PLANT SCIENCE | PLANT HEALTH AND PROTECTION

Plant scientists sustain and improve our current and future world as they work with foods, fibers, fuel, flowers, pharmaceuticals, urban forests, soil health, plant pests, and our natural environs. Plant Science students study biology, plant morphology and physiology, chemistry, entomology, physics, soil and water sciences, plant identification, plant pathology, plant propagation, and environmental horticulture.

About this Program

- **College**: Agricultural and Life Sciences (http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL)
- **Degrees**: Bachelor of Arts | Bachelor of Science
- **Credits for Degree**: 120
- **Additional Information**
- **Related Plant Science Programs**

To graduate with this major, students must complete all university, college, and major requirements.

The plant science degree offers diverse specializations that provide a wide range of professional opportunities. The specializations provide students with an interdisciplinary perspective of these areas and pursue coursework that tracks them into a variety of job opportunities.

The University of Florida offers some of the specializations in this major to transfer students who have the appropriate credentials through the statewide programs at the Fort Lauderdale Research and Education Center in Ft. Lauderdale, the Mid-Florida Research and Education Center in Apopka, or the West Florida Research and Education Center in Milton.

Course Requirements

**Bachelor of Science**

Designed for students with different professional objectives. All students, regardless of degree or specialization, are required to take an introductory plant science course, an introductory statistics course, an economics course, a technical writing course, a speech course, a soil science course, a plant physiology course, a plant pathology course, a professional development course, and a capstone experience course. All students must also complete an internship related to their area of interest.

**Bachelor of Arts**

Designed for students who want to learn about contemporary food systems from an interdisciplinary perspective. All students are required to take an introductory plant science course, a capstone experience course, and must complete an internship related to their area of interest.

Each specialization has a specific set of required core courses and a number of upper-division electives to choose from that represent important interdisciplinary topic areas. Core courses provide students with the knowledge and fundamental concepts essential to the specialization. Upper-division electives are designed to build knowledge, competency and skills applicable to professional development.

Students should meet with an advisor as early as possible in their academic careers to choose their specialization and to plan their course of study.

**Related Plant Science Programs**

- Environmental Horticulture minor (http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL/EVH_UMN)
- Golf and Sports Turf Management minor (http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL/GST_UMN)
- Plant Science minor (http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL/PLS_UMN)
- Environmental Horticulture Management certificate (http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL/AGL_UCT02)

**Bachelor of Science | Plant Health and Protection**

This specialization is designed for students who want to pursue careers related to plant health management in the public or private sector. It will prepare students for entry into the workplace in insect and disease control, plant diagnostics, crop production management, plant pathology and entomology research, plant growth consulting, integrated pest management, cooperative extension or to pursue advanced degrees in plant pathology, entomology, plant medicine, or other related disciplines.

**Critical Tracking**

Critical Tracking records each student’s progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites (http://www.flvc.org/cpp/displayRecord.jsp?cip=011101&track=01) may be used for transfer students.

**Semester 1**

- Complete 2 of 6 critical-tracking courses, excluding labs: ECO 2013; BOT 2010C or BSC 2010/BSC 2010L; BOT 2011C or BSC 2011/BSC 2011L; CHM 2045/CHM 2045L; CHM 2046/CHM 2046L; MAC 1147
  - 2.0 GPA required for all critical-tracking courses
  - 2.0 UF GPA required
Semester Two
- Complete 1 additional critical-tracking course, excluding labs
- 2.0 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester Three
- Complete 2 additional critical-tracking courses, excluding labs
- 2.0 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester Four
- Complete 1 additional critical-tracking course, excluding labs
- 2.0 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester Five
- Complete all critical-tracking courses, including labs
- 2.0 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Model Semester Plan
To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student’s academic record and scheduling availability of courses. Prerequisites still apply.

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester One</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BOT 2010C</td>
<td>Select one:</td>
<td>Introductory Botany (Critical Tracking; State Core Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>BSC 2010</td>
<td>&amp; 2011L</td>
<td>Integrated Principles of Biology 1 and Integrated Principles of Biology Laboratory 1 (Critical Tracking; State Core Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>ENC 1101</td>
<td></td>
<td>Expository and Argumentative Writing (State Core Gen Ed Composition (<a href="http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext">http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext</a>); Writing Requirement: 6,000 words)</td>
<td>3</td>
</tr>
<tr>
<td>MAC 1147</td>
<td></td>
<td>Precalculus Algebra and Trigonometry (Critical Tracking; State Core Gen Ed Mathematics)</td>
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</tr>
<tr>
<td>MUL 2010</td>
<td></td>
<td>Experiencing Music (State Core Gen Ed Humanities and International)</td>
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| Credits | 13-14 |

