

# Department of Plant and Soil Sciences

## Department Head: Dr. Mike Phillips

Office: 117 Dorman Hall

Plant and Soil Sciences curricula focus on the application of sciences to the integrated management of plants, soil, and climate for high-quality production of food, fiber, fuel, and ornamental plants. Central to this course of study is the dedication to conserve, maintain and enhance our environment. An undergraduate student may major in either Agronomy (AGN) or Horticulture (HO) and specialize in concentration areas such as Agricultural and Environmental Soil Sciences (AGN), Golf and Sports Turf Management (AGN), Integrated Crop Management (AGN), Integrated Pest Management (AGN), Floriculture and Ornamental Horticulture (HO), and Floral Management (HO). A grade of "C" or better is required in all required PSS courses in the student's major prior to completion of the degree.

Graduate programs (M.S. and Ph.D.) are also offered in the Department of Plant and Soil Sciences in Agronomy, Horticulture, and Weed Science. Consult the Graduate Bulletin for additional details.

## Agronomy Major (AGN)

### General Education Requirements

#### English Composition

EN 1103	English Composition I	3
or EN 1163	Accelerated Composition I	
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	

#### Mathematics

MA 1313	College Algebra	3
Select 3 hours from the following General Education courses or see Concentrations:		3

#### Science

See major core/concentration		6-9
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#### Humanities

See major core/concentration or General Education list		6
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#### Fine Arts

See major core/concentration or General Education list		3
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#### Social Science

See major core/concentration or General Education list		6
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#### Major Core

BIO 4214	General Plant Physiology	4
PSS 3301	Soils Laboratory	1
PSS 3303	Soils	3
PSS 4313	Soil Fertility and Fertilizers	3

#### Oral Communication Requirement:

CO 1003	Fundamentals of Public Speaking	3
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Total Hours 47-50

## Choose one of the following concentrations: Agricultural and Environmental Soil Sciences Concentration (SOSI)

Advisors: Professors Michael Cox, William Kingery, and Jac Varco

The Agricultural and Environmental Soil Science curriculum provides an educational foundation in soil processes involving physical, chemical, and biological interrelationships. The soil resource is an integral component of our environment and is subject to loss and degradation through human activities. Humanity's dependence on soil for food and fiber production and the need for ensuring environmental quality require individuals trained in the management of this resource. Career opportunities exist both nationally and internationally in agricultural and environmental consulting, agribusiness, government agencies, teaching, and research. Required courses provide soil science training, while elective courses can be selected to meet specific needs.

**Cooperative Education:** Agricultural and Environmental Soil Science students are encouraged to participate in the cooperative education program.

BIO 2113	Plant Biology <sup>1</sup>	3
GR 1123	Introduction to World Geography <sup>1</sup>	3
MA 1323	Trigonometry <sup>1</sup>	3
MA 1713	Calculus I <sup>1</sup>	3
ST 3123	Introduction to Statistical Inference	3
AEC 2713	Introduction to Food and Resource Economics <sup>1</sup>	3
BIO 3304	General Microbiology	4
CH 1211	Investigations in Chemistry I <sup>1</sup>	1
CH 1213	Chemistry I <sup>1</sup>	3
CH 1221	Investigations in Chemistry II <sup>1</sup>	1
CH 1223	Chemistry II <sup>1</sup>	3
CH 2311	Analytical Chemistry I Laboratory	1
CH 2313	Analytical Chemistry I	3
CH 4513	Organic Chemistry I	3
CH 4523	Organic Chemistry II	3
GG 1111	Earth Sciences I Laboratory	1
GG 1113	Survey of Earth Sciences I	3
PH 1113	General Physics I	3
PH 1123	General Physics II	3
PSS 4314	Soil Microbiology	4
PSS 4603	Soil Chemistry	3
PSS 4323	Soil Classification	3
PSS 4333	Soil Conservation and Land Use	3
Restricted Electives (see advisor) <sup>2</sup>		19
<b>Computer Science Requirement</b>		
AIS 4203	Applications of Computer Technology to Agricultural Information Science and Education	3
or AEC 1223	Computer Applications for Agriculturists and Life Scientists	

#### Writing Requirement

AIS 3203	Professional Writing in Agriculture, Natural Resources, and Human Sciences	3
<b>Total Hours</b>		123

<sup>1</sup> Satisfies General Education requirements.

