalism and communication services. Graduates are qualified to pursue graduate studies in the natural and agricultural sciences, such as plant biology, genetics, breeding, horticulture, agronomy, biotechnology, ecology, environmental studies, pest management, education, or business management.

Code	Title	Units
Preparatory Subject Matter		
Biological Science		*10*
BIS 002A	Introduction to Biology: Essentials of Life on Earth	
BIS 002B	Introduction to Biology: Principles of Ecology & Evolution	
Plant Sciences & Statistics		*12*
PLS 002	Botany & Physiology of Cultivated Plants	
PLS 003	Seminar: Overview of the Plant Sciences Major	
PLS 021	Application of Computers in Technology	
or PLS 021V	Application of Computers in Technology	
PLS 120	Applied Statistics in Agricultural Sciences	
Chemistry		*16-22*
CHE 002A	General Chemistry	
CHE 002B	General Chemistry	
Choose a series:		
CHE 008A	Organic Chemistry: Brief Course	
CHE 008B	Organic Chemistry: Brief Course	
OR		
CHE 118A	Organic Chemistry for Health & Life Sciences	
CHE 118B	Organic Chemistry for Health & Life Sciences	
CHE 118C	Organic Chemistry for Health & Life Sciences	
Physics		*12*
PHY 007A	General Physics	
PHY 007B	General Physics	
PHY 007C	General Physics	
Mathematics		*8*
MAT 017A	Calculus for Biology & Medicine	
MAT 017B	Calculus for Biology & Medicine	
Preparatory Subject Matter Subtotal		58-64
Depth Subject Matter		
Soil Science		*5*
SSC 100	Principles of Soil Science	
Plant Science		*25*
PLS 100A	Metabolic Processes of Cultivated Plants	
PLS 100B	Growth & Yield of Cultivated Plants	
PLS 100C	Environmental Interactions of Cultivated Plants	
PLS 100AL	Metabolic Processes of Cultivated Plants Laboratory	
PLS 100BL	Growth & Yield of Cultivated Plants Laboratory	
PLS 100CL	Environmental Interactions of Cultivated Plants Laboratory	
PLS 101	Agriculture & the Environment	
PLS 152	Plant Genetics	
PLS 192	Internship (Capstone Experience: Internship/Research Report)	
or PLS 199	Special Study for Advanced Undergraduates	
Restricted electives; choose at least two from two different categories:		*7-10*
Plant Diversity/Evolution/Taxonomy		
ENH 105	Taxonomy & Ecology of Environmental Plant Families	
EVE 100	Introduction to Evolution	
PLB/PLS 102	California Floristics (Discontinued)	

PLB/EVE 108	Systematics & Evolution of Angiosperms (Discontinued)	
PLB 143	Evolution of Crop Plants	
PLS/PLB 116	Plant Morphology & Evolution	
Ecology		
PLB/EVE 117	Plant Ecology	
PLS 150	Sustainability & Agroecosystem Management	
ENH 160 series:		
ENH 160	Restoration Ecology	
ENH 160L	Restoration Ecology Laboratory	
PLS 147 series:		
PLS 147	California Plant Communities	
PLS 147L	California Plant Communities Field Study	
Pest Management		
PLP 120	Introduction to Plant Pathology	
ENT 110	Arthropod Pest Management	
NEM 100	Plant Nematology	
PLS 105	Concepts in Pest Management	
PLS 176	Introduction to Weed Science	
PLB/EVE 119	Population Biology of Invasive Plants & Weeds	
Depth Subject Matter Subtotal		37-40
Areas of Specialization; choose one:		**21-34**
In consultation with an advisor, a student may complete requirements for more than one specialization, which can be noted on the student's transcript.		
Crop Production & Agroecology Option (p. 2)		
Crop Quality and Safety Option (p. 2)		
Ecological Management & Restoration Option (p. 3)		
Environmental Horticulture & Urban Landscape Management Option (p. 3)		
Individual Option (p. 3)		
Plant Breeding, Genetics, & Genomics Option (p. 3)		
Plant Informatics Option (p. 4)		
Total Units		**116-138**

