

# GENERAL BOTANY

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The Botany curriculum provides a broad background in the biology of plants, from the molecular to the organismic level. Students who major in Botany will take courses in ecology, genetics, physiology, taxonomy, evolution, cells and tissues, molecular biology, and biodiversity of plants.

## About this Program

- **College:** Liberal Arts and Sciences (<http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/>)
- **Degree:** Bachelor of Science
- **Specializations:** General Botany (p. 1) | Botanical Research ([http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/BOT\\_BS/BOT\\_BS01/](http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/BOT_BS/BOT_BS01/))
- **Credits for Degree:** 120
- **More Info**

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

## Department Information

The Department of Biology studies life at all levels from molecules to the biosphere to understand the evolution, structure, maintenance and dynamics of biological systems. The department's teaching and research provide the integrative and conceptual foundations of the life sciences.

**Website** (<https://biology.ufl.edu/>)

## CONTACT

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Map (<http://campusmap.ufl.edu/#/index/0747>)

## Curriculum

- Biology UF Online
- Biology | CALS
- Biology | CLAS
- Botany Minor
- Botany | CALS
- Botany | CLAS
- Combination Degrees
- Zoology
- Zoology Minor

Small classes are taught by faculty who have a commitment to undergraduate education. Students participate in mentored research, assisting faculty with research projects on campus and abroad. The major prepares students for careers in industry and government agencies, for graduate and professional schools, and for teaching jobs in high schools.

## Specializations

### General Botany

For students who may not intend to pursue a graduate degree but are interested in a career in plant biology. This specialization provides some flexibility in tailoring the courses needed in order to pursue specific interests. Students are encouraged to consult with an advisor and botany faculty member when deciding on which courses to take.

### Botanical Research

For students who intend to pursue a graduate degree, and requires research with a faculty member. This specialization provides the coursework background typically required by botany graduate programs. Students are encouraged to consult with an advisor and biology faculty member when deciding on which courses to take.

## Coursework for the Major

Required coursework is dependent upon the specialization. Coursework for each specialization can be found below under Critical Tracking and Model Semester Plan.

## Relevant Minors and Certificates

Students majoring in botany can minor in most other disciplines, and this is a good way to organize students' electives around areas of interest. Note that botany majors cannot minor in biology or chemistry, nor can biology majors minor in botany (the curricula for the botany and biology majors are too similar).

### UFTeach Program

There is a severe shortage of qualified secondary science teachers in Florida and nationwide. Students interested in becoming part of this high-demand profession should see a botany advisor or the UFTeach advisor. UFTeach students complete the UFTeach minor in science teaching with their BS in botany and have the coursework and preparation for professional teacher certification in Florida when they graduate.

More Info (<https://education.ufl.edu/uf-teach/>)

### Research

Botany majors are strongly encouraged to participate in research, and research is required for the Botanical Research specialization. Research experience is valuable on many levels: it diversifies the college experience; it teaches students how scientists apply the knowledge gained in the classroom to real world questions; it provides the opportunity to work with and get to know researchers who are the best in their field; it introduces students to cutting edge scientific questions and techniques; it can enhance a student's resume/CV when applying to graduate or professional school; and, finally, it is essential in helping students determine if science is a good career choice.

CLAS Biology, Botany, and Zoology majors may participate in research for course credit, as a scholar (e.g., University Scholar, Science for Life Scholar, Beckman Scholar), as a volunteer, or, in rare cases, as a paid research assistant. Students who plan to enroll for course credit must contact potential research mentors, develop a project, and turn in the required application and proposal no later than the week of drop/add. If the window is missed, students should still contact potential research mentors to discuss upcoming opportunities.

More Info (<https://biology.ufl.edu/undergraduates/research/>)

## General Botany

This option is intended for students who do not plan to attend graduate or professional school, but are planning a career in government, public service, or secondary education. A student must achieve a minimum grade of C in all required courses for the major.