<sup>2</sup> Restricted Electives. Select from: ABE 4263, ADS 1114, AEC 3133, BCH 4013, BIO 4213, BIO 4404, CH 3213, CH 4303, CH 4404, CH 4413, EPP 2213, EPP 4113, GG 3133, GG 4114, GG 4304, GG 4503, GR 2313, GR 3113, GR 4603, MA 1723, PSS 1313, PSS 3133, PSS 4103, PSS 4123, PSS 4133, PSS 4223, PSS 4373, PSS 4414, PSS 4483.

## Golf and Sports Turf Management Concentration (GSTM)

Advisors: Associate Professor Barry Stewart; Assistant Professor Christian Baldwin

Golf and Sports Turf Management (GSTM) is the study of plant and soil sciences for the culture of turfgrass on golf and sports facilities. The GSTM curriculum prepares individuals for careers as golf course superintendents at private, daily fee, and resort courses or as sports turf managers at city, school, and professional sports turf facilities (i.e. football, baseball, soccer fields.) New construction of golf courses and sports facilities has led to a heightened demand for trained golf and sports turf management professionals. Three semesters of Cooperative Education work experience will be required of all students enrolled in the GSTM concentration.

**Cooperative Education Requirements:** GSTM students must complete a minimum 12 months or three semesters of Coop work at a golf course with an individual who is certified or progressing toward certification with the Golf Course Superintendents Association of America or at a sports stadium with a recognized sports turf manager. One of the three Coop semesters enrolled by the student must be a non-summer semester period. A 2.50 cumulative GPA on all MSU work is required to participate in the GSTM program. All new students must register with their coop advisor early in their initial semester of enrollment.

ACC 2013	Principles of Financial Accounting	3
ABE 2873	Land Surveying	3
ABE 4163	Machinery Management for Agro-Ecosystems	3
BIO 2113	Plant Biology <sup>1</sup>	3
CH 1043	Survey of Chemistry I <sup>1</sup>	3
CH 1053	Survey of Chemistry II <sup>1</sup>	3
CH 1051	Experimental Chemistry <sup>1</sup>	1
CH 2503	Elementary Organic Chemistry	3
CH 2501	Elementary Organic Chemistry Laboratory	1
EC 2113	Principles of Macroeconomics <sup>1</sup>	3
EPP 4113	Principles of Plant Pathology	3
EPP 3423	Ornamental and Turfgrass Insects	3
EPP 4523	Turfgrass Diseases	3
FLS 1113	Spanish I <sup>1</sup>	3
FLS 1123	Spanish II <sup>1</sup>	3
LA 3603	Design of the Golf Environment	3
LA 4344	Landscape Architecture Construction IV	4
MGT 3513	Introduction to Human Resource Management	3

KI 2213	Emergency Health Care	3
PSS 1313	Plant Science	3
PSS 2423	Plant Materials I	3
PSS 3133	Introduction to Weed Science	3
PSS 3411	Turf Seminar I	1
PSS 3421	Turn Seminar II	1
PSS 4353	Arboriculture and Landscape Maintenance	3
PSS 4414	Turf Management	4
PSS 4423	Golf Course Operations	3
PSS 4443	Athletic Field Management	3
PSS 4823	Turfgrass Weed Management	3
CP 2103	First Work Semester	3
CP 2203	Second Work Semester	3
CP 3303	Third Work Semester	3
Restricted Electives (see advisor) <sup>2</sup>		9

### Computer Science Requirement

PSS 4423	Golf Course Operations	3
PSS 4443	Athletic Field Management	3

### Writing Requirement

PSS 3411	Turf Seminar I	1
PSS 3421	Turn Seminar II	1

<b>Total Hours</b>		122
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<sup>1</sup> Satisfies General Education requirements.

<sup>2</sup> Restricted Electives. Select from: ABE 1073, ABE 2173, BCH 4013, BIO 2213, BIO 4203, CO 3213, CO 2253, CO 3833, FIN 2003, MGT 3213, PE 1081, PH 1113, PSS 3473, PSS 3923, PSS 4223, PSS 4314, PSS 4323, PSS 4333, PSS 4343, PSS 4503.

## Integrated Crop Management Concentration (ICM)

Advisors: Professors Brian Baldwin and Frank B. Matta  
Associate Professors David J. Lang and Ted Wallace

Integrated Crop Management (ICM) is the study of food and fiber production utilizing ecologically sound and technologically advanced methods. Areas covered include basic concepts of plant science and specific practices in crop initiation, culture, harvesting, processing, distribution and marketing. Methods of germplasm enhancement are taught. Specific program areas of study include agronomic crop production, crop science, fruit science, seed science, seed technology, and vegetable crop production. Students completing the Integrated Crop Management curriculum are prepared for careers as producers, consultants, technical representative plant breeders, extension agents, or inspectors with USDA and state agencies. This curriculum also provides a good background of basic sciences for those who wish to pursue graduate studies.

