

Natural Resources (BS): Policy and Administration Concentration

Two natural resources curricula are offered by the Department of Forestry and Environmental Resources. The curricula are also accredited by the Society of American Foresters and produce natural resources professionals with a broad interdisciplinary background coupled with specifically focused skills needed to manage natural resources. The Natural Resources curricula include a series of common courses to highlight the integrated nature of work by interdisciplinary teams.

The curriculum in Natural Resources Ecosystem Assessment produces graduates who have knowledge and skills to inventory and describe ecosystems characteristics and to evaluate the impacts of management decisions. Ecosystem assessment or environmental impact assessment is an important part of development planning that calls for individuals who understand ecosystem structure and processes; who can identify, measure, inventory, and describe ecosystems; and who can apply standard evaluation and classification systems such as wildlife habitat evaluation procedures and the federal wetland delineation criteria. The curriculum entails a strong science base, as well as advanced courses in sampling and measurements, vegetation, soils, hydrology, and wildlife and fisheries are added. The 400-level courses also address techniques and issues of natural resource management.

The curriculum in Natural Resources Policy and Administration produces graduates who have knowledge and skills to manage natural resources programs in a variety of settings and organizations with an emphasis on public agencies. The advanced courses of the curriculum provide background in economics, policy, government, public administration, and natural resources management. An economics track begins with introductory microeconomics and culminates with environmental economics and public finance. Courses in government and public administration provide knowledge of how public institutions work. Courses in forestry, wildlife and fisheries, and outdoor recreation provide techniques of managing natural ecosystems for various uses. A common thread of how public policy on natural resources is influenced and developed runs through many of the courses already noted and culminates in two senior courses that focus on policy. For information on entrance requirements, contact the program coordinator:

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Plan Requirements

| First Year | | Hours |
|------------|---|-------|
| ENV 100 | Student Success in Environmental First Year | 1 |
| ENV 101 | Exploring the Environment | 2 |

| | | |
|--|--|-----------|
| BIO 181 | Introductory Biology: Ecology, Evolution, and Biodiversity | 4 |
| CH 101 & CH 102 | Chemistry - A Molecular Science and General Chemistry Laboratory | 4 |
| Math Electives (p. 2) | | 6 |
| FOR 150 | Critical Thinking and Data Analysis | 2 |
| Acad Writing Research (p.) ¹ | | 4 |
| Select one of the following: | | 3 |
| ARE 201 | Introduction to Agricultural & Resource Economics | |
| ARE 201A | Introduction to Agricultural & Resource Economics | |
| EC 201 | Principles of Microeconomics | |
| EC 205 | Fundamentals of Economics | |
| Hours | | 26 |

| Second Year | | |
|-------------------------|--|-----------|
| COM 110 or COM 112 | Public Speaking or Interpersonal Communication | 3 |
| Physics Elective (p. 2) | | 4 |
| FOR 252 | Introduction to Forest Science | 3 |
| FOR 339 | | 4 |
| SSC 200 & SSC 201 | Soil Science and Soil Science Laboratory | 4 |
| PS 201 or PS 202 | American Politics and Government or State and Local Government | 3 |
| Hours | | 21 |

| Third Year | | |
|------------------------------------|--|-----------|
| ENG 333 | Communication for Science and Research | 3 |
| Select one of the following: | | 4 |
| AEC 360 | Ecology | |
| FOR 260 | Forest Ecology | |
| PB 360 | Ecology | |
| NR 300 | Natural Resource Measurements | 4 |
| NR 301 | Practicum for Professional Development I | 1 |
| Spatial Technology Elective (p. 2) | | 3 |
| ST 311 | Introduction to Statistics | 3 |
| ARE 336 | Introduction to Resource and Environmental Economics | 3 |
| Hours | | 21 |

| Summer | | |
|--------------|-----------------------|----------|
| NR 360 | Internship Experience | 3 |
| Hours | | 3 |

| Fourth Year | | |
|------------------------------|--|-----------|
| NR 400 | Natural Resource Management | 4 |
| NR 460 | Renewable Natural Resource Management and Policy | 3 |
| NR 484 | Environmental Impact Assessment | 4 |
| Select one of the following: | | 3 |
| FW 333 | Conservation Biology in Practice | |
| FW 353 | Wildlife Management | |
| FW 404 | Wildlife Habitat Management | |
| Hours | | 14 |

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|--------------------|--|-----------|
| Total Hours | | 85 |
|--------------------|--|-----------|

¹ A grade of C- or better is required.

