

Biological Sciences (BS): Human 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 Human Biology (HB) curriculum provides the opportunity to study those areas of science most important to health-related professions as well as relevant aspects of the humanities and social sciences. It is designed to provide students with a solid education in the scientific and humanistic concepts that underlie modern health sciences and related areas of scientific research. Course requirements in HB include those most commonly required by medical schools.

Plan Requirements

Code	Title	Hours	Counts towards
Exploring the Life Sciences			
LSC 103	Exploring Opportunities in the Life Sciences	1	
Writing			
	Advanced Writing Requirement Electives (p. 2) ¹	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	
Physiology Electives (p. 3) ¹			
GN 311	Principles of Genetics ¹	4	
MB 351	General Microbiology ¹	3	
MB 352	General Microbiology Laboratory ¹	1	

or MB 354	Inquiry-Guided Microbiology Lab	
BCH 351	General Biochemistry ¹	3
or BCH 451	Principles of Biochemistry	

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

Human Biology Electives (p. 3) 1	12
Students can use up to 3 hours of BIO 269, BSC 492, BSC 493, BSC 494, BSC 498, GN 453, PSY 491, or BIO 499 toward this requirement.	
Additional Science & Math Electives (p. 4)	9
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 Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)	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 (12 Hr S/U Lmt) 2	10

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		
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 the Rhetorical Tradition	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

Physiology Electives

Code	Title	Hours	Counts towards
BIO 240	Principles of Human Anatomy & Physiology (A): Nervous, Skeletal, Muscular, & Digestive Systems	4	
BIO 245	Principles of Human Anatomy & Physiology (B): Endocrine, Cardiovascular, Respiratory & Renal Systems	4	
BIO 424	Endocrinology	3	
BIO 488	Neurobiology	3	
BIO 588	Neurobiology	3	
MB 441	Immunology	3	

Human Biology Electives

Code	Title	Hours	Counts towards
ANS 452/552	Comparative Reproductive Physiology and Biotechnology		
ANT 371	Human Variation		
ANT 374	Disease and Society		
ANT 421/521	Human Osteology		
ANT 424/524	Bioarchaeology		
ANT 444/544	Cross-Cultural Perspectives on Women		
ANT 450/550	Culture, Ecology, and Sustainable Living		
BCH 452	Introductory Biochemistry Laboratory		

BCH 453/553	Biochemistry of Gene Expression
BCH 454	Advanced Biochemistry Laboratory
BCH 455/555	Proteins and Molecular Mechanisms
BIO 315	General Parasitology
BIO 361	Developmental Biology
BIO 370	Developmental Anatomy of the Vertebrates
BIO 375	Developmental Anatomy Laboratory
BIO 405	Functional Histology
BIO 414	Cell Biology
BIO 416	Cancer Cell Biology
BIO 418	Cell Biology Research Lab
BIO 424	Endocrinology
BIO 432	Evolutionary Medicine
BIO 434	Hormones and Behavior
BIO 440	The Human Animal: An Evolutionary Perspective
BIO 482	Capstone Course in Molecular, Cellular, and Developmental Biology
BIO 483	Capstone Course in Integrative Physiology and Neurobiology
BIO 484	Capstone Course in Human Biology
BIO 488/588	Neurobiology
BIT 477/577	Metagenomics
EDP 476	Psychology of Adolescent Development
ENT 207	Insects and Human Disease
FS 301	Introduction to Human Nutrition

