A Welcome Message from our Department Head:

Dr. Tom Gower

On behalf of the faculty, staff, and fellow students in the Department of Forestry and Environmental Resources (FER) at NC State, I welcome you to FER - your new extended family. FER is comprised of five majors: Environmental Sciences, Environmental Technology and Management, Forest Management, Natural Resources and Fish, Wildlife, and Conservation Biology. We all have a common interest: sustainable management and conservation of natural resources. The department has a long and storied history and has always been one of the most respected forestry and natural resource programs in the United States. The faculty and staff strive to offer exciting hands-on classroom experiences that emphasize student participation. It is your opportunity and responsibility to take advantage of this exciting way to learn, and if you do, you will be well-prepared to have a successful and rewarding career.

Embrace Being a Scholar of the Environment

Congratulations for selecting the NC State department that is dedicated to protecting and improving all natural resources. For those of you who enjoy playing video games or other challenging intellectual games, sustainable management and conservation of natural resources is the ultimate real-life “game” – except this game affects this and future generations. The demand for renewable wood fiber to produce paper and wood products and bioenergy feedstock continues to increase as the world population continues to increase. However, the real challenge that each of you will learn about, and hopefully provide solutions to, is “How do we meet the growing demand for wood fiber and maintain or improve water, soil and air quality, habitat for wildlife and pollinators of all our crops, and sustainable communities for humans?”

In addition to the growing demand for wood fiber, scientists, natural resource managers, and policy makers must identify and implement adaptation and mitigation strategies to protect natural and managed ecosystems from climate change, land use and fragmentation, and new pests, pathogens, and invasive species. In essence, our world is a living, breathing three-dimensional puzzle that continues to change. Teaching students to memorize how the ecosystem puzzle pieces fit together will never work. Memorizing facts is not an effective approach to educate our future generations of natural resource scientists and managers. Instead, the FER faculty will constantly encourage you to learn concepts that can be used to identify and solve natural resource problems. These concepts or “first principles” will allow you to be a successful natural resource scientist or manager, even in
an ever-changing environment. Take pride in your profession and apply yourself in the classroom so you can help ensure our natural resources are used wisely.

A Systems Approach

How many times have you done something and realized afterwards your action had more than the intended result, or worse yet, had the opposite intended result? This phenomenon is often caused by too narrow a view of the problem, or the lack of a “systems” approach. During your undergraduate program, the faculty will help you construct a systems-understanding of our ecosystems (natural and human-made) and how humans interact with these ecosystems.

For example, forests can be managed using different approaches and intensities resulting in varying effects on each category of natural resources (e.g. water, soil, air, vegetation, wildlife). In fact, a single forest management practice may have different impacts on different groups of wildlife, or even different species of birds. Why? Because different species require different habitats, and different management approaches and intensities affect the habitats differently. Another example for the need for a systems approach is well-intentioned management policies in one region of the world may cause adverse effects in a different region of the world. A systems approach is essential in the global world we now live in.

Practice makes Perfect

Learning basic concepts and applying them to real world problems may be a different learning style than you were accustomed to in high school when homework seemed more like “busy work”. The curriculum of each of the majors in FER has been specifically designed to incrementally challenge you to integrate the concepts and skills you have learned from previous courses (or disciplines) to develop solutions to increasingly complex natural resource problems. All of the classroom and field exercises are designed to provide you the opportunity to practice using your technical knowledge, quantitative reasoning skills, and systems thinking to identify solutions and their trade-offs. In many classes, the students actively collect and analyze data in the field or laboratory and then use the data to develop management recommendations or research conclusions. These fundamental courses prepare students for summer internships, research experiences with faculty, or study abroad courses and culminate with a senior capstone experience in several of the majors. These experiential learning activities will further prepare you for a successful research, management or policy/administration career in natural resources.

Knowledge is powerful, but it is useless if you cannot effectively communicate your ideas. The FER faculty will provide you with ample opportunities to practice communicating (writing, speaking and listening) with a varied cross-section of society, ranging from scientists, employers and employees, and the public.

Opportunities to Learn Outside the Classroom

The FER faculty takes enormous pride in offering students many learning experiences outside the traditional classroom and you should take advantage of these amazing opportunities. There are FER study abroad courses in Costa Rica, Namibia, South
Africa, Sweden, Canada, Bahamas, and England. Also, there are a myriad of activities right on campus. NC State recognizes over 600 student organizations and the Department of Forestry and Environmental Resources has over 20 programs, such as Xi Sigma Pi Honors Society, Students for Sustainable Solutions, Leopold Wildlife Club, and Forestry Club – just to name a few. Living Learning Communities (LLC) range from science to social-themed residence halls that offer camaraderie and a stimulating learning environment. I encourage each student to participate and take an active leadership role in one or more of these activities.

My last bit of advice is “Don’t be a stranger.” The FER faculty chose this profession because they enjoy interacting with aspiring students. Take time to get to know your professors, advisor, staff, and your Department Head. Good luck this year. Go Pack!
CH. 1. PHILOSOPHY OF THE UNDERGRADUATE PROGRAM

The undergraduate programs of the Department of Forestry and Environmental Resources at NCSU prepare students for professional challenges, personal growth, and a lifetime of service as managers of renewable natural resources. The curricula endeavor to produce well educated forestry and natural resources graduates who have the basic knowledge, skills, flexibility, and attitude needed for successful professional performance. Elective courses allow students to prepare in greater depth for careers in industry, science, private consulting, extension, and public land management.

The Department has six curricula: Environmental Science (ES); Environmental Technology and Management (ETM); Forest Management (FOM); Natural Resources - Ecosystem Assessment (NRE); Natural Resources - Policy and Administration (NRP); and Fisheries, Wildlife and Conservation Biology (FWCB). The Environmental Science curriculum prepares students to link energy, sustainability and the environment. They will learn to understand human impacts on the environment, comprehend environmental systems and the earth processes, how to connect sound scientific understanding to environmental policies and recognize economic and socio-political ramifications on the environment. The Environmental Technology and Management curriculum prepares students to collect data on real world environmental problems, analyze and interpret those data, and determine appropriate solutions. The Forest Management curriculum provides the broad based forestry education needed for direct employment into positions in a wide variety of forestry or forestry related organizations. The Natural Resources curricula (NRE, NRP) provide more programs in natural resources management that focus on Ecosystem Assessment and Policy and Administration. The Fisheries, Wildlife and Conservation Biology – Wildlife Concentration (SFW) provides students with a strong base in biological, social, and physical sciences required for career positions in wildlife and management. The Fisheries, Wildlife and Conservation Biology – Fisheries Concentration (SFF) provides students with a strong base in biological, social, and physical sciences required for careers in fisheries resources. The Fisheries, Wildlife, and Conservation Biology – Conservation Biology Concentration (FWCB) focuses on conservation of non-game fish and wildlife, human dimensions, landscape and urban planning, and global issues such as climate change. Students who have the requisite capabilities in math are encouraged to take the more rigorous math and physics sequence consisting of three semesters of calculus and one or two semesters of calculus-based physics. Flexibility for specialization, planning for graduate study, or dual degrees is provided and encouraged.

