

BIOLOGY MAJOR, B.S.

Biology is the study of life from both basic and applied perspectives across a broad range of analytical levels, from the molecule and cell to the organism and ecosystem. This program is designed for students who intend to continue graduate study in biological or health sciences.

Student Learning Outcomes

Upon completion of the biology (B.A., B.S.) program, students should be able to:

- **Knowledge Base:** Demonstrate knowledge of major concepts, theoretical perspectives, empirical findings, and historical trends in the broad field of Biology
- **Research Methods:** Apply basic research methods in the biological sciences, including research design, data analysis, and data interpretation
- **Critical Thinking Skills:** Demonstrate the use of critical and creative thinking skills in upper-level biology courses and in their approach to undergraduate research
- **Application of Knowledge, Research Methods, and Critical Thinking:** Apply knowledge of the field of biology, research skills, and critical thinking skills to undertake a course-based, field, or laboratory research project

Requirements

In addition to the program requirements, students must

- earn a minimum final cumulative GPA of 2.000
- complete a minimum of 45 academic credit hours earned from UNC–Chapel Hill courses
- take at least half of their major core requirements (courses and credit hours) at UNC–Chapel Hill
- earn a minimum cumulative GPA of 2.000 in the major core requirements. Some programs may require higher standards for major or specific courses.

For more information, please consult the degree requirements section of the catalog (<https://catalog.unc.edu/undergraduate/degree-requirements/>).

Code	Title	Hours
Gateway Course		
BIOL 101 & 101L	Principles of Biology and Introductory Biology Laboratory ^{1, H, F}	4
Core Requirements		
Fundamentals Core Courses		
BIOL 103	How Cells Function ^{2, F}	3
BIOL 104	Biodiversity ^{2, H, F}	3
BIOL 105L	Biological Research Skills	3
Intermediate Level Core Courses		
Two from among the following five options: ³		6-7
BIOL 220	Molecular Genetics ^H	
BIOL 240	Cell Biology ^H	
BIOL 250	Evolutionary Biology	
BIOL 260	Introduction to Ecology	

An organismal structure and diversity course (see list below)		
Four biology electives (each of three or more credits) numbered above 200 (not including BIOL 213, BIOL 222, BIOL 253, BIOL 291, BIOL 292, BIOL 293, BIOL 294, BIOL 295, BIOL 296, BIOL 353, a second semester of BIOL 395, and BIOL 495). At least two courses in the major must have a laboratory (not including BIOL 101L or BIOL 105L). ENEC 489 can also count as a biology elective. ^{4,5}		14
Additional Requirements		
CHEM 101 & 101L	 General Descriptive Chemistry I and  Quantitative Chemistry Laboratory I ^{H, F}	4
CHEM 102 & 102L	 General Descriptive Chemistry II and Quantitative Chemistry Laboratory II ^{H, F}	4
CHEM 261	Introduction to Organic Chemistry I ^H	3
MATH 231	 Calculus of Functions of One Variable I ^{H, F}	4
Two of the following:		6-8
MATH 232	 Calculus of Functions of One Variable II ^{H, F}	
PHYS 115	 General Physics II: For Students of the Life Sciences ^F	
	or PHYS 119  Introductory Calculus-based Electromagnetism and Quanta	
COMP 110	 Introduction to Programming ^H	
	or COMP 111Introduction to Scientific Programming	
	 Introduction to Programming with Biological Data	
STOR 120	 Foundations of Statistics and Data Science ^{H, F}	
	or STOR 215  Foundations of Decision Sciences	
	 Introduction to Data Analysis	
	or STOR 155  Introduction to Data Models and Inference	
One of the following:		4
PHYS 114	 General Physics I: For Students of the Life Sciences ^F	
PHYS 118	 Introductory Calculus-based Mechanics and Relativity ^{H, F}	
A choice of two additional allied sciences electives selected from the course list below (some courses are more than 3 credits)		6
Remaining General Education requirements and enough free electives to accumulate 120 academic hours		
Total Hours		64-67

^H Honors version available. An honors course fulfills the same requirements as the nonhonors version of that course. Enrollment and GPA restrictions may apply.

^F FY-Launch class sections may be available. A FY-Launch section fulfills the same requirements as a standard section of that course, but also fulfills the FY-SEMINAR/FY-LAUNCH First-Year Foundations requirement. Students can search for FY-Launch sections in ConnectCarolina using the FY-LAUNCH attribute.