Code	Title	Credits
<b>Required Foundation Courses</b>		
<i>Introductory Botany / Biology</i>		
Select one option:		7-8
<b>Option A (preferred)</b>		
BOT 2010C	Introductory Botany (preferred) <sup>1</sup>	
BOT 2011C	Plant Diversity	
OR		
<b>Option B</b>		
BSC 2010 & 2010L	Integrated Principles of Biology 1 and Integrated Principles of Biology Laboratory 1	
BSC 2011 & 2011L	Integrated Principles of Biology 2 and Integrated Principles of Biology Laboratory 2	
<i>Chemistry</i>		
CHM 2045 & 2045L	General Chemistry 1 and General Chemistry 1 Laboratory	4
CHM 2046 & 2046L	General Chemistry 2 and General Chemistry 2 Laboratory	4
CHM 2200 & 2200L	Fundamentals of Organic Chemistry and Fundamentals of Organic Chemistry Laboratory	4
<i>Math</i>		
MAC 1147 or MAC 2311	Precalculus Algebra and Trigonometry Analytic Geometry and Calculus 1	4
Select one:		3
STA 2023	Introduction to Statistics 1	
COP 2800	Computer Programming Using JAVA (or equivalent)	
COP 3275	Computer Programming Using C (or equivalent)	
BSC 2891	Python Programming for Biology	
<i>Physics</i>		
PHY 2004 & 2004L	Applied Physics 1 and Laboratory for Applied Physics 1	4
<b>Required Courses for the General Botany Specialization</b>		

AGR 3303	Genetics	3-4
or PCB 3063	Genetics	
PCB 4674	Evolution	4
BOT 2710C	Practical Plant Taxonomy	3
BOT 3503	Physiology and Molecular Biology of Plants	5
& 3503L	and Physiology and Molecular Biology of Plants Laboratory	
BSC 4936	Critical Analysis of Biological Research	2
<i>Ecology and Florida Biodiversity</i>		
Select two:		6-8
PCB 4043C	General Ecology	
PCB 3601C	Plant Ecology	
BOT 3151C	Local Flora of North Florida	
BSC 3307C	Climate Change Biology	
<i>Cells and Tissues</i>		
BOT 4935/5225C	Special Topics (Plant Anatomy)	3-4
or PCB 3023	Essential Cell Biology	
<i>Biodiversity Breadth</i>		
Select one:		3-4
BOT 2011C	Plant Diversity <sup>1</sup>	
BOT 4650	Plant Symbiosis	
PCB 4460	Biodiversity and Ecology Field Immersion	
ZOO 4205C	Invertebrate Biodiversity	
ZOO 4307C	Vertebrate Biodiversity	
ZOO 4472C	Avian Biology	
ZOO 4926	Special Topics in Zoology (Mammalogy)	
ENY 3005	Principles of Entomology	
& 3005L	and Principles of Entomology Laboratory	
WIS 4934	Topics in Wildlife Ecology and Conservation (Mammalogy)	
PLP 3002C	Fundamentals of Plant Pathology	
PLP 4653C	Basic Fungal Biology	
MCB 2000	Microbiology	
& 2000L	and Microbiology Laboratory	
MCB 3020	Basic Biology of Microorganisms	
& 3020L	and Laboratory for Basic Biology of Microorganisms	
<i>Botany Electives</i>		
Select two additional courses from the above Ecology, Cells and Tissues, or Biodiversity categories, or from the list of approved electives		4-8
<b>Total Credits</b>		<b>63-73</b>

<sup>1</sup> Students who select BOT 2011C to fulfill the foundation requirements may not use BOT 2011C to fulfill the biodiversity breadth requirements for the major.

## Recommended and Approved Electives

Some courses may have prerequisites.

Code	Title	Credits
AGG 3501	Environment, Food and Society	3
AGR 4304	Plant Chromosomes and Genomes	3
AGR 4320	Plant Breeding	3
AGR 4512	Physiology and Ecology of Crops	3
ALS 4163	Challenges in Plant Resource Protection	3
BCH 3023	Elementary Organic and Biological Chemistry (online)	3
BCH 5045	Graduate Survey of Biochemistry (online)	4
BOT 2800C	Plants in Human Affairs	3
BOT 4053	Practical Experience in Teaching Botany	2
BOT 4851C	Medical and Forensic Plant Biology	3
BOT 4935	Special Topics	2-4
BOT 4935/5305	Special Topics (Paleobotany)	3
BSC 2862	Global Change Ecology and Sustainability	3
BSC 3402	Theory and Practice in the Biological Sciences	2
BSC 4434C	Introduction to Bioinformatics	3

