Biological Sciences (BS): Ecology, Evolution and Conservation Biology Concentration

To see more about what you will learn in this program, visit the Learning Outcomes website (https://apps.oirp.ncsu.edu/pgas/)!

There are five different avenues to earning a B.S. in Biological Sciences at NC State. Students studying for a degree in Biological Sciences can opt for a general curriculum (BLS) or can choose to focus in a particular area by selecting one of four areas of concentration: Molecular, Cellular, and Developmental Biology (MCD), Integrative Physiology and Neurobiology (IPN), Human Biology (HB), or Ecology, Evolution, and Conservation Biology (EEC).

The EEC curriculum offers students in-depth studies in areas of biology at the level of the organism, populations, communities, and ecosystems. It is designed for students who have an interest in whole organisms and their biodiversity — what causes and maintains it, what environmental changes affect it, and how to protect it in the face of critical challenges in the Anthropocene.

Plan Requirements

Code	Title	Hours	Counts towards
Exploring the Life Sciences			
LSC 103	Exploring Opportunities in the Life Sciences	1	
Writing			
Advanced Writing Elective (p. 2) [1]	Requirement	3	
Cannot be double-counted for a GEP requirement.			
Biological Sciences			
LSC 101	Critical and Creative Thinking in the Life Sciences [1]	2	
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity [1]	4	
BIO 183	Introductory Biology: Cellular and Molecular Biology [1]	4	
BIO 270	Introduction to Evolution [1]	3	
or BIO 330	Evolutionary Biology		
AEC 360	Ecology [1]	4	
or PB 360	Ecology		
AEC 460	Field Ecology and Methods [1]	4	
GN 311	Principles of Genetics [1]	4	
GN 312	Elementary Genetics Laboratory [1]	1	
NR 406	Conservation of Biological Diversity [1]	3	
or GN 450	Conservation Genetics		
Select one of the following Physiology courses: [1]		3	
PB 321	Introduction to Whole Plant Physiology		
PB 421	Plant Physiology		
ZO 250	Animal Anatomy and Physiology		
Physical & Mathematical Sciences			
MA 131	Calculus for Life and Management Sciences A [1]	3	
or MA 141	Calculus I		
MA 231	Calculus for Life and Management Sciences B [1]	3	
or MA 241	Calculus II		
CH 101	Chemistry - A Molecular Science [1]	3	
CH 102	General Chemistry Laboratory [1]	1	
CH 201	Chemistry - A Quantitative Science [1]	3	
CH 202	Quantitative Chemistry Laboratory [1]	1	
CH 221	Organic Chemistry I [1]	3	
CH 222	Organic Chemistry I Lab [1]	1	
CH 223	Organic Chemistry II [1]	3	
CH 224	Organic Chemistry II Lab [1]	1	
Select one of the following: [1]		4	
PY 211	College Physics I		
PY 205 & PY 206	Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory		

Select one of the following: [1]		4
PY 212	College Physics II	
PY 208 & PY 209	Physics for Engineers and Scientists II and Physics for Engineers and Scientists II Laboratory	
ST 311	Introduction to Statistics [1]	3
Major Electives		
EECB Electives (p. 3) [1]		18
Organismal Biology Elective (p. 4) [1]		3
Learning Experience Elective (p. 5)		3
Plant Co-Requisite (verify requirement) (p. 5)		
GEP Courses		
ENG 101	Academic Writing and Research [1]	4
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		6
GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)		6
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		2
GEP Additional Breadth (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) (Humanities/Social Sciences/Visual and Performing Arts)		3
GEP U.S. Diversity (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-us-diversity/) (verify requirement)		
GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement)		
Foreign Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/) (verify requirement)		
Free Electives		
Free Electives [2]		6
These electives cannot be remedial nor can they be taken at an elementary level after you have taken comparable coursework at a more advanced level. Students interested in graduate school or professional school should check the courses required for admission to the programs to which they plan to apply.		
Total Hours		**120**

1 A grade of C- or higher is required.

2 Students should consult their academic advisors to determine which courses fill this requirement.

Advanced Writing Requirement Electives

Code	Title	Hours	Counts towards
BIO 267	Research in the Life Sciences I: Research Skills	3	
COM 211	Argumentation and Advocacy	3	
ENG 214	Introduction to Editing	3	
ENG 232	Literature and Medicine	3	
ENG 287	Explorations in Creative Writing	3	
ENG 288	Fiction Writing	3	
ENG 289	Poetry Writing	3	
ENG 292	Writing About Film	3	
ENG 316	Introduction to News and Article Writing	3	
ENG 323	Writing in Rhetorical Traditions	3	
ENG 331	Communication for Engineering and Technology	3	
ENG 332	Communication for Business and Management	3	
ENG 333	Communication for Science and Research	3	
ENG 381	Creative Nonfiction Writing Workshop	3	
ENG 388	Intermediate Fiction Writing Workshop	3	
ENG 389	Intermediate Poetry Writing Workshop	3	

ENG 416	Advanced News and Article Writing	3
ENG 417	Editorial and Opinion Writing	3
ENG 422	Writing Theory and the Writing Process	3
ENG 425	Analysis of Scientific and Technical Writing	3
ENG 426	Analyzing Style	3

