HORTICULTURAL SCIENCE | PLANT MOLECULAR AND CELLULAR BIOLOGY

This major prepares students for careers in plant science, including management, production, applied research, molecular biology research, marketing, sales and a number of other areas. Students can receive training ranging from commodity production/cropping systems to basic plant science/molecular biology.

About this Program
- **College:** Agricultural and Life Sciences
- **Degree:** Bachelor in Science
- **Credits for Degree:** 120
- **Specializations:** Horticultural Production | Horticultural Science | Organic Crop Production | Plant Molecular and Cellular Biology
- **Additional Information**
  - **Related Horticultural Science Programs**

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

The department offers four specializations: horticultural sciences, horticultural production, organic crop production, and plant molecular and cellular biology. These options provide a strong science background and flexibility when choosing elective courses. Details of the specializations are outlined below. An academic advisor will help develop the curriculum that best suits your career and educational goals.

Related Horticultural Science Programs
- **Combined Degree**
- **Horticultural Science minor**

Plant Molecular and Cellular Biology
This is a comprehensive program focusing on the molecular aspects of crops, including crop growth, development and cultivar improvement. This specialization is geared toward preparing students for careers in laboratory research and is also an excellent preparation for students planning to pursue graduate studies.

Critical Tracking
Note that critical tracking is the same for all specializations of this major except Plant Molecular and Cellular Biology.

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 may be used for transfer students.

Semester 1
- Complete 1 of 6 critical-tracking courses, excluding labs:
  - BSC 2010/BSC 2010L, BSC 2011/BSC 2011L, CHM 2045/CHM 2045L, CHM 2046/CHM 2046L, MAC 2311, PHY 2048/PHY 2048L or PHY 2053/PHY 2053L
  - 2.0 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

Semester 2
- Complete 1 additional critical-tracking course, excluding labs
  - 2.0 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

Semester 3
- Complete 2 additional critical-tracking courses, excluding labs
  - 2.0 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

Semester 4
- Complete 2 additional critical-tracking courses, excluding labs
  - 2.0 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

Semester 5
- 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>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Semester One</td>
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<tr>
<td>BSC 2010 &amp; 2010L</td>
<td>Integrated Principles of Biology 1 and Integrated Principles of Biology Laboratory 1 (Critical Tracking; State Core Gen Ed Biological and Physical Sciences)</td>
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<tr>
<td>IUF 1000</td>
<td>What is the Good Life (Gen Ed Humanities)</td>
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<tr>
<td>MAC 1147</td>
<td>Precalculus Algebra and Trigonometry (State Core Gen Ed Mathematics)</td>
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<tr>
<td>State Core Gen Ed Composition; Writing Requirement</td>
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<td><strong>Credits</strong></td>
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<td>Semester Two</td>
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<tr>
<td>BSC 2011 &amp; 2011L</td>
<td>Integrated Principles of Biology 2 and Integrated Principles of Biology Laboratory 2 (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>Select one:</td>
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<tr>
<td>PHY 2053 &amp; 2053L</td>
<td>Physics 1 and Laboratory for Physics 1 (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences)</td>
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<tr>
<td>PHY 2048 &amp; 2048L</td>
<td>Physics with Calculus 1 and Laboratory for Physics with Calculus 1 (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences)</td>
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</tbody>
</table>
State Core Gen Ed Social and Behavioral Sciences 3
Elective 3

Semester Three
AEC 3033C  
Research and Business Writing in Agricultural and Life Sciences (Writing Requirement) 3
CHM 2045 & 2045L  
General Chemistry 1 and General Chemistry 1 Laboratory (Critical Tracking; Gen Ed Biological Sciences and Physical Sciences) 4
MAC 2311  
Analytic Geometry and Calculus 1 (Critical Tracking; Gen Ed Mathematics) 4
State Core Gen Ed Humanities 3
Elective 3
Credits 14-15

Semester Four
Select one: 3-4
AEB 2014  
Economic Issues, Food and You (Gen Ed Social and Behavioral Sciences) 4
ECO 2013  
Principles of Macroeconomics (Gen Ed Social and Behavioral Sciences) 3
ECO 2023  
Principles of Microeconomics (Gen Ed Social and Behavioral Sciences) 3
AEC 3030C  
Effective Oral Communication 3
CHM 2046 & 2046L  
General Chemistry 2 and General Chemistry 2 Laboratory (Critical Tracking) 4
Gen Ed Composition; Writing Requirement 3
Elective 3
Credits 16

Semester Five
AGR 3303  
Genetics 3
CHM 2210  
Organic Chemistry 1 3
HOS 3202  
Introduction to Plant Molecular Biology 3
HOS 4313C  
Laboratory Methods in Plant Molecular Biology 2
Credits 14

Semester Six
CHM 2211 & 2211L  
Organic Chemistry 2 and Organic Chemistry Laboratory 5
HOS 4933  
Professional Development in Horticulture 3
Approved electives 3
Credits 16

Semester Seven
BCH 3025 or BCH 4024  
Fundamentals of Biochemistry or Introduction to Biochemistry and Molecular Biology 4
HOS 4304  
Horticultural Physiology 3
PLP 3002C  
Fundamentals of Plant Pathology 4
Approved elective 3
Credits 14

Semester Eight
AGR 4320  
Plant Breeding 3
MCB 3020 & 3020L  
Basic Biology of Microorganisms and Laboratory for Basic Biology of Microorganisms 4
Approved electives 3
Credits 9
Total Credits 120

Academic Learning Compact
The horticultural science major prepares students for a career in plant science, including management, production, research, marketing and sales. Students will gain knowledge ranging from commodity production and cropping systems to basic plant science and molecular biology. They will develop skills to describe how plant physiology and genetics relate to plant growth and development as well as developing knowledge of plant diseases and other factors that affect horticultural crops.

Before Graduating Students Must
• Pass the horticultural sciences competency test, given in three parts. One part will be given in each of these required courses:
  Code Title Credits
  HOS 3020 Principles of Horticulture Crop Production 3
  HOS 4304 Horticultural Physiology 3
  HOS 4341 Advanced Horticultural Physiology 3
• 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 fundamental concepts, skills and processes in horticultural science.
2. Apply fundamental concepts, skills and processes in horticultural science.

Critical Thinking
3. Critically analyze and interpret data in horticultural science.
4. Solve problems in horticultural science.

Communication
5. Communicate effectively in written form in a manner appropriate in the field of horticultural science.
6. Communicate effectively orally in a manner appropriate in the field of horticultural science.

Curriculum Map
\( I = \text{Introduced}; R = \text{Reinforced}; A = \text{Assessed} \)

<table>
<thead>
<tr>
<th>Courses</th>
<th>SLO 1</th>
<th>SLO 2</th>
<th>SLO 3</th>
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Assessment Types
• Class project
• Writing assignments
• Exams
• Final grades