ENY 4161	Insect Classification	3
FNR 3131C	Dendrology/Forest Plants	3
FOR 2662	Forests for the Future	3
FOR 3004	Forests, Conservation and People	3
FOR 3153C	Forest Ecology	3
FOR 3342C	Tree Biology	3
FOR 4060	Global Forests	3
HOS 3305	Introduction to Plant Molecular Biology	3
HOS 4304	Horticultural Physiology	3
HOS 4313C	Laboratory Methods in Plant Molecular Biology	2
HOS 4341	Advanced Horticultural Physiology	3
MCB 4304	Genetics of Microorganisms	3
MCB 4320C	The Microbiome	3
MCB 4503	General Virology	3
MCB 4652	Environmental Microbiology	3
ORH 3513C	Environmental Plant Identification and Use	3
ORH 3773	Public Gardens	2
ORH 3815C	Florida Native Landscaping	3
PCB 4553	Population Genetics	4
PCB 5338	Principles of Ecosystem Ecology	3
PLP 2060	Fungus among Us: Mushrooms, Molds and Civilization	3
PLP 3230	Survey of Plant Pathogens	3
PLS 2003C	Plants That Feed the World	3
PLS 3223 & 3223L	Plant Propagation and Plant Propagation Laboratory	3
PLS 4601C	Principles of Weed Science	3

### Critical Tracking

Critical Tracking records each student's progress in courses that are required for progress toward 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 (<https://cpm.flvc.org/advance-search/>) may be used for transfer students.

## Semester 1

- Complete 1 of 5 critical-tracking courses, including lab: BSC 2010/BSC 2010L or BOT 2010C, BSC 2011/BSC 2011L or BOT 2011C, CHM 2045/CHM 2045L, CHM 2046/CHM 2046L, MAC 1147 or MAC 2311 or STA 2023
- 2.0 UF GPA required

## Semester 2

- Complete 1 additional critical-tracking course, including labs
- 2.0 UF GPA required

## Semester 3

- Complete 1 additional critical-tracking course, including labs, with a 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

## Semester 4

- Complete 1 additional critical-tracking course, including labs, with 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

## Semester 5

- Complete all critical-tracking courses, including labs, with 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

## Semester 6

- Complete at least 2 required courses for this specialization
- 2.0 UF GPA required

## Semester 7

- Complete one of the remaining Required Foundation courses: CHM 2200/CHM 2200L, PHY 2004/PHY 2004L, MAC 1147/MAC 2311, or STA 2023/COP 2800/COP 3275/BSC 2891
- Complete at least 2 additional (4 total) required courses for this specialization
- 2.0 UF GPA required

## Semester 8

- Complete all remaining major course requirements
- 2.0 UF GPA required

### Model Semester Plan

For degree requirements outside of the major, refer to CLAS Degree Requirements: Structure of a CLAS Degree.

Students are expected to complete the Writing Requirement while in the process of taking the courses below. Students are also expected to complete the General Education International (GE-N) and Diversity (GE-D) requirements concurrently with another General Education requirement (typically, GE-C, H, or S).

CHM 2211, CHM 2211L, PHY 2054, PHY 2054L, PHY 2049, and PHY 2049L may count towards 3000 level or above electives outside of the major.