AEC 2713	Introduction to Food and Resource Economics <sup>1</sup>	3
AEC 3133	Introductory Agribusiness Management	3
AEC 3413	Introduction to Food Marketing	3
BCH 4013	Principles of Biochemistry	3
BIO 2113	Plant Biology <sup>1</sup>	3
BIO 3304	General Microbiology	4
CH 1043	Survey of Chemistry I <sup>1</sup>	3

CH 1053	Survey of Chemistry II <sup>1</sup>	3
CH 1051	Experimental Chemistry	1
CH 2503	Elementary Organic Chemistry	3
CH 2501	Elementary Organic Chemistry Laboratory	1
EPP 2213	Introduction to Insects	3
EPP 4113	Principles of Plant Pathology	3
PO 3103	Genetics I	3
PSS 1313	Plant Science	3
PSS 3133	Introduction to Weed Science	3
Restricted Electives (see advisor) <sup>2</sup>		24
Unrestricted Electives		9
<b>Computer Science Requirement</b>		
AIS 4203	Applications of Computer Technology to Agricultural Information Science and Education	3
or AEC 1223	Computer Applications for Agriculturists and Life Scientists	
<b>Writing Requirement</b>		
AIS 3203	Professional Writing in Agriculture, Natural Resources, and Human Sciences	3
<b>Total Hours</b>		122

<sup>1</sup> Satisfies General Education requirements.

<sup>2</sup> Restricted Electives. Select from: EPP 4163, EPP 4263, GA 1111, MA 1713, PH 1113, PSS 2423, PSS 3043, PSS 3423, PSS 3923, PSS 4103, PSS 4123, PSS 4133, PSS 4143, PSS 4223, PSS 4314, PSS 4323, PSS 4333, PSS 4343, PSS 4363, PSS 4373, PSS 4414, PSS 4444, PSS 4453, PSS 4483, PSS 4503, PSS 4603, PSS 4633, PSS 4813, Agribusiness Elective (3).

## Integrated Pest Management Concentration (IPM)

Major Advisor: Assistant Professor Fred R. Musser

Integrated Pest Management (IPM) is an interdisciplinary concentration of study in Entomology, Plant Pathology and Weed Science jointly administered by the Department of Entomology and Plant Pathology and the Department of Plant and Soil Sciences. Effective management of pest problems requires a broad base of knowledge in the pest disciplines and practical field experience. The Integrated Pest Management concentration features a strong core of courses in the three pest disciplines (entomology, plant pathology, and weed science); a strong background in biological and physical sciences; and practical training through an internship. The curriculum is designed to meet the needs of students who wish to pursue advanced degrees and of students who wish to terminate their higher education with a baccalaureate degree. A range of restricted and non-restricted electives allows students to personalize their degree program for careers in crop production, agribusiness, natural resource management, and/or graduate studies preparation. A grade of "C" or better is required in all courses with the EPP, PSS, CH, or BIO prefix prior to completion of the degree. No course may be transferred for credit from another college or university in which a grade of "D" was made. A student may transfer up to nine hours of "T" level technical courses from community colleges as unrestricted lower-level electives. "T" level technical courses may not be transferred for credit on any course listed specifically in the IPM curriculum.

Graduates are well prepared for employment with industry; state and federal research, extension and regulatory agencies; private agricultural

consulting firms; farmer's cooperatives; nurseries, home and garden centers; greenhouse plant production; and corporate farms.

Internship: IPM students must complete a minimum one semester internship with an approved internship sponsor in industry, private consulting firms/individuals, or governmental agencies.

AEC 2713	Introduction to Food and Resource Economics <sup>1</sup>	3
BIO 1134	Biology I <sup>1</sup>	4
BIO 1144	Biology II <sup>1</sup>	4
BIO 4213	Plant Ecology	3
CH 1051	Experimental Chemistry	1
CH 1043	Survey of Chemistry I <sup>1</sup>	3
CH 1053	Survey of Chemistry II <sup>1</sup>	3
CH 2503	Elementary Organic Chemistry	3
EPP 4113	Principles of Plant Pathology	3
EPP 4154	General Entomology	4
EPP 4163	Plant Disease Management	3
EPP 4263	Principles of Insect Pest Management	3
PO 3103	Genetics I	3
PSS 3133	Introduction to Weed Science	3
PSS 3423	Agronomy Internship	3
PSS 4633	Weed Biology and Ecology	3
PSS 4813	Herbicide Technology	3
ST 3123	Introduction to Statistical Inference <sup>1</sup>	3
Restricted Electives (see advisor) <sup>2</sup>		17
Unrestricted Electives		11
<b>Writing Requirement</b>		
AIS 3203	Professional Writing in Agriculture, Natural Resources, and Human Sciences	3
<b>Computer Literacy</b>		
AIS 4203	Applications of Computer Technology to Agricultural Information Science and Education	3
or AEC 1223	Computer Applications for Agriculturists and Life Scientists	
<b>Total Hours</b>		124

<sup>1</sup> Satisfies University Core.