¹ With a C grade or better in BIOL 101

² Both BIOL 103 and BIOL 104 need to be completed before taking a 400-level BIOL class in the major.

³ Core courses taken beyond the two required ones may be used as electives.

⁴ At least two courses in the major must be numbered above 400 (not including BIOL 501 and BIOL 692H). One additional elective may consist of a total of three hours of courses numbered above 600 (not including BIOL 692H).

⁵ BIOL 395 counts as a one semester laboratory course for students entering in Fall 2022 or later, however, additional research for credit will not count towards the major. Other laboratory courses include all of the Organismal Structure and Diversity courses listed below, any course with an "L" designation (except BIOL 253/BIOL 253L, which does not count as an elective in the major), and the following courses: BIOL 255H, BIOL 256, BIOL 459, BIOL 461, BIOL 463, BIOL 526H, BIOL 535, BIOL 562, and BIOL 563.

Code	Title	Hours
Organismal Structure and Diversity Course List		
BIOL 271 & 271L	 Plant Biology and  Plant Biology Laboratory	4
BIOL 272 & 272L	Local Flora and Local Flora Lab	4
BIOL 273		4
BIOL 274 & 274L	 Plant Diversity and  Plant Diversity Laboratory	4
BIOL 277 & 277L	Vertebrate Field Zoology and Vertebrate Field Zoology Laboratory	4
BIOL 278 & 278L	Animal Behavior and Animal Behavior Laboratory	4
BIOL 279 & 279L	Seminar in Organismal Biology and Topics in Organismal Biology Laboratory	3-4
BIOL 422 & BIOL 421L or BIOL 422 & 422L	Microbiology and Bacterial Genetics Laboratory or Microbiology and Microbiology Laboratory	4-5
BIOL 441 & 441L	Vertebrate Embryology and Vertebrate Embryology Laboratory	4
BIOL 451 & 451L	Comparative Physiology and Comparative Physiology Laboratory	4
BIOL 471 & 471L	Evolutionary Mechanisms and Evolutionary Mechanisms Laboratory	4
BIOL 473 & 473L	Mammalian Morphology and Development and Mammalian Morphology Laboratory	4
BIOL 474 & 474L	Evolution of Vertebrate Life and Vertebrate Structure and Evolution Laboratory ^H	4
BIOL 475 & 475L	Biology of Marine Animals and Biology of Marine Animals Laboratory	4
BIOL 476 & 476L	Avian Biology and Avian Biology Laboratory	4
BIOL 479 & 479L	Topics in Organismal Biology at an Advanced Level and Laboratory in Organismal Biology: Advanced Topics	4
BIOL 579		4

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Allied Science Electives

All allied science elective courses need to have a minimum of three credit hours.

Code	Title	Hours
ANTH 143	Human Evolution and Adaptation	3
ANTH 148	 Human Origins	3
ANTH 298	 Biological Anthropology Theory and Practice	3
ANTH 315	 Human Genetics and Evolution	3
ANTH 318	 Human Growth and Development	3
ANTH 412	Paleoanthropology	3
ANTH 414	 Laboratory Methods: Human Osteology	3
ANTH 415	 Laboratory Methods: Zooarchaeology	3
ANTH 416	 Bioarchaeology	3
ANTH 470	Medicine and Anthropology	3
ANTH 623	Human Disease Ecology	3
ASTR —	Any ASTR course above 99	3
BIOC 107	Introduction to Biochemistry	4
BIOC 108	Introduction to Biochemistry	4
BIOL —	Any BIOL course above 101, except BIOL 213, BIOL 291, BIOL 292, BIOL 294, BIOL 295, BIOL 296, and BIOL 495	3
BIOS —	Any BIOS course	3
BMME 335	Biomaterials	3
CHEM —	Any CHEM course above 101	3
CLAS 260	 Ancient Medicine ^H	3
COMP —	Any COMP course above 100, except COMP 380	3
EMES —	Any EMES course above 100	3
ENEC 202I	 Introduction to the Environmental Sciences	4
ENEC 256	Mountain Biodiversity	4
ENEC 324	 Water in Our World: Introduction to Hydrologic Science and Environmental Problems	3
ENEC 403	Environmental Chemistry Processes	3
ENEC 406	Atmospheric Processes II	4
ENEC 410	Earth Processes in Environmental Systems	4
ENEC 411	Oceanic Processes in Environmental Systems	4
ENEC 415	Environmental Systems Modeling	3
ENEC 471	Human Impacts on Estuarine Ecosystems	4
ENEC 489	Ecological Processes in Environmental Systems	4
EPID 600	Principles of Epidemiology for Public Health	3
EXSS 155	 Human Anatomy and Physiology I ^{H, F}	3
EXSS 256	Human Anatomy and Physiology II	3
GEOG 110	 The Blue Planet: An Introduction to Earth's Environmental Systems ^H	3
GEOG 111	 Weather and Climate	3
GEOG 212	 Environmental Conservation and Global Change	3
GEOG 222	Health and Medical Geography	3
GEOG 253	Introduction to Atmospheric Processes	4
GEOL —	Any GEOL course above 100	3
MASC —	Any MASC course above 100	3