Areas of Specialization

Crop Production & Agroecology Option

Code	Title	Units
Required Major Electives; not included in AOS unit count:		
PLS 150	Sustainability & Agroecosystem Management	
Required courses:		**8**
HYD 124	Plant-Water-Soil Relationships	
PLS 158	Mineral Nutrition of Plants	
Production; choose two:		**4-9**
ENH 120	Management of Container Media	
ENH 125	Greenhouse & Nursery Crop Production	
PLS 007	Just Coffee: The Biology, Ecology & Socioeconomic Impacts of the World's Favorite Drink	
or PLS 007V	Just Coffee: The Biology, Ecology & Socioeconomic Impacts of the World's Favorite Drink	
PLS 049	Organic Crop Production Practices	
PLS 110	Crop Management Systems for Vegetable Production	
PLS 111	Principles of Agronomic Crop Production Systems	
PLS 112	Forage Crop Production	
PLS 113	Biological Applications in Fruit Tree Management	
PLS 114	Biological Applications in Fruit Production	
PLS/ESM 144	Trees & Forests	
PLS/IAD 160	Agroforestry: Global & Local Perspectives	
PLS 170A	Fruit & Nut Cropping Systems	
PLS 170B	Fruit & Nut Cropping Systems	
PLS 171	Principles & Practices of Plant Propagation	
Advanced Soil Science; choose one:		**3-4**
SSC 102	Environmental Soil Chemistry	
SSC 109	Sustainable Nutrient Management	
SSC 111	Soil Microbiology	
SSC 112	Soil Ecology	
Global Food Systems; choose one:		**4**
ARE 015	Population, Environment & World Agriculture	
CRD 020	Food Systems	
IAD 010	Introduction to International Agricultural Development	
Pest Management; choose one in addition to core:		**3-5**
ENT 110	Arthropod Pest Management	
NEM 100	Plant Nematology	
PLB/EVE 119	Population Biology of Invasive Plants & Weeds	
PLP 120	Introduction to Plant Pathology	
PLS 105	Concepts in Pest Management	
PLS 176	Introduction to Weed Science	
VEN 118	Grapevine Pests, Diseases & Disorders	
Outreach & Communication; choose one:		**4**
EDU 142	Introduction to Environmental Education	
Total Units		**26-34**

Crop Quality & Safety Option

Code	Title	Units
Required Courses:		**14**
PLS 172	Biology and Quality of Harvested Crops	
PLS 173	Molecular & Cellular Aspects of Postharvest Biology (Discontinued)	
PLS 174	Microbiology & Safety of Fresh Fruits & Vegetables	
PLS 196	Postharvest Technology of Horticultural Crops (Discontinued)	
Depth; choose 8 units:		**8**
FST 117	Design & Analysis for Sensory Food Science	

ARE 100A	Intermediate Microeconomics: Theory of Production & Consumption	
FST 109	Principles of Quality Assurance in Food Processing	
PLS 006	Flower Power; Art & Science of Flowers & Their Uses	
or PLS 006V	Flower Power; Art & Science of Flowers & Their Uses	
PLS 007	Just Coffee: The Biology, Ecology & Socioeconomic Impacts of the World's Favorite Drink	
or PLS 007V	Just Coffee: The Biology, Ecology & Socioeconomic Impacts of the World's Favorite Drink	
FST 131	Food Packaging	
PLS 113	Biological Applications in Fruit Tree Management	
PLS 114	Biological Applications in Fruit Production	
Total Units		**22**

Ecological Management & Restoration Option

Code	Title	Units
Required Major Electives (not included in AOS unit count):		
PLS/PLB 102	California Floristics (Discontinued)	
Ecological Management & Restoration; choose at least four:		**12-17**
PLB/EVE 119	Population Biology of Invasive Plants & Weeds	
ENH 120	Management of Container Media	
PLS 130	Grassland Ecology	
PLS 135	Ecology & Community Structure of Grassland & Savannah Herbivores (Discontinued)	
ESM 141	Role of Fire in Natural Ecosystems	
PLS/ESM 144	Trees & Forests	
PLS 147 & 147L	California Plant Communities and California Plant Communities Field Study	
PLS 150	Sustainability & Agroecosystem Management	
ESP 155	Wetland Ecology	
ENH 160 & 160L	Restoration Ecology and Restoration Ecology Laboratory	
PLS 162	Urban Ecology	
PLS 163	Ecosystem & Landscape Ecology	
PLS 171	Principles & Practices of Plant Propagation	
Environmental Analysis, Monitoring, & Policy; choose at least two:		**7-9**
ESM 108	Environmental Monitoring	
LDA/ABT 150	Introduction to Geographic Information Systems	
ESP 160	The Policy Process	
ESP 172	Public Lands Management	
ESP 179	Environmental Impact Assessment	
Outreach & Communication; choose one:		**3-4**
EDU 142	Introduction to Environmental Education	
Internship:		**2**
PLS 164	(Discontinued)	
PLS 192	Internship	
Total Units		**24-32**