<sup>2</sup> Restricted Electives. Select from: FO 4313, FO 4451, FO 4452, GR 3303, GR 3311, ABE 3513, ABE 4313, ACC 2013, AEC 3113, AEC 3133, AEC 3213, AEC 3233, AEC 3413, AEC 3513, AEC 4123, BIO 3304, BIO 4203, EPP 3124, EPP 3423, EPP 4214, EPP 4523, EPP 4244, EPP 4543, GR 2313, GR 4303, GR 4323, LA 2433, MGT 3513, PSS 2423, PSS 3473, PSS 4103, PSS 4123, PSS 4133, PSS 4314, PSS 4323, PSS 4333, PSS 4343, PSS 4353, PSS 4363, PSS 4373, PSS 4411, PSS 4414, PSS 4453, WFA 4153, WFA 4253.

## Horticulture Major (HO)

### General Education Requirements

#### English Composition

EN 1103	English Composition I	3
or EN 1163	Accelerated Composition I	
EN 1113	English Composition II	3

or EN 1173 Accelerated Composition II

**Mathematics**

MA 1313	College Algebra	3
See concentration		3

**Science**

BIO 2113	Plant Biology	3
CH 1043	Survey of Chemistry I	3
CH 1051	Experimental Chemistry	1
CH 1053	Survey of Chemistry II	3

**Humanities**

Floriculture - See concentration		3
Floral Management - Select from General Education courses		3

**Fine Arts**

Choose one of the following:		3
PSS 2343	Floral Design	
LA 1803	Landscape Architecture Appreciation (F&O only)	

**Social/Behavioral Sciences****Floriculture**

Choose one of the following:		3
AEC 2713	Introduction to Food and Resource Economics	
EC 2113	Principles of Macroeconomics	
EC 2123	Principles of Microeconomics	
General Education courses		3

**Floral Management**

PS 1113	American Government	3
PSY 1013	General Psychology	3

**Major Core**

ACC 2013	Principles of Financial Accounting	3
MKT 3013	Principles of Marketing	3
PSS 1313	Plant Science	3
PSS 2423	Plant Materials I	3
PSS 3313	Interior Planting Design and Maintenance	3
PSS 3473	Plant Materials II	3
PSS 3923	Plant Propagation	3
PSS 3511	Seminar	1

**Writing Requirement**

AIS 3203	Professional Writing in Agriculture, Natural Resources, and Human Sciences	3
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**Choose one of the following concentrations:****Floral Management Concentration (FLMG)**

Advisors: Professor James DelPrince  
Instructor Lynette McDougald

Floral Management involves sourcing, purchasing, distributing, marketing, designing with, and selling floricultural products. Students enrolled in this concentration are provided with courses in design and horticulture, balanced with business and sciences. Career opportunities for graduates include retailing, wholesaling, special event designing, and display gardening. The University Florist, a professional flower shop owned and operated by the Department of Plant and Soil Sciences on the MSU campus, provides students with work and management opportunities.

Internship Requirements (PSS 3413): FM majors must complete a 12 week, 480 clock hour work experience in a floral industry enterprise. The internship requirement may be completed any semester after successful completion of PSS 2343 Floral Design.

ACC 2023	Principles of Managerial Accounting	3
ART 1113	Art Appreciation	3
ART 1123	Design I	3
BL 2413	The Legal Environment of Business	3
EPP 2213	Introduction to Insects <sup>1</sup>	3
FIN 3113	Financial Systems	3
HS 2603	Interior Design Fundamentals	3
LA 2423	History of Landscape Architecture	3
PSS 2351	Techniques in Flowershop Management	1
PSS 3023	Retail Floristry Operation and Management	3
PSS 3343	Wedding Floral Design	3
PSS 3413	Floristry Internship	3
PSS 3443	Permanent Botanical Floral Design	3
Math course from General Education		3
Art Electives (see advisor) <sup>2</sup>		6
Restricted Electives (see advisor) <sup>3</sup>		6

