

Zoology (BS): Applied Zoology

The Applied Zoology concentration provides a greater focus on the human dimensions of zoology and broad exposure to other science disciplines. It allows students the flexibility to pair their disciplinary coursework with classes in fields such as science education and communication, environmental policy and history, natural resource conservation, and non-profit operations. This concentration is ideal for students interested in more interdisciplinary careers in zoos, parks, museums, aquariums, schools, and other public, private, and non-profit sectors.

Core courses provide a foundation for all students in writing and communication, math and statistical sciences, natural sciences, natural history, and the human dimensions of conservation and natural resource management. Zoology electives are chosen with guidance from professional and faculty advisors. These electives in combination with additional science and math electives allow students to explore more advanced topics ranging from behavior, ecology, and climate science to data science and geographic information systems. The program prioritizes giving students the opportunity to shape their degree to fit their interests and goals.

All Zoology majors must complete an Experiential Learning Experience. This high-impact experience gives students real world experience through internships, volunteering, research, or teaching positions.

Plan Requirements

| Code | Title | Hours |
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| Exploring the Life Sciences | | |
| LSC 103 | Exploring Opportunities in the Life Sciences | 1 |
| or ENV 100 | Student Success in Environmental First Year | |
| Communication¹ | | |
| | Communication Requirement Elective (p.) | 3 |
| | Advanced Writing Requirement Elective (p. 2) | 3 |
| Math & Statistical Sciences¹ | | |
| ST 311 | Introduction to Statistics | 3 |
| | Select one of the following: | 3 |
| MA 131 | Calculus for Life and Management Sciences A | |
| MA 141 | Calculus I | |
| MA 121 | Elements of Calculus | |
| Natural Sciences¹ | | |
| LSC 101 | Critical and Creative Thinking in the Life Sciences | 2 |
| or ENV 101 | Exploring the Environment | |
| BIO 181 | Introductory Biology: Ecology, Evolution, and Biodiversity | 4 |
| BIO 183 | Introductory Biology: Cellular and Molecular Biology | 4 |
| ZO 250 | Animal Anatomy and Physiology | 4 |
| AEC/PB 360 | Ecology | 4 |
| CH 101 | Chemistry - A Molecular Science | 3 |
| CH 102 | General Chemistry Laboratory | 1 |
| CH 220 | Introductory Organic Chemistry | 3 |
| or CH 221 | Organic Chemistry I | |

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| CH 222 | Organic Chemistry I Lab | 1 |
| Core Electives¹ | | |
| Select two of the following: | | 6 |
| MB 251 | General Microbiology | |
| GN 311 | Principles of Genetics | |
| or GN 301 | Genetics in Human Affairs | |
| BIO 270 | Introduction to Evolution | |
| BIO 310 | Quantitative Approaches to Biological Problems | |
| Physics Elective¹ | | |
| Select one of the following: | | 4 |
| PY 131 | Conceptual Physics | |
| PY 201 | University Physics I | |
| PY 205 & PY 206 | Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory | |
| PY 211 | College Physics I | |
| Applied Conservation and Natural Resource Management (p. 2) | | 3 |
| Human Dimensions (p. 2) | | 3 |
| Environmental Science and Marine, Earth, and Atmospheric Sciences (MEAS) | | |
| Select two of the following: | | 7 |
| ES 100 | Introduction to Environmental Sciences | |
| ES 150 | Water and the Environment | |
| ES 200 | Climate Change and Sustainability | |
| MEA 101 & MEA 110 | Geology I: Physical and Geology I Laboratory | |
| MEA 200 & MEA 210 | Introduction to Oceanography and Oceanography Lab | |
| MEA 215 | Introduction to Atmospheric Sciences | |
| MEA 320 | Fundamentals of Air Pollution | |
| MEA 415 | Climate Dynamics | |
| Major Electives | | |
| Zoology Electives (p. 3) ¹ | | 9 |
| Natural History Electives (p. 3) ¹ | | 7 |
| Additional Science & Math Electives (p. 3) | | 9 |
| Experiential Learning Elective | | 3 |
| BSC 492 | Professional Experience | |
| BSC 493 | Research Experience | |
| BSC 494 | Teaching Experience | |
| BSC 497 | Biological Sciences Honors Project Part 1 | |
| BSC 498 | Biological Sciences Honors Project Part 2 | |
| 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 Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/) | | 3 |

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| GEP Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) | 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) | 6 |
| Total Hours | 120 |

¹ A grade of C- or higher is required.

Communication Requirement Electives

| Code | Title | Hours |
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| COM 201 | Introduction to Persuasion Theory | 3 |
| COM 202 | Small Group Communication | 3 |
| COM 110 | Public Speaking | 3 |
| COM 112 | Interpersonal Communication | 3 |
| COM 211 | Argumentation and Advocacy | 3 |
| COM 226 | Introduction to Public Relations | 3 |
| COM 289 | Science Communication and Public Engagement | 3 |
| COM 436 | Environmental Communication | 3 |
| COM 479 | Climate Change Communication | 3 |
| THE 203 | Theory and Practice of Acting | 3 |

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 |

Applied Conservation and Natural Resource Management Electives

| Code | Title | Hours |
|---------|------------------------------------------------------------------|-------|
| AEC 245 | Practicing Conservation Ecology | 3 |
| ES 300 | Energy and Environment | 3 |
| ES 400 | Analysis of Environmental Issues | 3 |
| FW 221 | Conservation of Natural Resources | 3 |
| FW 353 | Wildlife Management | 3 |
| FW 333 | Conservation Biology in Practice | 3 |
| FW 403 | Urban Wildlife Management | 3 |
| FW 404 | Wildlife Habitat Management | 3 |
| FOR 353 | GIS and Remote Sensing for Environmental Analysis and Assessment | 3 |
| NR 300 | Natural Resource Measurements | 4 |
| NR 406 | Conservation of Biological Diversity | 3 |
| NR 460 | Renewable Natural Resource Management and Policy | 3 |
| NR 484 | Environmental Impact Assessment | 4 |
| GIS 205 | Spatial Thinking with GIS | 3 |
| GIS 280 | Introduction to GIS | 3 |