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<thead>
<tr>
<th>Course</th>
<th>Semester Two</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BOT 2011C</td>
<td>Select one:</td>
<td>Plant Diversity (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences)</td>
<td>4</td>
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<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Three</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AEC 3030C</td>
<td></td>
<td>Effective Oral Communication or Introduction to Public Speaking</td>
<td>3</td>
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<tr>
<td>AMH 2020</td>
<td></td>
<td>United States Since 1877 (Gen Ed Social and Behavioral Sciences and Diversity)</td>
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<tr>
<td>CHM 2045L</td>
<td>&amp; 2045C</td>
<td>General Chemistry 1 and General Chemistry 1 Laboratory (Critical Tracking; State Core Gen Ed Biological and Physical Sciences)</td>
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<tr>
<td>ENY 3005L</td>
<td>&amp; 3005C</td>
<td>Principles of Entomology and Principles of Entomology Laboratory (Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>ECO 2013</td>
<td></td>
<td>Principles of Macroeconomics (Critical Tracking; State Core Gen Ed Social and Behavioral Sciences)</td>
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| Credits | 14 |

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<tr>
<th>Course</th>
<th>Semester Four</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>CHM 2046</td>
<td>&amp; 2046C</td>
<td>General Chemistry 2 and General Chemistry 2 Laboratory (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>SWS 3022</td>
<td>&amp; 3022L</td>
<td>Introduction to Soils in the Environment and Introduction to Soils in the Environment Laboratory (Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>ENY 3005</td>
<td>&amp; 3005L</td>
<td>Principles of Entomology and Principles of Entomology Laboratory (Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>PLS 3004C</td>
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<td>Principles of Plant Science</td>
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| Credits | 14 |

<table>
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<tr>
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<th>Summer After Semester Four</th>
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<tr>
<td>CHM 2210</td>
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<td>Organic Chemistry 1</td>
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<td>Select one:</td>
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<td>ORH 3513C</td>
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<td>Environmental Plant Identification and Use</td>
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<td>BOT 2710C</td>
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<td>Practical Plant Taxonomy</td>
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<td>BOT 3151C</td>
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<td>Local Flora of North Florida</td>
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<td>PLP 3002C</td>
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<td>Fundamentals of Plant Pathology</td>
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| Credits | 6 |

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<td>AGR 3304</td>
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<td>Genetics</td>
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<tr>
<td>ORH 4256</td>
<td>or SWS 4116</td>
<td>Nutritional Management of Nursery Crops or Environmental Nutrient Management</td>
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<tr>
<td>IPM 3022</td>
<td></td>
<td>Fundamentals of Pest Management</td>
<td>3</td>
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<tr>
<td>Approved electives</td>
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| Credits | 13 |

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<th>Summer After Semester Six</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PLS 4941</td>
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<td>Practical Work Experience</td>
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</table>

| Credits | 3 |
Semester Seven
Entomology elective 3
Plant Pathology elective 3
Approved electives 8

Credits 14

Semester Eight
AEB 4126 Agricultural and Natural Resource Ethics 3
AGR 4512 Physiology and Ecology of Crops 3
ORH 4933 Professional Seminar in Environmental Horticulture 1
PLS 4950 Plant Science Capstone 3
PLS 3223 Plant Propagation and Plant Propagation Laboratory 2

Approved elective Credits 15

Total Credits 120

Approved Electives | Minimum 22 credits
In addition to the Plant Pathology elective and the Entomology elective in Semester 7, there are 22 additional elective credits to be completed. Choose courses from each focus area; minimum credits for each area listed below. Students must consult with their advisor for assistance in selecting the designated listed electives in order to take applicable and appropriate courses for the students’ job and career aspirations. Consult an advisor for other options, which may include study abroad courses.

Plant Pathology | Minimum 3 credits

Code | Title | Credits
--- | --- | ---
PLP 3103C | Control of Plant Diseases | 3
PLP 4104 | Applied Plant Disease Management | 3
PLP 4222C | Introduction to Plant Virology | 3
PLP 4242C | Introduction to Plant Bacteriology | 3
PLP 4260C | Introduction to Plant Pathogenic Fungi | 3
PLP 4653C | Basic Fungal Biology | 3
PLP 4905 | Problems in Intermediate Plant Pathology | 4
PLP 4931 | Seminar in Plant Pathology | 1

