

# AGRICULTURAL BIOLOGY - BACHELOR OF SCIENCE IN AGRICULTURE

The agricultural biology course work prepares you for a variety of careers in the biological sciences and agriculture. You will develop your curriculum with an academic advisor to attain your individual goals. Many will pursue advanced degrees in the sciences or prepare for admittance to professional schools (medical, dental, etc.). A diverse program is offered with five separate options that allow you to tailor your program for careers in the commercial sector, such as agricultural consulting, and pest management or for careers with county, state, or federal agencies, such as research technicians, land managers, and extension agents. A minimum of 120 credit hours is required for graduation. Any undergraduate student majoring in Agricultural Biology must earn a grade of C- or higher in core (EPWS prefix) courses to satisfy degree requirements. Students earning a D or F in a core (EPWS prefix) course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in Agricultural Biology.

## Requirements

### Departmental Requirements

A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 111G	Natural History of Life	3
BIOL 211G	Cellular and Organismal Biology	3
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
CHEM 111G	General Chemistry I	4
CHEM 112G	General Chemistry II	4
ENGL 111G	Rhetoric and Composition	4
EPWS 100	Applied Biology	3
EPWS 100 L	Applied Biology Lab	1
EPWS 301	Agricultural Biotechnology	3
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
EPWS 447	Seminar	1
MATH 121G	College Algebra	3
Select one from the following:		3
COMM 253G	Public Speaking	
COMM 265G	Principles of Human Communication	
AXED 201G	Effective Leadership and Communication in Agricultural Organizations	
Select one from the following:		3
ENGL 211G	Writing in the Humanities and Social Sciences	
ENGL 218G	Technical and Scientific Communication	
<b>General Education Electives</b>		
Humanities and Fine Arts		6-9
Social and Behavioral Sciences		6-9

### Viewing a Wider World

Select 6 credits at the 300 or 400 Level <sup>1</sup> 6

### Concentrations/Options

Select at least one from the following options: <sup>2</sup>

Applied Biology	
Applied Microbiology	
Entomology	
Environmental Biology	
Pest Biology and Management	

Total Credits 114-129

<sup>1</sup> Select two General Education Courses: one must be from a college outside of the College of Agricultural, Consumer and Environmental Sciences.

<sup>2</sup> In addition to the departmental requirements listed above, you must also complete all of the courses in at least one of the options listed below. Courses with higher numbered prefixes may replace courses listed as departmental requirements in some cases.

## Agricultural Biology Concentrations/ Options

### Concentrations: Applied Biology

The Applied Biology option prepares you for professional advancement including admittance to medical, dental, veterinary and graduate schools. Students interested in the health professions must register with the Health Professional Advisory Committee no later than the sophomore year. Students should check the specific entrance requirements for the professional or graduate school of their choice prior to selecting electives within this option.

### Required Courses

BCHE 341	Survey of Biochemistry	4
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
MATH 190G	Trigonometry and Precalculus	4
MATH 191G	Calculus and Analytic Geometry I	4
PHYS 211G	General Physics I	3
or PHYS 221G	General Physics for Life Sciences I	
PHYS 211GL	General Physics I Laboratory	1
or PHYS 221GL	Laboratory to General Physics for Life Science I	

Select 6-8 credits from the following: 6-8

ANSC 370	Anatomy and Physiology of Farm Animals	
BIOL 312	Plant Taxonomy	
BIOL 354	Physiology of Humans	
BIOL 377	Cell Biology	
EPWS 314	Plant Physiology	
EPWS 373	Fungal Biology	
EPWS 481	Plant Nematology	

### Suggested Electives

MATH 192G	Calculus and Analytic Geometry II	4
PHYS 212G	General Physics II	3

or PHYS 222G	General Physics for Life Sciences II	
Total Credits		37-39

### Option: Applied Microbiology

The Applied Microbiology option prepares you for professional positions in algal biofuels, environmental monitoring and improvement, industrial applications of microbiology, food sanitation, research or graduate study.