MATH ---	Any MATH course above 110, except MATH 129P	3
MCRO 251	Introductory Medical Microbiology	4
NSCI 175	Introduction to Neuroscience ^{H, F}	3
NSCI 222	Learning ^H	3
NSCI 225	Sensation and Perception ^H	3
NUTR 240	Introduction to Human Nutrition	3
PHIL 155	Truth and Proof: Introduction to Mathematical Logic ^H	3
PHYS ---	Any PHYS course above 99, except PHYS 132	
PSYC 101	General Psychology ^F	3
PSYC 210	Statistical Principles of Psychological Research ^H	3
PSYC 220	Biopsychology ^H	3
PSYC 230	Cognitive Psychology ^H	3
STOR 120	Foundations of Statistics and Data Science ^{H, F}	4
STOR ---	Any STOR course above 151	3
SPHS 570	Anatomy and Physiology of the Speech, Language, and Hearing Mechanisms	3

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Sample Plan of Study

Sample plans can be used as a guide to identify the courses required to complete the major and other requirements needed for degree completion within the expected eight semesters. The actual degree plan may differ depending on the course of study selected (second major, minor, etc.). Students should meet with their academic advisor to create a degree plan that is specific and unique to their interests. The sample plans represented in this catalog are intended for first-year students entering UNC–Chapel Hill in the fall term. Some courses may not be offered every term.

Suggested Program of Study for B.S. Majors

First Year	Hours
First-Year Foundation Courses	
IDST 101 College Thriving	1
ENGL 105 English Composition and Rhetoric	3
First-Year Seminar or First-Year Launch (https://catalog.unc.edu/undergraduate/ideas-in-action/first-year-seminars-launches/) ^F	3
IDST 111L Data Literacy Lab	1
Global Language through level 3 (https://catalog.unc.edu/undergraduate/ideas-in-action/global-language/)	varies
Major Courses	

BIOL 101 & 101L Principles of Biology and Introductory Biology Laboratory ^{H, F}	4
CHEM 101 & 101L General Descriptive Chemistry I and Quantitative Chemistry Laboratory I ^{H, F}	4
A fundamentals course BIOL 103 or BIOL 104	3
BIOL 105L Biological Research Skills	3
MATH 231 Calculus of Functions of One Variable I ^{H, F}	4

Additional Courses

Gen Ed courses	6
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Hours	32
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Sophomore Year

The remaining Fundamentals course BIOL 103 or 104	3
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Two core BIOL courses	6
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CHEM 102 & 102L General Descriptive Chemistry II and Quantitative Chemistry Laboratory II ^{H, F}	4
CHEM 261 Introduction to Organic Chemistry I ^H	3

First course from among COMP, MATH, PHYS, STOR options (see course list on the Requirements tab)	3-4
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Lifetime Fitness	1
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Gen Ed and elective courses	9
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Hours	30
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Junior Year

PHYS 114 or PHYS 118 General Physics I: For Students of the Life Sciences ^F or Introductory Calculus-based Mechanics and Relativity	4
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Second course from among COMP, MATH, PHYS, STOR options (see course list on the Requirements tab)	3-4
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Biology electives (two courses, one with lab)	7
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Gen Ed and elective courses	15
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Hours	30
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Senior Year

Biology electives (two courses, one with lab)	7
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Allied sciences electives (two courses)	6
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Note: Students who want to pursue research in molecular or cellular biology are highly encouraged to add CHEM 262 and then CHEM 430 (as one of their biology electives). Students who want to pursue a pre-medical or pre-dentistry path are highly encouraged to add CHEM 262 and then CHEM 430 (as one of their biology electives), as well as CHEM 241/L and CHEM 262L.