Human Dimensions

| Code | Title | Hours |
|----------------|------------------------------------------------------------------|-------|
| MEA 260 | Human Dimensions of Climate Change | 3 |
| FW 411 | Human Dimensions of Wildlife and Fisheries | 3 |
| PRT 152 | Introduction to Parks, Recreation, Tourism, and Event Management | 3 |
| PRT/IDS/NR 203 | Humans and the Environment | 3 |
| PRT 238 | Principles of Community Engagement | 3 |
| PRT 319 | Sustainable Tourism | 3 |
| PRT 342 | Recreation and Park Interpretive Services | 3 |
| PRT 485 | Environmental Education in Practice | 3 |
| PRT 510 | Active Recreation and Community Health | 3 |
| PRT 550 | Human Behavior and the Environment | 3 |
| EMS 450 | Teaching Environmental Education | 3 |
| AEE 325 | Planning and Delivering Non-Formal Education | 3 |
| PRT 230 | Foundations of Outdoor Recreation Management | 3 |
| PRT 415 | Principles and Practices of Outdoor Leadership | 3 |
| EMS 205 | Introduction to Teaching Science | 2 |
| EMS 350 | Teaching Environmental Education | 3 |
| ED 204 | Introduction to Teaching in Today's Schools | 2 |
| ARE 201 | Introduction to Agricultural & Resource Economics | 3 |
| ARE 309 | Environmental Law & Economic Policy | 3 |
| ARE 336 | Introduction to Resource and Environmental Economics | 3 |
| COM 289 | Science Communication and Public Engagement | 3 |
| COM 436 | Environmental Communication | 3 |
| COM 479 | Climate Change Communication | 3 |
| PS 320 | U.S. Environmental Law and Politics | 3 |
| PS 336 | Global Environmental Politics | 3 |
| PS 202 | State and Local Government | 3 |
| STS/REL 471 | Darwinism and Christianity | 3 |

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| HI 380 | History of Nonprofits, Philanthropy, and Social Change | 3 |
| NPS 340 | Fundamentals of Grant Development for Nonprofits | 3 |
| ENG/WGS 308 | Contemporary Issues in Ecofeminism | 3 |
| HI 323 | Science, American Style | 3 |
| HI 322 | Rise of Modern Science | 3 |
| HI 342 | Global Environmental History | 3 |
| HI 344 | Dinomania: Dinosaurs in Culture and Science | 3 |
| HI 386 | Introduction to Museum Studies | 3 |
| IS 200 | Introduction to International Studies | 3 |

Zoology Electives

| Code | Title | Hours |
|---------|-----------------------------------------------------------------------------|-------|
| AEC 370 | Parasite and Disease Ecology | 3 |
| AEC 371 | Parasite and Disease Ecology Lab | 1 |
| AEC 380 | Water Resources: Global Issues in Ecology, Policy, Management, and Advocacy | 3 |
| AEC 384 | Tropical Ecology in a Changing World | 3 |
| AEC 390 | Community Ecology | 3 |
| AEC 400 | Applied Ecology | 3 |
| AEC 419 | Freshwater Ecology | 4 |
| AEC 441 | Biology of Fishes | 3 |
| AEC 442 | Biology of Fishes Laboratory | 1 |
| AEC 460 | Field Ecology and Methods | 4 |
| AEC 470 | Urban Ecology | 3 |
| AEC 501 | Avian Ecology | 4 |
| AEC 509 | Ecology and Conservation of Freshwater Invertebrates | 4 |
| AEC 515 | Fish Physiology | 3 |
| AEC 519 | Freshwater Ecology | 4 |
| AEC 761 | Conservation and Climate Science | 3 |
| BIO 270 | Introduction to Evolution | 3 |
| BIO 315 | General Parasitology | 3 |
| BIO 323 | Paleoecology | 3 |
| BIO 330 | Evolutionary Biology | 3 |
| BIO 361 | Developmental Biology | 3 |
| BIO 370 | Developmental Anatomy of the Vertebrates | 3 |
| BIO 375 | Developmental Anatomy Laboratory | 2 |
| BIO 444 | The Biology of Love and Sex | 3 |
| BIO 555 | Creative Media Production for Scientists | 3 |
| BSC 492 | Professional Experience | 1-3 |
| BSC 493 | Research Experience | 1-3 |
| BSC 494 | Teaching Experience | 1-3 |
| BSC 497 | Biological Sciences Honors Project Part 1 | 3 |
| BSC 498 | Biological Sciences Honors Project Part 2 | 3 |
| ENT 402 | Forest Entomology | 3 |
| ENT 425 | General Entomology | 3 |
| ENT 509 | Ecology and Conservation of Freshwater Invertebrates | 3 |
| ENT 582 | Medical and Veterinary Entomology | 3 |
| FOR 402 | Forest Entomology | 3 |
| FW 444 | Mammalogy | 3 |

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| MB 435 | Bacterial Pathogenesis | 3 |
| MB 470 | Emerging and Re-emerging Infectious Diseases | 3 |
| MB 535 | Bacterial Pathogenesis | 3 |
| MEA 220 | Marine Biology | 3 |
| PHY 524 | Comparative Endocrinology | 3 |
| PO 524 | Comparative Endocrinology | 3 |
| ZO 317 | Primate Ecology and Evolution | 3 |
| ZO 333 | Captive Animal Biology | 3 |
| ZO 410 | Introduction to Animal Behavior | 3 |
| ZO 486 | Capstone Course in Zoology | 3 |
| ZO 582 | Medical and Veterinary Entomology | 3 |

