BACHELOR OF ARTS

The Biology majors combine the faculty and resources of the College of Agricultural and Life Sciences and the College of Liberal Arts and Sciences to prepare undergraduates for careers in the biological sciences, advanced study in professional and graduate schools, productive citizenship and leadership, and lifelong learning. The program is comprehensive and flexible, emphasizing the diverse forms, processes, and systems of life. Students in the program complete required and elective courses that promote critical thinking through the investigation and understanding of principles and unifying themes that govern living systems. The Biology major offers a broader approach to biology than is available through a major in botany, zoology, or other specialized biological sciences majors.

About this Program

- **College:** Liberal Arts and Sciences (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/)
- **Degrees:** Bachelor of Arts (p. 1) | Bachelor of Science
- **Specializations:** Integrative Biology (BS) (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/BIO_BA_BS/BIO_BS03/) | Preprofessional Biology (BS) (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/BIO_BA_BS/BIO_BS04/)
- **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

The BA major is designed for students interested in a career in education, the allied health professions, and interdisciplinary fields such as environmental or biotechnology law, science journalism, and bioscience management. The BA is not recommended for students preparing for health professions such as medicine, dentistry, and veterinary medicine.

Requirements for the major

The major requires 29-34 credits of foundation coursework and a minimum of 30 credits of Biology BA major coursework. All coursework for the major must be completed with minimum grades of C.

At least 18 credits of major coursework must be taken at UF. At least two Biology Distribution Courses and at least 9 credits of Biology BA electives must be taken at UF.

Code	Title	Credits
Required Foundation Coursework		
General Biology		*8*
BSC 2010	Integrated Principles of Biology 1	4
& 2010L	and Integrated Principles of Biology Laboratory	

BSC 2011 & 2011L	Integrated Principles of Biology 2 and Integrated Principles of Biology Laboratory 2	4
General Chemistry; Select one option:		*6-8*
Option A		
CHM 1030	Basic Chemistry Concepts and Applications 1	
CHM 1031	Basic Chemistry Concepts and Applications 2	
Option B		
CHM 2045 & 2045L	General Chemistry 1 and General Chemistry Laboratory	
CHM 2046 & 2046L	General Chemistry 2 and General Chemistry 2 Laboratory	
Mathematics; Select one:		*4-5*
MAC 1147	Algebra and Trigonometry	
MAC 1114 & MAC 1140	Trigonometry and Precalculus Algebra	
A math course above MAC 1147 / MAC 1140 + MAC 1114		
Physics; Select one option:		*8-10*
Option A		
PHY 2004 & 2004L	Applied Physics 1 and Laboratory for Physics 2004	
PHY 2005 & 2005L	Applied Physics 2 and Applied Physics 2 Lab	
Option B		
PHY 2053 & 2053L	Physics 1 and Laboratory for PHY 2053	
PHY 2054 & 2054L	Physics 2 and Laboratory for PHY 2054	
STA 2023	Introduction to Statistics 1	3
Total		29-34
Required Biology BA Major Coursework: Biology BA Distribution, Capstone, and Approved Biology BA Major Electives must total a minimum of 30 credits. At least 18 credits must be taken at UF [1]		
Biology Distribution Courses		
Complete one course or course/lab combination from 3 of the 5 Groups. At least two Biology Distribution Courses must be taken at UF. Only one 2000-level course may be applied to the Biology Distribution Course requirement. No course may be applied to more than one group. Courses may vary from 3-5 credits in each category		9-13
Group 1: Molecular Biology, Cellular Biology and Genetics		
AGR 3303	Genetics	
BCH 3023	Elementary Organic and Biological Chemistry	
PCB 3023	Essential Cell Biology [2]	
PCB 3063	Genetics	
PCB 3134	Eukaryotic Cell Structure and Function	
PCB 4522	Molecular Genetics	
PCB 4553	Population Genetics	
Group 2: Organismal Biology		
BOT 3503 & 3503L	Physiology and Molecular Biology of Plants and Physiology and Molecular Biology of Plants Laboratory [2]	
BSC 3096	Human Physiology	
MCB 2000 & 2000L	Microbiology and Microbiology Laboratory	
MCB 3020 & 3020L	Basic Biology of Microorganisms and Laboratory for Basic Biology of Microorganisms [2]	
PCB 3134	Eukaryotic Cell Structure and Function [2]	
PCB 3713C	Cellular and Systems Physiology [2]	
PCB 4712	Comparative Biomechanics [2]	
PCB 4723C	Physiology and Molecular Biology of Animals [2]	
ZOO 3603C	Evolutionary Developmental Biology	
ZOO 3713C	Functional Vertebrate Anatomy	
Group 3: Ecology		
BSC 3307C	Climate Change Biology	
PCB 3601C	Plant Ecology	
PCB 4043C	General Ecology	
Group 4: Evolution and Diversity		