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.*

Course	Title	Credits
<b>Semester One</b>		
Quest 1 (Gen Ed Humanities)		3
BSC 1920	First Year Introduction: Biology at UF (recommended elective)	1
Select one:		4
BSC 2010 & 2010L	Integrated Principles of Biology 1 and Integrated Principles of Biology Laboratory 1 ( <b>Critical Tracking</b> ; Gen Ed Biological Sciences)	
BOT 2010C	Introductory Botany ( <b>Critical Tracking</b> ; Gen Ed Biological Sciences)	
Select one:		4
MAC 1147	Precalculus Algebra and Trigonometry ( <b>Critical Tracking</b> ; State Core Gen Ed Mathematics)	
MAC 2311	Analytic Geometry and Calculus 1 ( <b>Critical Tracking</b> ; State Core Gen Ed Mathematics)	
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		3
	<b>Credits</b>	<b>15</b>
<b>Semester Two</b>		
Select one:		4
BSC 2011 & 2011L	Integrated Principles of Biology 2 and Integrated Principles of Biology Laboratory 2 ( <b>Critical Tracking</b> ; Gen Ed Biological Sciences)	
BOT 2011C	Plant Diversity ( <b>Critical Tracking</b> ; Gen Ed Biological Sciences)	
CHM 2045 & 2045L	General Chemistry 1 and General Chemistry 1 Laboratory ( <b>Critical Tracking</b> ; State Core Gen Ed Biological and Physical Sciences)	4
Gen Ed Composition; Writing Requirement		3
State Core Gen Ed Social and Behavioral Sciences ( <a href="http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext">http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext</a> )		3
	<b>Credits</b>	<b>14</b>
<b>Semester Three</b>		
CHM 2046 & 2046L	General Chemistry 2 and General Chemistry 2 Laboratory ( <b>Critical Tracking</b> ; Gen Ed Physical Sciences)	4

State Core Gen Ed Humanities ( <a href="http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext">http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext</a> )		3
Quest 2 (Gen Ed Social and Behavioral Sciences or Gen Ed Physical or Biological Sciences)		3
Foreign language		5
	<b>Credits</b>	<b>15</b>
<b>Semester Four</b>		
PHY 2004 & 2004L	Applied Physics 1 and Laboratory for Applied Physics 1 ( <b>Critical Tracking</b> ; Gen Ed Social and Behavioral Sciences)	4
Select one:		3
STA 2023	Introduction to Statistics 1 ( <b>Critical Tracking</b> ; Gen Ed Mathematics)	
COP 2800	Computer Programming Using JAVA (or equivalent; <b>Critical Tracking</b> )	
COP 3275	Computer Programming Using C (or equivalent; <b>Critical Tracking</b> ; Gen Ed Mathematics)	
BSC 2891	Python Programming for Biology ( <b>Critical Tracking</b> )	
Gen Ed Social and Behavioral Sciences or Gen Ed Physical or Biological Science - Option not taken in Quest 2 above)		3
Foreign language		5
	<b>Credits</b>	<b>15</b>
<b>Semester Five</b>		
CHM 2200 & 2200L	Fundamentals of Organic Chemistry and Fundamentals of Organic Chemistry Laboratory ( <b>Critical Tracking</b> )	4
Select one:		3-4
PCB 4043C	General Ecology ( <b>Critical Tracking</b> )	
PCB 3601C	Plant Ecology ( <b>Critical Tracking</b> )	
BOT 3151C	Local Flora of North Florida ( <b>Critical Tracking</b> )	
BSC 3307C	Climate Change Biology ( <b>Critical Tracking</b> )	
PCB 4674	Evolution ( <b>Critical Tracking</b> )	4
Gen Ed Humanities		3
	<b>Credits</b>	<b>14-15</b>
<b>Semester Six</b>		
AGR 3303 or PCB 3063	Genetics ( <b>Critical Tracking</b> ) or Genetics	3-4
BOT 2710C	Practical Plant Taxonomy ( <b>Critical Tracking</b> )	3
BOT 4935/5225C or PCB 3023	Special Topics (Plant Anatomy; <b>Critical Tracking</b> ) or Essential Cell Biology	3-4
Gen Ed Mathematics <sup>1</sup>		3
Elective		3
	<b>Credits</b>	<b>15-17</b>
<b>Semester Seven</b>		
BOT 3503 & 3503L	Physiology and Molecular Biology of Plants and Physiology and Molecular Biology of Plants Laboratory ( <b>Critical Tracking</b> )	5
Select one:		3-4
PCB 4043C	General Ecology ( <b>Critical Tracking</b> )	
PCB 3601C	Plant Ecology ( <b>Critical Tracking</b> )	
BOT 3151C	Local Flora of North Florida ( <b>Critical Tracking</b> )	
BSC 3307C	Climate Change Biology ( <b>Critical Tracking</b> )	
Approved botany electives		4
Electives		4
	<b>Credits</b>	<b>16-17</b>
<b>Semester Eight</b>		
BSC 4936	Critical Analysis of Biological Research	2
Biodiversity breadth courses		4
Electives		10
	<b>Credits</b>	<b>16</b>
	<b>Total Credits</b>	<b>120</b>

<sup>1</sup> Gen Ed Mathematics; if COP 2800 or BSC 2891 taken for computational requirement; or elective.