Natural History Electives

| Code | Title | Hours |
|-------------------|--------------------------------------------------------------------|-------|
| ZO 350 | Animal Phylogeny and Diversity | 4 |
| ZO 402 | Invertebrate Biology | 4 |
| BIO 227 | Understanding Structural Diversity through Biological Illustration | 3 |
| BIO 230 | The Science of Studying Dinosaurs | 3 |
| BIO 270 | Introduction to Evolution | 3 |
| BIO 323 | Paleoecology | 3 |
| BIO 370 | Developmental Anatomy of the Vertebrates | 3 |
| BIO 375 | Developmental Anatomy Laboratory | 2 |
| AEC 441 & AEC 442 | Biology of Fishes and Biology of Fishes Laboratory | 4 |
| AEC 501 | Avian Ecology | 4 |
| FW 444 | Mammalogy | 3 |
| ENT 402 | Forest Entomology | 3 |
| ENT 425 | General Entomology | 3 |
| MEA 220 | Marine Biology | 3 |
| MEA 252 | Biology of Marine Mammals | 3 |
| MEA 350 | Marine Conservation Biology | 3 |
| MEA 369 | Life on Earth: Principles of Paleontology | 3 |
| MEA 370 | Invertebrate Paleontology | 3 |
| MEA 449 | Principles of Biological Oceanography | 3 |
| MEA 469 | Ecology of Coastal Resources | 3 |

Additional Science & Math Electives

| Code | Title | Hours |
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| Science and Math | | |
| Take any course from the following list OR any course at the 200-level or higher from the following prefixes: BIO, DSC, ZO | | |
| AEC 245 | Practicing Conservation Ecology | 3 |
| AEC 370 | Parasite and Disease Ecology | 3 |
| AEC 371 | Parasite and Disease Ecology Lab | 1 |
| AEC 384 | Tropical Ecology in a Changing World | 3 |
| AEC 390 | Community Ecology | 3 |
| AEC 400 | Applied Ecology | 3 |
| AEC 419 | Freshwater Ecology | 4 |
| AEC 424 | Marine Fisheries Ecology | 3 |
| AEC 437 | Gut Microbial Ecology | 3 |
| BIO 323 | Paleoecology | 3 |
| AEC 441 | Biology of Fishes | 3 |

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| AEC 442 | Biology of Fishes Laboratory | 1 |
| AEC 450 | Conservation Genetics | 3 |
| AEC 458 | Environmental Issues in Aquatic Ecology | 3 |
| AEC 460 | Field Ecology and Methods | 4 |
| AEC 470 | Urban Ecology | 3 |
| AEC 480 | Applied Science Communication | 3 |
| ANS 220 & ANS 221 | Reproductive Physiology and Reproductive Physiology Lab | 4 |
| ANS 225 | Principles of Animal Nutrition | 3 |
| ANS 230 & ANS 231 | Animal Nutrition and Animal Nutrition Lab | 4 |
| ANS 330 | Laboratory Animal Science | 3 |
| ANS 415/515/ NTR 415/515/ PO 415/515 | Comparative Nutrition | 3 |
| ANS 452/552 | Comparative Reproductive Physiology and Biotechnology | 3 |
| ANS 453/553 | Physiology and Genetics of Growth and Development | 3 |
| ANS 454/554/ NTR 454 | Lactation, Milk and Nutrition | 3 |
| ANS/NTR 561 | Equine Nutrition | 3 |
| ANS/BCH 571 | Regulation of Metabolism | 3 |
| FS/NTR 301 | Introduction to Human Nutrition | 3 |
| NTR 419 | Human Nutrition and Chronic Disease | 3 |
| Science and Math (ANT) | | |
| ANT 251 | Introduction to Biological Anthropology | 3 |
| ANT 370 | Introduction to Forensic Anthropology | 3 |
| ANT 371 | Human Variation | 3 |
| ANT 421/521 | Human Osteology | 3 |
| ANT 424/524 | Bioarchaeology | 3 |
| ANT 475/575 | Environmental Archaeology | 3 |
| ANT 483/583 | Theories of Archaeological Research | 3 |
| ANT 529 | Advanced Methods in Forensic Anthropology | 4 |
| ANT 585 | Skeletal Biology in Anthropology | 3 |
| Science and Math (BCH) | | |
| ANS/BCH 571 | Regulation of Metabolism | 3 |
| BCH 220 | Role of Biotechnology in Society | 3 |
| BCH 351 | General Biochemistry | 3 |
| BCH 451 & BCH 452 | Principles of Biochemistry and Introductory Biochemistry Laboratory | 6 |
| BCH 453/553 | Biochemistry of Gene Expression | 3 |
| BCH 454 | Advanced Biochemistry Laboratory | 4 |
| BCH 455/555 | Proteins and Molecular Mechanisms | 3 |
| BCH 552 | Experimental Biochemistry | 3 |
| Science and Math (BIT) | | |
| BEC 463/563/ CHE 463/563 | Fermentation of Recombinant Microorganisms | 2 |
| BIO 572 | Proteomics | 3 |
| BIT/MB 210 | Phage Hunters | 3 |
| BIT/MB 211 | Phage Genomics | 2 |
| BIT 410 | Manipulation of Recombinant DNA | 4 |
| BIT 463/563 | Fermentation of Recombinant Microorganisms | 2 |
| BIT 464/564 | Protein Purification | 2 |

