

Biological Sciences (BS): Human Biology Concentration

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
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. 2) ¹		7
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. 2) 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. 3)	9
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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 Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)		3
GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement)		
GEP Foundations of American Democracy (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-fad/) (verify requirement)		
World Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-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
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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
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

Physiology Electives

Code	Title	Hours
BIO 240	Principles of Human Anatomy & Physiology (A): Nervous, Skeletal, Muscular, & Digestive Systems	3
BIO 242	Human Anatomy and Physiology Laboratory	2
BIO 245	Principles of Human Anatomy & Physiology (B): Endocrine, Cardiovascular, Respiratory & Renal Systems	3
BIO 424	Endocrinology	3
BIO 488	Neurobiology	3
BIO 588	Neurobiology	3
MB 441	Immunology	3

Human Biology Electives

Code	Title	Hours
ANS 452/552	Comparative Reproductive Physiology and Biotechnology	3
ANT 371	Human Variation	3
ANT 374	Disease and Society	3
ANT 421/521	Human Osteology	3
ANT 424/524	Bioarchaeology	3
ANT 444/544	Cross-Cultural Perspectives on Women	3
ANT 450/550	Culture, Ecology, and Sustainable Living	3
BCH 452	Introductory Biochemistry Laboratory	2
BCH 453/553	Biochemistry of Gene Expression	3
BCH 454	Advanced Biochemistry Laboratory	4
BCH 455/555	Proteins and Molecular Mechanisms	3
BIO 315	General Parasitology	3

BIO 361	Developmental Biology	3
BIO 370	Developmental Anatomy of the Vertebrates	3
BIO 375	Developmental Anatomy Laboratory	2
BIO 405	Functional Histology	3
BIO 414	Cell Biology	3
BIO 416	Cancer Cell Biology	3
BIO 418	Cell Biology Research Lab	2
BIO 424	Endocrinology	3
BIO 432	Evolutionary Medicine	3
BIO 434	Hormones and Behavior	3
BIO 440	The Human Animal: An Evolutionary Perspective	3
BIO 482	Capstone Course in Molecular, Cellular, and Developmental Biology	3
BIO 483	Capstone Course in Integrative Physiology and Neurobiology	3
BIO 484	Capstone Course in Human Biology	3
BIO 488/588	Neurobiology	3
BIT 477/577	Metagenomics	2
EDP 476	Psychology of Adolescent Development	3
ENT 207	Insects and Human Disease	3
FS 301	Introduction to Human Nutrition	3
FS 405 & FS 406	Food Microbiology and Food Microbiology Lab	5
FS 505 & FS 506	Food Microbiology and Food Microbiology Lab	5
GN 301	Genetics in Human Affairs	3
GN 421/521	Molecular Genetics	3
GN 434	Genes and Development	3
GN 441/541	Human and Biomedical Genetics	3
GN 451	Genome Science	3
GN 456	Epigenetics, Development, and Disease	3
GPH 201		
GPH 404	Epidemiology and Statistics in Global Public Health	3
MB 405 & MB 406	Food Microbiology and Food Microbiology Lab	5
MB 411 & MB 412	Medical Microbiology and Medical Microbiology Laboratory	4
MB 435/535	Bacterial Pathogenesis	3
MB 441	Immunology	3
MB 470	Emerging and Re-emerging Infectious Diseases	3
NTR 301	Introduction to Human Nutrition	3
NTR 330	Public Health Nutrition	3
NTR 410/510	Maternal and Infant Nutrition	3
NTR 419	Human Nutrition and Chronic Disease	3
PB 215	Medicinal Plants	3
PHI 221	Contemporary Moral Issues	3
PHI 325	Bio-Medical Ethics	3
PHY 503	General Physiology I	3
PHY 504	General Physiology II	3
PSY 370	Personality	3
PSY 376	Developmental Psychology	3
PSY 406	Psychology of Gender	3

PSY 430	Biological Psychology	3
PSY 431	Health Psychology	3
PSY 470	Psychopathology and Mental Health	3
PSY 475	Child Psychology	3
PSY 476	Psychology of Adolescent Development	3
SOC 301	Human Behavior	3
SOC 381	Sociology of Medicine	3
ST 404	Epidemiology and Statistics in Global Public Health	3
STS 325	Bio-Medical Ethics	3
TOX 201	Poisons, People and the Environment	3
TOX 401	Principles of Toxicology	4
TOX 501	Principles of Toxicology	4
WGS 406	Psychology of Gender	3
WGS 444/544	Cross-Cultural Perspectives on Women	3