The undergraduate program in the Department of Forestry and Environmental Resources is a dynamic one where continuous improvements are designed to respond to changes in the natural resources profession and the needs of employers. The Department of Forestry strives to recruit and retain the highest quality students and faculty. Its academic curricula are enriched by out-of-class contacts among students, faculty and practicing professionals, promoting a sense of professionalism and professional community. Gaining practical experience is encouraged through participation in summer employment and the cooperative education program. For more information visit http://www.cnr.ncsu.edu/fer/

All N.C. State Department of Forestry and Environmental Resources graduates should:

- Understand the social, political, and economic framework in which forestry, environmental sciences, fish and wildlife resources, and natural resources graduates must function;
- Communicate effectively;
- Utilize modern technologies, skills, and tools;
- Appreciate the role of research in furthering the practice of modern natural resource management; and
Recognize that forestry, environmental sciences, fisheries and wildlife sciences, and natural resources management are important to the long term welfare of society and as managers they must maintain the highest ethical standards.
CH. 2. DEPARTMENT OF FORESTRY AND ENVIRONMENTAL RESOURCES
TEACHING AND ADVISING FACULTY

A. YOUR ADVISOR

Every student is assigned a faculty advisor to guide him/her through their academic years. You are asked to stop by his or her office and introduce yourself if you have missed the department social functions during orientation. During the three-week pre-registration advisory period, please sign up for advising time on the sheet posted on your advisor’s door, and complete the plan of course work prior to your meeting with your advisor. You will not be able to pre-register without your hold released and your advisor is the only authorized person to give it to you.

If you experience mid-semester difficulties or if you need tutoring, contact your advisor. He/she should be able to help and guide you through these difficulties. Similarly, if your interests and goals have changed and you have decided that another advisor might serve you best, please contact the Undergraduate Programs Director, Dr. Gary Blank, for guidance and support.

B. TEACHING AND ADVISING FACULTY

Robert C. Abt
Professor of Forestry
3126 Jordan Hall, Ph. 515-7791
bob_abt@ncsu.edu
Research Interests: Regional timber supply modeling; economics of agroforestry; econometric applications in forestry.

Courses: FOR 595 (Forest Ec Readings); FOR 810 (Special Topics in Forestry); NR 400/500 (Natural Resource Management); NR 610 (Special Topics in Forestry)

Robert E. Bardon
Professor and Extension Specialist/Forestry
4233 Jordan Addition, Ph. 515-5575
robert_bardon@ncsu.edu
Research Interests: Forest marketing and management; distance learning in delivering outreach and economic development and bioenergy; compatible land use and military readiness.

Courses: FOR 610/810 (Special Topics in Forestry)

D. Michael Benson
Professor of Plant Pathology
Ph. 515-3966
mike_benson@ncsu.edu
Research Interests: Epidemiology & control of ornamental diseases; ecology of root-infecting fungi

Courses: FOR (PP) 318 (Forest Pathology).

Gary B. Blank
Director of Undergraduate Programs
Associate Professor of Forestry
5229 Jordan Addition, Ph. 515-7566
gary_blank@ncsu.edu

Research Interests: History of forested environments; longleaf restoration; Harris Research Tract
environmental impact assessment; science & technical communications development; environmental education

Courses: FOR 248 (Forest History, Technology and Society); FOR 293/FOR 294 (Independent Study in FOM); FOR 491/NR 491 (Sp Topics for FOR & NR, including Longleaf Pine Field Analysis, NR Teamwork Lab, & Wildlife Habitat Analysis); FOR 493/494 (Independent Study in Forest Management); FOR 610(Special Topics in Forestry); FOR 784 (Practice of Environmental Impact Assessment); FOR 810 (Special Topics in Forestry); NR 100 (Introduction to Natural Resources); NR 293/294 (Independent Study in NR); NR 350 International Sustainable Resource Use; NR 484 (Environmental Impact Assessment); NR 493/494 (Independent Study in NR); NR 595 (Special Topics in Natural Resources); NR 610 (Special Topics in Forestry)

Richard R. Braham
Professor of Forestry
FOM Program Coordinator
3003 Biltmore Hall, Ph. 515-7568
richard_braham@ncsu.edu

Research Interests: Dendrology; phytosociology; ecology & management of protected species; restoration of longleaf pine & pocosins

Courses: FOR 252 (Introduction to Forest Science); FOR 261 (Forest Communities); FOR 339/501 (Dendrology); FOR 561 (Forest Communities of the Southeastern Coastal Plain); FOR 562 (Forest Communities of the Southern Appalachians); FOR 610 (Special Topics in Forestry)

Glenn P. Catts
Director of CNR Forest Operations
2326 Biltmore Hall, Ph. 513-3973
gpc@ncsu.edu

Research Interests: Phytosociology; ecology & management of protected species; restoration of longleaf pine & pocosins

Courses: FOR 252 (Introduction to Forest Science); FOR 261 (Forest Communities); FOR 339/501 (Dendrology); FOR 561 (Forest Communities of the Southeastern Coastal Plain); FOR 562 (Forest Communities of the Southern Appalachians); FOR 610 (Special Topics in Forestry)
**Research Interests:** Development of an accurate 3-D hydrological model of Hofmann Forest; creation of a 3-D time series of Hofmann Forest stereo image models; valuation of ecosystem services in a land management portfolio for sustainable landscapes; development of biomass energy markets in Eastern North Carolina; reduction of wildfire risk

**Courses:** FOR 273 (Forest Systems, Mapping, Mensuration II); FOR 334 (Operations Research Applications in Natural Resources); FOR 422/522 (Consulting Forestry); NR 610 (Special Topics in Natural Resources)

**Barbara Conkling**
Researcher & Assistant Professor  
Forest Sciences Laboratory  
Ph. 54-4084  
bconkling@fs.fed.us

**Research Interests:** Forest soils and relationships among above and below ground properties and ecology; broad soil chemistry; efficient and useful technology transfer

**Courses:** FOR 250 (Professional Development II: Communications in Natural Resources).

**Rachel Cook**
Assistant Professor  
Co-Director of Forest Productivity Co-Op  
3108B Jordan Hall, Ph. 515-5979  
rlcook@ncsu.edu

**Research Interests:** Improving soil fertility management, long-term productivity and protecting natural resources.

**Courses:** TBA

**Frederick W. Cubbage**
Professor of Forestry  
3118B Jordan Hall, Ph. 515-7789  
fred_cubbage@ncsu.edu

**Research Interests:** Forest resource policy; timber production & harvesting economics; forest certification; sustainable forest management

**Courses:** FOR 319/519 (Forest Economics); FOR 509 (Forest Resource Policy); NR 460/595 (Renewable Resource Policy Management);

**Jason Delborne**
Associate Professor of  
Natural Resources/Environmental Policy  
5221 Jordan Addition, Ph. 515-0106

Ph.D. – Univ. of California, Berkeley (2005)
jadelbor@ncsu.edu

Research Interests: Science, Technology, and Society (STS); science & technology policy; genetic engineering and society; politicized scientific controversies; environmental policy.