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| BIT 466/566/ PO 466/566 | Animal Cell Culture Techniques | 2 |
| BIT 467/567 | PCR and DNA Fingerprinting | 2 |
| BIT 471/571 | RNA Interference and Model Organisms | 2 |
| BIT 473/573 | Protein Interactions | 2 |
| BIT 474/574 | Plant Genetic Engineering | 2 |
| BIT 476 | Applied Bioinformatics | 2 |
| BIT 477/577 | Metagenomics | 2 |
| BIT/PB 481 | Plant Tissue Culture and Transformation | 2 |
| BIT 510 | Core Technologies in Molecular and Cellular Biology | 4 |
| BIT/CH 572 | Proteomics | 3 |
| Science and Math (MA) | | |
| BIO/BMA 560 | Population Ecology | 3 |
| BMA 567 | Modeling of Biological Systems | 4 |
| BMA 573 | Mathematical Modeling of Physical and Biological Processes I | 3 |
| BMA 574 | Mathematical Modeling of Physical and Biological Processes II | 3 |
| Science and Math (CBS) | | |
| CBS 565 | Fundamentals of Biomedical Sciences | 3 |
| CBS 570 | Methods in Biomedical Sciences | 1 |
| CBS 580 | Epidemiology I | 3 |
| Science and Math (CH) | | |
| CH 201 | Chemistry - A Quantitative Science | 3 |
| CH 202 | Quantitative Chemistry Laboratory | 1 |
| CH 223 | Organic Chemistry II | 3 |
| CH 224 | Organic Chemistry II Lab | 1 |
| CH 230 | Computational Chemistry Lab I | 1 |
| CH 232 | Computational Chemistry Lab II | 1 |
| CH 315 | Quantitative Analysis | 3 |
| CH 331 | Introductory Physical Chemistry | 4 |
| CH 401 | Systematic Inorganic Chemistry I | 3 |
| CH 403 | Systematic Inorganic Chemistry II | 3 |
| CH 431 | Physical Chemistry I | 3 |
| CH 433 | Physical Chemistry II | 3 |
| CH 435 | Introduction to Quantum Chemistry | 3 |
| CH 441 | Forensic Chemistry | 3 |
| CH 442 | Advanced Synthetic Techniques | 4 |
| CH 444 | Advanced Synthetic Techniques II | 4 |
| CH 452 | Advanced Measurement Techniques I | 4 |
| CH 463/563 | Molecular Origins of Life | 3 |
| Science and Math (ENT) | | |
| AEC 409/509 | Ecology and Conservation of Freshwater Invertebrates | 4 |
| ENT 207 | Insects and Human Disease | 3 |
| ENT 305 | Introduction to Forensic Entomology | 3 |
| ENT/FOR 402 | Forest Entomology | 3 |
| ENT 425 | General Entomology | 3 |
| ENT 502 | Insect Diversity | 4 |
| ENT 503 | Insect Morphology and Physiology | 3 |
| ENT/GES 506 | Principles of Genetic Pest Management | 3 |
| ENT 526 | Organic Agriculture: Principles and Practices | 3 |

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| ENT/ZO 582 | Medical and Veterinary Entomology | 3 |
| Science and Math (ES) | | |
| ES 300 | Energy and Environment | 3 |
| ES 400 | Analysis of Environmental Issues | 3 |
| Science and Math (FOR) | | |
| AEC 423 | Introduction to Fisheries Sciences Laboratory | 1 |
| ENT 402 | Forest Entomology | 3 |
| FOR 252 | Introduction to Forest Science | 3 |
| FOR 260 | Forest Ecology | 4 |
| FOR 261 | Forest Communities | 2 |
| FOR 264 | Forest Wildlife | 1 |
| FOR 265 | Fire Management | 1 |
| FOR 303 | Silvics and Forest Tree Physiology | 3 |
| FOR 304 | Theory of Silviculture | 4 |
| FOR 318 | Forest Pathology | 3 |
| FOR 330 | North Carolina Forests | 3 |
| FOR 402 | Forest Entomology | 3 |
| FOR 401 | Dendrology | 4 |
| FOR 405 | Forest Management | 4 |
| FOR 411 | Forest Genetics | 3 |
| FOR 414 | World Forestry | 3 |
| FOR 415 | World Forestry Study Tour | 1 |
| FOR 420 | Watershed and Wetlands Hydrology | 4 |
| FOR 505 | Forest Management | 4 |
| FOR 507 | Silviculture Mini Course | 1 |
| FOR 510 | Introduction to GPS | 1 |
| FOR 513 | Silviculture for Intensively Managed Plantations | 3 |
| FOR 520 | Watershed and Wetlands Hydrology | 4 |
| FOR 540 | Advanced Dendrology | 3 |
| FOR 562 | Forest Communities of the Southern Appalachians | 1 |
| FOR 575 | Advanced Terrestrial Ecosystem Ecology | 3 |
| FOR 583 | Tropical Forestry | 3 |
| FW 221 | Conservation of Natural Resources | 3 |
| FW 404 | Wildlife Habitat Management | 3 |
| NR 420/520 | Watershed and Wetlands Hydrology | 4 |
| PP 318 | Forest Pathology | 3 |
| Science and Math (FW) | | |
| AEC 420 | Introduction to Fisheries Science | 3 |
| AEC 515 | Fish Physiology | 3 |
| FW 221 | Conservation of Natural Resources | 3 |
| FW 333 | Conservation Biology in Practice | 3 |
| FW 353 | Wildlife Management | 3 |
| FW 403 | Urban Wildlife Management | 3 |
| FW 404 | Wildlife Habitat Management | 3 |
| FW 444 | Mammalogy | 3 |
| FW 453 | Principles of Wildlife Science | 4 |
| Science and Math (GN) | | |
| GN 301 | Genetics in Human Affairs | 3 |
| GN 312 | Elementary Genetics Laboratory | 1 |
| GN 421 | Molecular Genetics | 3 |
| GN 423 | Population, Quantitative and Evolutionary Genetics | 3 |
| GN 425 | Advanced Genetics Laboratory | 2 |

