Map Your Future in Plant Sciences

WHY PLANT SCIENCES?

Plant Sciences pairs comprehensive preparation in foundational science courses with practical training in basic and applied Plant Sciences, including biotechnology and plant breeding.

AVAILABLE EMPHASES:

GENERAL PLANT SCIENCES

Provides students with a strong foundation in modern plant biology and related disciplines, including plant molecular biology, plant biotechnology, genomics and genetics of plants, plant physiology, smart agriculture, and plant-environment interactions. Students are prepared not only for careers in plant science research, but also for diverse careers in which their scientific training and knowledge can make a difference.

PLANT HEALTH SCIENCES

Trains students in both biotic and abiotic factors that impact plant health at scales from molecular to microscopic and macroscopic. Professionals working in Plant Health Science apply plant, microbial, and insect sciences to predict disease epidemiology, protect plant, environmental, and human health, and optimize plant growth or yields.

THE UNIVERSITY OF ARIZONA
COLLEGE OF AGRICULTURE & LIFE SCIENCES
Plant Sciences

B.S. in Plant Sciences

PREPARE FOR A BIOSCIENCE CAREER IN AGRICULTURE, HEALTH OR SUSTAINABILITY

Do you want to create solutions to feed, clothe, and fuel our planet for future generations to come? The Plant Sciences major prepares students to solve the world's greatest challenges by providing comprehensive training and preparation for specialized careers in diverse areas ranging from global food and energy security to environmental and human health. You may pursue careers in industry related to crop improvement, plant health, agricultural sustainability, biologic pharmaceuticals, natural resource management, or in basic research or medicine.

The Plant Sciences program is right for you if:

- You are driven toward innovations in research and technology to create efficient processes and sustainable products.
- You want to research, test, and analyze soil, microorganisms, and plants.
- You have a passion for working in collaborative teams within industries related to agriculture, food, and manufacturing.
- You're conscious of the growing human population and climate change and the need for practical solutions to ensure an abundant supply of sustainable food, renewable energy, medicines, and materials.
- You want to advance environmental conservation and restoration efforts.
- You see yourself working in greenhouses, managing land, or breeding plants.
- You're considering pursuing a graduate degree in the biological sciences or a medical degree.

CAREER PATHS

Research Assistant/Technician: Conduct research for pharmaceutical, biotechnical, or food/beverage companies; or academic, institutional, or government research laboratories. Perform research or other laboratory tasks under the supervision of a more senior scientist.

Agronomist: Manage soil and crop field production, conduct research, and develop new crop hybrids and varieties for public and private sectors.

Plant Pathologist: Research and work to understand plant responses to pests with design strategies for pest management.

Plant Breeder: Develop crops adapted to arid and semi-arid environments for public and private sectors.

Graduate or Professional School: Rigorous preparation for many biological science fields in a related field including:

- **MS degree:** Research Associate, with more independence than a Research Assistant.
- **PhD degree:** Scientist or Research Professor. Design experiments and manage projects and people.
- **Medical school** or other health-related advanced degree.

CAREER OPTIONS BY EMPHASIS

General Plant Sciences: Perform basic and applied research in academic, institutional, or government laboratories; manage the use and development of forests and other natural resources.

Plant Health Sciences: Greenhouse management; optimize agricultural production.

Contact Academic Advisor
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THE UNIVERSITY OF ARIZONA
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For more information, visit plantbiology.arizona.edu