BOT 2011C	Plant Diversity	
BOT 2710C	Practical Plant Taxonomy	
BOT 3151C	Local Flora of North Florida	
PCB 4674	Evolution [2]	
ZOO 3513C	Animal Behavior	
ZOO 4205C	Invertebrate Biodiversity	
ZOO 4307C	Vertebrate Biodiversity	
ZOO 4050	Animal Behavior	
ZOO 4205C	Invertebrate Biodiversity	
ZOO 4307C	Vertebrate Biodiversity	
Group 5: Biology and Society		
AGG 3501	Environment, Food and Society	
ALS 4162	Consequences of Biological Invasions	
BOT 2800C	Plants in Human Affairs	
PLP 2000	Plants, Plagues, & People	
PLP 2060	Fungus among Us: Mushrooms, Molds and Civilization	
PLS 2830	World Herbs and Vegetables	
Biology BA Major Electives: See approved list in tab above (total credits needed depends on credits taken for Biology Distribution courses). At least 9 credits of BA electives must be taken at UF. [4]		
Approved Biology BA electives courses		15-19
Capstone		
BSC 4936	Critical Analysis of Biological Research	2
Total Credits Biology BA Major Coursework		**30**
Foundation and Major Total Credits		**59-64**

1 This major requires a minimum of 30 credits in major courses. **At least 18 of the 30 credits of the required major coursework must be taken at UF.** Any additional credits remaining after completion of required coursework must be met by taking courses from the approved additional Biology BA electives.

2 Course has specific prerequisites. Students should consult the course description when planning their programs to ensure that they may select this course.

UFTeach Program

There is a severe shortage of qualified secondary school biology teachers in Florida and nationwide. Students interested in becoming part of this high-demand profession should see a biology advisor or the UFTeach advisor. UFTeach students complete the UFTeach minor in science teaching with their BA or BS in Biology and have the coursework and preparation for professional teacher certification in Florida when they graduate.
More Info (http://education.ufl.edu/uf-teach/)

Research

All biology majors are encouraged to participate in research. Research experience is valuable on many levels: it diversifies the college experience, teaches how scientists apply the knowledge gained in the classroom to real world questions, provides the opportunity to work with and get to know researchers who are the best in their field, enables participation in cutting edge scientific questions and techniques, enhances the student's resume/CV when applying to graduate or professional school and, finally, it is essential to help the student determine if science is an appropriate career choice.

More Info (http://major.biology.ufl.edu/do-research/)

CLAS biology majors may participate in research for course credit, as a scholar (e.g., University Scholar), as a volunteer, or, in rare cases, as a paid research assistant.

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.

For degree requirements outside of the major, refer to CLAS Degree Requirements: Structure of a CLAS Degree (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/).

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 one of the following: BSC 2010/BSC 2010L; or CHM 1025 or CHM 1030 or CHM 2045/CHM 2045L; or MAC 1147 or equivalent or higher math course
- 2.0 UF GPA required

Semester 2

- Complete CHM 1030 or CHM 2045/CHM 2045L and one of the following: BSC 2010/BSC 2010L or MAC 1147 or equivalent or higher MAC course
- 2.0 UF GPA required

Semester 3

- Complete BSC 2010/BSC 2010L and MAC 1147 or equivalent or higher MAC course
- 2.0 UF GPA required

Semester 4

- Complete CHM 1031 or CHM 2046/CHM 2046L; BSC 2011/BSC 2011L; and MAC 1147 or equivalent or higher MAC course with a 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 5

- Complete at least one biology distribution course
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 6

- Complete a minimum of 2 of the remaining Biology major 3000/4000 level required core courses

Semester 7

- Complete a minimum of 2 of the remaining Biology major 3000/4000 level required core courses

Semester 8

- Complete BSC 4936 (Capstone)
- Complete all remaining Biology major 3000/4000 level required core courses

Model Semester Plan

Students are expected to complete the Writing, Civic Literacy, summer enrollment, and Quest requirements while in the process of taking the courses below. Students are also expected to complete the general education international (GE-N) requirements concurrently with another general education requirement (typically, GE-C, H, or S) as part of the CLAS Basic Distribution requirements. One of the two general education mathematics courses must be a pure math course.