| Code | Title | Hours | Counts towards |
|----------------------------|--|-----------|----------------|
| Technical Electives | | | |
| | Management Sciences (p. 3) ¹ | 15 | |
| | Resource Sciences (p. 3) | 7 | |
| GEP Courses | | | |
| | GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/) | 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/) | 2 | |
| | GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement) | | |
| | World Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-language-proficiency/) (verify requirement) | | |
| Total Hours | | 35 | |

¹ At least one from each

Acad Writing Research

| Code | Title | Hours | Counts towards |
|------------------------------|--------------------------------------|-------|----------------|
| Acad Writing Research | | | |
| ENG 101 | Academic Writing and Research | 4 | |
| FLE 101 | Academic Writing and Research | 4 | |
| Transfer Sequence | | | |
| ENG 1GEP | | 3 | |
| ENG 202 | Disciplinary Perspectives in Writing | 3 | |

Math Electives

| Code | Title | Hours | Counts towards |
|--------|--|-------|----------------|
| MA 114 | Introduction to Finite Mathematics with Applications | 3 | |
| MA 121 | Elements of Calculus | 3 | |
| MA 131 | Calculus for Life and Management Sciences A | 3 | |
| MA 141 | Calculus I | 4 | |
| MA 231 | Calculus for Life and Management Sciences B | 3 | |
| MA 241 | Calculus II | 4 | |

Physics Electives

| Code | Title | Hours | Counts towards |
|--------|---|-------|----------------|
| PY 131 | Conceptual Physics | 4 | |
| PY 205 | Physics for Engineers and Scientists I | 3 | |
| PY 206 | Physics for Engineers and Scientists I Laboratory | 1 | |
| PY 211 | College Physics I | 4 | |

Spatial Technology Electives

| Code | Title | Hours | Counts towards |
|---------|--|-------|----------------|
| GIS 280 | Introduction to GIS | 3 | |
| FOR 353 | GIS and Remote Sensing for Environmental Analysis and Assessment | 3 | |
| GIS 510 | Fundamentals of Geospatial Information Science and Technology | 3 | |
| SSC 440 | Geographic Information Systems (GIS) in Soil Science and Agriculture | 3 | |
| SSC 540 | Geographic Information Systems (GIS) in Soil Science and Agriculture | 3 | |

Management Science Electives

Code Title Hours Counts towards

At least one course from each category:

| Management Category | | | |
|----------------------------|--|-----|--|
| ACC 200 | Introduction to Managerial Accounting | 3 | |
| ACC 220 | Introduction to Managerial Accounting | 3 | |
| ACC 280 | Survey of Financial and Managerial Accounting | 3 | |
| FOR 248 | Forest History, Technology and Society | 3 | |
| FW 221 | Conservation of Natural Resources | 3 | |
| FW 333 | Conservation Biology in Practice | 3 | |
| GIS 295 | Special Topics in Geospatial Information Science | 1-4 | |
| HI 381 | Changemakers: The Global Context of Activism | 3 | |
| LAR 430 | Site Planning | 3 | |
| NR 350 | International Sustainable Resource Use | 4 | |
| PRT 350 | Foundations of Outdoor Recreation Management | 3 | |
| PRT 451 | Principles of Recreation Planning and Facility Development | 3 | |
| Economics Category | | | |
| ARE 301 | Intermediate Microeconomics | 3 | |
| ARE 304 | Agribusiness Management | 3 | |
| EC 301 | Intermediate Microeconomics | 3 | |
| EC 348 | Introduction to International Economics | 3 | |
| EC 410 | Public Finance | 3 | |

| FOR 319 | Forest Economics | 3 | |
|------------------------|--|---|--|
| Policy Category | | | |
| ARE 309 | Environmental Law & Economic Policy | 3 | |
| FOR 414 | World Forestry | 3 | |
| FW 411 | Human Dimensions of Wildlife and Fisheries | 3 | |
| FW 511 | Human Dimensions of Wildlife and Fisheries | 3 | |
| MIE 305 | Legal and Regulatory Environment | 3 | |
| NR 406 | Conservation of Biological Diversity | 3 | |
| PS 201 | American Politics and Government | 3 | |
| PS 202 | State and Local Government | 3 | |
| PS 312 | Introduction to Public Administration | 3 | |
| PS 320 | U.S. Environmental Law and Politics | 3 | |
| PS 336 | Global Environmental Politics | 3 | |
| PS 401 | American Political Parties | 3 | |

