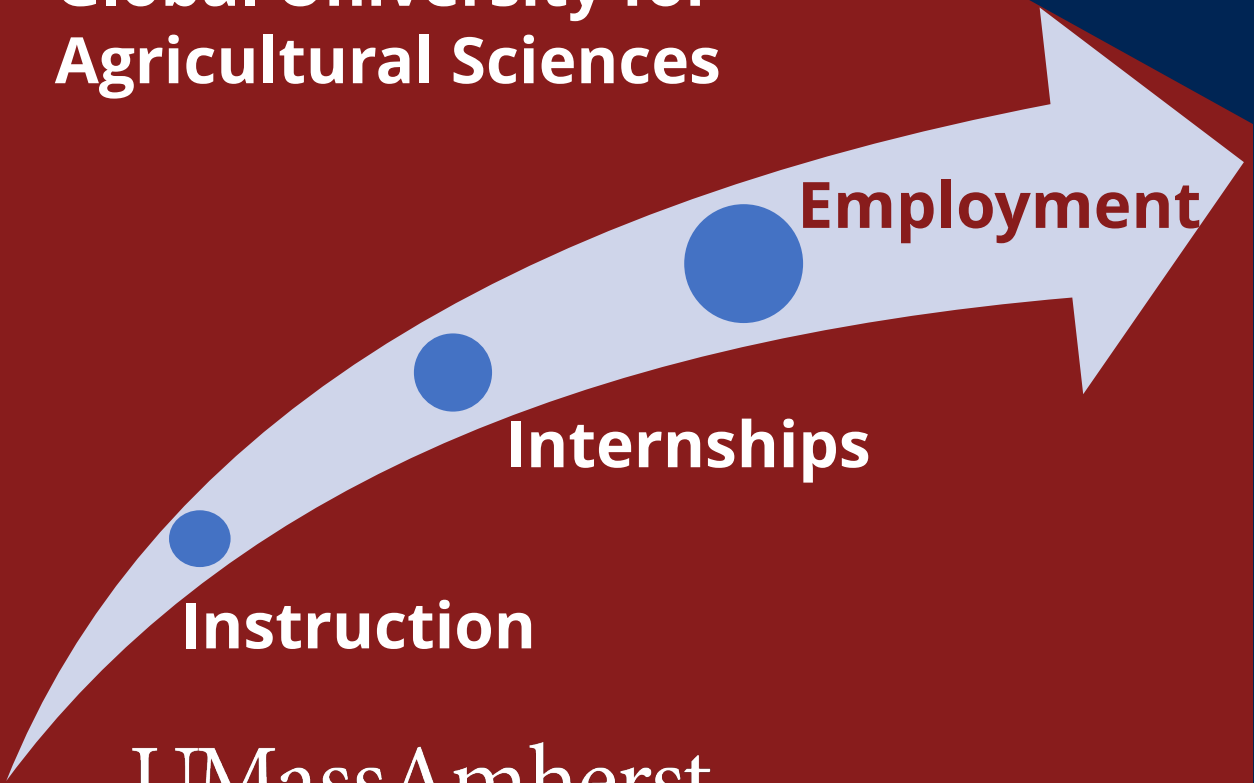


**B.S. Degree  
Handbook  
2022-2023**

**Top 5**

**Global University for  
Agricultural Sciences**



**UMassAmherst**

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## OUR ACADEMIC MAJORS

### **Horticultural Science**

Concepts and practices vital to the preservation of natural resources in managed plant systems are stressed. This major provides students with the tools and knowledge to work in the horticultural field. Students receive scientific training in the production of herbaceous ornamentals, fruits, and vegetables. In addition, students have the option of taking business courses to complement their horticultural training or to further enhance their scientific training through more courses in basic science. The University-operated greenhouses, vegetable field, and orchard are used as laboratory spaces to provide hands-on experience related to knowledge acquired in the classroom. Successful graduates find employment in plant conservatories and arboreta as well as manage businesses, including direct-market farms, greenhouse operations, landscaping firms and nurseries, or they continue to graduate school for advanced degrees.

### **Plant and Soil Sciences**

Through theoretical and practical training, the Plant and Soil Sciences major prepares students to tackle real-world problems by integrating and applying knowledge they learn from different disciplines. This major includes rigorous training in biology and laboratory methods. Students focus their study in one of two general areas: plant science or soil science. They may also choose to focus their advanced course work in horticultural science, plant pathology, plant science and biotechnology, soil science or a related discipline. Many successful graduates work in research or applied aspects of the biotech industries, agricultural and horticultural businesses, environmental consulting arenas, and pest management. Others go on for advanced graduate training for careers in academia, business, or the public sector.

### **Sustainable Food and Farming**

The Sustainable Food and Farming major allows students who are interested in the practical, social, political and scientific issues of sustainable agriculture and food systems to seek a broad exposure to this discipline in the liberal arts tradition. Students can tailor their individual programs to prepare for careers in sustainable farming, policy, advocacy, community outreach and education in topics related to crop production, food access, and hunger issues, as well as many others. Graduates will be qualified to compete successfully for a wide array of emerging careers in the growing field of sustainable food systems.

### **Turfgrass Science and Management**

The Turfgrass Science and Management major is an applied science program that focuses on the production and maintenance of grassed areas, including home lawns, parks, golf courses and other athletic surfaces. This concentration integrates scientific theory with practical experience and covers such topics as grass and seed identification, turfgrass culture and physiology, pest control, and equipment maintenance. Students in this major have the option of selecting a business management or a science focus. Many graduates find employment in the golf course industry, while others choose to specialize in sports turf management. The lawn care industry also employs many of our graduates in jobs as varied as direct lawn maintenance, research, and sales.

## GENERAL INFORMATION

### Curriculum Requirements

The undergraduate curriculum in the Stockbridge School of Agriculture has been designed with the goal of allowing students to tailor their course work to best reflect individual academic interests and career objectives. The major encompasses a broad range of related disciplines dealing with applied biology and ecology. Specific majors include: Horticultural Science, Plant and Soil Sciences, Sustainable Food and Farming, and Turfgrass Science and Management.

Students begin their studies with introductory classes in the major and with general education courses required of all University students. These initial courses, which include biology, chemistry, ecology and mathematics, form the foundation for more advanced study in the major. The exact sequence of courses is determined by the student's selection of an area of study. Independent study and internships are available under each major providing students with the opportunity to integrate laboratory and field work into their curriculum.

All four majors share a common core of discipline areas:

- **Biological Science** two semesters of course work with labs in introductory biology, botany and/or soil science
- **Chemistry** one semester minimum of introductory chemistry with lab
- **Ecosystems Studies** a course in the fundamentals of ecosystem ecology
- **Math, Statistics and Reasoning** two semesters in math, statistics and/or analytical reasoning
- **Writing** two semesters of writing: College Writing taken during the freshman year, and Junior Year Writing

### Independent Study and Internships

Students are encouraged to enhance their major with an independent study research project or an internship experience. These opportunities provide students with experience and training that will be useful in career planning as well as in decision-making regarding fields of possible graduate study. Students must have attained at least sophomore status and be in good academic standing. The University allows up to 18 credits of internship to be applied towards the 120 credits required for graduation.

**Independent Study** - students wishing to complete a research project or independent learning project must select a faculty member within the major who will approve the project and provide guidance. An Independent Study form must be completed, which specifies the number of credits to be earned, a statement of objectives, planned activities, and criteria to be used for evaluation and grading. This form must be filed with the Director's Office before the project is initiated.

**Internships** - an internship is a summer or semester-long work experience that allows students to "apprentice" with professionals in their field. Internships are intended to be learning experiences, and do not necessarily provide significant monetary compensation. Instead, academic credits are earned. Students can earn 12 credits for a full time, semester long internship experience and 3 to 9 credits for a summer program. Prior to undertaking an internship, the student and his/her faculty sponsor must complete an Academic Contract (Independent Study/Practicum form), including planned activities, a statement of objectives, as well as criteria for evaluation and grading.

## Major Requirements

Students will complete a minimum of 30 course credits taken within the Stockbridge School of Agriculture. Specific course requirements vary by major.

## Research Papers & Projects Assistance

Two librarians are available to Stockbridge School of Agriculture students to provide assistance with finding reliable information for research papers and other projects. Students may contact them for an individual consultation by phone, email, skype, or in person. Please feel free to contact:

Paulina Borrego, Lederle Grad Research Center; 413-545-7891; pborrego@library.umass.edu  
Madeleine Charney, Du Bois Library; 413-577-0784; mcharney@library.umass.edu

## UNIVERSITY REQUIREMENTS

### Credits

A minimum of 120 credits must be earned, at least 45 of which must be earned in residence. Residence credits are defined as credits earned for work done while registered on the UMass Amherst campus or while enrolled in one of the University's formal exchange programs. In addition, students generally must complete their final year in residence, residence in this sense meaning continuous enrollment and regular attendance in classes conducted on the Amherst campus.