College of Liberal Arts and Sciences allows students additional flexibility in its Distribution Requirements. Students may count a maximum of 6 credits TOTAL from the CLAS Distribution course lists towards Humanities, Social and Behavioral Sciences, or Biological and Physical Sciences, with no more than 3 credits of Humanities, 3 credits of Social and Behavioral Sciences, or 6 credits of Biological or Physical Sciences.

The full list of major-specific requirements for this major can be found on the Overview tab. College of Liberal Arts and Sciences degree requirements can be found on the College's degree requirements page. (https://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/#degreerequirementstext)

Approved Biology electives may not count towards the 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
Semester One		
Select one:		3-4
CHM 1030	Basic Chemistry Concepts and Applications 1 (**Critical Tracking**; Gen Ed Physical Sciences)	

CHM 2045	General Chemistry 1	
& 2045L	and General Chemistry Laboratory (**Critical Tracking**; Gen Ed Physical Sciences)	
MAC 1147	Algebra and Trigonometry (**Critical Tracking**; Gen Ed Mathematics)	4
Quest 1		3
State Core Gen Ed Composition (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext); Writing Requirement		3
	Credits	**13-14**
Semester Two		
Select one:		3-4
CHM 1031	Basic Chemistry Concepts and Applications 2 (**Critical Tracking**; Gen Ed Physical Sciences)	
CHM 2046	General Chemistry 2	
& 2046L	and General Chemistry 2 Laboratory (**Critical Tracking**; Gen Ed Physical Sciences)	
STA 2023	Introduction to Statistics 1 (State Core Gen Ed Mathematics (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext))	3
Gen Ed Composition; Writing Requirement		3
State Core Gen Ed Social and Behavioral Sciences (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext)		3
Gen Ed Humanities		3
Elective		1
	Credits	**16-17**
Semester Three		
BSC 2010	Integrated Principles of Biology 1	4
& 2010L	and Integrated Principles of Biology Laboratory (**Critical Tracking**; State Core Gen Ed Biological Sciences)	
Quest 2		3
Gen Ed Social and Behavioral Sciences		3
CLAS Foreign Language Proficiency Requirement [1]		4-5
	Credits	**14-15**
Semester Four		
BSC 2011	Integrated Principles of Biology 2	4
& 2011L	and Integrated Principles of Biology Laboratory 2 (**Critical Tracking**; Gen Ed Biological Sciences)	
State Core Gen Ed Humanities (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext)		3
Gen Ed Social and Behavioral Sciences		3
CLAS Foreign Language Proficiency Requirement [1]		3-5
Elective		3
	Credits	**16-18**
Semester Five		
Biological distribution courses (Critical Tracking)		6-8
PHY 2004	Applied Physics 1	4
& 2004L	and Laboratory for Physics 2004	
Elective (3000 level or above, not in major)		3
Elective (or CLAS Foreign Language Proficiency Requirement if 4-3-3 language option) [1]		3
	Credits	**16-18**
Semester Six		
Biology distribution course (Critical Tracking)		3-5
PHY 2005	Applied Physics 2	4
& 2005L	and Applied Physics 2 Lab	
Gen Ed Humanities		3
Elective (3000 level or above, not in major)		3
Elective		3
	Credits	**16-18**
Semester Seven		
Approved Biology BA Major electives (Critical Tracking) [2]		9
Electives (3000 level or above, not in major)		6
	Credits	**15**
Semester Eight		
BSC 4936	Critical Analysis of Biological Research (**Critical Tracking**)	2
Approved Biology BA Major electives (Critical Tracking) [2]		6-10

Electives (3000 level or above, not in major)		6
	Credits	**14-18**
	Total Credits	**120**

1 CLAS Foreign Language Proficiency Requirement (https://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/#degreerequirementstext)
2 Biology BA Distribution, Capstone and Approved Biology BA Major Elective courses must total a minimum of 30 credits.