Resource Science Electives

| Code | Title | Hours | Counts towards |
|--------------|--|-------|----------------|
| Flora | | | |
| CS 414 | Weed Science | 4 | |
| FOR 204 | Silviculture | 2 | |
| FOR 261 | Forest Communities | 2 | |
| FOR 265 | Fire Management | 1 | |
| FOR 273 | Forest System Mapping and Mensuration II | 3 | |
| FOR 303 | Silvics and Forest Tree Physiology | 3 | |
| FOR 318 | Forest Pathology | 3 | |
| FOR 330 | North Carolina Forests | 3 | |
| FOR 411 | Forest Tree Genetics and Biology | 3 | |

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|--------------|--|---|
| PB 220 | Local Flora | 3 |
| PB 345 | Economic Botany | 3 |
| PB 400 | Plant Diversity and Evolution | 4 |
| PB 403 | Systematic Botany | 4 |
| PB 421 | Plant Physiology | 3 |
| PB 464 | Rare Plants of North Carolina | 3 |
| PB 503 | Systematic Botany | 4 |
| PB 564 | Rare Plants of North Carolina | 3 |
| PP 318 | Forest Pathology | 3 |
| Fauna | | |
| AEC 419 | Freshwater Ecology | 4 |
| AEC 420 | Introduction to Fisheries Science | 3 |
| AEC 423 | Introduction to Fisheries Sciences Laboratory | 1 |
| AEC 441 | Biology of Fishes | 3 |
| AEC 442 | Biology of Fishes Laboratory | 1 |
| AEC 460 | Field Ecology and Methods | 4 |
| AEC 501 | Avian Ecology | 4 |
| AEC 509 | Ecology and Conservation of Freshwater Invertebrates | 3 |
| AEC 519 | Freshwater Ecology | 4 |
| AEC 586 | | 3 |
| ENT 402 | Forest Entomology | 3 |
| ENT 425 | General Entomology | 3 |
| ENT 509 | Ecology and Conservation of Freshwater Invertebrates | 3 |
| FOR 264 | Forest Wildlife | 1 |
| FOR 402 | Forest Entomology | 3 |
| FOR 430 | Forest Health and Protection | 3 |
| FW 311 | Piedmont Wildlife Ecology and Management | 3 |
| FW 312 | Fisheries Techniques and Management | 1 |

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|-----------------------|---|---|
| FW 313 | Mountain Wildlife Ecology and Management | 1 |
| FW 314 | Coastal Ecology and Management | 1 |
| FW 353 | Wildlife Management | 3 |
| FW 373 | Vertebrate Natural History | 3 |
| FW 403 | Urban Wildlife Management | 3 |
| FW 404 | Wildlife Habitat Management | 3 |
| FW 405 | Tropical Wildlife Ecology | 3 |
| FW 444 | Mammalogy | 3 |
| FW 544 | Mammalogy | 3 |
| FW 586 | | 3 |
| MEA 220 | Marine Biology | 3 |
| ZO 333 | Captive Animal Biology | 3 |
| Earth Sciences | | |
| AEC 380 | Water Resources: Global Issues in Ecology, Policy, Management, and Advocacy | 3 |
| ES 150 | Water and the Environment | 3 |
| ES 200 | Climate Change and Sustainability | 3 |
| FOR 420 | Watershed and Wetlands Hydrology | 4 |
| FOR 520 | Watershed and Wetlands Hydrology | 4 |
| GEO 200 | Principles of Geography | 3 |
| MEA 200 | Introduction to Oceanography | 3 |
| MEA 210 | Oceanography Lab | 1 |
| MEA 250 | Introduction to Coastal Environments | 3 |
| MEA 251 | Introduction to Coastal Environments Laboratory | 1 |
| MEA 300 | Environmental Geology | 4 |
| NR 420 | Watershed and Wetlands Hydrology | 4 |

| | | |
|---------|--|---|
| NR 421 | Wetland Science and Management | 3 |
| NR 520 | Watershed and Wetlands Hydrology | 4 |
| NR 521 | Wetland Science and Management | 3 |
| SSC 421 | | 3 |
| SSC 442 | Soil and Environmental Biogeochemistry | 3 |
| SSC 452 | Soil Classification | 4 |
| SSC 455 | Soils, Environmental Quality and Global Challenges | 3 |
| SSC 461 | Soil Physical Properties and Plant Growth | 3 |
| SSC 470 | Wetland Soils | 3 |
| SSC 570 | Wetland Soils | 3 |

Semester Sequence

This is a sample.