## Electives

### Recommended and Approved Electives

Some courses may have prerequisites.

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AGG 3501	Environment, Food and Society	3
AGR 4304	Plant Chromosomes and Genomes	3
AGR 4320	Plant Breeding	3
AGR 4512	Physiology and Ecology of Crops	3
ALS 4163	Challenges in Plant Resource Protection	3
BCH 3023	Elementary Organic and Biological Chemistry (online)	3
BCH 5045	Graduate Survey of Biochemistry (online)	4
BOT 2800C	Plants in Human Affairs	3
BOT 4053	Practical Experience in Teaching Botany	2
BOT 4851C	Medical and Forensic Plant Biology	3
BOT 4935	Special Topics	2-4
BOT 4935/5305	Special Topics (Paleobotany)	3
BSC 2862	Global Change Ecology and Sustainability	3
BSC 3402	Theory and Practice in the Biological Sciences	2
BSC 4434C	Introduction to Bioinformatics	3
ENY 4161	Insect Classification	3
FNR 3131C	Dendrology/Forest Plants	3
FOR 2662	Forests for the Future	3
FOR 3004	Forests, Conservation and People	3
FOR 3153C	Forest Ecology	3
FOR 3342C	Tree Biology	3
FOR 4060	Global Forests	3
HOS 3305	Introduction to Plant Molecular Biology	3
HOS 4304	Horticultural Physiology	3
HOS 4313C	Laboratory Methods in Plant Molecular Biology	2
HOS 4341	Advanced Horticultural Physiology	3
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MCB 4320C	The Microbiome	3
MCB 4503	General Virology	3
MCB 4652	Environmental Microbiology	3
ORH 3513C	Environmental Plant Identification and Use	3
ORH 3773	Public Gardens	2
ORH 3815C	Florida Native Landscaping	3
PCB 4553	Population Genetics	4
PCB 5338	Principles of Ecosystem Ecology	3
PLP 2060	Fungus among Us: Mushrooms, Molds and Civilization	3
PLP 3230	Survey of Plant Pathogens	3
PLS 2003C	Plants That Feed the World	3
PLS 3223 & 3223L	Plant Propagation and Plant Propagation Laboratory	3
PLS 4601C	Principles of Weed Science	3

## Academic Learning Compact

The Botany major is offered by both the College of Liberal Arts and Sciences and the College of Agricultural and Life Sciences. This major provides a foundation in the life sciences with emphasis on plant systems. Students will learn the diversity of life, the structure of organisms and ecosystems and how they function (i.e., the acquisition, flow, organization and uses of information, energy and nutrients in living systems). Students will learn the scientific method and how it facilitates the discovery of new knowledge in botany and biology, including how to critically evaluate hypotheses and conclusions.

## Before Graduating Students Must

- Achieve acceptable performance in all required botany courses.
- Complete requirements for the baccalaureate degree, as determined by faculty.

## Students in the Major Will Learn to

### Student Learning Outcomes | SLOs

#### Content

1. Identify, describe, and explain the basic terminology, concepts, methodologies, and theories used within the biological sciences.

#### Critical Thinking

2. Analyze biological information and develop reasoned solutions to problems using the processes and applications of scientific inquiry.
3. Discriminate ethical behavior from unethical behavior in scientific research.

#### Communication

4. Communicate knowledge, ideas, and reasoning clearly and effectively in written or oral forms appropriate to the biological sciences.

### Curriculum Map

*I = Introduced; R = Reinforced; A = Assessed*

Courses	SLO 1	SLO 2	SLO 3	SLO 4
BOT 2011C	R	R		I
BOT 2710	R	R		R
BOT 3503 and BOT 3503L	R/A	R/A		R/A
BSC 2010	I	I	I	
BSC 2011	I	I		
PCB 3601C	R/A	R/A	R/A	R/A
PCB 4043C	R/A	R/A	R/A	R/A

### Assessment Types

- Major field test for biology
  - Bioethics quiz
  - Scientific paper
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