



THE UNIVERSITY  
OF ARIZONA

Interested in producing and managing plants  
in a way that conserves natural resources?

## B.S., Sustainable Plant Systems



### Controlled Environment Agriculture

Develop technologies to efficiently produce plants and plant-based products, with optimized resource consumption, using environmentally, socially and economically sustainable growing systems in arid lands and urban settings.



### Urban Horticulture

Explore the use of plants in urban and suburban residential and commercial settings: urban plant selection, sustainable landscape design and management, community gardens, indoor and outdoor horticultural production techniques.



### Agronomy

Develop low water use and disease resistant plants that maximize crop yield and plant health in field production where marginal lands often constrain plant production.



### Fresh Produce Safety

(A Yuma-based program.) Understand how production chains become contaminated with diseases, and learn Good Agricultural Practices (GAP) for field and harvest of leafy greens, and fresh vegetable food safety.

**For more information contact an advisor:**

**Juliana Lincoln**, Academic Advisor

[julianalincoln@email.arizona.edu](mailto:julianalincoln@email.arizona.edu)

520-621-2945

## CORE COURSES

CORE COURSES		
General Education Requirements	Course	27-35 Units
Foreign language	Various	0-8
First Year Composition 1	ENGL 101	3
First Year Composition 2	ENGL 102	3
General Education, Tier 1	TRAD 1	3
General Education, Tier 1	TRAD 2	3
General Education, Tier 1	INDV 1	3
General Education, Tier 1	INDV 2	3
General Education, Tier 2	Humanities	3
General Education, Tier 2	Individuals & Societies	3
General Education, Tier 2	Arts	3
<i>*Diversity Emphasis</i>		
General Science Core	Course	20-21 Units
Calculus	MATH 113	3
General Chemistry I Lecture and Laboratory	CHEM 151	4
General Chemistry II Lecture and Laboratory	CHEM 152	4
Lectures in Organic Chemistry	CHEM 241A	3
OR Environmental Soil and Water Chemistry	OR ENVS 462	
Quantitative Skills For Natural Sciences	ENVS 275	3-4
OR Introduction to Statistics and Data Analysis	OR AREC 239	
OR Introduction to Statistics and Biostatistics	OR MATH 263	
OR Intro to Statistical Methods	OR MATH 363	
Introductory Physics 1 Lecture	PHYS 102	3
Plant, Soil and Water Science Core	Course	30 Units
Plant Biology	PLS 240	4
Applied Plant Physiology	PLS 475A	3
OR Plant Growth and Physiology	OR PLS 360	
Animal and Plant Genetics	PLS 312	4
OR Genetics	OR ECOL 320	
Principles and Techniques of Plant Propagation and Culture	PLS 330	3
OR Yuma Production Systems (Yuma)	OR PLS 397A	
Introduction to Soil Science & Laboratory	ENVS 200/201	4
Soil Fertility & Plant Nutrition	ENVS 316	3
Soil Ecology of Sustainable Systems	ENVS 300	3
OR Irrigation Principles and Management (Yuma)	OR ASM 404	
Insect Pest Management	ENTO 468	3
OR Greenhouse Pest Mngmt: Methods & Practice	OR ENTO 497C	
OR Insect Pest Mngmt for Desert Cropping Systems	OR ENTO 300	
Introductory Plant Pathology	PLP 305	3
Career Preparation	Course	10 Units
Communication – Technical Writing	ENVS 408	3
OR Translating Environmental Science	OR ENVS 415	
OR Ag Communications	OR ALC 422	
Freshman Colloquium: How to Feed and Clothe 9 Billion	PLS 195A	1
OR Intro to Agricultural Systems Mnmgt (Yuma)	OR ASM 195A	
Experiential Learning	ASM, ENVS, PLS, or BE 392,	3
CALS Colloquium AND Senior Capstone	CALS 195C and PLS 498	3
OR Internship (Yuma)	OR ASM 499	
<i>Select a sub-plan</i>		<i>27 Units</i>