#### Required Courses

BCHE 341	Survey of Biochemistry	4
BIOL 311 L	General Microbiology Laboratory	2
BIOL 451	Physiology of Microorganisms	3
BIOL 473	Ecology of Microorganisms	3
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
EPWS 373	Fungal Biology	3
EPWS 420	Environmental Behavior of Pesticides	3
EPWS 486	Plant Virology	3
MATH 142G	Calculus for the Biological and Management Sciences	3
PHYS 211G	General Physics I	3
PHYS 212GL	General Physics II Laboratory	1
Select 6-7 credits from the following:		6-7

A ST 456	Statistical Methods and Data Analysis	
AGRO 471	Plant Mineral Nutrition	
BIOL 477	Applied and Environmental Microbiology	
E S 301	Principles of Ecology	
E S 370	Environmental Soil Science	
EPWS 455	Advanced Integrated Pest Management	
EPWS 462	Parasitology	
EPWS 481	Plant Nematology	
EPWS 492	Diagnosing Plant Disorders	
FSTE 320	Food Microbiology	
SOIL 252	Soils	
SOIL 312	Soil Management and Fertility	
SOIL 476	Soil Microbiology	
TOX 361	Basic Toxicology	

Total Credits	42-43
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### Concentration: Entomology

The Entomology concentration prepares you for graduate degrees in entomology. Emphasis is placed on a broad background in field and laboratory aspects of insect biology and management.

#### Required Courses

MATH 142G	Calculus for the Biological and Management Sciences	3
BIOL 465	Invertebrate Zoology	4
CHEM 211	Organic Chemistry	4
EPWS 303	Economic Entomology	3
EPWS 325V	Insects, Humans, and the Environment	3
EPWS 455	Advanced Integrated Pest Management	3
EPWS 462	Parasitology	3

EPWS 475	Urban Entomology	3
EPWS 481	Plant Nematology	3
EPWS 492	Diagnosing Plant Disorders	3
Select at least three from the following:		7-11
EPWS 314	Plant Physiology	
EPWS 451	Special Topics	
EPWS 456	Biological Control	
EPWS 486	Plant Virology	
BIOL 301	Principles of Ecology	
AGRO 365	Principles of Crop Production	
AGRO 471	Plant Mineral Nutrition	
SOIL 252	Soils	
ANSC 370	Anatomy and Physiology of Farm Animals	
BIOL 436	Disease Vector Biology	
BIOL 462	Conservation Biology	
BIOL 469	Biology of Emerging Infectious Diseases	
BIOL 480	Animal Behavior	
GENE 452	Applied Bioinformatics	
E S 301	Principles of Ecology	
Total Credits		39-43

### Concentration: Environmental Biology

The Environmental Biology option prepares you for professional positions in environmental impact, regulation, compliance and improvement.

#### Required Courses

CHEM 211	Organic Chemistry	4
E S 301	Principles of Ecology	3
E S 330	Environmental Management Seminar I	1
E S 430	Environmental Management Seminar II	1
EPWS 380V	Science & Society	3
EPWS 314	Plant Physiology	3
EPWS 455	Advanced Integrated Pest Management	3
EPWS 492	Diagnosing Plant Disorders	3
MATH 142G	Calculus for the Biological and Management Sciences	3
PHYS 211G	General Physics I	3
PHYS 211GL	General Physics I Laboratory	1
SOIL 252	Soils	3
TOX 361	Basic Toxicology	3

Select at least two from the following:	5-8
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A ST 456	Statistical Methods and Data Analysis	
AGRO 365	Principles of Crop Production	
AGRO 471	Plant Mineral Nutrition	
BCHE 341	Survey of Biochemistry	
E S 370	Environmental Soil Science	
EPWS 420	Environmental Behavior of Pesticides	
EPWS 451	Special Topics	
EPWS 481	Plant Nematology	
GEOG 381	Cartography and Geographic Information Systems	
SOIL 312	Soil Management and Fertility	

TOX 361	Basic Toxicology	
Total Credits		39-42

### Concentration: Pest Biology and Management

This option prepares you for careers such as insect, weed and disease management; in both field and urban environments, including IPM and Sustainable/Organic Techniques research technician; federal and state agencies; border security; agricultural consulting; and extension positions.

#### Required Courses

CHEM 211	Organic Chemistry	4
EPWS 314	Plant Physiology	3
EPWS 455	Advanced Integrated Pest Management	3
EPWS 481	Plant Nematology	3
or EPWS 462	Parasitology	
EPWS 492	Diagnosing Plant Disorders	3
MATH 142G	Calculus for the Biological and Management Sciences	3
PHYS 110G	The Great Ideas of Physics	4
SOIL 252	Soils	3
SOIL 312	Soil Management and Fertility	3
TOX 361	Basic Toxicology	3
Select one from the following:		3
BIOL 312	Plant Taxonomy	
RGSC 357	Grass Taxonomy and Identification	
RGSC 316	Rangeland Plants	
Select 3 credits from the following:		3
EPWS 451	Special Topics	
AGRO 365	Principles of Crop Production	
BIOL 301	Principles of Ecology	
Total Credits		38