Courses: NR 571 (Current Issues in Natural Resources Policy)

Christopher S. DePerno
Professor of Fisheries and Wildlife
Turner House, 110 Brooks Avenue
Ph. 513-7559
chris_deperno@ncsu.edu

Research Interests: Population ecology and management of big game species and predators; habitat use & selection of big game species and predators; interactions of predators and prey; sexual segregation and resource partitioning in ungulates; animal damage & wildlife education

Courses: FW 311 (Piedmont Wildlife Ecology & Management); FW 353 (Wildlife Management); FW 602 (Seminar in Wildlife Management): FW 610 (Special Topics in Fisheries and Wildlife Management)

Ryan Emanuel
Associate Professor of Forestry
2217 Jordan Addition, Ph. 513-2511
ryan_emanuel@ncsu.edu

Research Interests: Echohydrology; watershed hydrology; watershed biogeochemistry; land-atmosphere interaction; secondary ecosystem succession.

Courses: FOR 420 (Watershed & Wetlands Hydrology); FOR 610 (Special Topics in Forestry); NR 610 (Land, Water, People: Socio-Ecology)

Jodi Forrester
Assistant Professor of Forestry
3108 Jordan Hall, Ph. 515-7576
Jaforre3@ncsu.edu

Research Interests: Forest ecosystem ecology.

Courses: FOR 172 (Forest Systems, Mapping & Mensuration I)

John L. Frampton
Professor of Forestry
3219 Jordan Addition, Ph. 515-7580
john_frampton@ncsu.edu

Research Interests: Echohydrology; watershed hydrology; watershed biogeochemistry; land-atmosphere interaction; secondary ecosystem succession.
**Research Interests**: Christmas tree genetics; genetic conservation of Fraser fir; propagation and use of clones in forest tree species; host-pest interactions in forest tree species.

**Courses**: FOR 491 (Special Topics in Forestry- Christmas Tree Research)

**Douglas J. Frederick**  
Professor of Forestry  
3128 Jordan Hall, Ph. 515-7788  
doug_frederick@ncsu.edu

**Research Interests**: Hardwood silviculture & ecology; restoration ecology; mitigation, wetlands, biomass, nutrient & energy distribution in hardwood forests of the South; species selection & silvicultural systems for plantation hardwoods in the Southeast.

**Courses**: FOR 330 (North Carolina Forests); FOR 406 (Forest Inventory, Analysis & Planning); FOR 491 (Special Topics in Forestry-Hardwood Ecology & Management); FOR 507 (Silviculture Mini Course); FOR 595 (Forest Management/Hardwood Ecology and Management); FOR 713 (Advanced Topics in Silviculture)

**Barry Goldfarb**  
Professor of Forestry and Environmental Resources  
And Director-Center for Advanced Forestry Systems  
2221 Jordan Addition, Ph. 515-4471  
barry_goldfarb@ncsu.edu

**Research Interests**: Molecular & genetic control of root systems in forest trees; vegetative propagation of forests.

**Courses**: EA 665 (Professional Project); NR 295 (Special Topics in NR)

**Joshua Gray**  
Assistant Professor of GIS and Landscape Ecology  
Josh_gray@ncsu.edu

**Research Interests**: Understand global scale landscape and vegetation change using remotely sensed imagery; model the impact of these changes on carbon and water cycles; disentangle climate and landscape effects.

**Courses**: TBA

**George R. Hess**  
Professor of Forestry  
George_r_hess@ncsu.edu
George Hess
5233 Jordan Addition, Ph. 515-7437
B.S. – Columbia College (1979)
Ph. D. – N.C. State University (1994)
george_hess@ncsu.edu

Research Interests: Green infrastructure conservation and management, conservation, ecology, natural resources measurements.

Courses: FW 333 (Conservation Biology in Practice); NR 295 (Special Topics in NR); NR 300 (Natural Resource Measurements); Effective Scientific Posters

Fikret Isik
Professor of Forestry
B.S. – Istanbul University (1982)
M.S. – Istanbul University (1986)
Ph.D. – Akdeniz University (1998)
Fikret_isik@ncsu.edu

Research Interests: Quantitative genetics; genetic basis of disease resistance of forest trees; application of molecular markers in tree breeding; genomic selection; tree breeding strategies; conservation of forest genetic resources.

Courses: FOR 726 (Advanced Topics in Quantitative Genetics and Breeding); NR 491 (Special Topics in Natural Resources); NR 554 (Introduction to Data Analysis in Natural Resources)

Stephanie Jeffries
Teaching Assistant Professor
B.S. – Univ. of South Carolina (1993)
steph_jeffries@ncsu.edu

Research Interests: Ecology, patterns and processes of forested ecosystems, forest succession, dendrology, conservation biology and communicating science to broad audiences.

Courses: ET 330 (Environmental Technology Practicum); ET 490 (Senior Seminar in Environmental Technology); NR 301 (Practicum for Professional Development I); NR 360 (Internship Experience); NR 401 (Practicum for Professional Development II).

Roland Kays
Research Associate Professor
B.S. – Cornell University (1993)
Ph.D. – University of Tennessee (1999)
roland_kays@ncsu.edu

Research Interests: Ecology; evolution; conservation of mammals.

Courses: FW 444/544 (Mammology); FW 595 (Resource Selection Functions)

Siamak Khorram
Professor
Founder-Center for Earth Observation
5114 Jordan Hall, Ph. 515-3430
Research Interests: Remote sensing; computer graphics.