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| GN 427 | Introductory Bioinformatics | 3 |
| GN 434 | Genes and Development | 3 |
| GN 441 | Human and Biomedical Genetics | 3 |
| GN 450 | Conservation Genetics | 3 |
| GN 451 | Genome Science | 3 |
| GN 453 | Personal Genomics | 3 |
| GN 461 | Advanced Bioinformatics | 3 |
| GN 521 | Molecular Genetics | 3 |
| GN 541 | Human and Biomedical Genetics | 3 |
| GN 550 | Conservation Genetics | 3 |
| Science and Math (MA) | | |
| BAE 455 | R Coding for Data Management and Analysis | 3 |
| BMA 573 | Mathematical Modeling of Physical and Biological Processes I | 3 |
| BMA 574 | Mathematical Modeling of Physical and Biological Processes II | 3 |
| CSC 416 | Introduction to Combinatorics | 3 |
| CSC 427 | Introduction to Numerical Analysis I | 3 |
| CSC 428 | Introduction to Numerical Analysis II | 3 |
| CSC 565 | Graph Theory | 3 |
| CSC 580 | Numerical Analysis I | 3 |
| CSC 583 | Introduction to Parallel Computing | 3 |
| E 531 | Dynamic Systems and Multivariable Control I | 3 |
| FIM 547 | Stochastic Calculus for Finance | 3 |
| ISE 505 | Linear Programming | 3 |
| LOG 335 | Symbolic Logic | 3 |
| MA 225 | Foundations of Advanced Mathematics | 3 |
| MA 231 | Calculus for Life and Management Sciences B | 3 |
| MA 241 | Calculus II | 4 |
| MA 242 | Calculus III | 4 |
| MA 302 | Numerical Applications to Differential Equations | 1 |
| MA 303 | Linear Analysis | 3 |
| MA 305 | Introductory Linear Algebra and Matrices | 3 |
| MA 315 | Mathematics Methods in Atmospheric Sciences | 4 |
| MA 325 | Introduction to Applied Mathematics | 3 |
| MA 331 | Differential Equations for the Life Sciences | 3 |
| MA 335 | Symbolic Logic | 3 |
| MA 341 | Applied Differential Equations I | 3 |
| MA 351 | Introduction to Discrete Mathematical Models | 3 |
| MA 401 | Applied Differential Equations II | 3 |
| MA 402 | Mathematics of Scientific Computing | 3 |
| MA 403 | Introduction to Modern Algebra | 3 |
| MA 405 | Introduction to Linear Algebra | 3 |
| MA 408 | Foundations of Euclidean Geometry | 3 |
| MA 410 | Theory of Numbers | 3 |
| MA 413 | Short-Term Actuarial Models | 3 |
| MA 416 | Introduction to Combinatorics | 3 |
| MA 421 | Introduction to Probability | 3 |
| MA 425 | Mathematical Analysis I | 3 |
| MA 426 | Mathematical Analysis II | 3 |
| MA 427 | Introduction to Numerical Analysis I | 3 |
| MA 428 | Introduction to Numerical Analysis II | 3 |

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| MA 430 | Mathematical Models in the Physical Sciences | 3 | MB 200 | The Fourth Horseman: Plagues that Changed the World | 3 |
| MA 432 | Mathematical Models in Life Sciences | 3 | MB 211 | Phage Genomics | 2 |
| MA 437 | Applications of Algebra | 3 | MB 351 | General Microbiology | 3 |
| MA 444 | Problem Solving Strategies for Competitions | 1 | MB 352 | General Microbiology Laboratory | 1 |
| MA 501 | Advanced Mathematics for Engineers and Scientists I | 3 | MB 354 | Inquiry-Guided Microbiology Lab | 1 |
| MA 502 | Advanced Mathematics for Engineers and Scientists II | 3 | MB 360 | Scientific Inquiry in Microbiology: At the Bench | 3 |
| MA 504 | Introduction to Mathematical Programming | 3 | MB 405 | Food Microbiology | 3 |
| MA 505 | Linear Programming | 3 | MB 406 | Food Microbiology Lab | 2 |
| MA 511 | Advanced Calculus I | 3 | MB 411 | Medical Microbiology | 3 |
| MA 513 | Introduction To Complex Variables | 3 | MB 412 | Medical Microbiology Laboratory | 1 |
| MA 515 | Analysis I | 3 | MB 414 | Microbial Metabolic Regulation | 3 |
| MA 518 | Geometry of Curves and Surfaces | 3 | MB 420 | Fundamentals of Microbial Cell Biotransformations | 2 |
| MA 520 | Linear Algebra | 3 | MB 435 | Bacterial Pathogenesis | 3 |
| MA 521 | Abstract Algebra I | 3 | MB 441 | Immunology | 3 |
| MA 522 | Computer Algebra | 3 | MB 451 | Microbial Diversity | 3 |
| MA 523 | Linear Transformations and Matrix Theory | 3 | MB 452 | Microbial Diversity Lab | 2 |
| MA 524 | Combinatorics I | 3 | MB 455 | Microbial Biotechnology | 3 |
| MA 531 | Dynamic Systems and Multivariable Control I | 3 | MB 461 | Molecular Virology | 3 |
| MA 532 | Ordinary Differential Equations I | 3 | MB 470 | Emerging and Re-emerging Infectious Diseases | 3 |
| MA 534 | Introduction To Partial Differential Equations | 3 | MB 501 | Biology of Plant Pathogens | 3 |
| MA 537 | Nonlinear Dynamics and Chaos | 3 | MB 505 | Food Microbiology | 3 |
| MA 544 | Computer Experiments In Mathematical Probability | 3 | MB 506 | Food Microbiology Lab | 2 |
| MA 546 | Probability and Stochastic Processes I | 3 | MB 520 | Fundamentals of Microbial Cell Biotransformations | 2 |
| MA 547 | Stochastic Calculus for Finance | 3 | MB 532 | Soil Microbiology | 3 |
| MA 551 | Introduction to Topology | 3 | MB 535 | Bacterial Pathogenesis | 3 |
| MA 555 | Introduction to Manifold Theory | 3 | MB 555 | Microbial Biotechnology | 3 |
| MA 561 | Set Theory and Foundations Of Mathematics | 3 | MB 575 | Introduction to Mycology | 4 |
| MA 573 | Mathematical Modeling of Physical and Biological Processes I | 3 | PB 501 | Biology of Plant Pathogens | 3 |
| MA 574 | Mathematical Modeling of Physical and Biological Processes II | 3 | PB 575 | Introduction to Mycology | 4 |
| MA 580 | Numerical Analysis I | 3 | PP 501 | Biology of Plant Pathogens | 3 |
| MA 583 | Introduction to Parallel Computing | 3 | PP 575 | Introduction to Mycology | 4 |
| MA 584 | Numerical Solution of Partial Differential Equations--Finite Difference Methods | 3 | SSC 532 | Soil Microbiology | 3 |
| MA 587 | Numerical Solution of Partial Differential Equations--Finite Element Method | 3 | Science and Math (MEA) | | |
| MEA 315 | Mathematics Methods in Atmospheric Sciences | 4 | CE 435 | Engineering Geology | 3 |
| OR 504 | Introduction to Mathematical Programming | 3 | CE 479 | Air Quality | 3 |
| OR 505 | Linear Programming | 3 | CE 581 | Fluid Mechanics in Natural Environments | 3 |
| OR 531 | Dynamic Systems and Multivariable Control I | 3 | ET 320 | Fundamentals of Air Pollution | 3 |
| OR 565 | Graph Theory | 3 | GIS 582 | Geospatial Modeling | 3 |
| ST 412 | Long-Term Actuarial Models | 3 | MA 315 | Mathematics Methods in Atmospheric Sciences | 4 |
| ST 413 | Short-Term Actuarial Models | 3 | MEA 200 | Introduction to Oceanography | 3 |
| ST 546 | Probability and Stochastic Processes I | 3 | MEA 202 | Geology II: Historical | 3 |
| Science and Math (MB) | | | MEA 210 | Oceanography Lab | 1 |
| BIT 210 | Phage Hunters | 3 | MEA 211 | Geology II Laboratory | 1 |
| BIT 211 | Phage Genomics | 2 | MEA 220 | Marine Biology | 3 |
| FS 405/505 | Food Microbiology | 3 | MEA 250 | Introduction to Coastal Environments | 3 |
| FS 406/506 | Food Microbiology Lab | 2 | MEA 251 | Introduction to Coastal Environments Laboratory | 1 |
| | | | MEA 300 | Environmental Geology | 4 |
| | | | MEA 312 | Atmospheric Thermodynamics | 4 |
| | | | MEA 315 | Mathematics Methods in Atmospheric Sciences | 4 |
| | | | MEA 320 | Fundamentals of Air Pollution | 3 |
| | | | MEA 321 | Fundamentals of Air Quality and Climate Change | 3 |