### Grade Point Average (GPA)

A cumulative average of at least C (2.0 GPA) overall, and a minimum C (2.0 cumulative GPA) for courses in the major.

### General Education (Gen Ed) Requirements

*Consult your Academic Requirements Report (ARR) and/or advisor for clarification*

**Analytic Reasoning** 1 course 3 credits

- R2 course

**Basic Mathematics** 1 course 0-3 credits

- R1 course

**OR**

- Passing score achieved on Tier I Math Exemption Exam

**Biological & Physical World** 2 courses 8 credits

- BS Biological Science 1 course
- PS Physical Science 1 course

**Integrative Experience** 1 course 3 credits

- IE Integrative Experience 1 course

**Social World** 4 courses 16 credits

- AT/AL Art/Literature 1 course
- HS Historical Studies 1 course
- SB Social & Behavioral Sciences 1 course
- AL Literature **OR** 1 course  
AT Art **OR**  
I Interdisciplinary **OR**  
SB Social & Behavioral Sciences **OR**  
SI Science Interdisciplinary

Two courses within the Social World are needed to fulfill the **Social & Cultural Diversity** requirement

One course focusing on UNITED STATES diversity (designated as DU) and one course focusing on GLOBAL diversity (designated as DG)

Courses fulfilling Social and Cultural Diversity requirement are offered as joint designations with the Social World courses (i.e., ALU, ALDU, ALG, ALDG, etc.)

**Writing** 2 courses 6 credits

- College Writing (CW) or exemption (see Writing Program)
- Junior Year Writing course within your major

**NOTE:**

- Up to three courses can count for JYW, IE, and one additional Gen Ed requirement. One course from the major department can also count toward Diversity. There is no limit on Gen Ed or Diversity courses that can be counted toward major requirements.
- Interdisciplinary courses (I, IDU, IDG, SI, SIDU, SIDG) may only count toward the last Social World requirement. Additional Interdisciplinary courses may count toward the Social & Cultural Diversity requirement. No more than three I or SI courses will count toward Gen Ed and Diversity.
- Gen Ed courses cannot be taken on a pass/fail basis.
- To monitor your Gen Ed progress, regularly review your Academic Requirements Report (ARR) via SPIRE and consult with your advisor.

It is important to you plan your Gen Ed courses carefully with the help of your advisor. You want to choose subjects that interest you and that will create a unifying experience for you. You do not need to complete your Gen Ed courses at the start of your college career; plan to distribute them throughout your four years.

**Core Requirements of the Major**

**Biological Science**

fall/spr	STOCKSCH 105	Soils (BS)	4
fall	STOCKSCH 108	Introductory Botany	4

**Chemistry**

fall/spr	CHEM 111	General Chemistry-Science (PS)	4
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**Ecosystems Studies**

SELECT ONE (1) OF THE FOLLOWING:

fall/spr	BIOLOGY 287	Introductory Ecology	3
fall	ENVIRSCI 101	Introduction to Environmental Science (BS)	4
spr	ENVIRSCI 214	Ecosystems, Biodiversity and Global Change	3
fall	NRC 100	Environment and Society (SI)	4

**Integrative Experience**

spr	STOCKSCH 494I	Global Issues in Applied Biology	3
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**Junior Year Writing**

fall/spr	NATSCI 387	CNS Junior Writing	3
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**Math, Statistics and Reasoning**

SELECT COURSE(S) FROM BOTH CATEGORIES 1 & 2:

**1. Basic Mathematics (R1)**

fall/spr	MATH 101	Precalculus Algebra with Functions & Graphs	3
	<b>AND</b>	<b>AND</b>	<b>AND</b>
fall/spr	MATH 102	Analytic Geometry & Trigonometry (R1)	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	MATH 104	Algebra, Analytic Geometry, & Trig (R1)	3

**2. Analytical Reasoning (R2)**

fall/spr	STATISTC 111	Elementary Statistics (R2)	4
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	STATISTC 240	Introduction to Statistics (R2)	4

**Total Core Requirements 28-32**

**Major Requirements**

**Required Courses**

**Horticulture**

fall/odd yrs	STOCKSCH 200	Plant Propagation	3
fall/odd yrs	STOCKSCH 360	Landscape Plant Production	4



## HORTICULTURAL SCIENCE

## CREDITS

### Pest Management

fall	STOCKSCH 505	General Plant Pathology	4
	<b>AND</b>	<b>AND</b>	<b>AND</b>
3 CREDITS MINIMUM IN ENTOMOLOGY:			
spr	STOCKSCH 101	Insects & Related Forms	2
fall	STOCKSCH 109	Insects of Ornamentals	3
fall	STOCKSCH 326	Insect Biology	3

### Plant Nutrition

SELECT ONE (1) OF THE FOLLOWING:

fall	STOCKSCH 530	Plant Nutrition	4
spr	STOCKSCH 580	Soil Fertility	3

### Plant Physiology

spr	STOCKSCH 384	Introduction to Plant Physiology	3
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### Restricted Electives

SELECT 15 CREDITS MINIMUM FROM COURSES LISTED BELOW

AT LEAST 6 CREDITS MUST BE AT OR ABOVE 500-LEVEL

6 CREDITS MAXIMUM MAY BE TAKEN OUTSIDE THE DEPARTMENT

COURSES CAN BE MIXED AND MATCHED ACROSS MORE THAN ONE SUBJECT AREA

CREDITS TAKEN TO SATISFY *MAJOR REQUIREMENTS* IN OTHER AREAS OF THE *CORE REQUIREMENTS FOR THE MAJOR* AND FOR OTHER *MAJOR REQUIREMENTS* **CANNOT** BE COUNTED AS RESTRICTED ELECTIVES

### Crop Physiology

fall	STOCKSCH 523	Plant Stress Physiology	3
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### Food Crops

fall/spr	STOCKSCH 120	Organic Farming and Gardening (BS)	4
fall/even yrs	STOCKSCH 320	Organic Vegetable Production	3
fall	STOCKSCH 350	Sustainable Soil and Crop Management	3

### Greenhouse Horticulture

spr	STOCKSCH 255	Herbaceous Plants	3
fall/odd yrs	STOCKSCH 360	Landscape Plant Production	4
fall	SUSTCOMM 335	Plants in Landscape	4

### Landscape Horticulture

fall	NRC 232	Principles of Arboriculture	3
spr	STOCKSCH 255	Herbaceous Plants	3
fall/odd yrs	STOCKSCH 360	Landscape Plant Production	4
fall	SUSTCOMM 335	Plants in Landscape	4

## HORTICULTURAL SCIENCE

## CREDITS

### Pest Management

fall	STOCKSCH 109	Insects of Ornamentals	3
spr	STOCKSCH 510	Management and Ecology of Plant Diseases	3
fall	STOCKSCH 587	Phyto/Bioremediation	3

### Plant Nutrition and Soils

fall	STOCKSCH 515	Microbiology of the Soil	3
fall	STOCKSCH 530	Plant Nutrition	4
fall	STOCKSCH 575	Environmental Soil Chemistry	4
spr	STOCKSCH 580	Soil Fertility	3

### Focus

SELECT **BUSINESS OR SCIENCE FOCUS**:

#### 1. Business Focus

SELECT FOUR (4) COURSES IN BUSINESS

THESE COURSES SHOULD BE DISTRIBUTED ACROSS FOUR OF THE FIVE CATEGORIES BELOW (a-e):

a. fall/spr	ACCOUNTG 221	Principles of Financial Accounting	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
spr	RES-ECON 324	Small Business Finance	3
b. fall/spr	ECON 103	Introduction to Microeconomics (SB)	4
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	ECON 104	Introduction to Macroeconomics (SB)	4
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	RES-ECON 102	Introduction to Resource Economics (SB)	4
c. fall/spr	HT-MGT 260	Human Resource Mgt/Hospitality Industry	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	MANAGMNT 314	Human Resource Management	3
d. fall/spr	MANAGMNT 301	Principles of Management	3
e. fall/spr	MARKETNG 301	Fundamentals of Marketing	3

## HORTICULTURAL SCIENCE

CREDITS

### 2. Science Focus

SELECT FOUR (4) COURSES IN SCIENCE

CHOOSE ONE (1) COURSE FROM EACH OF THE FOUR CATEGORIES (a-d) BELOW:

a. fall/spr	BIOLOGY 151	Introductory Biology I (BS)	4
b. fall/spr	BIOLOGY 285	Cellular & Molecular Biology	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
spr	CHEM 250	Organic Chemistry	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	CHEM 261	Organic Chemistry	3
c. fall/spr	CHEM 112	General Chemistry-Science (PS)	4
d. fall/spr	MATH 127	Calculus for the Life and Social Sciences I (R2)	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	MATH 131	Calculus I (R2)	4