Plant Sciences Major

General Education Requirements	Course	Offered	32 Units
Introduction to the General Education Experience	UNIV 101	F/SP/SU	1
Foreign Language (2nd Semester Proficiency)	Various	F/SP/SU	0-8
First Year Composition 1	ENGL 101	F/SP/SU	3
First Year Composition 2	ENGL 102	F/SP/SU	3
General Education – Artist	Various	F/SP/SU	3
General Education – Humanist	Various	F/SP/SU	3
General Education – Natural Scientist	Various	F/SP/SU	3
General Education – Social Scientist	Various	F/SP/SU	3
General Education – Building Connections	Various	F/SP/SU	3
General Education – Building Connections	Various	F/SP/SU	3
General Education – Building Connections	Various	F/SP/SU	3
General Education Portfolio	UNIV 301	F/SP	1
General Science Core	**Courses**	**Offered**	**34-36 Units**
Calculus	MATH 113 or MATH 122A+122B or MATH 125	F/SP/SU	3-5
Introduction to Stats and Biostatistics	MATH 263	F/SP/SU	3
Introductory Physics I, Lecture	PHYS 102	F/SP/SU	3
General Chemistry I (Lecture and Laboratory)	CHEM 151 or CHEM 161+163	F/SP/SU	4
General Chemistry II (Lecture and Laboratory)	CHEM 152 or CHEM 162+164	F/SP/SU	4
Organic Chemistry I (Lecture and Laboratory)	CHEM 241A+243A	F/SP/SU	4
Biochemistry	BIOC 384	F/SP/SU/W	3
Introductory Biology I, Lecture	MCB 181R	F/SP/SU	3
Introductory Biology II, Lecture	ECOL 182R	F/SP/SU	3
Science Communication (Choose 1)			
Scientific Writing	ENVS 408	F/SP	3
or Translating Environmental Science	ENVS 415	SP	3
or Technical Writing	ENGL 308	F/SP/SU	3
or Applied Organizational Communication	COMM 312	F/SP	3
or Business Writing	ENGL 308	F/SP/SU	3
or Communicating Knowledge in Ag & Life	ALC 422	F/SU	3
Major Core	**Courses**	**Offered**	**21 Units**
Colloquium	PLS 195A	F	1
Plant Biology	PLS 240	F	4

Introductory Plant Pathology	PLP 305	F	3
Animal and Plant Genetics	PLS 312	SP	4
Plant Cell Structure and Function	PLS 359	F	3
Plant Growth and Physiology	PLS 360	SP	3
Principles of Plant Physiology Lab	PLS 361	SP	1
Senior Capstone	PLS 498	SP	2
Select an Emphasis – next sections			

General Plant Sciences Emphasis

Emphasis Core	**Courses**	**Offered**	**15 Units**
Origins of Food Plants	PLS 307	SP	3
Plant Molecular Biology	PLS 358	SP	3
Mechanisms in Plant Development	PLS 440	F	3
Plant Biochemistry and Metabolic Engineering	PLS 448A (Online)	F	3
Plant Genetics and Genomics	PLS 449A	SP	3
Emphasis Electives	See pages 3-5 for elective options		14 Units

Plant Health Sciences Emphasis

Emphasis Core I	**Courses**	**Offered**	**13 Units**
Introduction to Soil Science	ENVS 200	F/SP	3
Soils Laboratory	ENVS 201	F/SP	1
Insect Pest Management (Choose 1)			
Integrated Pest Management	ENTO 468	F	3
or Controlled Environment Agriculture IPM	ENTO 497C	SP	3
Soil Fertility and Plant Nutrition	ENVS 316	F/SP	3
Microbial Diversity	PLP 329A	F	3
Emphasis Core II	**Courses**	**Offered**	**6 Units**
General Biology Class (Choose 2)			
General Microbiology	MIC 205A	F/SP/SU	3
General Virology	PLS 333	SP (even only)	3
General Mycology	PLP 427R	F	3
Emphasis Electives	See pages 3-5 for elective options		10 Units