Credits 3

Entomology | Minimum 3 credits

Code | Title | Credits
--- | --- | ---
ALS 3153 | Agricultural Ecology | 3
ALS 4161 | Exotic Species and Biosecurity Issues | 3
ALS 4162 | Consequences of Biological Invasions | 3
ALS 4163 | Challenges in Plant Resource Protection | 3
ENY 3005 | Principles of Entomology | 2
ENY 3510C | Turf and Ornamental Entomology | 3
ENY 4161 | Insect Classification | 3
ENY 4573 | Beekeeping | 3
NEM 3002 | Principles of Nematology | 3

Credits 3

Ethical and Social Issues | Minimum 3 credits

Code | Title | Credits
--- | --- | ---
AEB 4123 | Agricultural and Natural Resource Law | 3
AGG 3501 | Environment, Food and Society | 3
IDS 2154 | Facets of Sustainability | 3
PHM 3032 | Ethics and Ecology | 3
POT 3503 | Environmental Ethics and Politics | 3

Credits 3

Microbiology and Molecular Biology | Minimum 3 credits

Code | Title | Credits
--- | --- | ---
BCH 4024 | Introduction to Biochemistry and Molecular Biology | 4
CHM 2211 | Organic Chemistry 2 | 5
& 2211L | and Organic Chemistry Laboratory | 3
HOS 3305 | Introduction to Plant Molecular Biology | 3
HOS 4313C | Laboratory Methods in Plant Molecular Biology | 2
MCB 4304 | Genetics of Microorganisms | 3
MCB 4320C | The Microbiome | 3
PCB 4522 | Molecular Genetics | 3
SWS 4303C | Soil Microbial Ecology | 3

Credits 3

Production Agriculture | Minimum 3 credits

Code | Title | Credits
--- | --- | ---
AEB 3122 | Financial Planning for Agribusiness | 3
AEB 3133 | Principles of Agribusiness Management | 3
AEB 4342 | Agribusiness and Food Marketing Management | 3
AGR 4212 | Alternative Cropping Systems | 3
AGR 4214C | Applied Field Crop Production | 3
AGR 4231C | Forage Science and Range Management | 4
AGR 4932 | Agronomy Topics | 1-3
AOM 3734 | Irrigation Principles and Practices in Florida | 3
AOM 4434 | Precision Agriculture | 3
AOM 4455 | Agricultural Operations and Systems | 3
HOS 3281C | Organic and Sustainable Crop Production | 3
HOS 4283C | Advanced Organic and Sustainable Crop Production | 3
PLS 4242C | Micropropagation of Horticultural Crops | 4
SWS 3022 & 3022L | Introduction to Soils in the Environment and Introduction to Soils in the Environment Laboratory | 4

Credits 4

Other Approved Electives

Code | Title | Credits
--- | --- | ---
PHY 2004 | Applied Physics 1 | 4
& 2004L | and Laboratory for Applied Physics 1

Credits 4

Academic Learning Compact
The plant science major, offered jointly by the departments of Agronomy and Plant Pathology, enables students to apply principles associated with production and improvement of agronomic crops. Students will acquire knowledge about the scientific fundamentals of plant growth of field and forage crops. They will acquire knowledge about fungi, bacteria and viruses, as well as environmental factors that cause plant disease. This program prepares students to work in the lab and field settings and to develop applied skills for research and extension.

Before Graduating Students Must
- Complete a research paper and an oral presentation with satisfactory faculty evaluation.
- Achieve minimum grades of C in AEC 3030C and AEC 3033C. These courses are graded using rubrics developed by a faculty team.
- Complete requirements for the baccalaureate degree, as determined by faculty.
Students in the Major Will Learn to

Student Learning Outcomes (SLOs)

Content
1. Describe plant growth and development in terms of plant morphology and physiology and evaluate the abiotic and biotic factors that impact plant growth and management.
2. Recommend practices that growers and managers can implement to address the abiotic and biotic components of their cropping system.

Critical Thinking
3. Analyze and apply science-based data to solve problems in plant production, distribution and/or utilization.
4. Design and evaluate a project that addresses a problem or challenge related to their area of interest.

Communication
5. Create, interpret and analyze written text and multimedia presentations.
6. Communicate effectively through oral and multimedia presentations.

Curriculum Map

I = Introduced; R = Reinforced; A = Assessed

<table>
<thead>
<tr>
<th>Courses</th>
<th>SLO 1</th>
<th>SLO 2</th>
<th>SLO 3</th>
<th>SLO 4</th>
<th>SLO 5</th>
<th>SLO 6</th>
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<tr>
<td>AEC 3030C</td>
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<td>PLS 4941 A</td>
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Assessment Types
- Standardized post-test
- Capstone and individual projects
- Final grades