**Total Major Requirements 47-53**

## SUMMARY OF REQUIREMENTS

### Total Core Requirements

**28-32**

Biological Science	8
Chemistry	4
Ecosystems Studies	3-4
Integrative Experience	3
Junior Year Writing	3
Math, Statistics and Reasoning	7-10

### Total Major Requirements

**47-53**

Required Courses	20-23
Restricted Electives	27-30

**Grand Total for Horticultural Science 75-85**

## PLANT AND SOIL SCIENCES

Michelle DaCosta, Ph.D., Advisor

Bachelor Degree

### Core Requirements of the Major

CREDITS

fall/spr	STOCKSCH 105	Soils (BS)	4
fall	STOCKSCH 108	Introductory Botany	4
spr	STOCKSCH 384	Introduction to Plant Physiology	3
fall	STOCKSCH 505	General Plant Pathology	4

**Total Core Requirements 15**

### Major Requirements

#### Basic Mathematics (R1)

fall/spr	MATH 101	Precalculus Algebra with Functions & Graphs	3
	<b>AND</b>	<b>AND</b>	<b>AND</b>
fall/spr	MATH 102	Analytic Geometry & Trigonometry (R1)	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	MATH 104	Algebra, Analytic Geometry, & Trig (R1)	3

#### Biological Science

fall/spr	BIOLOGY 151	Introductory Biology I (BS)	4
fall/spr	BIOLOGY 152	Introductory Biology II	3
fall/spr	BIOLOGY 285	Cellular & Molecular Biology	3
fall/spr	BIOLOGY 311	General Genetics	3

#### Chemistry

fall/spr	CHEM 111	General Chemistry-Science (PS)	4
fall/spr	CHEM 112	General Chemistry-Science (PS)	4

#### Ecosystems Studies

SELECT ONE (1) OF THE FOLLOWING SUGGESTED COURSES:

fall/spr	BIOLOGY 287	Introductory Ecology	3
fall	ENVIRSCI 101	Introduction to Environmental Science (BS)	4
spr	ENVIRSCI 214	Ecosystems, Biodiversity and Global Change	3
fall	NRC 100	Environment and Society (SI)	4
fall	STOCKSCH 490S	Soil Ecology	3
spr	STOCKSCH 510	Management and Ecology of Plant Diseases	3

#### General Science

SELECT 6 CREDITS MINIMUM FROM THE FOLLOWING SUGGESTED COURSES:

fall/spr	BIOCHEM 320	Elementary Biochemistry	3
fall/spr	CHEM 261	Organic Chemistry	3
fall/spr	CHEM 262	Organic Chemistry	3
fall/spr	MICROBIO 310	General Microbiology	3
fall/spr	MICROBIO 312	Microbiology Laboratory	3
fall/spr	PHYSICS 131/151	Introductory Physics I/General Physics I (PS)	4
fall/spr	PHYSICS 132/152	Introductory Physics II/General Physics II (PS)	4
fall/spr	STATISTC 111/240	Elementary Statistics/Intro to Statistics (R2)	4

## PLANT AND SOIL SCIENCES

## CREDITS

### Integrative Experience

spr	STOCKSCH 494I	Global Issues in Applied Biology	3
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### Junior Year Writing

fall/spr	NATSCI 387	CNS Junior Writing	3
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### Experimental Techniques Course or Independent Study

SELECT 2-4 CREDITS FROM THE FOLLOWING SUGGESTED COURSES:

fall/spr	BIOLOGY 153	Introductory Biology Lab	2
fall	BIOLOGY 383H	Gene and Genome Analysis	4
fall/spr	CHEM 269	Organic Chemistry Lab	2
spr	MICROBIO 385	Introduction to Biotechnology Laboratory	4
fall/spr	NRC 585	Introduction to GIS	4

### Restricted Electives

SELECT 12 CREDITS MINIMUM AT OR ABOVE 300-LEVEL WITH 6 CREDITS MINIMUM AT 500-LEVEL COURSES MAY BE MIXED AND MATCHED ACROSS MORE THAN ONE SUBJECT AREA

#### Horticultural Science

fall/even yrs	STOCKSCH 320	Organic Vegetable Production	3
fall	STOCKSCH 350	Sustainable Soil and Crop Management	3
fall/odd yrs	STOCKSCH 360	Landscape Plant Production	4
fall	STOCKSCH 505	General Plant Pathology	4
spr	STOCKSCH 510	Management and Ecology of Plant Diseases	3
fall	STOCKSCH 530	Plant Nutrition	4
fall	STOCKSCH 575	Environmental Soil Chemistry	4
spr	STOCKSCH 580	Soil Fertility	3

#### Plant Biotechnology

fall/spr	BIOLOGY 284	General Genetics Lab	2
spr	BIOLOGY 379H	Genomics and Bioinformatics	3
fall	BIOLOGY 383H	Gene and Genome Analysis	4
fall	STOCKSCH 530	Plant Nutrition	4
fall	STOCKSCH 587	Phyto/Bioremediation	3

#### Plant Pathology

fall/spr	MICROBIO 310	General Microbiology	3
fall/spr	MICROBIO 312	Microbiology Laboratory	3
fall	STOCKSCH 505	General Plant Pathology	4
spr	STOCKSCH 510	Management and Ecology of Plant Diseases	3
fall	STOCKSCH 523	Plant Stress Physiology	3

#### Soil Science

fall	GEO-SCI 519	Aqueous Envrn Geochemistry	4
fall	GEO-SCI 563	Glacial Geology	4
spr	GEO-SCI 587	Hydrogeology	4
spr	NRC 568	Wetland Soils	2
fall	STOCKSCH 350	Sustainable Soil and Crop Management	3

## PLANT AND SOIL SCIENCES

## CREDITS

### Soil Science (cont.)

fall	STOCKSCH 515	Microbiology of the Soil	3
fall	STOCKSCH 575	Environmental Soil Chemistry	4
spr	STOCKSCH 580	Soil Fertility	3
spr	STOCKSCH 585	Inorganic Contaminants/Soil, Water, & Sediment	3
fall	STOCKSCH 587	Phyto/Bioremediation	3

**Total Major Requirements 53-59**

## SUMMARY OF REQUIREMENTS

**Total Core Requirements 15**

**Total Major Requirements 53-59**

Basic Mathematics	3-6
Biological Science	13
Chemistry	8
Ecosystems Studies	3-4
General Science	6
Integrative Experience	3
Junior Year Writing	3
Experimental Techniques Course or Independent Study	2-4
Restricted Electives	12

**Grand Total for Plant and Soil Sciences 68-74**

## SUSTAINABLE FOOD AND FARMING

Sarah Berquist, M.S., Advisor

Bachelor Degree

CREDITS

### Core Requirements of the Major

#### Botany and Soils

fall/spr	STOCKSCH 105	Soils (BS)	4
fall	STOCKSCH 108	Introductory Botany	4

#### Chemistry

fall/spr	CHEM 111	General Chemistry-Science (PS)	4
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall	STOCKSCH 117	Agricultural Chemistry	3

#### Ecosystems Studies

SELECT ONE (1) OF THE FOLLOWING:

OTHER ECOSYSTEMS COURSES MAY BE SUBSTITUTED WITH ADVISOR APPROVAL

fall/spr	BIOLOGY 287	Introductory Ecology	3
fall	STOCKSCH 186	Introduction to Permaculture	3
spr	STOCKSCH 510	Management and Ecology of Plant Diseases	3

#### Food/Land Policy or Agricultural Education

SELECT ONE (1) OF THE FOLLOWING:

fall	STOCKSCH 297AL	Agricultural Leadership & Community Educ	3
fall/odd yrs	STOCKSCH 355	Community Food Systems	3
spr	STOCKSCH 387	Global Food Systems	3
spr	STOCKSCH 397R	Social Permaculture	3

#### Math, Statistics and Reasoning

SELECT COURSE(S) FROM BOTH CATEGORIES 1 & 2:

##### 1. Basic Mathematics (R1)

fall/spr	MATH 101	Precalculus Algebra with Functions & Graphs	3
	<b>AND</b>	<b>AND</b>	<b>AND</b>
fall/spr	MATH 102	Analytic Geometry & Trigonometry (R1)	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	MATH 104	Algebra, Analytic Geometry, & Trig (R1)	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	MATH 127	Calculus for the Life and Social Sciences I (R2)	3

##### 2. Analytical Reasoning (R2)

Advisor Approval Required 3

**Total Core Requirements 23-27**

## SUSTAINABLE FOOD AND FARMING

CREDITS

### Major Requirements

#### Integrative Experience

fall	STOCKSCH 379	Agricultural Systems Thinking	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
spr	STOCKSCH 494I	Global Issues in Applied Biology	3