Environmental Horticulture & Urban Landscape Management Option

Code	Title	Units
Required Major Electives; not included in AOS unit count:		
ENH 105	Taxonomy & Ecology of Environmental Plant Families	
PLS 105	Concepts in Pest Management	
Required Courses:		**8**
PLS 162	Urban Ecology	
PLS 157	Physiology of Environmental Stresses in Plants	
Depth		
Choose at least three of the following:		*9-13*
ENH 100	Urban Forestry	
ENH 133	Woody Plants in the Landscape: Growth, Ecology & Management	
SSC 112	Soil Ecology	
LDA/ABT 150	Introduction to Geographic Information Systems	
ENH 120	Management of Container Media	
ENH 125	Greenhouse & Nursery Crop Production	
PLS 171	Principles & Practices of Plant Propagation	
PLS 158	Mineral Nutrition of Plants	
PLS 123	Introduction to Plant & Crop Systems Modeling	
Choose one:		*4*
ESP 171	Urban & Regional Planning	
ESP 179	Environmental Impact Assessment	
Total Units		**21-25**

Individual Option

Code	Title	Units
Choose a minimum of 23 upper division units, with approval from the master advisor, to form a coherent program of study resulting in expertise and competence in a sub-discipline of plant sciences.		23
Total Units		**23**

Plant Breeding, Genetics, & Genomics Option

Code	Title	Units
Required courses:		**18**
BIS 101	Genes & Gene Expression	
BIT 160	Principles of Plant Biotechnology	
BIT 161B	Plant Genetics & Biotechnology Laboratory	
BIT 171	Professionalism & Ethics in Genomics & Biotechnology	
PLS 154	Introduction to Plant Breeding	
Production; choose one:		**2-5**
ENH 120	Management of Container Media	
ENH 125	Greenhouse & Nursery Crop Production	

PLS 007	Just Coffee: The Biology, Ecology & Socioeconomic Impacts of the World's Favorite Drink
or PLS 007V	Just Coffee: The Biology, Ecology & Socioeconomic Impacts of the World's Favorite Drink
PLS 049	Organic Crop Production Practices
PLS 110	Crop Management Systems for Vegetable Production
PLS 111	Principles of Agronomic Crop Production Systems
PLS 112	Forage Crop Production
PLS 113	Biological Applications in Fruit Tree Management
PLS 114	Biological Applications in Fruit Production
PLS/ESM 144	Trees & Forests
PLS/IAD 160	Agroforestry: Global & Local Perspectives
PLS 170A	Fruit & Nut Cropping Systems
PLS 170B	Fruit & Nut Cropping Systems
PLS 171	Principles & Practices of Plant Propagation
Restricted Elective; choose one:	**3-5**
Choose one additional course from either Production or Depth Subject Matter.	
Total Units	**23-28**

Plant Informatics Option

Code	Title	Units
Required courses:		**15**
PLS 124	Introduction to Digital Agriculture	
PLS 125	Proximal & Remote Sensing of Plants	
PLS 123	Introduction to Plant & Crop Systems Modeling	
BIT 150	Applied Bioinformatics	
Depth; choose three:		**11-12**
PLS 105	Concepts in Pest Management	
ABT/LDA 150	Introduction to Geographic Information Systems	
PLS 150	Sustainability & Agroecosystem Management	
PLS 157	Physiology of Environmental Stresses in Plants	
PLS 158	Mineral Nutrition of Plants	
HYD 124	Plant-Water-Soil Relationships	
Total Units		**26-27**