Additional Science and Math Electives

Code	Title	Hours
AEC/GN 450	Conservation Genetics	3
BEC/BIT 463	Fermentation of Recombinant Microorganisms	2
BIO 230	The Science of Studying Dinosaurs	3
BIO 240	Principles of Human Anatomy & Physiology (A): Nervous, Skeletal, Muscular, & Digestive Systems	3
BIO 242	Human Anatomy and Physiology Laboratory	2
BIO 245	Principles of Human Anatomy & Physiology (B): Endocrine, Cardiovascular, Respiratory & Renal Systems	3
BIO 269	Research in the Life Sciences II: Guided Research	3
BIO 310	Quantitative Approaches to Biological Problems	3
BIO 416	Cancer Cell Biology	3
BIO 418	Cell Biology Research Lab	2
BIO 432	Evolutionary Medicine	3
BIT 477	Metagenomics	2
GN 428	Introduction to Machine Learning in Biology	3
GN 453	Personal Genomics	3
MA 331	Differential Equations for the Life Sciences	3
MB 470	Emerging and Re-emerging Infectious Diseases	3
PB 205	Our Green World	3
ZO 334	Captive Animal Biology Field Laboratory	2
ZO 486	Capstone Course in Zoology	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	4
MA 231	Calculus for Life and Management Sciences B ¹	3

Hours 15

Second Year

Fall Semester

Physiology Requirement (p. 2)		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

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

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. 3)		3
Physiology Requirement or HB Elective (p. 1)		3-4

Hours 14

Fourth Year**Fall Semester**

HB Elective (p. 2)	3
HB Elective (p. 2)	3
GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)	3
GEP Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)	3
Science and Math Elective (p. 3)	3
Hours	15

Spring Semester

HB Elective (p. 2)	3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)	3
Science and Math Elective (p. 3)	3
Free Elective	3
Free Elective	3
Hours	15
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 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.

Career Titles

- Agricultural Sciences Professor
- Agronomist
- Allergists and Immunologists

- Anesthesiologist (MD)
- Anesthesiologist Assistants
- Animal Breeder
- Animal Scientist
- Aquaculture Specialist
- Aquarium Curator
- Biochemist
- Biological Technician
- Biologist
- Biology Professor
- Biomedical Engineer
- Biophysicist
- Biopsychologist
- Botanist
- Cardiologist (MD)
- Clinical Dietitian
- Dentist (DDS)
- Dietitian and Nutritionist
- Environmental Disease Analyst
- Environmental Engineer
- Environmental Research Analyst
- Epidemiologists
- Family Practitioner (MD)
- Fish and Game Warden
- Fish Hatchery Specialist
- Food & Drug Inspector
- Food Science Technicians
- Food Technologist
- Forensic Science Technicians
- General Internists (MD)
- Genetic Counselors
- Geneticist
- Gynecologist (MD)
- Hazardous Waste Management Analyst
- Horticulturist
- Hospitalists
- Industrial Hygienist
- Industrial Waste Inspector
- Low Vision Therapists, Orientation and Mobility Specialists, and Vision Rehabilitation Therapists
- Marine and Aquatic Biologist
- Medical and Scientific Illustrator
- Medical Equipment Technician
- Medical Technologist
- Microbiologist
- Obstetrician (MD)
- Occupational Health and Safety Technicians
- Occupational Physician (MD)
- Oceanographer
- Optometrist
- Park Naturalist
- Pathologist (MD)

- Pediatrician (MD)
- Pharmacist
- Pharmacologist
- Phlebotomist
- Physical Medicine and Rehabilitation Physicians
- Physician Assistant (PA)
- Radiologist (MD)
- Sales Representative (Chemicals & Drugs)
- Soil Conservationist
- Soil Scientist
- Sports Physician (Orthopedist)
- Surgeons (MD)
- Toxicologist
- Urologists
- Veterinarian (VMD)
- Water Pollution Control Inspector
- Wildlife Biologist
- Wildlife Control Agent
- Winemaker / Vintner
- Zoologist

Learn More About Careers

NCcareers.org (<https://nccareers.org/>)

Explore North Carolina's central online resource for students, parents, educators, job seekers and career counselors looking for high quality job and career information.

Occupational Outlook Handbook (<https://www.bls.gov/ooh/>)

Browse the Occupational Outlook Handbook published by the Bureau of Labor Statistics to view state and area employment and wage statistics. You can also identify and compare similar occupations based on your interests.

Career One Stop Videos (<https://www.careeronestop.org/>)

View videos that provide career details and information on wages, employment trends, skills needed, and more for any occupation. Sponsored by the U.S. Department of Labor.

Focus 2 Career Assessment (<https://careers.dasa.ncsu.edu/explore-careers/career-assessments/>) (NC State student email address required)

This career, major and education planning system is available to current NC State students to learn about how your values, interests, competencies, and personality fit into the NC State majors and your future career. An NC State email address is required to create an account. Make an appointment with your career counselor (<https://careers.dasa.ncsu.edu/about/hours-appointments/>) to discuss the results.

Focus 2 Apply Assessment (<https://www.focus2career.com/Portal/Register.cfm?SID=1929>) (Available to prospective students)

A career assessment tool designed to support prospective students in exploring and choosing the right major and career path based on your unique personality, interests, skills and values. Get started with Focus 2 Apply and see how it can guide your journey at NC State.

Bio Careers (<http://biocareers.weebly.com/>)

American Institute of Biological Sciences (<https://www.aibs.org/>)

Federation of American Societies for Experimental Biology (<https://www.faseb.org/>)