First Year

| Fall Semester | | Hours |
|--------------------------------|--|-----------|
| BIO 181 | Introductory Biology: Ecology, Evolution, and Biodiversity | 4 |
| GEP Health and Science Studies | | 1 |
| ENG 101 | Academic Writing and Research ¹ | 4 |
| Math Elective | | 3 |
| ENV 100 | Student Success in Environmental First Year | 1 |
| ENV 101 | Exploring the Environment | 2 |
| Hours | | 15 |

Spring Semester

| | | |
|---|---|-----------|
| CH 101 & CH 102 | Chemistry - A Molecular Science and General Chemistry Laboratory | 4 |
| FOR 150 | Critical Thinking and Data Analysis | 2 |
| GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) | | 3 |
| Math Elective (p. 2) | | 3 |
| ARE 201 or EC 201 | Introduction to Agricultural & Resource Economics or Principles of Microeconomics | 3 |
| Hours | | 15 |

Second Year

| Fall Semester | | Hours |
|---|--|-------|
| Physics Elective (p. 2) | | 4 |
| GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/) | | 1 |
| FOR 339 | | 4 |

| | | |
|---|--|---|
| GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) | | 3 |
|---|--|---|

Hours 12

Spring Semester

| | | |
|--------------------|--|---|
| FOR 252 | Introduction to Forest Science | 3 |
| SSC 200 | Soil Science | 3 |
| PS 201 or PS 202 | American Politics and Government or State and Local Government | 3 |
| COM 110 or COM 112 | Public Speaking or Interpersonal Communication | 3 |

Hours 12

Third Year

Fall Semester

| | | |
|------------------------------------|--|---|
| Ecology Elective (p. 1) | | 4 |
| NR 301 | Practicum for Professional Development I | 1 |
| Spatial Technology Elective (p. 2) | | 3 |
| ST 311 | Introduction to Statistics | 3 |
| Technical Elective (p.) | | 4 |

Hours 15

Spring Semester

| | | |
|---|--|---|
| ARE 336 | Introduction to Resource and Environmental Economics | 3 |
| ENG 333 | Communication for Science and Research | 3 |
| NR 300 | Natural Resource Measurements | 4 |
| GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) | | 3 |
| Technical Elective (p.) | | 3 |

Hours 16

Summer

| | | |
|--------------|-----------------------|----------|
| NR 360 | Internship Experience | 3 |
| Hours | | 3 |

Fourth Year

Fall Semester

| | | |
|---------------------------|--|---|
| Technical Electives (p.) | | 6 |
| NR 460 | Renewable Natural Resource Management and Policy | 3 |
| NR 484 | Environmental Impact Assessment | 4 |
| Wildlife Elective (p. 1) | | 3 |

Hours 16

Spring Semester

| | | |
|---|-----------------------------|---|
| NR 400 | Natural Resource Management | 4 |
| GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) | | 3 |
| Technical Electives (p.) | | 9 |

Hours 16

Total Hours 120

¹ A grade of C- or better is required.

Career Opportunities

Graduates of the Natural Resources Ecosystem Assessment curriculum work in environmental service firms, public agencies, non-governmental organizations, and industries. The U.S. Environmental Protection Agency,

the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the N.C. Division of Water Quality, and county and city governments employ graduates to help manage compliance with county, state, and federal environmental regulations, particularly wetlands and protected species. Non-governmental organizations and private engineering and environmental consulting firms employ graduates to prepare environmental impact statements and assessments, delineate wetlands, and conduct searches for threatened or endangered plant and animal species. The broad background in natural resources provided by this curriculum also provides a strong base for students interested in graduate school or environmental law.

The curriculum in Natural Resources Policy and Administration produces managers and administrators for public agencies and private organizations involved with management, administration, policy-making, planning, preservation, or regulation of natural resources. Examples are the USDI National Park Service, the US Environmental Protection Agency, the US Geological Survey, state and local government agencies, and not-for-profit environmental organizations. Background in government, economics, policy, and natural resource management also provides a strong base for students who wish to pursue a graduate program in natural resources economics and policy or environmental law.

Career Titles

- Climate Change Policy Analysts
- Conservation Scientist
- Environmental Engineer
- Environmental Planner
- Environmental Research Analyst
- Forest and Conservation Technician
- Forest and Conservation Workers
- Forester
- Forestry and Conservation Science Professor
- Park Naturalist
- Range Manager
- Soil Conservationist
- Wildlife Control Agent
- Natural Resources Management and Policy
- Conservation Scientist
- Environmental Engineer
- Environmental Planner
- Environmental Research Analyst
- Fish and Game Warden
- Forest and Conservation Workers
- Forester
- Landfill Inspectors
- Range Manager
- Soil Conservationist
- Wind Energy Operations Managers
- Wind Energy Project Managers

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.