Courses: FOR 353 Air Photo Interpretation; FOR 595 (Remote Sensing)

John King  
Professor  
1019 Biltmore Hall; Ph. 513-7855  
john_king@ncsu.edu

Research Interests: Assessing how the cycling and storage of carbon and water in forested ecosystems are influenced by climate variability, management, genetics, and the interaction of biotic and abiotic stresses; effects of climate warming, drought stress and sea-level rise on forest productivity and resilience to insects and other pests; potential productivity and sustainability of short-rotation woody cropping systems for bioenergy.

Courses: FOR 303 (Silvics and Forest Tree Physiology); FOR 595 (Silviculture and Tree Physiology)

Tom Kwak  
Unit Leader, Associate Professor  
NC Coop. Fish and Wildlife Res. Unit  
201 David Clark Labs, Ph. 513-2696  
tkwak@ncsu.edu

Research Interests: Fish ecology, impacts of habitat and environmental alterations, biotic interactions. The main emphasis of this work has been identifying physical and biotic factors that influence the ecological success of fishes at different spatial, temporal, and organizational scales and quantifying such relationships. This includes studies of population and production dynamics, habitat assessment and manipulation, food web functions, density-dependent effects, and simulation modeling. The ultimate goal of this effort is to incorporate fish ecology into sound ecosystem and fisheries conservation and management.

Courses: FW 312 (Fisheries Technique & Management).

Terrie H. Litzenberger  
Senior Lecturer  
2227 Jordan Addition, Ph. 515-7581  
terrie_litzenberger@ncsu.edu

Research Interests: Service learning projects involved in local water quality.

Courses: ET 201(Water Quality- Lab I) ; ET 202 (Plants, Soils & Natural Systems- Lab II) ; ET 293/294 (Independent Study in ETM) ; ET 302 (Indoor Air Quality- Lab IV) ; ET 493/494 (Independent Study in ETM) ; ET 495 (ETM Study Abroad) ; NR 595 (Study Abroad)
**James McCarter**
Associate Professor of Forestry                                  B.S. – Utah State University (1981)
3112 Jordan Hall; Ph. 515-1248                                 M.F. – Utah State University (1984)
James_mccarter@ncsu.edu                                   University of Washington (2001)

**Research Interests**: Quantitative silviculture, forest stand dynamics, growth and yield modeling, forest visualization, software development, and forest mensuration.

**Courses**: FOR 374 (Forest Measurement, Modeling and Inventory); GIS 520 (Advance Geospatial Analytics); GIS 550 (Geospatial Data Structures and Web Services)

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**Melissa McHale**
Assistant Professor of Urban                                      B.S. – Rutgers University (1998)
Ecology                                                                       Ph.D. – Colorado State Univ. (2007)
5225 Jordan Addition, Ph 515-7579
melissa_mchale@ncsu.edu

**Research Interests**: Carbon dynamics in urban systems, urbanization effects on nutrient cycling, ecosystem service tradeoffs, social drivers of ecosystem processes, spatial & temporal dynamics of urbanization, policy driven & multi-disciplinary approaches to urban ecological analyses.

**Courses**: ET 495 (ETM Study Abroad); FOR 220 (Urban Forestry), NR 595 (Study Abroad)

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**Steven E. McKeand**
Professor of Forestry and                                           B.S. – Purdue University (1976)
Co-Director of Tree Improvement Program                          M.S. – Purdue University (1978)
1019 Biltmore Hall, Ph. 515-6073                             Ph.D. – N.C. State University (1983)
steve_mckeand@ncsu.edu

**Research Interests**: Genetic effects on nutritional and ecophysiological processes in forest trees, genetic and environmental control of wood properties, biotechnology/breeding interface, propagation effects on forest trees, seed orchard management, and genotype by environment interactions.

**Courses**: FOR 411 (Forest Tree Genetics & Biology); FOR 725 (Forest Genetics); FOR 727 (Tree Improvement Research Techniques)

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**Ross Meentemeyer**
Professor in Forestry                                           B.S. – University of Georgia (1993)
Director of Center for Geospatial Analytics                    Ph.D. – UNC Chapel Hill (2000)
5106 Jordan Hall, Ph. 513-2372
ross_meentemeyer@ncsu.edu

**Research Interests**: Geospatial analytics for sustainability solutions, urban landscape ecology, landscape epidemiology, species distribution models, land change models.
Courses: GIS 609 (Geospatial Forum); GIS 610 (Special Topics in Geospatial Information Science);

Christopher Moorman
Professor and Coordinator of the Fisheries, Wildlife, and Conservation Program
Turner House, Ph. 515-7586

B.S. – University of Georgia (1992)
M.S. – University of Georgia (1995)
Ph.D. – Clemson University (1999)

Research Interests: Global change and wildlife; habitat management for wildlife; urban wildlife ecology and management; native plant conservation.

Courses: FOR 264 (Forest Wildlife); FW 404 (Forest Wildlife Management); FW 405 (Tropical Wildlife Ecology in Nicaragua; FW 595 (Study Abroad); FW 610 (Special Topics in Fisheries and Wildlife Science)

Stacy Nelson
Associate Professor
5123 Jordan Hall, Ph. 513-7162

B.S. Jackson State University (1990)
M.A. College of William and Mary - Virginia Institute of Marine Science (1995)
Ph.D. – Michigan State University (2002)

Research Interests: Using remote sensing and GIS technologies to address both regional and local-scale questions of land use/cover change and also the impact of this change on inland lakes, wetland, and coastal ecosystems, as well their associated effects on water quality and fisheries ecology.

Courses: GIS 512 (Introduction to Environmental Remote Sensing)

Elizabeth G. Nichols
Associate Professor
2225 Jordan Addition, Ph. 513-4832

B.S. – Emory University (1987)
M.S. – UNC-Chapel Hill (1994)
Ph.D. – UNC-Chapel Hill (1997)

Research Interests: Persistent organic pollutant fate in the environment in particular soils and sediments, pollutant bioavailability, ecological toxicology and risk assessment, hazardous materials management.

Courses: EA 504 (Environmental Monitoring/Analysis); ET 120 (Introduction to Renewable Energy Technologies & Assessments); ET 220 (Solar Photovoltaics Assessment); ET 240 (Wind and Hydroelectric Energy Assessment); ET 255 (Assessing Lands for Bioenergy Production); ET 262 (Renewable Energy Adoption: Barriers and Incentives); ET 310 (Environmental Monitoring and Analysis); ET 460 (Practice of Environmental Technology); ET 484 (Practice of Renewable Energy Assessments); NR 491 (Renewable Energy Assessments).
Larry Nielsen  
Professor of Natural Resources  
3118 A Jordan Hall  
Phone 515-5314  
larry_nielsen@ncsu.edu  

Research Interests: Sustainable natural resource management; History & philosophy of natural resource management; Ecosystem management.