FS 405 & FS 406	Food Microbiology and Food Microbiology Lab	0	PHI 325	Bio-Medical Ethics	
FS 505 & FS 506	Food Microbiology and Food Microbiology Lab	0	PHY 452	Comparative Reproductive Physiology and Biotechnology	
GN 301	Genetics in Human Affairs		PHY 503	General Physiology I	
GN 421/521	Molecular Genetics		PHY 504	General Physiology II	
GN 434	Genes and Development		PHY 552	Comparative Reproductive Physiology and Biotechnology	
GN 441/541	Human and Biomedical Genetics		PSY 370	Personality	
GN 451	Genome Science		PSY 376	Developmental Psychology	
GN 456	Epigenetics, Development, and Disease		PSY 406	Psychology of Gender	
GPH 201	Fundamentals of Global Public Health		PSY 430	Biological Psychology	
GPH 404	Epidemiology and Statistics in Global Public Health		PSY 431	Health Psychology	
MB 405 & MB 406	Food Microbiology and Food Microbiology Lab	0	PSY 470	Abnormal Psychology	
MB 411 & MB 412	Medical Microbiology and Medical Microbiology Laboratory	0	PSY 475	Child Psychology	
MB 435/535	Bacterial Pathogenesis		PSY 476	Psychology of Adolescent Development	
MB 441	Immunology		SOC 301	Human Behavior	
MB 470	Emerging and Re-emerging Infectious Diseases		SOC 381	Sociology of Medicine	
NTR 301	Introduction to Human Nutrition		ST 404	Epidemiology and Statistics in Global Public Health	
NTR 330	Public Health Nutrition		STS 325	Bio-Medical Ethics	
NTR 410/510	Maternal and Infant Nutrition		TOX 201	Poisons, People and the Environment	
NTR 419	Human Nutrition and Chronic Disease		TOX 401	Principles of Toxicology	
NTR 521	Life Cycle Nutrition		TOX 501	Principles of Toxicology	
PB 215	Medicinal Plants		WGS 406	Psychology of Gender	
PHI 221	Contemporary Moral Issues		WGS 444/544	Cross-Cultural Perspectives on Women	

Additional Science and Math Electives

Code	Title	Hours	Counts towards
AEC/GN 450	Conservation Genetics		

BEC/BIT 463	Fermentation of Recombinant Microorganisms
BIO 230	The Science of Studying Dinosaurs
BIO 240	Principles of Human Anatomy & Physiology (A): Nervous, Skeletal, Muscular, & Digestive Systems
BIO 245	Principles of Human Anatomy & Physiology (B): Endocrine, Cardiovascular, Respiratory & Renal Systems
BIO 310	Quantitative Approaches to Biological Problems
BIO 416	Cancer Cell Biology
BIO 418	Cell Biology Research Lab
BIO 432	Evolutionary Medicine
BIT 477	Metagenomics
GN 428	Introduction to Machine Learning in Biology
GN 453	Personal Genomics
MA 331	Differential Equations for the Life Sciences
MB 470	Emerging and Re-emerging Infectious Diseases
PB 205	Our Green World
ZO 334	Captive Animal Biology Field Laboratory
ZO 486	Capstone Course in Zoology

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	4
MA 231	Calculus for Life and Management Sciences B ¹	3
Hours		15

Second Year

Fall Semester

Physiology Requirement (p. 3)		4
CH 223	Organic Chemistry II ¹	3
CH 224	Organic Chemistry II Lab ¹	1
ST 311	Introduction to Statistics ¹	3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3
Free Elective		3
Hours		17

Spring Semester

Physiology Requirement or HB Elective (p. 1)		3-4
PY 211	College Physics I ¹	4
CH 201	Chemistry - A Quantitative Science ¹	3
CH 202	Quantitative Chemistry Laboratory ¹	1
Advanced Writing Requirement (p. 2)		3
Hours		14-15

Third Year

Fall Semester

BCH 351 or BCH 451	General Biochemistry ¹ or Principles of Biochemistry	3-4
PY 212	College Physics II ¹	4
MB 351	General Microbiology ¹	3
MB 352 or MB 354	General Microbiology Laboratory ¹ or Inquiry-Guided Microbiology Lab	1
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)		3

GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)	1
Hours	15-16
Spring Semester	
GN 311 Principles of Genetics ¹	4
GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)	3
Science & Math Elective (p. 4)	3
Physiology Requirement or HB Elective (p. 1)	3-4
Hours	13-14
Fourth Year	
Fall Semester	
HB Elective (p. 3)	3
HB Elective (p. 3)	3
GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)	3
GEP Additional Breadth (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) (Humanities/Social Sciences/Visual and Performing Arts)	3
Science and Math Elective (p. 4)	3
Hours	15
Spring Semester	
HB Elective (p. 3)	3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)	3
Science and Math Elective (p. 4)	3
Free Elective	3
Free Elective	3
Hours	15
Total Hours	119-122

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 various 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, 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.