EECB Electives

Code	Title	Hours	Counts towards
AEC 380	Water Resources: Global Issues in Ecology, Policy, Management, and Advocacy	3	
AEC 400	Applied Ecology	3	
AEC 419	Freshwater Ecology	4	
AEC 420	Introduction to Fisheries Science	3	
AEC 441	Biology of Fishes	3	
AEC 442	Biology of Fishes Laboratory	1	
AEC 501	Avian Ecology	4	
AEC 509	Ecology and Conservation of Freshwater Invertebrates	3	
AEC 519	Freshwater Ecology	4	
BCH 451	Principles of Biochemistry	4	
BIO 230	The Science of Studying Dinosaurs	3	
BIO 267	Research in the Life Sciences I: Research Skills	3	
BIO 269	Research in the Life Sciences II: Guided Research	3	
BIO 315	General Parasitology	3	
BIO 330	Evolutionary Biology	3	
BIO 440	The Human Animal: An Evolutionary Perspective	3	
BIO 444	The Biology of Love and Sex	3	
BIO 485	Capstone Course in Ecology, Evolution, and Conservation Biology	3	
BIO 498	Honors Project Part I	3	
BIO 499	Honors Project Part 2	3	
BMA 567	Modeling of Biological Systems	4	
BSC 492	Professional Experience	1-3	
BSC 493	Research Experience	1-3	
COM 436	Environmental Communication	3	
CS 230	Introduction to Agroecology	3	
CS 430	Advanced Agroecology	4	
ENT 425	General Entomology	3	
ENT 502	Insect Diversity	4	
ENT 509	Biology of Aquatic Insects	3	
ENT 520	Insect Behavior	3	
FOR 565	Plant Community Ecology	4	
FW 353	Wildlife Management	3	
FW 444	Mammalogy	3	
FW 544	Mammalogy	3	
GIS 510	Fundamentals of Geospatial Information Science and Technology	3	
GIS 530	Spatial Data Foundations	3	
GIS 550	Geospatial Data Structures and Web Services	3	
GN 423	Population, Quantitative and Evolutionary Genetics	3	
GN 450	Conservation Genetics	3	
GN 456	Epigenetics, Development, and Disease	3	
GN 550	Conservation Genetics	3	
MA 242	Calculus III	4	

MA 331	Differential Equations for the Life Sciences	3
MB 451	Microbial Diversity	3
MB 452	Microbial Diversity Lab	2
MEA 220	Marine Biology	3
MEA 454	Marine Physical-Biological Interactions	3
MEA 469	Ecology of coastal Resources	3
MEA 554	Marine Physical-Biological Interactions	3
PB 250	Plant Biology	4
PB 400	Plant Diversity and Evolution	4
PB 403	Systematic Botany	4
PB 503	Systematic Botany	4
PP 222	Kingdom of Fungi	3
SSC 421	Role of Soils in Environmental Management	3
SSC 470	Wetland Soils	3
SSC 562	Environmental Applications Of Soil Science	3
SSC 570	Wetland Soils	3
ZO 250	Animal Anatomy and Physiology	4
ZO 317	Primate Ecology and Evolution	3
ZO 333	Captive Animal Biology	3
ZO 350	Animal Phylogeny and Diversity	4
ZO 402	Invertebrate Biology	4
ZO 410	Introduction to Animal Behavior	3
MA 432	Mathematical Models in Life Sciences	3
BSC 497	Biological Sciences Honors Project Part 1	3
BSC 498	Biological Sciences Honors Project Part 2	3
BSC 499	Honors Thesis in Biological Sciences	1

Organismal Biology Electives

Code	Title	Hours	Counts towards
AEC 441	Biology of Fishes	3	
AEC 442	Biology of Fishes Laboratory	1	
AEC 501	Avian Ecology	4	
AEC 509	Ecology and Conservation of Freshwater Invertebrates	3	
BIO 315	General Parasitology	3	
BIO 370	Developmental Anatomy of the Vertebrates	3	
ENT 425	General Entomology	3	
ENT 503	Insect Morphology and Physiology	3	
ENT 509	Biology of Aquatic Insects	3	
FOR 339	Dendrology	4	
FW 444	Mammalogy	3	
FW 544	Mammalogy	3	
MB 351	General Microbiology	3	
MB 352	General Microbiology Laboratory	1	
PB 220	Local Flora	3	
PB 250	Plant Biology	4	
PB 403	Systematic Botany	4	
PB 421	Plant Physiology	3	
PB 445	Paleobotany	4	
PB 503	Systematic Botany	4	
PB 545	Paleobotany	4	
PB 570	Plant Functional Ecology	3	
PP 222	Kingdom of Fungi	3	
ZO 350	Animal Phylogeny and Diversity	4	
ZO 402	Invertebrate Biology	4	