Approved Biology BA Electives

Code	Title	Credits
AGR 4320	Plant Breeding	3
ALS 3153	Agricultural Ecology	3
ALS 4161	Exotic Species and Biosecurity Issues	3
ALS 4162	Consequences of Biological Invasions [1]	3
ALS 4163	Challenges in Plant Resource Protection [1]	3
ANS 3006 & 3006L	Introduction to Animal Science and Introduction to Animal Science Laboratory	4
ANS 3319C	Reproductive Physiology and Endocrinology in Domestic Animals	4
ANS 3440	Principles of Animal Nutrition	4
ANT 3514C	Introduction to Biological Anthropology	4
ANT 3515	Human Evolutionary Anatomy	3
ANT 3555	Monkeys, Apes, and Lemurs	3
ANT 4468	Health and Disease in Human Evolution	3
ANT 4530	Genetic Perspectives on Human Diversity	3
ANT 4531	Molecular Genetics of Disease	3
ANT 4539	Evolutionary Medicine	3
ANT 4552	Primate Behavior	3
ANT 4554C	Primate Evolution	3
ANT 4586	Human Evolution	3
APK 2100C	Applied Human Anatomy with Laboratory	4
BCH 4024	Introduction to Biochemistry and Molecular Biology	4
BMS 3521	Human Physiology in Translation	3
BMS 4136C	Human Histology	4
BOT 2710C	Practical Plant Taxonomy	3
BOT 2800C	Plants in Human Affairs	3
BOT 3151C	Local Flora of North Florida	3
BOT 3503 & 3503L	Physiology and Molecular Biology of Plants and Physiology and Molecular Biology of Plants Laboratory	5
BOT 4650	Plant Symbiosis	3
BOT 4851C	Medical and Forensic Plant Biology	3
BOT 4935	Special Topics	1-4
BSC 1920	First Year Introduction: Biology at UF	1
BSC 2862	Global Change Ecology and Sustainability	3
BSC 2891	Python Programming for Biology	3
BSC 3307C	Climate Change Biology	4
BSC 3402	Theory and Practice in the Biological Sciences	2
BSC 3911	Entering Research in Biology	1
BSC 4055	Climate Change and Human Systems	3
BSC 4434C	Introduction to Bioinformatics	3
BSC 4452	Computational Tools for Research in Biology	3
BSC 4892	AI in Biology	3
BSC 4821C	Evolutionary Biogeography	3
BSC 4910	Individual Mentored Research in Biology	0-3
BSC 4912	Advanced Mentored Research in Biology	0-4
BSC 4930	Special Topics in Biology	1-4
ENY 2890C	Insect Research CURE	3
ENY 3005 & 3005L	Principles of Entomology and Principles of Entomology Laboratory	4
ENY 3007C	Life Science	3
ENY 3563	Introduction to Tropical Entomology	3

ENY 3564L	Tropical Entomology Field Laboratory	2
ENY 4161	Insect Classification	3
ENY 4202	Ecology of Vector-Borne Disease	3
ENY 4210	Insects and Wildlife	3
ENY 4453	Behavioral Ecology and Systematics	3
ENY 4455C	Social Insects	3
ENY 4571	Honey Bee Biology	3
ENY 4592	Mosquito Biology	3
ENY 4660 & 4660L	Medical and Veterinary Entomology and Medical and Veterinary Entomology Laboratory	3
FAS 4202C	Biology of Fishes	4
FAS 4305C	Introduction to Freshwater Fishery Science	4
FOS 2040	Introductory Food Science	3
FNR 3133C	Tree Biology	3
GLY 3603C	Paleontology	4
HOS 3305	Introduction to Plant Molecular Biology	3
HOS 4304	Horticultural Physiology	3
HOS 4313C	Laboratory Methods in Plant Molecular Biology	2
HUN 3403	Nutrition through the Life Cycle	2
HUN 4221	Nutrition and Metabolism	3
HUN 4445	Nutrition and Disease: Part 1	3
HUN 4446	Nutrition and Disease: Part 2	3
MCB 3703	Astrobiology	3
MCB 4150	Prokaryotic Diversity	3
MCB 4203	Bacterial Pathogens	3
MCB 4271	Antimicrobial Resistance	3
MCB 4271L	Antimicrobial Resistance Lab	1
MCB 4304	Genetics of Microorganisms	3
MCB 4320C	The Microbiome	3
MCB 4403	Prokaryotic Cell Structure and Function	3
MCB 4503	General Virology	3
NEM 3002	Principles of Nematology	3
PCB 3023	Essential Cell Biology	3
PCB 3109	Cancer Biology	3
PCB 3134	Eukaryotic Cell Structure and Function	3
PCB 3402	Disease Ecology and Evolution	3
PCB 3601C	Plant Ecology	3
PCB 4043C	General Ecology	4
PCB 4085	Genetical Ethics	1
PCB 4233	Immunology	3
PCB 4522	Molecular Genetics	3
PCB 4553	Population Genetics	4
PCB 4562	Epigenetics and Human Disease	3
PCB 4666	Human Genomics	3
PCB 4674	Evolution	4
PHI 3633	Bioethics	3
PLP 3002C	Fundamentals of Plant Pathology	4
PLP 4653C	Basic Fungal Biology	4
PLS 3004C	Principles of Plant Science	3
PLS 3223 & 3223L	Plant Propagation and Plant Propagation Laboratory	3
PSB 3340	Behavioral Neuroscience	3
PSB 4434	Neurochemistry, Pharmacology and Behavior	3
PSB 4504	Developmental Psychobiology	3
PSB 4810	Neurobiology of Learning and Memory	3
SWS 4223	Environmental Biogeochemistry	3
SWS 4307	Ecology of Waterborne Pathogens	3
WIS 3404	Natural Resource Ecology	3
WIS 3553C	Introduction to Conservation Genetics	4
WIS 4203C	Landscape Ecology and Conservation	3
WIS 4443C	Wetland Wildlife Ecology	4
WIS 4501	Introduction to Wildlife Population Ecology	3

