

PLANT BIOLOGY, BACHELOR OF SCIENCE

College of Biological Sciences

As organisms that sequester carbon and convert solar energy into oxygen, sugar and other usable forms, plants are a primary source of food and myriad biomaterials on the planet and function as an important buffer against climate change. The Plant Biology major focuses on fundamental aspects of how plants function as organisms and interact with their environment, and the use of this knowledge to address global challenges. A wide variety of scientific disciplines are integrated within the Plant Biology major, including physiology, cell and molecular biology, development, genetics and genomics.

The Program

The Plant Biology major consists of a biological sciences core covering the general principles of biology plus three plant-specific classes dealing with advanced aspects of plant biology including physiology, development, and anatomy. Electives allow students to tailor the degree to suit their interests. Independent research in a laboratory setting is a requirement, and students in the Plant Biology B.S. major are guaranteed this opportunity. Because of the value of plants as a model system for research in molecular genetics, cell biology, and biochemistry, Plant Biology also can make an excellent minor or second major for student in these fields.

Career Alternatives

A degree in Plant Biology serves as an excellent launching point for a wide range of career options, including domestic and international opportunities in business, research, management, and teaching in both governmental and private sectors. The program is excellent preparation for students wishing to enter graduate or other professional schools, including medicine, law (particularly environmental or patent law) or journalism. Plant biologists can work in the laboratory, in the field, in the forest, in botanical gardens or nurseries, in agricultural companies, or in biotechnology, pharmaceutical, energy or chemical industries, or in the area of environmental protection.

Honors & Honors Programs

Students on the honors list may elect to include a maximum of 5 units of 194H in their major programs. For Dean's Honors List information, see the Honors & Awards (<https://catalog.ucdavis.edu/academic-information-policies-regulations/honors-awards/>) for the appropriate College section.

Faculty Advisor

Philipp Zerbe, Ph.D.

Graduate Study

Consult Plant Biology (Graduate Group) (<https://catalog.ucdavis.edu/departments-programs-degrees/plant-biology-graduate-group/>).

The major requirements below are in addition to meeting University Degree Requirements (<https://catalog.ucdavis.edu/undergraduate-education/university-degree-requirements/>) & College Degree Requirements (<https://catalog.ucdavis.edu/undergraduate-education/college-degree-requirements/>); unless otherwise noted. The minimum number of units required for the Plant Biology Bachelor of Science is 99.

Code	Title	Units
Preparatory Subject Matter		
<i>Biological Science</i>		15
BIS 002A & BIS 002B & BIS 002C	Introduction to Biology: Essentials of Life on Earth and Introduction to Biology: Principles of Ecology & Evolution and Introduction to Biology: Biodiversity & the Tree of Life	
<i>Chemistry</i>		15
Choose the 002 series or 004 series:		
CHE 002A & CHE 002B & CHE 002C	General Chemistry and General Chemistry and General Chemistry	
OR		
CHE 004A & CHE 004B & CHE 004C	General Chemistry for the Physical Sciences & Engineering and General Chemistry for the Physical Sciences & Engineering and General Chemistry for the Physical Sciences & Engineering	
Choose the 008 or 118 series: ¹		6-12
CHE 008A & CHE 008B	Organic Chemistry: Brief Course and Organic Chemistry: Brief Course	
OR		
CHE 118A & CHE 118B & CHE 118C	Organic Chemistry for Health & Life Sciences and Organic Chemistry for Health & Life Sciences and Organic Chemistry for Health & Life Sciences	
<i>Mathematics</i>		8-12
Choose the 017 series or 021 series: ²		
MAT 017A & MAT 017B & MAT 017C	Calculus for Biology & Medicine and Calculus for Biology & Medicine and Calculus for Biology & Medicine	
OR		
MAT 021A & MAT 021B & MAT 021C	Calculus and Calculus and Calculus (Recommended)	
<i>Physics</i>		12
PHY 007A & PHY 007B & PHY 007C	General Physics and General Physics and General Physics	
Preparatory Subject Matter Subtotal		56-66
Depth Subject Matter		
<i>Biological Sciences</i>		
BIS 101 or BIS 101V	Genes & Gene Expression	4
BIS 104	Cell Biology	3
BIS 105 or (BIS 102 OR BIS 102V) & BIS 103	Biomolecules & Metabolism and Bioenergetics & Metabolism	3-6
<i>Statistics</i>		
STA 100	Applied Statistics for Biological Sciences	4
<i>Plant Biology</i>		