Courses: FW 221 (Conservation of Natural Resources)

Krishna Pacifici  
Assistant Professor, Fisheries, Wildlife and Conservation Biology  
5217 Jordan Addition, Ph. 513-7558  
jkpacifi@ncsu.edu  

Research Interests: Quantitative ecology; wildlife ecology; spatio-temporal modeling; statistical ecology; computational statistics; disease ecology; structured decision making; adaptive management; decision making under uncertainty.

Courses: FW 453/553 (Principles of Wildlife Science); FW 595 (Resource Selection Functions)

Lara Pacifici  
Assistant Teaching Professor and Undergraduate Coordinator of the Fisheries, Wildlife, and Conservation Biology Program  
Turner House, Ph. 515-3431  
lara_pacifici@ncsu.edu  

Research Interests: Environmental and forest biology; wildlife biology; science education.

Courses: FW 293/294 (Independent Study in FWCB); FW 313 (Mountain Wildlife Ecology & Management); FW 333 (Conservation Biology in Practice); FW 373 (Vertebrate Natural History); FW 415 (Professional Development in Fisheries, Wildlife & Conservation Biology); FW 492 (External Learning Experience); FW 493/494 (Independent Study in FWCB)

M. Nils Peterson  
Associate Professor, Fisheries and Wildlife Sciences, Human Dimensions  
Turner House, Ph 515-7588  
nils_peterson@ncsu.edu  

Research Interests: Unraveling the drivers of human behavior relevant to wildlife conservation: environmental literacy, household dynamics, conflict, hunting, democracy.
Courses: FW 411 (Human Dimensions of Wildlife & Fisheries Management); FW 511 (Human Dimensions of Wildlife and Fisheries)

Louie Rivers, III
Assistant Professor
2219 Jordan Addition, Ph. 513-2516
lrivers@ncsu.edu

B.S. – Kentucky State University (2001)
M.S. – Ohio State University (2003)
Ph.D. – Ohio State University (2006)

Research Interests: My research focuses on the examination of risk and judgment and decision process in minority and marginalized communities, particularly in regards to the natural environment.

Courses: ET 455 (Adaptive Management & Governance); FOR 495

Joseph P. Roise
Professor of Forestry
3114 Jordan Hall, Ph. 515-7783
joe_roise@ncsu.edu

B.S. – Southern Conn. St. University (1973)
M.S. – Colorado State University (1980)

Research Interests: Small diameter woody biomass harvesting and utilization; management science/operations research in forest resources; optimization of simulated processes; management information systems; Integrated planning.

Courses: FOR 265 (Fire Management); FOR 405 (Forest Management); FOR 434/534 (Forest Operations and Analysis); FOR 491 (Introduction to Fire Science); FOR 505 (Forest Management); FOR 531 (Wildland Fire Science); FOR 595 (Firefighter Type I& II); FOR 610 (Special Topics in Forestry); NR 595 (Fire Science); NR 610 (Special Topics in Natural Resources)

Ted Shear
Associate Professor of Forestry
3124 Jordan Hall, Ph. 513-7794
ted_shear@ncsu.edu

B.S. – Louisiana State University (1980)
Ph.D. – NC State University (1985)

Research Interests: Restoration ecology with an emphasis on wetland restoration and creation and reclamation of drastically disturbed lands; ecology and conservation biology aspects of forest management; urban natural resource management; plant physiology and biochemistry.

Courses: FOR 260 (Forest Ecology); FOR 601/801 (Graduate Seminar); FOR 750 (Ecological Restoration); NR 491 (Restoration Ecology); NR 595 (Restoration Ecology)

Erin O. Sills
Professor
3112 Jordan Hall, Ph. 515-7784
erin_sills@ncsu.edu

B.A. – Princeton University (1990)
**Research Interests:** Markets and payments for non-timber forest benefits; forest-based livelihoods and economic development; deforestation and land use in the tropics; impact valuation of conservation policies.

**Courses:** FOR 414 (World Forestry)

**Linda R. Taylor**  
Lecturer  
2223 Jordan Addition, Ph. 513-3972

**Research Interests:** Environmental regulations, hazardous waste remediation, industrial health and safety.

**Courses:** EA 502 (Environmental Risk Assessment); EA 665 (Professional Project); ET 301 (Hazardous Waste Operations and Emergency Response-Lab III); ET 303 (Occupational Safety and Health); ET 401 (Hazardous Waste and Groundwater Sampling)

**Sarah T. Warren**  
Associate Professor and Director of Graduate Programs  
3118 Jordan Hall, Ph. 515-7996

**Research Interests:** Rural development forestry; limited-resource traditionally underserved forest landowners; community forestry; agroforestry; urban forestry.

**Courses:** ET 410 (Toxic Substances & Society); FOR/NR 595 (Qual Soc Science Method); NR 303 (Humans & the Environment); NR 406 (Conservation of Biological Diversity)

**Ross Whetten**  
Professor  
5231 Jordan Addition, Ph. 515-7578

**Research Interests:** Applications of molecular biology methods to solve practical problems in management of natural or planted populations of forest trees, with an emphasis on conifer species native to the southeastern USA: massively-parallel or "next-generation" DNA sequencing technologies that provide new opportunities to detect and analyze genetic variation in forest tree populations; development and application of both new laboratory methods to generate data and new analytical methods to understand how genetic variation is related to variation in traits of ecological or economic importance.

**Courses:** FOR 350 (Professional Development III: Ethical Dilemmas in NR Management); FOR 411 (Forest Tree Genetics & Biology); FOR 725 (Forest Genetics)

**William E. Winner**  
Professor and Director of Environmental Sciences  
2231 Jordan Addition, Ph. 515-5780

**Research Interests:** Plant physiological ecology; plant responses to air pollution, environmental
change & environmental stresses; resource use by plants.

C. OTHER PEOPLE YOU NEED TO KNOW IN THE COLLEGE OF NATURAL RESOURCES

Office of Academic Affairs – College of Natural Resources

☞ Dr. Adrianna G. Kirkman, Associate Dean for Academic Affairs  
2018 Biltmore, Ph. 515-6191

- Responsible for administration of all academic programs in the College of Natural Resources. Signs all forms requiring approval of the College Dean.