Learning Experience Electives

Code	Title	Hours	Counts towards
Learning experience in an appropriate area, with prior approval by faculty adviser, prospective supervisor, and departmental undergraduate coordinator. Contact and arrangements with prospective supervisors is the responsibility of the student.			
BIO 269	Research in the Life Sciences II: Guided Research	3	
BIO 499	Honors Project Part 2	3	
BSC 492	Professional Experience	1-3	
BSC 493	Research Experience	1-3	
BSC 498	Biological Sciences Honors Project Part 2	3	
BSC 497	Biological Sciences Honors Project Part 1	3	

Plant Co-Requisites

Code	Title	Hours	Counts towards
A course from this list can also be used to meet one other requirement in the major.			
CS 230	Introduction to Agroecology	3	
CS 430	Advanced Agroecology	4	
FOR 339	Dendrology	4	
FOR 565	Plant Community Ecology	4	
PB 220	Local Flora	3	
PB 250	Plant Biology	4	
PB 321	Introduction to Whole Plant Physiology	3	
PB 400	Plant Diversity and Evolution	4	
PB 403	Systematic Botany	4	
PB 421	Plant Physiology	3	
PB 445	Paleobotany	4	
PB 503	Systematic Botany	4	
PB 545	Paleobotany	4	
PB 570	Plant Functional Ecology	3	
PP 222	Kingdom of Fungi	3	

Semester Sequence

This is a sample.

First Year		
Fall Semester		**Hours**
LSC 101	Critical and Creative Thinking in the Life Sciences [1]	2
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity [1]	4
CH 101	Chemistry - A Molecular Science [1]	3
CH 102	General Chemistry Laboratory [1]	1
MA 131	Calculus for Life and Management Sciences A [1]	3
LSC 103	Exploring Opportunities in the Life Sciences	1
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
	Hours	**15**
Spring Semester		
BIO 183	Introductory Biology: Cellular and Molecular Biology [1]	4
CH 221	Organic Chemistry I [1]	3
CH 222	Organic Chemistry I Lab [1]	1
ENG 101	Academic Writing and Research [1]	4
MA 231	Calculus for Life and Management Sciences B [1]	3
	Hours	**15**
Second Year		
Fall Semester		
Physiology Requirement (p. 1)		3
CH 223	Organic Chemistry II [1]	3
CH 224	Organic Chemistry II Lab [1]	1
Evolution or Ecology		3
GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)		3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3
	Hours	**16**
Spring Semester		
GN 311	Principles of Genetics	4
GN 312	Elementary Genetics Laboratory [1]	1
CH 201	Chemistry - A Quantitative Science [1]	3
CH 202	Quantitative Chemistry Laboratory [1]	1
Evolution or Ecology		4
GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)		3
	Hours	**16**
Third Year		
Fall Semester		
AEC 460	Field Ecology and Methods [1]	4
Advanced Writing Requirement (p. 2)		3
PY 211	College Physics I [1]	4
ST 311	Introduction to Statistics [1]	3

GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
	Hours	**15**
Spring Semester		
Learning Experience Elective (p. 5)		3
PY 212	College Physics II [1]	4
Organismal Biology Elective (p. 4)		3
Free Elective		3
EEC Elective		3
	Hours	**16**
Fourth Year		
Fall Semester		
NR 406	Conservation of Biological Diversity	3
EEC Elective (p. 3)		3
EEC Elective (p. 3)		3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3
Free Elective		3
	Hours	**15**
Spring Semester		
EEC Elective (p. 3)		3
EEC Elective (p. 3)		3
EEC Elective (p. 3)		3
GEP Additional Breadth (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) (Humanities/Social Sciences/Visual and Performing Arts)		3
	Hours	**12**
	Total Hours	**120**

[1] A grade of C- or higher is required.

Career Opportunities

Many students majoring in the Department of Biological Sciences take advantage of scholarship and honors programs available at NC State, including the University Honors Program and the University Scholars Program. In addition, we offer a discipline-based Undergraduate Honors Program in Biological Sciences (DBS Honors Program). The DBS Honors Program requires students to design a challenging program of advanced study, including eight credits of honors coursework in biology and at least two semesters of research or teaching scholarship. Participants write an honors thesis and are required to present their scholarly work at a local, regional, or national meeting. Invitations to join the DBS Honors Program are sent in the first three weeks of the Fall and Spring semesters. Students in any major in the Department of Biological Sciences who have earned an overall GPA of 3.60 after completing 30-65 credit hours at NC State will receive an invitation to join the DBS Honors Program; transfer students in any of our majors who have earned an overall GPA of 3.60 in 15 credit hours at NC State also will receive an invitation.

Students who graduate from the Department of Biological Sciences are well prepared for employment in broad variety of positions in government agencies and private industries. Graduates may continue their education with studies leading to advanced degrees in many areas of the biological sciences, including cell biology, ecology, evolutionary biology, microbiology, genetics, zoology, neurobiology, and biomedical disciplines. Many choose to seek advanced degrees in medicine, dentistry, optometry, veterinary medicine, public health, and other health-related fields. Students who plan to seek certification for pre-college teaching may want to pursue a second major in the Department of Science, Technology, Engineering & Mathematics Education. Overall, graduates in the EEC concentration pursue diverse and successful trajectories in local, state, and federal agencies, non-governmental organizations, diverse private industries, and academia.