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| MEA 323 | Geochemistry of Natural Waters | 3 |
| MEA 369 | Life on Earth: Principles of Paleontology | 3 |
| MEA 410 | Introduction to Mineralogy | 3 |
| MEA 411 | Marine Sediment Transport | 3 |
| MEA 412 | Atmospheric Physics | 3 |
| MEA 415 | Climate Dynamics | 3 |
| MEA 421 | Atmospheric Dynamics I | 3 |
| MEA 422 | Atmospheric Dynamics II | 3 |
| MEA 425 | Introduction to Atmospheric Chemistry | 3 |
| MEA 440 | Igneous and Metamorphic Petrology | 3 |
| MEA 443 | Synoptic Weather Analysis and Forecasting | 4 |
| MEA 444 | Mesoscale Analysis and Forecasting | 4 |
| MEA 449 | Principles of Biological Oceanography | 3 |
| MEA 450 | Introductory Sedimentology and Stratigraphy | 4 |
| MEA 451 | Structural Geology | 4 |
| MEA 454 | Marine Physical-Biological Interactions | 3 |
| MEA 455 | Micrometeorology | 3 |
| MEA 459 | Field Investigation of Coastal Processes | 5 |
| MEA 462 | Observational Methods and Data Analysis in Marine Physics | 3 |
| MEA 463 | Fluid Physics | 3 |
| MEA 464 | Ocean Circulation Systems | 3 |
| MEA 465 | Geologic Field Camp | 4 |
| MEA 467 | Marine Meteorology | 3 |
| MEA 469 | Ecology of Coastal Resources | 3 |
| MEA 470 | Introduction to Geophysics | 3 |
| MEA 471 | Exploration and Engineering Geophysics | 3 |
| MEA 473 | Principles of Chemical Oceanography | 3 |
| MEA 476 | Worldwide River and Delta Systems: Their Evolution and Human Impacts | 3 |
| MEA 479 | Air Quality | 3 |
| MEA 481 | Geomorphology: Earth's Dynamic Surface | 3 |
| MEA 485 | Introduction to Hydrogeology | 3 |
| MEA 510 | Air Pollution Meteorology | 3 |
| MEA 511 | Introduction to Meteorological Remote Sensing | 3 |
| MEA 514 | Advanced Physical Meteorology | 3 |
| MEA 515 | Climate Dynamics | 3 |
| MEA 525 | Introduction to Atmospheric Chemistry | 3 |
| MEA 540 | Principles of Physical Oceanography | 3 |
| MEA 549 | Principles of Biological Oceanography | 3 |
| MEA 554 | Marine Physical-Biological Interactions | 3 |
| MEA 562 | Marine Sediment Transport | 3 |
| MEA 570 | Geological Oceanography | 3 |
| MEA 573 | Principles of Chemical Oceanography | 3 |
| MEA 574 | Advanced Igneous Petrology | 3 |
| MEA 577 | Electron Microprobe Analysis of Geologic Material | 2 |
| MEA 579 | Principles of Air Quality Engineering | 3 |
| MEA 580 | Air Quality Modeling and Forecasting | 4 |
| MEA 581 | Fluid Mechanics in Natural Environments | 3 |
| MEA 582 | Geospatial Modeling | 3 |
| MEA 585 | Physical Hydrogeology | 3 |
| MEA 599 | Regional Geology of North America | 1-6 |