PLB 105	Developmental Plant Anatomy	5
PLB 111	Plant Physiology	3
PLB 112	Plant Growth & Development	3
<i>Research Internship</i>		
Choose 3 units:		3
PLB 092	Internship	
PLB 099	Special Study for Undergraduates	
PLB 192	Internship	
PLB 199	Special Study for Advanced Undergraduates	
OR Equivalent		
<i>Restricted Electives</i>		
Upper division courses in plant biology or other fields relevant to the student's interest chosen from the course lists below. Course in other departments may be allowed upon prior consultation with a PLB faculty advisor.		15
Depth Subject Matter Subtotal		43-46
Course Lists		
Ecology (p. 2)		
Evolution & Diversity (p. 2)		
Plant Genetics (p. 2)		
Plant Physiology, Development, & Molecular Biology (p. 2)		
Total Units		99-112

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With BASC advisor approval, these combinations also satisfy the Organic Chemistry requirement:

- CHE 118A-CHE 008B.
- CHE 128A-CHE 128B-CHE 008B.
- CHE 128A-CHE 118B-CHE 118C.
- CHE 128A-CHE 128B-CHE 129A-CHE 118C.
- CHE 118A-CHE 128B-CHE 128C-CHE 129A-CHE 129B.
- CHE 118A-CHE 118B-CHE 128C-CHE 129B.

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With BASC advisor approval, this combination also satisfies the Mathematics requirement: MAT 021A-MAT 017B-MAT 017C.

Ecology

Code	Title	Units
ESP 121	Population Ecology	4
ESP 123	Introduction to Field & Laboratory Methods in Ecology	4
ESP 151	Limnology	4
ESP 151L	Limnology Laboratory	3
ESP 155	Wetland Ecology	4
ESP 155L	Wetland Ecology Laboratory (Discontinued for winter 2026) **	3
EVE 101	Introduction to Ecology	4
EVE 131	Human Genetic Variation & Evolution	3
EVE 138	Ecology of Tropical Latitudes (Discontinued for winter 2026) **	5
HYD 124	Plant-Water-Soil Relationships	4
PLB/EVE 117	Plant Ecology	4

PLB/EVE 119	Population Biology of Invasive Plants & Weeds	3
PLP 150	Fungal Ecology (Discontinued for fall 2026) **	3
PLS 112	Forage Crop Production	3
PLS 130	Grassland Ecology	3
PLS 131	(Discontinued for summer 2023) **	2
PLS/ESM 144	Trees & Forests	4

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Course(s) discontinued; see your advisor for course options.

Evolution & Diversity

Code	Title	Units
BIS 180L	Genomics Laboratory	5
BIS 181	Comparative Genomics	3
EVE 100	Introduction to Evolution	4
EVE 102	Population & Quantitative Genetics	4
EVE/PLB 108	(Discontinued for winter 2024) **	5
EVE 140	Paleobotany	4
EVE 149	Evolution of Ecological Systems (Discontinued for winter 2026) **	4
PLB/PLS 102	(Discontinued for winter 2024) **	5
PLB/EVE 108	(Discontinued for winter 2024) **	5
PLB/PLS 116	Plant Morphology & Evolution	5
PLB 143	Evolution of Crop Plants	4
PLB/PLP 148	Introductory Mycology	4
PLS 131	(Discontinued for summer 2023) **	2

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Course(s) discontinued; see your advisor for course options.

Plant Genetics

Code	Title	Units
BIS 180L	Genomics Laboratory	5
BIS 181	Comparative Genomics	3
BIS 183	Functional Genomics	3
EVE 100	Introduction to Evolution	4
EVE 102	Population & Quantitative Genetics	4
MCB 164	(Discontinued for spring 2025) **	3
PLB 113	Molecular & Cellular Biology of Plants	3
PLP/ENT/PLB 123	Plant-Virus-Vector Interaction	3
PLS 152	Plant Genetics	4

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Course(s) discontinued; see your advisor for course options.

Plant Physiology, Development, & Molecular Biology

Code	Title	Units
BIS 180L	Genomics Laboratory	5
BIS 181	Comparative Genomics	3
BIS 183	Functional Genomics	3
BIT 160	Principles of Plant Biotechnology	3

BIT 161A	Genetics & Biotechnology Laboratory	6
BIT 161B	Plant Genetics & Biotechnology Laboratory	4
MCB/PLB 126	Plant Biochemistry	3
PLB 113	Molecular & Cellular Biology of Plants	3
PLB/MCB 126	Plant Biochemistry	3
PLP/ENT/PLB 123	Plant-Virus-Vector Interaction	3
PLP 130	Fungal Biology & Disease	3
PLS 157	Physiology of Environmental Stresses in Plants	4
PLS 158	Mineral Nutrition of Plants	4