☞ Mrs. Yvonne Lee, Student Services Manager  
2018 Biltmore, Ph. 515-5741

- Provides guidance and advice on all matters relating to academic programs. Assistant to Dr. Kirkman

☞ Ms. Shannon Cox, Administrative Support Specialist  
2018 Biltmore, Ph. 513-7616

- Assistant to Mrs. Lee and Dr. Kirkman

☞ Mrs. Cristen Philbrook, Coordinator of Academic and Student Services  
2018 Biltmore, Ph. 513-7487

- Assistant to Mrs. Lee and Dr. Kirkman

Department of Forestry and Environmental Resources

☞ Dr. Gary Blank, Director, Undergraduate Programs  
5229 Jordan Addition; Ph. 515-7566

- Responsible for administration of the undergraduate programs in the Department of Forestry and Environmental Resources, evaluates transfer transcripts, handles undergraduate academic requests requiring departmental approval

☞ Ms. Anna Giuli, Executive Assistant to Dr. Tom Gower, Department Head of Forestry and Environmental Resources; 3120 Jordan Hall; Ph. 515-2893.

☞ Ms. Sally Petters, Administrative Support Specialist for Payroll  
3127 Jordan Hall; Ph. 515-7792

☞ Mrs. Christi Standley, Undergraduate Program Coordinator  
3136-C Jordan, Ph. 513-2582
• Assists Dr. Blank in the undergraduate programs in the Department of Forestry and Environmental Resources

☞ Ms. Sydna Willis, Undergraduate Student Services Assistant
3136-H Jordan Hall, Ph. 515-7560

• Assists Dr. Blank with all aspects of administering the undergraduate programs in the Department of Forestry and Environmental Resources

☞ Ms. Sarah Slover, Graduate Programs Coordinator
3136 Jordan, Ph. 515-7563

☞ Ms. Carolina Thomson, Accounting Assistant for the Department of Forestry and Environmental Resources
3120 Jordan, Ph. 515-2892

☞ Mrs. Erin Champion, Program Coordinator for Environmental Sciences
3136-B Jordan Hall, Ph. 513-2520

☞ Mr. Greg Wilson, Academic Advisor for Environmental Sciences
3136-F Jordan Hall, Ph. 513-3165

D. UNDERGRADUATE PLANS OF STUDY

Upon admission as a degree-seeking student, a NC State undergraduate student is expected to make satisfactory progress in a planned and deliberate way toward graduation. This expectation of satisfactory progress translates into the following University minimum requirements:

A. Development and registering of a Plan of Study that serves as a planning tool for completing degree requirements for the major(s) in which the student is matriculated, or in the case of the student enrolled in the First Year Collage (and other undeclared or undesignated programs), expects to matriculate, or transfer. The Plan of Study can include plans for tailoring the academic education, study abroad and other specialized academic opportunities should be reflected in the registered Plan of Study.

B. Enrollment in course work consistent with the student’s Plan of Study.

C. Continuous full-time enrollment (a minimum of 12 credit hours) during consecutive semesters (i.e. Fall, Spring) until graduation, and successful completion of at least 24 credit hours of NC State or transferable course work each academic year, unless otherwise justified by an approved Plan of Study.

D. Matriculation into a degree program by the beginning of classes in the first semester that the student has junior status (i.e. 60 credit hours earned-criteria established in the Classification of Undergraduate Degree Students regulation).
A. The Curricula

The course sequences for four-year students (those beginning study as freshmen) are shown in the curriculum outlines in this section. The courses of the curricula are organized in a logical sequence with general education courses in the early semesters followed by the specific topical courses in the later semesters. Students who are academically well prepared and who take full course loads each semester will complete the degree in four years. Students who take less than full loads, who must take remedial courses, or retake failed courses, can expect to take longer than four years to complete the curriculum. **IT IS THE STUDENT'S RESPONSIBILITY TO KNOW THE CURRICULUM AND TO TAKE THE COURSES IN THE PROPER SEQUENCE.**

Check the Department’s course descriptions on the web at: [http://www.cnr.ncsu.edu/fer/ug/future](http://www.cnr.ncsu.edu/fer/ug/future) and be familiar with required prerequisite courses that must be completed prior to taking a particular course. Important prerequisite sequences are outlined later in this chapter.

The **Forest Management** (FOM) curriculum is a professional curriculum accredited by the Society of American Foresters (SAF). Its structure is based on University general education requirements, the subject matter guidelines of the SAF accreditation criteria, input from employers, and the knowledge and experience of the faculty. Graduates are prepared for public and private professional forestry positions as well as a variety of jobs closely related to forestry.

The **Natural Resources** (NRE, NRP) curricula in the Forestry Department are part of a campus-wide series of NR curricula that have a common general education core. That core has a base of communications, math, science, and humanities/social sciences that is similar to the Forest Management curriculum. The curriculum in Natural Resources - Policy and Administration (NRP) is a broad-based one with an in-depth series of courses in economics, government and public administration, and natural resource management. The curriculum will provide the kind of broadly trained managers needed by many public agencies and private organizations in the natural resources arena. Natural Resources - Ecosystem Assessment (NRE) is a more technically oriented curriculum that provides in-depth study in analysis of ecosystem components and also in natural resource management. This curriculum will produce the graduates needed by many public agencies and private organizations that are involved in ecosystem analysis and environmental regulations.

The **Fisheries, Wildlife, and Conservation Biology** curricula (SFF-Fisheries concentration; SFW-Wildlife concentration, & FWCB - Conservation Biology concentration) are professional curricula that build on a strong base in biological, physical and social sciences to prepare graduates to solve problems associated with consumptive and non-consumptive uses of fisheries and wildlife resources. Flexibility in the curricula allows the student to meet academic requirements for certification as Wildlife Biologist by The Wildlife Society. Graduates are prepared for positions with natural resource agencies and conservation education organizations, and for further graduate studies.

The **Environmental Sciences** (ES) curriculum focuses on environmental issues that are important to our future. It provides opportunities for students to rigorously explore complex, interdisciplinary environmental issues by combining courses from a number of NC State colleges to create a thorough interdisciplinary grounding. All degree options encourage students to pursue original research and gain field experience tackling real-world challenges, leaving them well prepared to take advantage of career opportunities once they graduate. Graduates will be prepared to find jobs in the environmental industry, including careers as environmental consultants, working in large corporations, or starting their own businesses. Others find careers working in federal, state, and local agencies with environmental mandates. Still others continue their educations in professional and graduate schools.
The **Environmental Technology and Management** (ETM) curriculum focuses on the assessment of impacts to the environment and the technology for managing those impacts. This curriculum prepares students to collect data on real world environmental problems, analyze and interpret those data, and determine appropriate solutions. Students receive a broad education in the natural sciences, humanities and social sciences, communications, and computer operation to acquire the technical knowledge and skills needed for sound environmental assessment and management. Many Environmental Technology and Management courses emphasize hands-on training with state-of-the-art monitoring equipment. A practicum to obtain actual working-world experience is required. Career opportunities include technical positions with: firms that offer environmental services; manufacturing companies that are required to maintain sophisticated environmental networks; consulting and audit firms that perform independent environmental audits; and state and federal regulatory agencies.
## College of Natural Resources, NCSU
### Forestry and Environmental Resources Department
### Environmental Sciences
### Effective: 08/2010