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| Science and Math (MT) | | |
| MT 323 | Introduction to Theory and Practice of Medical Fiber and Yarn Formation | 3 |
| MT 366 | Biotextile Product Development | 3 |
| MT 432 | Evaluation of Biotextiles | 3 |
| MT/PCC 471 | Chemistry of Biopolymers | 3 |
| Science and Math (NTR) | | |
| ANS 415 | Comparative Nutrition | 3 |
| ANS 454/554/FS 554 | Lactation, Milk and Nutrition | 3 |
| ANS 550 | Applied Ruminant Nutrition | 3 |
| ANS 561 | Equine Nutrition | 3 |
| FS 301 | Introduction to Human Nutrition | 3 |
| FS 401 | Advanced Nutrition and Metabolism | 3 |
| FS 555 | Exercise Nutrition | 3 |
| FS 557 | Nutraceuticals and Functional Foods | 3 |
| NTR 301 | Introduction to Human Nutrition | 3 |
| NTR 401 | Advanced Nutrition and Metabolism | 3 |
| NTR 415 | Comparative Nutrition | 3 |
| NTR 419 | Human Nutrition and Chronic Disease | 3 |
| NTR 500 | Principles of Human Nutrition | 3 |
| NTR 501 | Advanced Nutrition and Metabolism | 3 |
| NTR 515 | Comparative Nutrition | 3 |
| NTR 550 | Applied Ruminant Nutrition | 3 |
| NTR 555 | Exercise Nutrition | 3 |
| NTR 557 | Nutraceuticals and Functional Foods | 3 |
| NTR 561 | Equine Nutrition | 3 |
| PO 415/515 | Comparative Nutrition | 3 |
| Science and Math (PB) | | |
| AEC 360 | Ecology | 4 |
| BIO 330 | Evolutionary Biology | 3 |
| BIO 414 | Cell Biology | 3 |
| BIT 476 | Applied Bioinformatics | 2 |
| BIT 481 | Plant Tissue Culture and Transformation | 2 |
| FOR 565 | Plant Community Ecology | 4 |
| MB 501 | Biology of Plant Pathogens | 3 |
| MB 575 | Introduction to Mycology | 4 |
| PB 205 | Our Green World | 3 |
| PB 215 | Medicinal Plants | 3 |
| PB 219 | Plants in Folklore, Myth, and religion | 3 |
| PB 220 | Local Flora | 3 |
| PB 250 | Plant Biology | 4 |
| PB 321 | Introduction to Whole Plant Physiology | 3 |
| PB 360 | Ecology | 4 |
| PB 400 | Plant Diversity and Evolution | 4 |
| PB 403 | Systematic Botany | 4 |
| PB 421 | Plant Physiology | 3 |
| PB 445 | Paleobotany | 4 |
| PB 464 | Rare Plants of North Carolina | 3 |
| PB 480 | Introduction to Plant Biotechnology | 3 |
| PB 481 | Plant Tissue Culture and Transformation | 2 |
| PB 501 | Biology of Plant Pathogens | 3 |

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| PB 503 | Systematic Botany | 4 |
| PB 513 | Plant Anatomy | 2 |
| PB 545 | Paleobotany | 4 |
| PB 564 | Rare Plants of North Carolina | 3 |
| PB 570 | Plant Functional Ecology | 3 |
| PB 580 | Introduction to Plant Biotechnology | 3 |
| PP 501 | Biology of Plant Pathogens | 3 |
| PP 575 | Introduction to Mycology | 4 |
| Science and Math (PHY) | | |
| PHY 503 | General Physiology I | 3 |
| PHY 504 | General Physiology II | 3 |
| PHY 524 | Comparative Endocrinology | 3 |
| PO 524 | Comparative Endocrinology | 3 |
| Science and Math (PP) | | |
| CS 502 | Plant Disease: Methods & Diagnosis | 2 |
| FOR 318 | Forest Pathology | 3 |
| HS 502 | Plant Disease: Methods & Diagnosis | 2 |
| MB 501 | Biology of Plant Pathogens | 3 |
| MB 575 | Introduction to Mycology | 4 |
| PB 501 | Biology of Plant Pathogens | 3 |
| PB 575 | Introduction to Mycology | 4 |
| PP 315 | Principles of Plant Pathology | 4 |
| PP 318 | Forest Pathology | 3 |
| PP 501 | Biology of Plant Pathogens | 3 |
| PP 502 | Plant Disease: Methods & Diagnosis | 2 |
| PP 575 | Introduction to Mycology | 4 |
| Science and Math (PY) | | |
| PY 202 | University Physics II | 4 |
| PY 208 | Physics for Engineers and Scientists II | 3 |
| PY 209 | Physics for Engineers and Scientists II Laboratory | 1 |
| PY 212 | College Physics II | 4 |
| PY 252 | Instrumental and Data Analysis for Physics | 2 |
| PY 301 | Introduction to Quantum Mechanics | 3 |
| PY 328 | Stellar and Galactic Astrophysics | 3 |
| PY 341 | Relativity, Gravitation and Cosmology | 3 |
| PY 401 | Quantum Physics I | 3 |
| PY 402 | Quantum Physics II | 3 |
| Science and Math (SSC) | | |
| MB 352 | General Microbiology Laboratory | 1 |
| SSC 200 | Soil Science | 3 |
| SSC 201 | Soil Science Laboratory | 1 |
| SSC 332 | Environmental Soil Microbiology | 3 |
| SSC 341 | Soil Fertility and Nutrient Management | 3 |
| SSC 342 | Soil and Plant Nutrient Analysis | 1 |
| SSC 427 | Biological Approaches to Sustainable Soil Systems | 3 |
| SSC 442 | Soil and Environmental Biogeochemistry | 3 |
| SSC 452 | Soil Classification | 4 |
| SSC 461 | Soil Physical Properties and Plant Growth | 3 |
| SSC 470 | Wetland Soils | 3 |
| SSC 511 | Soil Physics | 4 |
| SSC 521 | Soil Chemistry | 3 |
| SSC 532 | Soil Microbiology | 3 |

