PREPROFESSIONAL BIOLOGY

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 (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/BIO_BA_BS/BIO_BA) | Bachelor of Science
- **Specializations:** Integrative Biology (BS) (http://catalog.ufl.edu/UGRD/colleges-schools/UGLAS/BIO_BA_BS/BIO_BS03) | Preprofessional Biology (BS) (p. 1)
- **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. Our 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 B.S. | Preprofessional Biology specialization is designed for students preparing for admission to medical, dental, optometry, veterinary, or other professional schools. Students in this track should contact the biology advisor or the Academic Advising Center in 100 Farrior Hall for specific requirements.

The biology degrees develop fundamental knowledge of animals, plants and microorganisms. The degrees and specializations are tailored to meet the needs of preprofessional students, those students preparing for graduate studies in biology or specialized areas, and those seeking careers in education, the allied health professions and interdisciplinary fields such as environmental or biotechnology law, science journalism, and bioscience management.

Bachelor of Science

The CLAS Bachelor of Science in biology offers two specializations.

Bachelor of Science | Integrative Biology

Designed for students preparing for graduate studies in biology or specialized areas such as ecology, evolution, genetics, molecular biology, physiology, and systematics.

Bachelor of Science | Preprofessional Biology

Designed for students preparing for admission to medical, dental, optometry, veterinary, or other professional schools.

Bachelor of Arts

The CLAS Bachelor of Arts in biology is a flexible degree that is best suited 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.

Coursework for the Majors

The B.S. biology specializations require significant introductory coursework and credits in general biology, calculus and/or statistics, general chemistry, organic chemistry, and physics. The B.A. requires less preparation in mathematics, chemistry and physics. Students who are uncertain about the program that best suits their goals should consult a biology advisor for information and curriculum planning. Students can also individualize their curricula with additional life science courses from other departments, colleges and units at UF.

Relevant Minors and/or Certificates

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 B.A. or B.S. 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.

Required Foundation Coursework

All coursework for the major must be completed with minimum grades of C.

Code	Title	Credits
Required Foundation Coursework		
BSC 2010 & 2010L	Integrated Principles of Biology 1 and Integrated Principles of Biology Laboratory 1	4
BSC 2011 & 2011L	Integrated Principles of Biology 2 and Integrated Principles of Biology Laboratory 2	4
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 2210	Organic Chemistry 1	3
CHM 2211 & 2211L	Organic Chemistry 2 and Organic Chemistry Laboratory	5
MAC 2311	Analytic Geometry and Calculus 1	4
MAC 2312	Analytic Geometry and Calculus 2	3-4
or STA 2023	Introduction to Statistics 1	
Select one option:		8-10
Option A		
PHY 2053 & 2053L	Physics 1 and Laboratory for Physics 1	
PHY 2054 & 2054L	Physics 2 and Laboratory for Physics 2	
Option B		
PHY 2048 & 2048L	Physics with Calculus 1 and Laboratory for Physics with Calculus 1	
PHY 2049 & 2049L	Physics with Calculus 2 and Laboratory for Physics with Calculus 2	
Required Core Coursework [1]		
BCH 4024	Introduction to Biochemistry and Molecular Biology	4
BSC 4936	Critical Analysis of Biological Research	2
Select one:		3-4
PCB 3063	Genetics	
AGR 3303	Genetics	
PCB 4522	Molecular Genetics	
Select one of the following:		3-4
MCB 3020 & 3020L	Basic Biology of Microorganisms and Laboratory for Basic Biology of Microorganisms	
PCB 3134	Eukaryotic Cell Structure and Function	
Select one:		4-5
BSC 3096	Human Physiology	
PCB 3713C	Cellular and Systems Physiology	
PCB 4723C	Physiology and Molecular Biology of Animals	
B.S. Preprofessional Electives		
Additional approved life sciences courses (Minimum; a maximum of 6 credits of approved research may be applied to this requirement)		12
Total Credits		67-73

[1] This degree requires a minimum of 28 credits in core courses. Any additional credits remaining after completion of the required core coursework must be met by taking courses from the approved B.S. preprofessional electives in the biological sciences.

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.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites (http://www.flvc.org/cpp/displayRecord.jsp?cip=260101&track=01) may be used for transfer students.

Semester 1

- Complete one of the following in BSC, CHM or MAC: BSC 2010/BSC 2010L; CHM 1025 or CHM 2045/CHM 2045L; MAC 1140, MAC 1114, MAC 1147 or MAC 2311
- 2.0 UF GPA required

Semester 2

- Complete CHM 2045/CHM 2045L; and BSC 2010/BSC 2010L or MAC 2311
- 2.0 UF GPA required

Semester 3

- Complete BSC 2010/BSC 2010L and MAC 2311 with a 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 4

- Complete CHM 2046/CHM 2046L and BSC 2011/BSC 2011L with a 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 5

- Complete CHM 2210 with a 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 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).