#### Junior Year Writing

fall/spr	NATSCI 387	CNS Junior Writing	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
spr	STOCKSCH 382	Professional Dev in Sustainable Food&Farming	3

#### Agricultural Science and Practice

SELECT 24 CREDITS MINIMUM WITH 12 CREDITS AT OR ABOVE 200-LEVEL

spr	STOCKSCH 101	Insects & Related Forms	2
spr	STOCKSCH 111	Introductory Plant Pathology	2
fall/spr	STOCKSCH 120	Organic Farming and Gardening (BS)	4
spr	STOCKSCH 182	Principles of Pesticide Management	2
fall	STOCKSCH 186	Introduction to Permaculture	3
fall/odd yrs	STOCKSCH 200	Plant Propagation	3
spr	STOCKSCH 255	Herbaceous Plants	3
fall	STOCKSCH 265	Intro to Sustainable Agriculture & Food Systems	3
spr	STOCKSCH 266	Farm Management, Planning & Marketing	3
spr	STOCKSCH 268	Small Farm Husbandry: Meat	3
fall	STOCKSCH 269	Small Farm Husbandry: Pigs & Poultry	3
spr	STOCKSCH 286	Permaculture Design & Practice	3
fall	STOCKSCH 297AL	Agricultural Leadership & Community Educ	3
fall/even yrs	STOCKSCH 320	Organic Vegetable Production	3
fall	STOCKSCH 326	Insect Biology	3
fall	STOCKSCH 350	Sustainable Soil and Crop Management	3
fall/odd yrs	STOCKSCH 355	Community Food Systems	3
spr	STOCKSCH 370	Tropical Agriculture	3
spr	STOCKSCH 390G	Sustainable Grape Production	3
spr	STOCKSCH 398E	Farm Enterprise Practicum	3-6
fall/spr	STOCKSCH 398G	Greenhouse Practicum	1-18
fall	STOCKSCH 498E	Farm Enterprise Practicum II	1-6

#### Advanced Courses

SELECT TWO (2) ADDITIONAL STOCKSCH COURSES AT OR ABOVE 500-LEVEL

6 CREDITS MINIMUM

COURSES NOT FROM STOCKSCH MUST BE APPROVED BY ADVISOR

fall	STOCKSCH 505	General Plant Pathology	4
spr	STOCKSCH 510	Management and Ecology of Plant Diseases	3
fall	STOCKSCH 530	Plant Nutrition	4
spr	STOCKSCH 580	Soil Fertility	3
fall	STOCKSCH 581	Integrated Pest Management	4-5
fall	STOCKSCH 587	Phyto/Bioremediation	3



**Professional Electives**

COURSES MAY ALSO BE USED TO MEET GEN ED REQUIREMENTS

SELECT 18 CREDITS MINIMUM ACROSS THE THREE CATEGORIES

ONE (1) COURSE MINIMUM FROM EACH CATEGORY

COURSES MAY BE TAKEN FROM OTHER DEPARTMENTS OR FROM ONE OF THE OTHER FIVE COLLEGES WITH ADVISOR APPROVAL

EXAMPLES OF PRE-APPROVED COURSES ARE LISTED BELOW

OTHER COURSES MAY FULFILL THIS REQUIREMENT WITH ADVISOR APPROVAL

**1. Biophysical Systems**

EXAMPLE

Most STOCKSCH courses 3-4

**2. Economic Systems**

EXAMPLES

fall/spr	ECON 308	Political Economy of the Environment	3
fall/spr	HT-MGT 260	Human Resource Mgt/Hospitality Industry	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	MANAGMNT 314	Human Resource Management	3
fall/spr	MANAGMNT 301	Principles of Management	3
fall/spr	MARKETNG 301	Fundamentals of Marketing	3
fall/spr	RES-ECON 212	Introductory Statistics/Social Sciences (R2)	4
spr	RES-ECON 262	Environmental Economics (SB)	4
fall	RES-ECON 263	Natural Resource Economics (SB)	4
spr	RES-ECON 324	Small Business Finance	3

**3. Social Systems**

EXAMPLE

spr SUSTCOMM 232 History of Sustainable Comm Dev (HS, DG) 4

12 CREDITS MAXIMUM OF RESTRICTED ELECTIVES CAN BE SATISFIED BY INTERNSHIP/PRACTICUM APPROVAL REQUIRED OF ACADEMIC ADVISOR AND DEAN OF UNDERGRADUATE AFFAIRS

fall/spr	STOCKSCH 396	Independent Study	1-6
fall/spr	STOCKSCH 398	Practicum	1-12
fall/spr	STOCKSCH 496	Independent Study	1-6
fall/spr	STOCKSCH 498	Practicum	1-12

**Total Major Requirements 54**

**Minimum Required Credits**

30 STOCKSCH CREDITS MINIMUM

## SUMMARY OF REQUIREMENTS

<b>Total Core Requirements</b>	<b>23-27</b>
Botany and Soils	8
Chemistry	3-4
Ecosystems Studies	3
Food/Land Policy or Agricultural Education	3
Math, Statistics and Reasoning	6-9
<b>Total Major Requirements</b>	<b>54</b>
Integrative Experience	3
Junior Year Writing	3
Agricultural Science and Practice	24
Advanced Courses	6
Professional Electives	18
<b>Grand Total for Sustainable Food and Farming</b>	<b>77-81</b>

**TURFGRASS SCIENCE AND MANAGEMENT**

Michelle DaCosta, Ph.D., Advisor

Bachelor Degree

CREDITS

**Core Requirements of the Major****Biological Science**

fall/spr	STOCKSCH 105	Soils (BS)	4
fall	STOCKSCH 108	Introductory Botany	4

**Chemistry**

fall/spr	CHEM 111	General Chemistry-Science (PS)	4
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**Ecosystems Studies**

SELECT ONE (1) OF THE FOLLOWING:

fall/spr	BIOLOGY 287	Introductory Ecology	3
fall	ENVIRSCI 101	Introduction to Environmental Science (BS)	4
spr	ENVIRSCI 214	Ecosystems, Biodiversity and Global Change	3
fall	NRC 100	Environment and Society (SI)	4

**Integrative Experience**

spr	STOCKSCH 494I	Global Issues in Applied Biology	3
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**Junior Year Writing**

fall/spr	NATSCI 387	CNS Junior Writing	3
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**Math, Statistics and Reasoning**

SELECT COURSE(S) FROM BOTH CATEGORIES 1 &amp; 2:

**1. Basic Mathematics (R1)**

fall/spr	MATH 101	Precalculus Algebra with Functions & Graphs	3
	<b>AND</b>	<b>AND</b>	<b>AND</b>
fall/spr	MATH 102	Analytic Geometry & Trigonometry (R1)	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	MATH 104	Algebra, Analytic Geometry, & Trig (R1)	3

**2. Analytical Reasoning (R2)**

fall/spr	RES-ECON 212	Introductory Statistics/Social Sciences (R2)	4
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	STATISTC 111	Elementary Statistics (R2)	4
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	STATISTC 240	Introduction to Statistics (R2)	4

**Total Core Requirements 28-32**

**Major Requirements****Required Courses****Pest Management**

spr	STOCKSCH 101	Insects & Related Forms	2
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall	STOCKSCH 326	Insect Biology	3
spr	STOCKSCH 107	Turfgrass Insects	2
fall	STOCKSCH 505	General Plant Pathology	4

**Plant Nutrition**

SELECT ONE (1) OF THE FOLLOWING:

fall	STOCKSCH 530	Plant Nutrition	4
spr	STOCKSCH 580	Soil Fertility	3

**Plant Physiology**

spr	STOCKSCH 384	Introduction to Plant Physiology	3
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**Turf**

fall	STOCKSCH 230	Introductory Turfgrass Management	4
spr	STOCKSCH 275	Turfgrass Physiology & Ecology	3
spr	STOCKSCH 340	Advanced Turfgrass Management	3

**Restricted Electives**

CREDITS TAKEN TO SATISFY MAJOR REQUIREMENTS IN OTHER AREAS CANNOT BE COUNTED AS RESTRICTED ELECTIVES

SELECT 12 CREDITS MINIMUM FROM COURSES LISTED BELOW

AT LEAST 6 CREDITS AT OR ABOVE 500-LEVEL

MAXIMUM 6 CREDITS MAY BE TAKEN OUTSIDE THE MAJOR

fall/spr	BIOLOGY 311	General Genetics	3
fall	NRC 232	Principles of Arboriculture	3
fall/odd yrs	STOCKSCH 200	Plant Propagation	3
spr	STOCKSCH 234	Irrigation & Drainage	2
spr	STOCKSCH 240	Applied Calculations in Turf Management	2
spr	STOCKSCH 255	Herbaceous Plants	3
spr	STOCKSCH 510	Management and Ecology of Plant Diseases	3
fall	STOCKSCH 515	Microbiology of the Soil	3
fall	STOCKSCH 523	Plant Stress Physiology	3
fall	STOCKSCH 530	Plant Nutrition	4
spr	STOCKSCH 580	Soil Fertility	3
fall	STOCKSCH 587	Phyto/Bioremediation	3
spr	STOCKSCH 597M	Topics in Turf Pathology	2-3
fall	SUSTCOMM 335	Plants in Landscape	4