## Agronomy subplan

<b>Complete the following courses:</b>		
Crop Science and Production	PLS 306	3
Environmental Physics	ENVS 420	3
OR Soil Physics	OR ENVS 470	
Plant Breeding	PLS415	3
OR Introduction to Biotechnology	OR PLS 340	
OR Plant Biotechnology	OR PLS 424R	
OR Plant Genetics and Genomics	OR PLS 449A	
Applied Weed Science	PLS 300	3
OR Noxious Invasive Plants of Arizona	OR RNR 400	
Sustainable Management of Arid Lands & Salt-Affected	ENVS 401	3
<b>Selectives: Choose 12 units from the following list</b>		
Agriculture, Environmental and Legal Issues	ACBS 411	3
Applications in Agricultural Mechanics	AGTM 350	3
Operations in Agricultural Mechanics	AGTM 351	3
Solar Photovoltaic Energy Systems with Applications to Ag.	AGTM200	3
Natural Resource Management in Native Communities	AIS 441A	3
Precision Observation with Drones	BE 385	3
Foundations in Biochemistry	BIOC 384	3
Agro-ecology	ENTO 436	3
Living in Symbiosis	ENTO 310	3
Environmental Chemistry	ENVS 340	3
Environmental Soil and Water Chemistry	ENVS 462*	3
Microbial Biogeochemistry and Global Change	ENVS 410	3
Soil Genesis and Classification	ENVS 431R	3
General Mycology	PLP 427R	3
Plant Cell Structure & Function	PLS 359	3
Plant Growth and Physiology	PLS 360*	3
General Virology	PLS 333	3
Applications of Geographic Information Systems	RNR 403	3
OR GIS for Natural and Social Sciences	OR RNR 417	
OR Geographic Applications of Remote Sensing	OR RNR 483	
OR Introduction to Remote Sensing	OR WSM 330	
<i>*Cannot be used for both core and elective</i>		

## Urban Horticulture subplan

<b>Complete the following courses:</b>		
Plant Materials	LAR 420	4
Introduction to Horticulture	PLS 235	3
Arboriculture	PLS 303	2
<b>Electives: Choose 18 units including 10 units of upper</b>		
Agriculture, Environmental and Legal Issues	ACBS 411	3
Food Safety Laws and Legal Policies	ACBS 437	3
Aquaculture	ACBS 456	3
Solar Photovoltaic Energy Systems with Applications to	AGTM 200	3
Turf and Landscape Technology	AGTM 330	3
Introduction to Hydroponics	BE 217	3
Lab: Introduction to Hydroponics	BE 217L	1
Introduction to Computer Aided Design	BE 221	3
Aquaponics Design	BE 334	3
Advanced Hydroponic Crop Production	BE 350	3
Advanced Hydroponic Crop Production Laboratory	BE 350L	1
Irrigation Systems Design	BE 456	3
Applied Instrumentation for Controlled Environment Ag.	BE 479	3
Controlled Environment Systems	BE 483	3
Foundations in Biochemistry	BIOC 384	3
Plants of the Desert	ECOL 414	2
Living in Symbiosis	ENTO 310	3
Agro-ecology	ENTO 436	3
Sustainable Mngmt of Arid Lands & Salt-Affected Soils	ENVS 401	3
Green Infrastructure	ENVS 450	3
Water Harvesting	ENVS 454	3
Parks and Urban Public Spaces	LAR 350	3
Landscape Ecology	LAR 423	3
Planning for Urban Resilience	PLG 408	3
General Mycology	PLP 427R	3
Arboriculture	PLS 303	3
Applied Weed Science	PLS 300	3
Crop Science and Production	PLS 306	3
General Virology	PLS 333	3
Introduction to Biotechnology	PLS 340	3
Plant Cell Structure and Function	PLS 359	3
Plant Growth and Physiology	PLS 360	3
Plant Breeding	PLS 415	3
Plant Biotechnology Laboratory	PLS 424L	2
Plant Biotechnology	PLS 424R	3

<b>Urban Horticulture Electives Continued...</b>		
Plant Genetics and Genomics	PLS 449A	3
Topics in Biotechnology	PLS 456	3
Medicinal Plants	PLS 480	3
Community and School Garden Workshop	PLS 497F	2 - 6
Agave, Cacti, and Other Succulents of Southern Arizona	RNR 310	3
Noxious Invasive Plants of Arizona	RNR 400	3
Applications of Geographic Information Systems	RNR 403	3
GIS for Natural and Social Sciences	RNR 417	3
Sustainable Design and Planning	SBE 201	3

### **Controlled Environment Agriculture subplan**

<b>Complete the following courses</b>		
Essential Computing for the Sciences	CSC 250	3
Intro to Biosystems Analytics	BE 310	3
Introduction to Horticulture	PLS 235	3
Introduction to Hydroponics (Lecture)	BE 217R	3
Introduction to Hydroponics (Lab)	BE 217L	1
Advanced Hydroponic Crop	BE 350R	3
Advanced Hydroponic Crop	BE 350L	1
Applied Instrumentation for CEA	BE 479	3
Controlled Environment Systems	BE 483	3
Aquaponics	BE 334 OR BE 444	3
Experiential Work	BE 391, 392, 393, 394, 399, 491, 492, 493, 494, or 499	1