Additional Life Science courses may not count as 3000 level or above electives outside of the major. 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
Semester One		
Quest 1 (Gen Ed Humanities)		3
BSC 1920	First Year Introduction: Biology at UF (recommended elective)	1
CHM 2045 & 2045L	General Chemistry 1 and General Chemistry 1 Laboratory (**Critical Tracking**; State Core Gen Ed Physical Sciences)	4
MAC 2311	Analytic Geometry and Calculus 1 (**Critical Tracking**; State Core Gen Ed Mathematics)	4
State Core Gen Ed Social and Behavioral Sciences (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext)		3
	Credits	15
Semester Two		
CHM 2046 & 2046L	General Chemistry 2 and General Chemistry 2 Laboratory (**Critical Tracking**)	4
Select one:		3-4
MAC 2312	Analytic Geometry and Calculus 2 (Gen Ed Mathematics)	
STA 2023	Introduction to Statistics 1 (Gen Ed Mathematics)	
Gen Ed Social and Behavioral Sciences		3
Elective		3
	Credits	13-14
Semester Three		
BSC 2010 & 2010L	Integrated Principles of Biology 1 and Integrated Principles of Biology Laboratory 1 (**Critical Tracking**; Gen Ed Biological Sciences)	4
CHM 2210	Organic Chemistry 1 (**Critical Tracking**)	3
State Core Gen Ed Composition (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext)		3
State Core Gen Ed Humanities (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext)		3
Quest 2 (Gen Ed Biological, Physical, or Social and Behavioral Sciences)		3
	Credits	16
Semester Four		
BSC 2011 & 2011L	Integrated Principles of Biology 2 and Integrated Principles of Biology Laboratory 2 (**Critical Tracking**; Gen Ed Biological Sciences)	4
CHM 2211 & 2211L	Organic Chemistry 2 and Organic Chemistry Laboratory	5
Elective (or Gen Ed Social and Behavioral Sciences if Quest 2 course is not GE-S)		3
Gen Ed Humanities		3
	Credits	15
Semester Five		
Select one:		3-4
AGR 3303	Genetics	
PCB 3063	Genetics	
PCB 4522	Molecular Genetics	
PHY 2048 or PHY 2053	Physics with Calculus 1 or Physics 1	3-4
PHY 2048L or PHY 2053L	Laboratory for Physics with Calculus 1 or Laboratory for Physics 1	1
Gen Ed Composition		3
Foreign language		5
	Credits	15-17
Semester Six		
BCH 4024	Introduction to Biochemistry and Molecular Biology	4
PHY 2049 or PHY 2054	Physics with Calculus 2 or Physics 2	3-4
PHY 2049L or PHY 2054L	Laboratory for Physics with Calculus 2 or Laboratory for Physics 2	1
Foreign language		5
Elective		3
	Credits	16-17
Semester Seven		
Select one:		3-4
MCB 3020 & 3020L	Basic Biology of Microorganisms and Laboratory for Basic Biology of Microorganisms	
PCB 3134	Eukaryotic Cell Structure and Function	
Approved electives		6
Electives (3000 level or above, not in major)		6
	Credits	15-16
Semester Eight		
BSC 4936	Critical Analysis of Biological Research (**Critical Tracking**)	2
Select one:		4-5
BSC 3096	Human Physiology	
PCB 3713C	Cellular and Systems Physiology	
PCB 4723C	Physiology and Molecular Biology of Animals	
Approved electives		6
Elective (3000 level or above, not in major)		3
	Credits	15-16
	Total Credits	120-126

Approved Electives

Code	Title	Credits
AGR 4320	Plant Breeding	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 4531	Molecular Genetics of Disease	3
ANT 4552	Primate Behavior	3
ANT 4554C	Primate Evolution	3
ANT 4586	Human Evolution	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 4621	Plant Geography	2
BOT 4935	Special Topics	1-4
BSC 1920	First Year Introduction: Biology at UF	1
BSC 2862	Global Change Ecology and Sustainability	3
BSC 3402	Theory and Practice in the Biological Sciences	2
BSC 3422C	Principles of the Biotechnology Industry	2
BSC 3911	Entering Research in Biology	1
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 2890	Using Insect Research to Understand the Nature of Scientific Engagement	3
ENY 3005 & 3005L	Principles of Entomology and Principles of Entomology Laboratory	3
ENY 3563	Introduction to Tropical Entomology	3
ENY 3564L	Tropical Entomology Field Laboratory	2
ENY 4161	Insect Classification	3
ENY 4210	Insects and Wildlife	3
ENY 4453	Behavioral Ecology and Systematics	3
ENY 4455C	Social Insects	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 Fishery Science	3
FOR 3342C	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 4221	Nutrition and Metabolism	3
HUN 4445	Nutrition and Disease: Part 1	2
HUN 4446	Nutrition and Disease: Part 2	3
MCB 4203	Bacterial Pathogens	3
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 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 4674	Evolution	4
PLP 3002C	Fundamentals of Plant Pathology	4
PLS 3004C	Principles of Plant Science	3
PLS 3223 & 3223L	Plant Propagation and Plant Propagation Laboratory	3
PSB 3002	Physiological Psychology	3
PSB 3340	Behavioral Neuroscience	3
PSB 4434	Neurochemistry, Pharmacology and Behavior	3
PSB 4504	Developmental Psychobiology	3
PSB 4654	Chemical Senses and Behavior	3
PSB 4810	Neurobiology of Learning and Memory	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 4945C	Wildlife Techniques	4
ZOO 3513C	Animal Behavior	4
ZOO 3603C	Evolutionary Developmental Biology	4
ZOO 3713C	Functional Vertebrate Anatomy	4
ZOO 4205C	Invertebrate Biodiversity	4
ZOO 4232	Human Parasitology	3
ZOO 4307C	Vertebrate Biodiversity	4
ZOO 4403C	Marine Biology	4
ZOO 4472C	Avian Biology	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