**Oral Communication Requirement**

CO 1003	Fundamentals of Public Speaking	3
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**Computer Literacy Requirement**

Choose one of the following:		3
AEC 1223	Computer Applications for Agriculturists and Life Scientists	
AIS 4203	Applications of Computer Technology to Agricultural Information Science and Education	
BIS 1012	Introduction to Business Information Systems	
TKT 1273	Computer Applications	

**Total Hours** 123<sup>1</sup> Satisfies General Education requirements.<sup>2</sup> Art Electives. Select from: ART 1013, ART 1023, ART 1133, ART 1153, ART 1213, ART 1223, ART 2013, ART 2213, ART 2303, ART 2403, ART 4533.<sup>3</sup> Restricted Electives. Select from: PSS 3043, PSS 3303, PSS 4143, PSS 4353, PSS 4363, PSS 4343, PSS 4453, PSS 4503, PSS 4503, PSS 4613.

**A minor in Floral Management is available. To obtain a minor, students are required to complete the following 15 hours:**

PSS 2343	Floral Design	3
PSS 3023	Retail Floristry Operation and Management	3
PSS 3313	Interior Planting Design and Maintenance	3
PSS 3343	Wedding Floral Design	3
PSS 3443	Permanent Botanical Floral Design	3

**Floriculture and Ornamental Horticulture Concentration (FLOR)**

Advisors: Professor Richard L. Harkess

Floriculture and Ornamental Horticulture offers diversified opportunities that are challenging, intellectually stimulating, and economically rewarding. Floriculture and Ornamental Horticulture is the science and art of producing, distributing, and marketing flowers, flowering and foliage plants. It offers a wide variety of employment opportunities and competitive salaries. Students completing this curriculum are prepared for many different careers including greenhouse or nursery management, landscape management, public service, research and technical product research and sales.

PSS 4343	Controlled Environment Agriculture
PSS 4353	Arboriculture and Landscape Maintenance
PSS 4363	Sustainable Nursery Production
PSS 4613	Floriculture Crop Programming

BIO 4203	Taxonomy of Spermatophytes	3
BIO 4214	General Plant Physiology	4
CH 2501	Elementary Organic Chemistry Laboratory	1
CH 2503	Elementary Organic Chemistry	3
EPP 4113	Principles of Plant Pathology	3
EPP 2213	Introduction to Insects	3
EPP 3423	Ornamental and Turfgrass Insects	3
FLS 1113	Spanish I <sup>1</sup>	3
FLS 1123	Spanish II <sup>1</sup>	3
MA 2113	Introduction to Statistics <sup>1</sup>	3
or ST 2113	Introduction to Statistics	
PO 3103	Genetics I	3
PSS 3301	Soils Laboratory	1
PSS 3303	Soils	3
PSS 3433	Horticulture Internship	3
PSS 4343	Controlled Environment Agriculture	3
PSS 4341	Controlled Environment Agriculture Laboratory	1
PSS 4363	Sustainable Nursery Production	3
PSS 4444	Plant Tissue Culture	4
PSS 4613	Floriculture Crop Programming	3
Restricted Electives (see advisor) <sup>2</sup>		15
<b>Oral Communication Requirement</b>		
CO 1003	Fundamentals of Public Speaking	3
<b>Computer Literacy Requirement</b>		
AEC 1223	Computer Applications for Agriculturists and Life Scientists	3
or AIS 4203	Applications of Computer Technology to Agricultural Information Science and Education	
<b>Total Hours</b>		<b>124</b>

<sup>1</sup> Satisfies General Education requirements.

<sup>2</sup> Restricted Electives. Select from: AEC 3413, BCH 4013, BIO 3304, BIO 4204, BIO 4213, BIO 4404, EPP 4163, EPP 4263, FLS 2133, FLS 2143, LA 2253, LA 2433, LA 4753, MGT 3114, MKT 3213, PSS 2343, PSS 2443, PSS 3023, PSS 3133, PSS 3343, PSS 3443, PSS 3633, PSS 4000, PSS 4143, PSS 4313, PSS 4353, PSS 4043, PSS 4414, PSS 4453, PSS 4503, PSS 4553.

A **minor** in Floriculture and Ornamental Horticulture is available. To obtain a minor, students are required to complete

PSS 2423	Plant Materials I	3
PSS 3473	Plant Materials II	3
PSS 3923	Plant Propagation	3
Choose two of the following:		3
PSS 3313	Interior Planting Design and Maintenance	