# TURFGRASS SCIENCE AND MANAGEMENT

CREDITS

## Restricted Electives (cont.)

### Focus

SELECT BUSINESS OR SCIENCE FOCUS:

#### 1. Business Focus

SELECT FOUR (4) COURSES IN BUSINESS

THESE COURSES SHOULD BE DISTRIBUTED ACROSS FOUR OF THE FIVE CATEGORIES (a-e) BELOW:

a. fall/spr	ACCOUNTG 221	Principles of Financial Accounting	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
spr	RES-ECON 324	Small Business Finance	3
b. fall/spr	ECON 103	Introduction to Microeconomics (SB)	4
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	ECON 104	Introduction to Macroeconomics (SB)	4
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	RES-ECON 102	Introduction to Resource Economics (SB)	4
c. fall/spr	HT-MGT 260	Human Resource Mgt/Hospitality Industry	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	MANAGMNT 314	Human Resource Management	3
d. fall/spr	MANAGMNT 301	Principles of Management	3
e. fall/spr	MARKETNG 301	Fundamentals of Marketing	3

#### 2. Science Focus

SELECT FOUR (4) COURSES IN SCIENCE

CHOOSE ONE (1) COURSE FROM EACH CATEGORY (a-d) BELOW:

a. fall/spr	BIOLOGY 151	Introductory Biology I (BS)	4
b. fall/spr	CHEM 112	General Chemistry-Science (PS)	4
c. spr	CHEM 250	Organic Chemistry	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	CHEM 261	Organic Chemistry	3
d. fall/spr	MATH 127	Calculus for the Life and Social Sciences I (R2)	3
	<b>OR</b>	<b>OR</b>	<b>OR</b>
fall/spr	MATH 131	Calculus I (R2)	4

**Total Major Requirements 51-56**

## SUMMARY OF REQUIREMENTS

**Total Core Requirements 28-32**

Biological Science	8
Chemistry	4
Ecosystems Studies	3-4
Integrative Experience	3
Junior Year Writing	3
Math, Statistics and Reasoning	7-10

**Total Major Requirements 48-53**

Required Courses	24-26
Restricted Electives	24-27

**Grand Total for Turfgrass Science and Management 76-85**

## STOCKBRIDGE SCHOOL COURSE DESCRIPTIONS

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### STOCKSCH 100 (Gen Ed BS)

#### **Botany for Gardeners**

A holistic view of plants including ecology, plant form and function, inheritance and evolution, and the relationship between plants and human life.

Online course.

4 credits/fall sem

### STOCKSCH 101

#### **Insects & Related Forms**

With lab. Introduction to insect recognition, development, damage, and control.

Seven-week course; first 7 weeks of the semester.

2 credits/spring sem

### STOCKSCH 104

#### **Plant Nutrients**

Functions of mineral nutrients in plants, effects of mineral deficiencies, and sources of these nutrients to prevent or alleviate deficiencies in crop production.

Seven-week course; first 7 weeks of the semester.

*Prerequisites: STOCKSCH 105; Stockbridge students only*

2 credits/spring sem

### STOCKSCH 105 (Gen Ed BS)

#### **Soils**

With lab. Interrelationship of soils and higher plants. Physical, chemical, and biological properties of soils. Practical approach to current problems through basic soil principles.

*Prerequisite: some knowledge of chemistry*

4 credits/both sem

### STOCKSCH 107

#### **Turfgrass Insects**

Principles and practical methods of controlling turf insect pests.

*Prerequisites: STOCKSCH 101 (may be taken concurrently); Turfgrass majors only*

2 credits/spring sem

### STOCKSCH 108

#### **Introductory Botany**

With lab. This introductory botany course covers the unique features of plants, how they function, how they are categorized, and how they fit into the ecosystem. Topics include classification of plants, analysis of cell structure and various plant tissues and organs, and study of sexual and asexual reproduction as well as structure and function of plant systems. In addition, students will develop a basic understanding of the processes of photosynthesis and cellular respiration.

4 credits/fall sem

## **STOCKSCH 109**

### **Insects of Ornamentals**

With lab. The recognition, biology, and control of major insect and mite pests attacking shade trees and woody ornamentals in the northeastern U.S. Emphasis on techniques and knowledge useful to the professional in tree care.

*Prerequisite: STOCKSCH 101*

3 credits/fall sem

## **STOCKSCH 111**

### **Introductory Plant Pathology**

With discussion. Applied introduction to plant pathology in horticultural crops. Identification, description, and management of diseases in modern horticultural production. Chemical, biological, cultural, and genetic controls and their integration.

Seven-week course; first 7 weeks of the semester.

*Prerequisites: STOCKSCH 108 or 100-level biology course; Stockbridge students only*

2 credits/spring sem

## **STOCKSCH 112**

### **Turfgrass Pathology Lab**

With lab. Diagnosis and management of turfgrass diseases. Diagnosis techniques and appropriate cultural, chemical, genetic, and biological management strategies.

Seven-week course; last seven weeks of the semester.

*Prerequisites: STOCKSCH 111; Turfgrass Management majors only*

2 credits/spring sem

## **STOCKSCH 117**

### **Agricultural Chemistry**

An introduction to chemical processes integral to understanding soils, agriculture and the environment, focused on basic chemistry principles as they effect carbon and nitrogen cycling, soil fertility, water contamination, organic matter and energy relations.

3 credits/fall sem

## **STOCKSCH 118**

### **Introduction to Sustainable Food and Farming**

Highly interactive and participatory introduction to the Sustainable Food and Farming major, focused on academic preparation, internships and careers. Especially for first year students and transfers into the major.

*Prerequisites: Sustainable Food and Farming majors only; consent of instructor*

1 credit/fall sem

## **STOCKSCH 119**

### **Designing a Backyard Homestead**

Exploration of home-scale food production systems with a focus on permaculture, intensive mini-farming and integrated homesteading. Research and practical applications will be integrated to create home-scale food systems that have the resiliency of natural ecosystems. Essential components of diverse garden systems will be discussed in detail, including edible ecosystem gardens, soil fertility, orchard systems, water management, tools and techniques and planting strategies.

Online course.

3 credits/fall sem

## **STOCKSCH 120**

### **Organic Farming and Gardening (Gen Ed BS)**

With discussion. Introduction to principles of soil fertility and crop management by organic procedures that are contrasted and evaluated against conventional chemical methods of farming.

4 credits/both sem

## **STOCKSCH 170**

### **Pesticide Certification**

Independent preparation for the state pesticide certification examination and licensure. The State Pesticide Exam Study Manual is used and available for purchase either online or at the UMass Extension Bookstore. Exams are given at various times throughout the state. Students must apply to take the exam; applications must be submitted by the deadline date (one week prior to the exam). Refer to [www.mass.gov/pesticide-examination-and-licensing](http://www.mass.gov/pesticide-examination-and-licensing) or call 617-626-1785 for dates of Massachusetts exams.

*Prerequisite: consent of instructor*

1 credit/both sem

## **STOCKSCH 171**

### **Plagues, Food and People: Ecology of Food and Disease (Gen Ed BS)**

The ecology of major diseases related to food, from ergotism and the Salem Witch Trials to the Irish Potato famine to celiac disease and diabetes. How people, microbes and farming change our health and the environment.

4 credits/spring sem

## **STOCKSCH 172**

### **Plants in Our World (Gen Ed SI)**

The study of the intricate and often intimate relationship between plants and people. Focus on fundamental concepts in plant biology, including fundamental properties of life, food chains and food webs, plants as primary producers and humans as consumers. Society's historical connection to plants and how plants have made an impact on civilizations. Topics include current environmental problems that affect local and global food security and supply, alternative food sources and farming techniques supported by thought-provoking case studies, documentaries, and discussions.

Online course.

4 credits/spring sem



## **STOCKSCH 182**

### **Principles of Pesticide Management**

Topics include state and federal pesticide laws and regulations, pesticides and the environment, handling and storage of pesticides, classes and formulations of pesticides, safety and application equipment, understanding the pesticide label, toxicity, proper calculation and mixing of pesticides, and history of pesticide use. Includes preparation for the Massachusetts Pesticide Core Exam.