### **(YUMA ONLY) Fresh Produce Safety subplan**

<b>Complete the following courses:</b>		
Fresh Produce Safety	PLS 467	3
Fundamentals of Food Science &	NSC 353	3
Food Microbiology and Biotechnology	MIC 430	3
Crop Production	PLS 306	3
Quantitative Business Analysis	ASM311	3
<b>Selectives: Choose 12 units from the</b>		
Advanced Ag Systems/Tech	ASM 409	3
Case studies in Agriculture	ASM490	3
Agriculture Law	AGTM 375	3
Plant Cell Structure & Function	PLS 359	3
Plant Growth & Physiology	PLS 360	3
Community & school gardens	PLS497	3
Citrus Production	PLS 403	3
Applied Weed Science	PLS 300	3

# Sustainable Plant Systems Minor

Students may select a Minor in Sustainable Plant Systems while majoring in a complementary alternate field of study. This minor requires twenty two units, regardless of department guidelines for minors. A minimum of nine units must be unique to this minor.

Sustainable Plant Systems Minor	Course	Units	Offered
Colloquia	ENVS 195B OR PLS195A	1	F
Intro. Chemistry I	CHEM 151	4	F/SP/SU
Intro. Soil Science	ENVS 200	3	F/SP
Intro. Soil Science Lab	ENVS 201	1	F/SP
Plant Biology	PLS 240	4	F
Upper Division Electives	Various*	9	
<b>TOTAL:</b>		<b>22</b>	

*\*See list of pre-approved electives*

## Course Planning

Electives	Units	Semester
Total Units: (at least 9)		

### Upper Division Minor Elective Options

Course	Title	Units	Offered
ACBS/ECOL/ENVS/MIC/PLP/PLS 428L	Microbial Genetics Lab	2	SP
ACBS/ECOL/ENVS/MIC/PLP/PLS 428R	Microbial Genetics	3	SP
AIS/ANTH/ENVS/GEOG/RAM/RNR/WFSC/WSN 431A	Tradition Ecological Knowledge	3	F
ARL/PLS 480	Medicinal Plants	3	F
ASM/ENVS 404	Irrig Principles+Mgmt	3	F/SP
BE/PLS 475A	Applied Plant Physiology	3	
BE/PLS 479	Appl Instrumentation CEA	3	
BE/PLS 483	Controlled Environ System	3	
BIOC/CHEM/ECOL/MCB/PLS 448A	Plant Bioc/Metabolic Eng	3	F
ECOL/MCB/PLS 440	Mechanisms in Plant Dev	3	SP
ECOL/GENE/MCB/PLS 449A	Plant Genetics+Genomics	3	SP
ECOL/ENVS/WFSC 454	Water Harvesting	3	SP
ENTO/ENVS/PLS/RNR 436	Agro-ecology	3	SP
ENVS 316	Soil Fert+Plnt Nutrition	3	SP
ENVS/GEOS/HWRS 340	Environmental Chemistry	3	SP
ENVS/PLS 393	Internship	1.00 - 3.00	
ENVS/PLS 399	Independent Study	1.00 - 4.00	F/SP/SU
ENVS/PLS 399H	Honors Independent Study	1.00 - 3.00	F/SP
ENVS 401	Sustain Mgmt Arid Lands	3	F
ENVS 420	Environmental Physics	3	F/SP
ENVS/MCB/PLS 424L	Plant Biotechnology	2	SP
ENVS/MCB 425	Envir Microbiology	3	F
ENVS/MCB 426	Envir Microbiology Lab	2	F
ENVS 431R	Soil Genesis & Classification	3	F
ENVS 461	Soil+Water Conservation	3	SU
ENVS 470	Soil Physics	3	SP
ENVS/PLS 491	Preceptorship	1.00 - 8.00	F/SP
ENVS/PLS 493	Internship	1.00 - 3.00	F/SP/SU
ENVS/PLS 499	Independent Study	1.00 - 4.00	F/SP/SU
ENVS/PLS 499H	Honors Independent Study	1.00 - 3.00	F/SP
ENVS/PLS/RNR 496D	Redesigning Food Systems	3	SP
ENVS/GEOG/HPS/LAS/NSC/PLS/STCH/TLS 497F	Comm/School Garden Workshop	2.00 - 6.00	
MCB/MIC/PLS 340	Intro to Biotechnology	3	F
MCB/PLS 361	Prin Plant Physiol Lab	1	F
MIC/PLP 305	Intro Plant Pathology	3	
PLS 306	Crop Science+Production	3	F
PLS 330	Princi Tech of Plant Propagat	3	F
PLS 333	General Virology	3	SP
PLS 359	Plant Cell Structure & Functio	3	F
PLS 403	Citrus Production	3	SP
PLS 458	Plant Molecular Biology	3	F