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| SSC 541 | Soil Fertility | 3 |
| SSC 551 | Soil Morphology, Genesis and Classification | 3 |
| SSC 562 | Environmental Applications Of Soil Science | 3 |
| SSC 570 | Wetland Soils | 3 |
| Science and Math (ST) | | |
| BUS 350 | Economics and Business Statistics | 3 |
| EC 351 | Econometrics I | 3 |
| ECG 561 | Applied Econometrics I | 3 |
| MA 412 | Long-Term Actuarial Models | 3 |
| MA 413 | Short-Term Actuarial Models | 3 |
| MA 546 | Probability and Stochastic Processes I | 3 |
| PSY 240 | Introduction to Behavioral Research I | 3 |
| PSY 241 | Introduction to Behavioral Research I Lab | 1 |
| PSY 242 | Introduction to Behavioral Research II | 3 |
| PSY 243 | Introduction to Behavioral Research II Lab | 2 |
| ST 311 | Introduction to Statistics | 3 |
| ST 312 | Introduction to Statistics II | 3 |
| ST 350 | Economics and Business Statistics | 3 |
| ST 371 | Introduction to Probability and Distribution Theory | 3 |
| ST 372 | Introduction to Statistical Inference and Regression | 3 |
| ST 401 | Experiences in Data Analysis | 4 |
| ST 412 | Long-Term Actuarial Models | 3 |
| ST 413 | Short-Term Actuarial Models | 3 |
| ST 421 | Introduction to Mathematical Statistics I | 3 |
| ST 422 | Introduction to Mathematical Statistics II | 3 |
| ST 430 | Introduction to Regression Analysis | 3 |
| ST 431 | Introduction to Experimental Design | 3 |
| ST 432 | Introduction to Survey Sampling | 3 |
| ST 435 | Statistical Methods for Quality and Productivity Improvement | 3 |
| ST 445 | Introduction to Statistical Computing and Data Management | 3 |
| ST 505 | Applied Nonparametric Statistics | 3 |
| ST 511 | Statistical Methods For Researchers I | 3 |
| ST 512 | Statistical Methods For Researchers II | 3 |
| ST 520 | Statistical Principles of Clinical Trials | 3 |
| ST 535 | Statistical Methods for Quality and Productivity Improvement | 3 |
| ST 546 | Probability and Stochastic Processes I | 3 |
| ST 561 | Applied Econometrics I | 3 |
| Science and Math (TOX) | | |
| TOX 401 | Principles of Toxicology | 4 |
| TOX 415 | Ecotoxicology | 4 |
| TOX 501 | Principles of Toxicology | 4 |
| TOX 515 | Environmental Toxicology | 4 |
| Science and Math (ZO) | | |
| AEC 409 | Ecology and Conservation of Freshwater Invertebrates | 4 |
| AEC 501 | Avian Ecology | 4 |
| AEC 509 | Ecology and Conservation of Freshwater Invertebrates | 4 |
| AEC 515 | Fish Physiology | 3 |

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| ENT 582 | Medical and Veterinary Entomology | 3 |
| MEA 449 | Principles of Biological Oceanography | 3 |
| MEA 549 | Principles of Biological Oceanography | 3 |
| PHY 503 | General Physiology I | 3 |
| PHY 504 | General Physiology II | 3 |
| PHY 524 | Comparative Endocrinology | 3 |
| PO 524 | Comparative Endocrinology | 3 |
| ZO 334 | Captive Animal Biology Field Laboratory | 2 |
| ZO 350 | Animal Phylogeny and Diversity | 4 |
| ZO 582 | Medical and Veterinary Entomology | 3 |

First Year

| Fall Semester | | Hours |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-----------|
| LSC 101 or ENV 101 | Critical and Creative Thinking in the Life Sciences ¹ or Exploring the Environment | 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 121 or MA 131 or MA 141 | Elements of Calculus ¹ or Calculus for Life and Management Sciences A or Calculus I | 3 |
| LSC 103 or ENV 100 | Exploring Opportunities in the Life Sciences or Student Success in Environmental First Year | 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 220 or CH 221 | Introductory Organic Chemistry ¹ or Organic Chemistry I | 3 |
| CH 222 | Organic Chemistry I Lab ¹ | 1 |
| ENG 101 | Academic Writing and Research ¹ | 4 |
| Human Dimensions (p. 2) ¹ | | 3 |
| Hours | | 15 |

Second Year

Fall Semester

| | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------|
| Communication Requirement Elective (p.) ¹ | | 3 |
| Core Electives (p. 1) ¹ | | 3 |
| ZO 250 | Animal Anatomy and Physiology ¹ | 4 |
| GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/) | | 3 |
| GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/) | | 1 |
| Hours | | 14 |

Spring Semester

| | | |
|-----------------------------------------|--|---|
| Ecology Requirement (p. 1) ¹ | | 4 |
|-----------------------------------------|--|---|

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Applied Conservation and Natural Resource Management (p. 2) ¹ | 3 |
| Core Electives (p. 1) ¹ | 3 |
| GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/) | 3 |
| GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/) | 3 |
| Hours | 16 |

Third Year

Fall Semester

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Natural History Requirement (p. 1) ¹ | 3 |
| Free Elective | 3 |
| Environmental Science and MEAS Requirement (p. 1) | 3 |
| Physics Requirement (p. 1) | 4 |
| GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/) | 3 |
| Hours | 16 |

Spring Semester

| | | |
|----------------------------------------------------------------|-----------------------------------------|-----------|
| ST 311 | Introduction to Statistics ¹ | 3 |
| Advanced Writing Requirement (p. 2) ¹ | | 3 |
| Environmental Science and MEAS Requirement (p. 1) ¹ | | 4 |
| Natural History Requirement (p. 1) ¹ | | 4 |
| Hours | | 14 |

Fourth Year

Fall Semester

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| Zoology Elective (p. 3) ¹ | 3 |
| Zoology Elective (p. 3) ¹ | 3 |
| Experiential Learning Requirement (p. 1) | 3 |
| Science & Math Elective (p. 3) | 3 |
| GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/) | 3 |
| Hours | 15 |

Spring Semester

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Zoology Elective (p. 3) ¹ | 3 |
| Science & Math Elective (p. 3) | 3 |
| Science & Math Elective (p. 3) | 3 |
| Free Elective | 3 |
| GEP Elective (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) | 3 |
| Hours | 15 |
| Total Hours | 120 |

¹ A grade of C- or higher is required.

Students who graduate from the Department of Biological Sciences with a Zoology degree with an Applied Concentration are well prepared for employment in various government agencies and private industries. Post graduation, students can gain employment in environmental education, parks and recreation, animal husbandry, natural resources, ecotourism, conservation, veterinary medicine and biomedical research. Graduates may choose to 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. 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. Those hoping to work in the non-profit sector may want to pursue a Non-Profit Management certificate or a minor in Non-Profit Studies.

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.

Zoological Association of America (<https://zaa.org/>)

Association of Zoos & Aquariums (<https://www.aza.org/>)