2 credits/spring sem

## **STOCKSCH 186**

### **Introduction to Permaculture**

Foundation in permaculture history, ethics, principles, design process, and practical applications, rooted in the observation of natural systems. Students are trained as critical thinkers, observers, and analysts of the world(s) around them and are provided with the tools necessary for designing and inspiring positive change.

3 credits/fall sem

## **STOCKSCH 192F**

### **First Year Seminar**

An overview course designed to provide First-Year students with information, opportunities, and skills to ease their transition into college and build a successful foundation necessary to reach their educational goals.

*Prerequisite: Stockbridge freshmen only*

1 credit/fall sem

## **STOCKSCH 196**

### **Independent Study**

Independent work related to some area of the food crops and green industries.

*Prerequisite: consent of instructor*

1-6 credits/both sem

## **STOCKSCH 197P**

### **Physical Care & Wellness for Beginning Farmers**

This class will help students become aware of how to manage the physical work required of beginning farmers. An introduction to basic anatomy, efficiency of common movements and positions used in agriculture, including simple stretches and breathing exercises.

1 credit/spring sem

## **STOCKSCH 197S**

### **Soils Lab**

For students who have completed STOCKSCH 106, and wish to complete the lab component of STOCKSCH 105 that is required for completing the major or minor in this program.

*Prerequisites: STOCKSCH 106; consent of instructor*

1 credit/spring sem

## **STOCKSCH 198P**

### **Permaculture Gardening at UMass**

Students will learn about permaculture basics while maintaining UMass on-campus permaculture demonstration gardens.

1 credit/both sem

## **STOCKSCH 200**

### **Plant Propagation**

With lab. The basic principles and techniques for propagating plants by both sexual and asexual means, including seeds, cuttings, bulbs, and tissue culture. The hormonal and physiological factors affecting rooting, seed dormancy, grafting, budding, and layering.

*Prerequisite: STOCKSCH 108 or 100-level biology course*

3 credits/fall sem/odd years

## **STOCKSCH 230**

### **Introductory Turfgrass Management**

With lab. Basic principles of selecting and managing turfgrass for home lawns, parks, golf courses, and other turf areas. Topics include: climatic adaptation, grass identification, establishment practices, pest control, fertility, environmental stresses, etc.

*Prerequisites: STOCKSCH 105 and STOCKSCH 108 (may be taken concurrently)*

4 credits/fall sem

## **STOCKSCH 234**

### **Irrigation & Drainage**

Principles of hydraulics and system design for turf and landscapes with an emphasis on golf courses. Irrigation systems, equipment performance, installation practices, operation procedures and troubleshooting. Drainage of sports turf also included.

2 credits/spring sem

## **STOCKSCH 240**

### **Applied Calculations in Turf Management**

Calculations involving area and volume measurements, fertilizer and pesticide requirements, cost analysis, seed calculations, irrigation calculations, and calculations relating to spreader and sprayer calibrations.

*Prerequisite: STOCKSCH 230*

2 credits/spring sem

## **STOCKSCH 255**

### **Herbaceous Plants**

Study and identification of herbaceous plants; their uses as ornamental plants for home, park, and business.

*Prerequisite: Stockbridge students only*

3 credits/spring sem

## **STOCKSCH 265**

### **Introduction to Sustainable Agriculture and Food Systems**

Exploration of ethical, practical and scientific aspects of agricultural sustainability, including economic, social and environmental impacts of food and farming. Uses systems thinking tools to compare industrial and ecological agriculture.

*Prerequisite: Sustainable Food and Farming majors only or consent of instructor*

3 credits/fall sem

## **STOCKSCH 266**

### **Farm Management, Planning & Marketing**

Designed for students who foresee starting a farming operation in the future or who currently own, manage or work on a small diversified farm. The complexity of whole farm planning is covered through agricultural business planning, organizational design, decision making, leadership and management of employees, production systems and record keeping.

3 credits/spring sem

## **STOCKSCH 268**

### **Small Farm Husbandry: Meat**

A farmer's perspective on the sustainable management of cows, sheep and goats on a small farm. Focus on the planning and management of cows, sheep and goats for meat production. All aspects from breeding to marketing will be addressed.

*Prerequisite: Sustainable Food and Farming majors only or consent of instructor*

3 credits/spring sem

## **STOCKSCH 269**

### **Small Farm Husbandry: Pigs & Poultry**

With discussion. A farmer's perspective on the management, production and marketing of poultry and pigs on a small farm. This course will address the advantages of having pigs and poultry and will review basic care, processing options, regulations and marketing.

*Prerequisite: Sustainable Food and Farming majors only*

3 credits/fall sem

## **STOCKSCH 275**

### **Turfgrass Physiology & Ecology**

First half of the semester: an introduction to basic concepts in agricultural chemistry as related to the growth and culture of turf grasses. Second half of the semester: the overall growth and development of grasses, including such areas as soil fertility and mineral nutrition.

*Prerequisite: STOCKSCH 230*

3 credits/spring sem

## **STOCKSCH 286**

### **Permaculture Design & Practice**

Deepened and applied practice in permaculture design process and techniques. Development of a permaculture design and community engagement process.

*Prerequisites: STOCKSCH 186; Sustainable Food and Farming majors only or consent of instructor*  
3 credits/spring sem

## **STOCKSCH 296**

### **Independent Study**

Sophomore-level educational project with a faculty member related to some area of the food crops or green industries.

*Prerequisite: consent of instructor*  
1-6 credits/both sem

## **STOCKSCH 296T**

### **Stockbridge School Teaching Experience**

Students gain experience teaching introductory (100-200 level) courses. Students will be expected to demonstrate specific competencies related to labs and assisting students; lead review sessions; gain experience in all aspects of teaching a Stockbridge School class.

*Prerequisites: successful completion of the course and related prerequisites for the course in which the student plans to TA; consent of instructor*  
1-2 credits/spring sem

## **STOCKSCH 297AL**

### **Agricultural Leadership & Community Education**

Focus on learning to work with community groups and schools as a community educator.

*Prerequisite: Sustainable Food and Farming majors only or consent of instructor*  
3 credits/fall sem

## **STOCKSCH 298**

### **Practicum**

Pre-professional work experience related to some area of the food crops and green industries.

*Prerequisite: consent of instructor*  
1-6 credits/both sem

## **STOCKSCH 298A**

### **Agricultural Practicum**

Description unavailable.

*Prerequisite: consent of instructor*  
1-12 credits/spring sem

## **STOCKSCH 298P**

### **Permaculture Practicum**

Hands-on, in-depth experience of how to manage and implement an installation of a permaculture design.

*Prerequisite: consent of instructor*

1-6 credits/spring sem

## **STOCKSCH 320**

### **Organic Vegetable Production**

Focus on organic insect, disease, and weed control, greenhouse production and construction, irrigation practices, planting and fertility, harvesting and marketing techniques, as well as how to manage money, people and natural resources.

3 credits/fall sem/even years

## **STOCKSCH 326**

### **Insect Biology**

With optional lab and field trips. How insects solve their problems of maintenance, survival, reproduction, etc., and how entomologists apply this knowledge in managing them. Topics include insect evolution, plant and insect interactions, biodiversity and conservation of insects, behavior, and insect pest management. Emphasis on various insect models (e.g., *Drosophila*) as they relate to major research in biology.

3 credits/fall sem

## **STOCKSCH 340**

### **Advanced Turfgrass Management**

Management of environmental stress in turfgrass. Special practices in managing high-quality turfgrass areas such as golf courses, athletic fields, and ornamental areas.

*Prerequisite: STOCKSCH 275*

3 credits/spring sem

## **STOCKSCH 350**

### **Sustainable Soil and Crop Management**

With lab. Maintenance and enhancement of long-term productivity and sustainability of soil in food and feed production. Students will gain an integrated knowledge of soil and crop influences on cropping systems.

*Prerequisite: STOCKSCH 105 (may be taken concurrently) or consent of instructor*

3 credits/fall sem

## **STOCKSCH 355**

### **Community Food Systems**

With lab. Examines the movement of food from seed to table. Participants explore local and global food systems, and specific food related issues that impact health of communities. Focus on the opportunities and challenges required in making community food projects that create real lasting systems change.

*Prerequisite: Sustainable Food and Farming majors only*

3 credits/fall sem/odd years

## **STOCKSCH 360**

### **Landscape Plant Production**

With lab. Cultural practices of field and container production; how these practices and environmental factors influence nursery crop growth and development. Topics include: site selection, planting and spacing, mineral nutrition, harvesting, irrigation practices, pest management, and overwintering. Basic economic management of nursery crops production and marketing reviewed.

*Prerequisites: STOCKSCH 105; SUSTCOMM 335 highly recommended*

4 credits/fall sem/odd years

## **STOCKSCH 365**

### **Hydroponics**

Instruction in and practice on soilless culture of plants by hydroponics. Topics include plant nutrition, nutrient solutions, media, systems and techniques of hydroponics, and marketing. Online course.