WIS 4547C	Avian Field Techniques	2
WIS 4554	Conservation Biology	3
WIS 4601C	Quantitative Wildlife Ecology	3
WIS 4945	Wildlife Techniques	3
ZOO 3513C	Animal Behavior	4
ZOO 3603C	Evolutionary Developmental Biology	4
ZOO 3713C	Functional Vertebrate Anatomy	4
ZOO 4050	Animal Behavior	3
ZOO 4205C	Invertebrate Biodiversity	4
ZOO 4232	Human Parasitology	3
ZOO 4307C	Vertebrate Biodiversity	4
ZOO 4403C	Marine Biology	4
ZOO 4405	Sea Turtle Biology and Conservation	3
ZOO 4462C	Herpetology	4
ZOO 4472C	Avian Biology	4
ZOO 4485	Marine Mammal Biology	3-4
ZOO 4926	Special Topics in Zoology	1-4

[1] Only one of ALS 4162 and ALS 4163 can apply toward ALS credits.

Academic Learning Compact

Biology is the study of the many diverse forms, processes and systems of life. These studies range across all levels of the biological hierarchy, from the simplest to the most complex life forms, across all environments on the earth and across recent and evolutionary time that interconnects ancestors to their descendants.

To understand this vast diversity, the field of biology correspondingly relies on integrative and comparative approaches for the resolution of the general processes, principles and unifying themes that govern living systems. Biology is therefore very interdisciplinary and biologists rely on knowledge from the physical sciences and mathematics, as well as from across the disciplines and subdisciplines of biology for advances and breakthroughs.

The Biology major is administered jointly by the College of Agricultural and Life Sciences and the College of Liberal Arts and Sciences.

Before Graduating Students Must

- Achieve a passing score for all content subsections of the Major Field Test for Biology. Content subscore areas are molecular biology and genetics, organismal biology, evolution, ecology and population biology.
- Achieve a passing score on the analytical skills assessment indicator of the Major Field Test for Biology.
- Achieve a passing score on the bioethics module quiz in BSC 4936. The content of the module and quiz are reviewed and approved by a faculty committee.
- Achieve a passing score on the scientific literacy paper assignment given in BSC 4936. This paper is graded using a faculty-developed rubric.
- 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
AGR 3303 or PCB 3063 or PCB 4522	R	R		R
ANS 3319C or BOT 3503 or HOS 4304 or PCB 3713C or PCB 4723C	R	R		R
BSC 1920	I		I	I
BSC 2010	I	I	I	
BSC 2011	I	I	I	
BSC 4936	A	A	A	A
MCB 3020 and MCB 3020L, or PCB 3134 or PCB 4674	R	R		R

Assessment Types

- Major field test for biology
- Bioethics module
- Scientific literacy paper