### FRESHMAN YEAR

<table>
<thead>
<tr>
<th>FALL SEMESTER</th>
<th>CREDITS</th>
<th>SPRING SEMESTER</th>
<th>CREDITS</th>
</tr>
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<tbody>
<tr>
<td>ENG 101 Academic Writing &amp; Research</td>
<td>4</td>
<td>CH 101 Chemistry - A Molecular Science</td>
<td>3</td>
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<tr>
<td>ES 100 Introduction to Environmental Sciences</td>
<td>3</td>
<td>CH 102 General Chemistry Lab</td>
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</tr>
<tr>
<td>BIO 181 Introductory Biology: Ecology, Evolution and Biodiversity</td>
<td>4</td>
<td>MA 231 Calculus for Life &amp; Management Sciences B</td>
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<td>MA 131 Calculus for Life &amp; Management Sciences A</td>
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<td>MEA 100 Earth System Science: Exploring the Connections</td>
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**Total: 15**  
**Total: 14**

### SOPHOMORE YEAR

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<tr>
<td>PY 211 College Physics I</td>
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<td>PY 212 College Physics II</td>
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<td>CH 220 Introductory Organic Chemistry</td>
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<td>ES 200 Climate Change &amp; Sustainability</td>
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<td>ST 311 Introduction to Statistics</td>
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<td>BIO 183 Introductory Biology: Cellular &amp; Molecular</td>
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<td>HES___ Health &amp; Exercise Study Course</td>
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**Total: 15**  
**Total: 17**

### JUNIOR YEAR

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<td>ES 300 Energy &amp; the Environment</td>
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<td>Focal Area II</td>
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<td>ARE 201 Introduction to Agricultural &amp; Resource Economics</td>
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<td>Advised Elective II</td>
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<tr>
<td>Advised Elective I</td>
<td>4</td>
<td>SSC 200 Soil Science</td>
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<tr>
<td>Communications Requirement</td>
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<td>SSC 201 Soil Science Laboratory</td>
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<tr>
<td>Focal Area I</td>
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<td>GEP Additional Breadth</td>
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<td>Free Elective</td>
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<td>(HUM/SS/VPA)</td>
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**Total: 15**  
**Total: 16**

### SENIOR YEAR

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<tr>
<td>PS 320 U.S. Environmental Law &amp; Politics</td>
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<td>ES 400 Analysis of Environmental Issues</td>
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<td>External Learning Experience</td>
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<td>Analytical Skills Requirement</td>
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<tr>
<td>Focal Area III</td>
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<td>Focal Area IV</td>
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<tr>
<td>Advised Elective III</td>
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<td>Focal Area V</td>
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<tr>
<td>GEP Humanities Elective</td>
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<td>Free Elective</td>
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**Total: 15**  
**Total: 13**

Minimum Credit Hours Required for Graduation **120**
1. The following substitutions are acceptable: MA 141 and 241 for MA 131 and MA 231; PY 205/PY 206 and PY 208/PY 209 for PY 211 and PY 212; EC 201 or EC 205 for ARE 201; PS 336 for PS 320; BIO 183 for BIO/PB 360.
2. All ES courses must be completed with a grade of C- or better.
3. Six credit hours are required. One 3 credit course must be an ENG course and the other must be a COM or ENG course beyond ENG 101. Consult with advisor.
4. Advised Electives (9 credit hours) are to be selected in consultation with your advisor and need to focus on Environmental Science. At least 6 hours must be at the 400 level or above.
5. See advisor to determine a relevant focal area and related course selections (15 credit hours).
6. Six (6) credit hours are required. ST 311 is required and satisfies 3 hours of the 6 credit hours Analytical Skills requirement. ST 312 is recommended to complete the requirement, but substitutions involving analytical skills such as Computer Science, Geographic Information Systems, Building and Landscape Design and Engineering are permitted with advisor consent.
7. External Learning Experience: 3 credit hour requirement to be chosen from ES 496, ES 497, ES 498 or ES 499.
8. Minimum 2.0 GPA required for graduation.
9. If not able to take ENG 101 in the Fall semester, take the GEP Humanities elective course in the Fall and then EGN 101 in the Spring.

* General Education Program (GEP) Requirements and GEP Footnotes:
To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at http://oucc.dasa.ncsu.edu/general-education-program-gep/

A. Mathematical Sciences (6 credit hours – one course with MA or ST prefix)
   This requirement is satisfied by the mathematics requirements in the major.

B. Natural Sciences (7 credit hours include one laboratory course or course with a lab).
   This requirement is satisfied by the natural sciences requirements in the major.

C. Humanities (6 credit hours selected from two different disciplines/course prefixes).
   Choose from the University approved GEP Humanities course list in two different disciplines.

D. Social Sciences (6 credit hours selected from two different disciplines/course prefixes).
   This requirement is satisfied by course requirements in the major – ARE 201 or EC 201 or EC 205; PS 320 or PS 336.

E. Physical Education/Healthy Living (2 credit hours – at least one 100-level Health & Exercise Studies Course)
   Choose from the University approved GEP Health & Exercise Studies course list.

F. Additional Breadth *3 credit hours to be selected from the following checked University-approved GEP course lists).
   X Humanities/Social Sciences/Visual Performing Arts or ___ Mathematical Sciences/Natural Sciences/Engineering

G. Interdisciplinary Perspectives (5-6 credit hours)
   This requirement is satisfied by course requirements in the major: ES 200, ES 300.

H. Introduction to Writing (4 credit hours satisfied by completing ENG 101 with a C- or better)
The following co-requisites must be satisfied to complete the General Education Program requirements:

I. **U.S. Diversity (USD)**
   Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement.

J. **Global Knowledge (GK)**
   Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement: ES 200 or ES 300, PS 320 or PS 336.