Emphasis Electives

Emphasis Elective Courses	Courses	Offered	Units
Genetics and Genomics			
Plant Genetics and Genomics	PLS 449A	SP	3
Microbial Genetics	PLP 428R+L	SP	3+2
Genomics	ECOL 326	F/SU	3
Evolutionary Biology	ECOL 335	SP	4
Molecular Genetics	MCB 304	F	3
Bioinformatics and Functional Genomic Analysis	MCB 416A	SP	3
Problem Solving with Genetic Tools	MCB 422	F/SP/SU	3
Population Genetics	ECOL 426	SP	3
Plant Growth and Development			
Introduction to Urban Horticulture	PLS 235	F	3
Mechanisms in Plant Development	PLS 440	F	3
Plant Biochemistry and Metabolic Engineering	PLS 448A (Online)	F	3
Cell and Developmental Biology	MCB 305	SP	4
Cell Biology	MCB 410	SP/SU	3
Molecular Biology	MCB 411	SU	3
Plant Pathology and Microbiology			
General Microbiology	MIC 205A	F/SP/SU	3
Microbial Physiology	MIC 328	SP	3
General Virology	PLS 333	SP (even only)	3
Microbial Diversity	PLP 329	F/SU	3
General Mycology	PLP 427R+L	F	3+2
Microbial Genetics	PLP 428R+L	SP/SU	3+2
Plant Production			
Introduction to Urban Horticulture	PLS 235	F	3
The Science of Cannabis	PLS 302	SP	3
Crop Science and Production	PLS 306	F	3
Plant Propagation, Production & Management	PLS 330	SP	3
Soil Fertility and Plant Nutrition	ENVS 316	F/SP	3
Turf and Landscape Technology	AGTM 330	SP (odd only)	3
Integrated Pest Management	ENTO 468	F	3
Water and Soils			
Soil Fertility and Plant Nutrition	ENVS 316	F/SP	3
Soil Genesis & Classification	ENVS 431	F	4
Water Harvesting	ECOL 454	SP	3

Emphasis Electives (continued)

Controlled Environment Production Systems			
Introduction to Hydroponics	PLS 217	F	3
Plant Biochemistry and Metabolic Engineering	PLS 448A (Online)	F	3
Physiology of Crop Production in CEA	PLS 475A	SP	3
Applied Instrumentation for CEA	BE 479	SP	3
Engineering of Biological Processes	BE 481A	SP	3
Controlled Environment Systems	BE 483	F	3
Controlled Environment Agriculture IPM	ENTO 497C	SP	3
Biodiversity			
Systematic Botany	PLS 472	SP	4
Microbial Diversity	PLP 329A	F/SU	3
Evolution of Plant Form and Function	ECOL 340	F	3
Biotechnology			
General Microbiology	MIC 205A	F/SP/SU	3
Introduction to Biotechnology	PLS 340	F	3
Recombinant DNA Methods & Application	MCB 473	SP	4
Microbial Genetics	PLP 428R	SP/SU	3+2
Plant Biotechnology			
Introduction to Biotechnology	PLS 340	F	3
Plant Biotechnology	PLS 424R	SP (odd only)	3
Directed Research	PLS 392/492	F/SP/SU	1-5
Metabolic Biochemistry	BIOC 385	F/SP/SU/W	3
Plant Biochemistry and Metabolic Engineering	PLS 448A (Online)	F	3
Computation			
Great Ideas of the Information Age	ISTA 100	F/SP/SU	3
Statistical Foundations for the Information Age	ISTA 116	F/SP	3
Computational Thinking and Doing	ISTA 130	F/SP/SU	4
Resource Management			
Water, Environment and Society	GEOG 304	F/SP/SU	3
Management and Restoration of Wildland Vegetation	RAM 446	SP	4
Field Botany	RNR 230R/L	F (R&L), SP/SU (R)	2+1
Natural Resources Ecology	RNR 316	F/SP	3
Ecological Surveys and Sampling	RNR 321	F/SP	3
Natural Resources Management Practices	RNR 384	SP	3
Noxious, Invasive Plants of Arizona	RNR 400	SU	3
Sustainable Management or Arid Lands & Salt Affected Soils	ENVS 401	F/SP	3

Emphasis Electives (continued)

Scientific Philosophy/Education			
The Science of Cannabis	PLS 302	SP	3
Origins of Food Plants	PLS 307	SP	3
Medicinal Plants	PLS 480	F	3
Additional Free Elective Courses			
Directed Research	PLS 392	F/SP/SU	1-5
Internship	PLS 393	F/SP	1-5
Independent Study	PLS 399	F/SP/SU	1-3
Honors Independent Study	PLS 399H	F/SP	1-3
Preceptorship or Honors Preceptorship	PLS 491 or PLS 491H	F/SP	1-5
Directed Research	PLS 492	F/SP/SU	1-5
Internship	PLS 493	F/SP/SU	1-5
Honors Thesis	PLS 498H	F/SP/SU	3
Independent Study	PLS 499	F/SP/SU	1-5
Honors Independent Study	PLS 499H	F/SP	3