*Prerequisites: STOCKSCH 105 or STOCKSCH 120; chemistry recommended*

4 credits/fall sem

## **STOCKSCH 370**

### **Tropical Agriculture**

Tropical regions of the world, their environment and classification; influence of climate, population, and socio-economic conditions on agriculture; major crops and cropping systems of sub-humid tropics; introduction to dry land agriculture; importance of rainfall and irrigation on productivity; green revolution; desertification; present and future research needs of region, and state of agricultural technology.

3 credits/spring sem

## **STOCKSCH 376**

### **Student Farm Management I**

How to formulate a complete production plan for a 20 acre organic vegetable farm through the comprehension of introduced topics and activity. Topics include small farm business development, production planning for established markets, compliance with farm certifications for organic production and food safety regulations, soil health and fertility, and methods for plant production and crop maintenance.

*Prerequisites: STOCKSCH 105 and STOCKSCH 398E (taken concurrently)*

3 credits/spring sem

## **STOCKSCH 378**

### **Introductory Agroecology**

Overview of the ecology related to agricultural production, emphasizing crop production. Students will be introduced to ecological principles related to agricultural ecosystems, and to the ways these principles work in modern industrialized agriculture, in traditional agricultural systems, and in alternative systems such as organic agriculture.

*Prerequisite: STOCKSCH 100 or STOCKSCH 108 or BIOLOGY 151 or consent of instructor*

3 credits/fall sem

## **STOCKSCH 379**

### **Agricultural Systems Thinking**

With discussion. Systems thinking is a way of understanding complex real-world situations such as those often encountered in sustainable food and farming careers. Students will be introduced to systems tools for unraveling complexity and integrating their learning from previous courses and experience.

*Prerequisites: STOCKSCH 265; junior and senior Sustainable Food and Farming majors only or consent of instructor*

3 credits/fall sem

## **STOCKSCH 382**

### **Professional Development in Sustainable Food and Farming**

Satisfies the Junior Year Writing requirement for Sustainable Food and Farming majors. Practice and improve writing skills while clarifying career goals and improving professional communication skills.

*Prerequisites: ENGLWRIT 112; Sustainable Food and Farming majors only*

3 credits/spring sem

## **STOCKSCH 384**

### **Introduction to Plant Physiology**

Introduction to fundamental concepts of physiological processes governing plant growth and development, from cell to whole plant responses. Blending of concepts from traditional plant physiology and recent research advances to help provide insight on plant growth and function under various environmental conditions.

*Prerequisites: STOCKSCH 108 and CHEM 110 or CHEM 111*

3 credits/spring sem

## **STOCKSCH 387**

### **Global Food Systems**

Focus on social aspects of the agri-food systems as well as the political economy of food, agriculture and sustainability. Examination of the cultural, ecological and economic implications of the ways food is perceived, produced and consumed. From rural development to the controversy of GMOs, from land conservation to the politics of globalization, from local food systems to global food justice, students use interdisciplinary perspectives to comprehend, analyze and visualize improved global and local food systems.

*Prerequisite: Sustainable Food and Farming majors only*

3 credits/spring sem

## **STOCKSCH 390G**

### **Sustainable Grape Production**

With lab. Exploration of grape origins, domestication, and fundamental principles of grape growing, both domestically and globally. Practices specific to the winter, such as pruning, will be included. Seven-week course; first seven weeks of the semester.

3 credits/spring sem

## **STOCKSCH 391B**

### **Turfgrass Science & Management**

Practical review of key subjects in turfgrass science and management. Specifically designed to prepare students for National Collegiate Turf Bowl competitions in the areas of golf course and sports turf management. Students from across the country participate in annual competitions to gain recognition for their university's turf programs and to network with industry professionals.

*Prerequisites: STOCKSCH 105, STOCKSCH 107, STOCKSCH 240 and STOCKSCH 275*

1 credit/fall sem

## **STOCKSCH 396**

### **Independent Study**

Upper-level project for students who have completed introductory courses in biology/botany, soils and/or entomology.

*Prerequisite: consent of instructor*

1-6 credits/both sem

## **STOCKSCH 397AL**

### **Agricultural Leadership & Community Education II**

This course will build upon STOCKSCH 297AL through deepening students' understanding of teaching methodologies and community-building strategies for Sustainable Food and Farming majors.

*Prerequisite: STOCKSCH 297AL*

3 credits/spring sem

## **STOCKSCH 397AM**

### **Student Farm Animal Program Marketing & Finance**

Hands-on opportunity to manage and organize meat sales through retail, wholesale and direct to consumer markets. Focus on understanding pricing products, estimating yields and revenue, managing inventory in relation to sales, organization of business through Excel spreadsheets, marketing and interpersonal marketing management skills.

*Prerequisites: STOCKSCH 268 and STOCKSCH 269 or ANIMLSCI 232 and ANIMLSCI 252; consent of instructor*

2 credits/fall sem



## **STOCKSCH 397R**

### **Social Permaculture**

How to apply permaculture ethics and principles to a variety of social systems. Use of methods and strategies that build capacity and resilience while leading to long term systemic change.

*Prerequisite: Sustainable Food and Farming majors only*

3 credits/spring sem

## **STOCKSCH 397U**

### **Horticulture Industry Topics**

Ornamental horticulture is an ever changing field adapting to meet consumer trends along with changing to address industry concerns and challenges. This course will explore current topics and issues in the horticulture industry. Topics to be covered will include: substrates, irrigation, pollinators, native plants, invasive plants, edible landscapes, etc.

3 credits/fall sem

## **STOCKSCH 398**

### **Practicum**

Internship or other pre-professional work experience in the field of plant and soil sciences.

*Prerequisites: course work in plant biology, soil science, and minimum two mid-level STOCKSCH courses; consent of faculty advisor*

1-12 credits/both sem

## **STOCKSCH 398A**

### **Practicum**

Internship or other pre-professional work experience in the field of plant and soil sciences. Requires prerequisite course work in plant biology, soil science, and at least two mid-level STOCKSCH courses.

*Prerequisite: consent of instructor*

1-12 credits/spring sem

## **STOCKSCH 398B**

### **Agricultural Practicum**

Description unavailable.

*Prerequisite: consent of instructor*

1-12 credits/both sem

## **STOCKSCH 398D**

### **HydroFarm Practicum**

The UMass HydroFarm Practicum is largely organized and run by students, who select crops, set up growing apparatus in the greenhouse, maintain it and grow the crops, then market and harvest them.

1 credit/both sem

## **STOCKSCH 398E**

### **Farm Enterprise Practicum**

Guided practicum experience providing students with practical experience in growing crops, as well as managing and marketing these crops in support of their educational goals. Students will develop, use and evaluate crop plans, including all aspects of production and marketing. Practical experience in management of soil fertility, water, and pests using IPM and organic methods.

Enrollment limited.

*Prerequisites: STOCKSCH 105 and STOCKSCH 376; juniors; consent of instructor*

3-6 credits/spring sem

## **STOCKSCH 398G**

### **Greenhouse Practicum**

Focus on greenhouse venting and temperature control, maintaining outdoor gardens, harvesting of floricultural crops, post-harvest handling of floricultural crops, fertilization, propagation (by seed, cuttings, division), greenhouse maintenance, operation of greenhouse equipment (fertilizer injector).

*Prerequisite: consent of instructor*

1-12 credits/both sem

## **STOCKSCH 398T**

### **Turf Practicum**

Internship or other pre-professional work experience in the field of turfgrass management, including but not limited to golf course management, athletic field maintenance, and professional lawn care.

*Prerequisites: STOCKSCH 230; consent of instructor*

1-12 credits/both sem

## **STOCKSCH 476**

### **Student Farm Management II: Harvesting, Marketing, and Management**

Practical application of harvesting and marketing techniques used for the sale of organic vegetable crops. Students will complete a financial analysis of the current growing season and make recommendations for the next production cycle.

*Prerequisites: STOCKSCH 376; should be taken concurrently with STOCKSCH 498E; consent of instructor*

3 credits/fall sem

## **STOCKSCH 490S**

### **Soil Ecology**

Introduction to soils as their own ecosystem. Descriptions of the diversity of life found within soils, plant-soil interactions and biogeography will be weaved together to paint a mosaic of soil life, its complexity and global importance. Final portion of the course will address the global challenges facing soil ecosystems and the potential of the soil health movement. Course includes three field trips during regular scheduled lecture time.

*Prerequisite: STOCKSCH 105 or ENVIRSCI 364*

3 credits/fall sem

## **STOCKSCH 494I**

### **Global Issues in Applied Biology**

Satisfies the Integrative Experience requirement for STOCKSCH majors.

This course consists of three case study modules. Each module is a real-world problem that integrates knowledge from a biological, social, political, and economic perspective. Students are expected to transfer their knowledge from the broader General Education training into specific real-world issues.