Free electives as needed to complete 120 academic hours	15
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Hours	28
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Total Hours	120
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- F FY-Launch class sections may be available. A FY-Launch section fulfills the same requirements as a standard section of that course, but also fulfills the FY-SEMINAR/FY-LAUNCH First-Year Foundations requirement. Students can search for FY-Launch sections in ConnectCarolina using the FY-LAUNCH attribute.

Special Opportunities in Biology

Students are encouraged to speak with their advisor about opportunities to serve as peer advisors in the Health Professions Advising Office, or to join Tri-Beta, the National Biological Sciences Honor Society.

Honors in Biology

Candidates for honors or highest honors must secure approval from the departmental honors advisor. They must have three hours of BIOL 395, take BIOL 692H, and maintain a grade point average of 3.3, both overall and in biology courses (exclusive of BIOL 692H and including only one semester of BIOL 395), calculated at the end of the semester preceding the semester in which they graduate. Other requirements are detailed on the department website (<http://bio.unc.edu/undergraduate/honors-info/>).

High-Impact Experience

After completing BIOL 201 or BIOL 202 (or a 200-level core course under the new curriculum), students are encouraged to pursue high-impact experience opportunities. The department offers several courses that meet the High-Impact Experience and the Research and Discovery requirements from the General Education curriculum.

Laboratory Teaching Apprenticeships and Assistantships

Opportunities exist to assist graduate instructors in lecture or undergraduate laboratory courses. Interested students should contact the instructor of the course, and will need to submit a form to obtain approval from the departmental director of undergraduate studies.

Undergraduate Awards

All awards include a personal plaque, a monetary gift, and a place on Coker Hall's list of department honorees. The awards include

- The Stephen G. Brantley Award in honor of Henry Van Peters Wilson, given annually to a senior biology major for excellence in research in molecular and cellular biology.
- The Robert Ervin Coker Award, given annually to a senior biology major for excellence in research in organismal biology and ecology.
- The John N. Couch Award, given annually to a senior biology major with interests in plant biology who has demonstrated the highest ideals of scholarship and research.
- The Irvine R. Hagadorn Award, given annually to the junior biology major based on academic and research excellence. This award is also recognized by the UNC–Chapel Hill chancellor at the Annual Chancellor's Awards Ceremony.
- The Francis J. LeClair Award, given annually to a senior biology major for academic excellence in biology with an emphasis in plant sciences.

Undergraduate Research

An undergraduate research experience can be extremely valuable to explore career choices and to prepare for postgraduate work in the biological sciences. Undergraduates may take a CURE course, and/or participate directly in the research of faculty in the Department of Biology or other departments (with Biology sponsorship). This research

opportunity allows students to put their knowledge of biology into practice through participation in cutting-edge research. Students' participation in research can begin as early as their second year by registration in BIOL 395.

Undergraduates with a 2.0 grade point average or higher in biology courses are encouraged to enroll in BIOL 395. Information concerning the procedure for enrolling in a research course can be obtained from the chair of the department's undergraduate honors research program. Additional information can be found on the department's website (<http://bio.unc.edu/undergraduate/research/>).

Department Programs

Majors

- Biology Major, B.S. (p. 1)
- Biology Major, B.S.–Quantitative Biology Track (<https://catalog.unc.edu/undergraduate/programs-study/biology-major-bs-quantitative-biology-track/>)
- Biology Major, B.A. (<https://catalog.unc.edu/undergraduate/programs-study/biology-major-ba/>)

Minor

- Biology Minor (<https://catalog.unc.edu/undergraduate/programs-study/biology-minor/>)

Graduate Programs

- M.A. in Biology (<https://catalog.unc.edu/graduate/schools-departments/biology/>)
- M.S. in Biology (<https://catalog.unc.edu/graduate/schools-departments/biology/>)
- Ph.D. in Biology (<https://catalog.unc.edu/graduate/schools-departments/biology/>)

Courses

- Biology (BIOL)

Contact Information

Department of Biology

Visit Program Website (<http://bio.unc.edu>)
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