*Prerequisites: STOCKSCH 108 or BIOLOGY 151; Stockbridge School juniors or seniors*

3 credits/spring sem

## **STOCKSCH 496**

### **Independent Study**

Research or other independent upper-level project in plant and soil sciences.

*Prerequisites: course work in plant biology, soil science, chemistry, and minimum one upper-level STOCKSCH course; consent of instructor*

1-6 credits/both sem

## **STOCKSCH 496A**

### **Independent Study-Plant Science**

Plant science research in laboratory or greenhouse.

*Prerequisites: course work in plant biology, soil science, chemistry, and minimum one upper-level STOCKSCH course; consent of instructor*

1-6 credits/spring sem

## **STOCKSCH 496B**

### **Independent Study-Soil Science**

Soil science research in laboratory or field setting.

*Prerequisites: course work in plant biology, soil science, chemistry, and minimum one upper-level STOCKSCH course; consent of instructor*

1-6 credits/spring sem

## **STOCKSCH 496C**

### **Independent Study-Teaching Assistant**

Assist with instruction/classroom preparation for Stockbridge School courses.

*Prerequisites: consent of instructor teaching the course; Independent Study contract; FERPA certification if involved with grading*

1-6 credits/both sem

## **STOCKSCH 496D**

### **Independent Study-Insect Science**

Upper-level project for students who have satisfactorily completed minimum one 500-level entomology-related class in addition to foundation course work in biology and/or entomology.

*Prerequisite: consent of instructor*

1-6 credits/spring sem

## **STOCKSCH 498**

### **Practicum**

Internship or other pre-professional work experience in the field of plant and soil sciences.

*Prerequisite: consent of instructor*

1-12 credits/both sem

## **STOCKSCH 498E**

### **Farm Enterprise Practicum II**

Continuation of STOCKSCH 398E. Students maintain crops planted in the spring semester and prepare fields for winter. Students will harvest, clean, store and market their crops.

*Prerequisites: STOCKSCH 398E; should be taken concurrently with STOCKSCH 476; consent of instructor*

1-6 credits/fall sem

## **STOCKSCH 498Y**

### **Practicum**

Description unavailable.

*Prerequisite: consent of instructor*

1-12 credits/both sem

## **STOCKSCH 505**

### **General Plant Pathology**

With lab. Causes, nature, and control of plant diseases. Diagnosis of plant diseases. Mechanisms, biochemistry, and genetics of plant disease induction, development, and control.

*Prerequisite: STOCKSCH 384 or MICROBIO 310 or 100-level biology course or consent of instructor*

4 credits/fall sem

## **STOCKSCH 510**

### **Management and Ecology of Plant Diseases**

The ecology of plant, microbe, and human interactions in plant diseases, from wilderness to industrial farms. Epidemics, traditional farming, environmental impacts and sustainability issues. Ways in which agriculture, particularly plant production and plant disease management, change ecosystems.

*Prerequisite: BIOLOGY 151 or equivalent*

3 credits/spring sem

## **STOCKSCH 515**

### **Microbiology of the Soil**

Microbial processes in the soil and sediment environment; ecology of the various microbial communities; decomposition of organic matter, carbon transformation, nitrogen, sulfur, phosphorus and other mineral transformations. Chemistry of these reactions and their biogeochemical implications. Biological equilibrium, the rhizosphere, and microbial associations.

*Prerequisite: CHEM 250 or CHEM 261*

3 credits/fall sem

## **STOCKSCH 523**

### **Plant Stress Physiology**

Advanced course focusing on plant responses to major abiotic stresses. Current research topics in stress physiology will be discussed.

*Prerequisite: STOCKSCH 384 or BIOLOGY 510*

3 credits/fall sem

## **STOCKSCH 530**

### **Plant Nutrition**

With lab. The acquisition, translocation, distribution, and function of the essential inorganic elements in plants. Genetic control of plant nutrition and ecological adaptation to nutritional variables. Diagnosis of plant nutritional disorders.

*Prerequisites: STOCKSCH 105 and STOCKSCH 108, and either CHEM 110 or CHEM 111 or equivalent courses*

4 credits/fall sem

## **STOCKSCH 575**

### **Environmental Soil Chemistry**

With lab. Fundamental chemical concepts/processes in soils, such as ion exchange, precipitation/dissolution, redox reactions, partitioning and adsorption, and solution speciation and nature of soil minerals and organic matter. Examination of how chemical processes affect fate, transport, availability, and remediation of trace elements, heavy metals and organic contaminants in soils and sediments. Discussion on current environmental issues and problems.

*Prerequisites: CHEM 110 or CHEM 111 or consent of instructor; STOCKSCH 105 strongly recommended*

4 credits/fall sem

## **STOCKSCH 580**

### **Soil Fertility**

The role of mineral elements in the growth of plants; plant response to fertilizers and other soil amendments; soil reaction, mineral deficiencies and toxicities; environmental impact of soil fertility management practices.

*Prerequisites: STOCKSCH 105 and STOCKSCH 108 (or equivalents), and either CHEM 110 or CHEM 111*

3 credits/spring sem

## **STOCKSCH 581**

### **Integrated Pest Management**

With lab. Theory and application of the principles of insect, disease, and weed pest management; emphasis on insects. Focus on pest and natural enemy sampling techniques, properties of available control strategies, underlying ecological and behavioral principles, model pest management systems and societal concerns.

*Prerequisite: STOCKSCH 326 or STOCKSCH 505*

4-5 credits/fall sem

## **STOCKSCH 585**

### **Inorganic Contaminants in Soil, Water, and Sediment**

Physical, chemical, and biological factors affecting the fate and transport of inorganic contaminants (including heavy metals) in soil, water and sediment. Sources, chemistry, pedogenic and geochemical behavior of these contaminants and methods used for their analysis. Risk assessment, and remediation technologies, options, and goals.

*Prerequisites: CHEM 111 and CHEM 112, knowledge of college algebra, basic soil science, and transition metal chemistry, or consent of instructor*

3 credits/spring sem

## **STOCKSCH 587**

### **Phyto/Bioremediation**

Various aspects of phytoremediation - the use of plants (both natural hyper-accumulators and transgenic) and their associated microbes with the purpose of environmental clean-up of contaminated soil, sediments and water. Various strategies for phytoremediation of a wide range of toxic pollutants, both organic and elemental, with special emphasis on toxic metals will be discussed.

*Prerequisite: STOCKSCH 384, BIOLOGY 151, or BIOLOGY 152*

3 credits/fall sem

## **STOCKSCH 597M**

### **Topics in Turf Pathology**

Review and discussion of concepts and issues related with turfgrass diseases. Reading of scientific papers and trade journals required each week. Guest speakers from turfgrass industry present many of the topics and lead subsequent class discussion.

*Prerequisite: STOCKSCH 505*

2-3 credits/spring sem

## ACADEMIC CALENDAR 2022 - 2023

### FALL 2022

September 6	Tuesday	First day of classes
September 12	Monday	Last day to ADD or DROP any class with no record
October 10	Monday	Holiday (Indigenous Peoples Day)
November 1	Tuesday	Last day to DROP with 'W' and select 'P/F'
November 7	Monday	Registration begins for Spring 2023
November 11	Friday	Holiday (Veterans' Day)
November 22	Tuesday	FRIDAY CLASS SCHEDULE will be followed
November 22	Tuesday	Thanksgiving recess begins after last class
November 28	Monday	Classes resume
December 12	Monday	Last day of classes
December 13	Tuesday	Reading Day
December 14	Wednesday	Final examinations begin
December 17	Saturday	Second Reading Day
December 20	Tuesday	Last day of final examinations
December 27	Tuesday	Final grades due by Midnight

Number of class meetings: MTuWThF: 13

### SPRING 2023

February 6	Monday	First day of classes
February 12	Sunday	Last day to ADD or DROP any class with no record
February 20	Monday	Holiday (Presidents' Day)
February 22	Wednesday	MONDAY CLASS SCHEDULE will be followed
March 12	Sunday	Spring recess begins
March 20	Monday	Classes resume
April 10	Monday	Last day to DROP with 'W' and select 'P/F'
April 15	Saturday	Patriots Day holiday begins
April 19	Wednesday	Classes resume
April 19	Wednesday	Registration begins for Fall 2023
May 17	Wednesday	Last day of classes
May 18	Thursday	Reading Day
May 19	Friday	Final examinations begin
May 20	Saturday	Second Reading Day
May 25	Thursday	Last day of final examinations; semester ends
May 26	Friday	Commencement Weekend begins
May 28	Sunday	Commencement Weekend ends
June 1	Thursday	Final grades due by Midnight

Number of class meetings: MTuWThF: 13



**COME GROW WITH US!**