K. **Foreign Language Proficiency** Proficiency at the FL_102 level is required for graduation.
# Environmental Technology and Management

**College of Natural Resources, NCSU**  
Forestry and Environmental Resources Department  
Effective: 01/2011

## FRESHMAN YEAR

<table>
<thead>
<tr>
<th>FALL SEMESTER</th>
<th>CREDITS</th>
<th>SPRING SEMESTER</th>
<th>CREDITS</th>
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<tbody>
<tr>
<td>NR 100 Introductions to Natural Resources</td>
<td>2</td>
<td>CH 101 Chemistry- A Molecular Science</td>
<td>3</td>
</tr>
<tr>
<td>BIO 181 Introductory Biology, Ecology, Evolution, and Biodiversity</td>
<td>4</td>
<td>CH 102 General Chemistry Lab</td>
<td>1</td>
</tr>
<tr>
<td>GEP Requirement Additional Breadth Elective*</td>
<td>3</td>
<td>ES 100 Intro to Environmental Sciences</td>
<td>3</td>
</tr>
<tr>
<td>ENG 101 Academic Writing &amp; Research*</td>
<td>4</td>
<td>ES 105 Intro to Environmental Regulations</td>
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<tr>
<td>MA 121 Elements of Calculus or MA 131 Calculus for Life/Mgmt. Sci. A</td>
<td>3</td>
<td>EC 201 Principles of Microeconomics or MA 131 Calculus for Life/Mgmt. Sci. A</td>
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</tr>
<tr>
<td>GEP Requirement</td>
<td>3</td>
<td>ARE 201 Intro to Ag &amp; Resource Economics*</td>
<td>3</td>
</tr>
<tr>
<td>HES*** Health &amp; Exercise Study Course*</td>
<td>1</td>
<td></td>
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Total: 16

## SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>FALL SEMESTER</th>
<th>CREDITS</th>
<th>SPRING SEMESTER</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ET 201 Environmental Technology Lab I or ET 203 Pollution Prevention</td>
<td>1</td>
<td>PY 131 Conceptual Physics or ET 211 College Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PB 360 Introduction to Ecology</td>
<td>4</td>
<td>ET 202 Environmental Technology Lab II</td>
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<tr>
<td>ST 311 Introduction to Statistics</td>
<td>3</td>
<td>ET 252 Intro. To Spatial Information Technology or GIS 410 Intro to Geographic Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>PS 320 US Environ. Law and Politics or PS 336 Global Environmental Politics or ARE 309 Environ. Law &amp; Economic Policy</td>
<td>3</td>
<td>ST 312 or MA 231</td>
<td>3</td>
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<td>SSC 200 Soil Science</td>
<td>4</td>
<td>Advised Electives*</td>
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</tr>
<tr>
<td>HES*** Health &amp; Exercise Study Course*</td>
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Total: 16

## JUNIOR YEAR

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<th>FALL SEMESTER</th>
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</thead>
<tbody>
<tr>
<td>CH 220 Introduction to Organic Chemistry or CH 221/222 Organic Chemistry I</td>
<td>4</td>
<td>ET 302 Environmental Technology Lab IV or ET 303 Lab Safety Systems and Management</td>
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<tr>
<td>GEP Requirement Humanities Elective*</td>
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<td>ET/MEA 320 Fundamentals of Air Pollution</td>
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<tr>
<td>GEP Requirement Interdisciplinary Perspective Elective*</td>
<td>2</td>
<td>CH 201 Chemistry A Quantitative Science and CH 202 Quantitative Chemistry Lab or Advised Elective*</td>
<td>3</td>
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<tr>
<td>Advised Electives*</td>
<td>4</td>
<td>NR 300 Natural Resource Measurements</td>
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Total: 14-15

### SUMMER

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<tr>
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<tbody>
<tr>
<td>ET 330 Environmental Technology Practicum</td>
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Total: 3

## SENIOR YEAR

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<th>SPRING SEMESTER</th>
<th>CREDITS</th>
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</thead>
<tbody>
<tr>
<td>ET 415 Toxicological and Environmental Chemistry or CH 223/224 Organic Chemistry II</td>
<td>4</td>
<td>ET 460 Practice of Environmental Technology</td>
<td>3</td>
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<tr>
<td>ET 401 Environmental Technology Lab V</td>
<td>1</td>
<td>ET 490 Seminar in Environmental Technology</td>
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<tr>
<td>ET 455 Adaptive Management or ET 470 Environmental Forensics</td>
<td>3</td>
<td>IDS 201 Environmental Ethics or STS 302 Technology and Human Values or PHI 340 Philosophy of Science</td>
<td>3</td>
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<tr>
<td>NR484 Environmental Impact Assessment or NR 420 Wetlands and Watershed Hydrology</td>
<td>4</td>
<td>Advised Elective*</td>
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<tr>
<td>Advised Elective*</td>
<td>3</td>
<td>Free Elective</td>
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</tbody>
</table>

Total: 15

Minimum Credit Hours Required for Graduation*264
Major/Program Footnotes:

1. FOR 260 may be substituted for PB 360
2. Advised Electives: Students are encouraged to select courses that will fulfill an academic minor. Courses should enhance students’ career objectives and must be approved by faculty advisor. Listed below are recommended courses:
   - ET 470*, ET 410, FOR 221, FOR 248, FOR 260, FOR 330, FOR 339, FOR 414, FOR 415, FOR 420*, MB 351/352, MB 409, MB 411/412, MEA 101/102, MEA 110/111, MEA 130, MEA 135, MEA 140, MEA 200, MEA 210, MEA 213, MEA 214, MEA 250, MEA 251, MEA 300, MEA 323, TOX 201, TOX 401, TOX 415, TOX 495, NR 350, NR 400, NR 421, PB 200, PB 213, PB 220, PB 400, PB 403, PB 413, PB 421, PB 480, PP 315, PP 460, SSC 341, SSC 361, SSC 452, SSC 461, SSC 470, ST 350, ST 361, ST 370, ST 371, ST 372, ZO 220, ZO 419, ZO 441/442, ZO 460.

*ET 470 and FOR 420 cannot be counted towards both core course requirements and advised electives.

3. ET 470 may be substituted for ET 460 if ET 455 is taken. ET 470 cannot be counted toward both core course requirements and advised elected.

General Education Program (GEP) requirements and GEP Footnotes:

To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at https://oucc.dasa.ncsu.edu/general-education-program/

A. Mathematical Sciences (6 credit hours – one course with MA or ST prefix)
   Choose from the University approved GEP Mathematical Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: MA 121 or MA 131 and ST 301 or ST 311

B. Natural Sciences (7 credit hours – include one laboratory course or course with a lab)
   Choose from the University approved GEP Natural Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: BIO 181 and CH 101/102

C. Humanities (6 credit hours selected from two different disciplines/course prefixes)
   Choose from the University approved GEP Humanities course list.

D. Social Sciences (6 credit hours selected from two different disciplines/course prefixes)
   Choose from the University approved GEP Social Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: EC 201 or EC 205 or ARE 201. Select an additional course other than Economics.

E. Health & Exercise Studies (2 credit hours – at least one 100-level Fitness and Wellness Course)
   Choose from the University approved GEP Health & Exercise Study course list.

F. Additional Breadth (3 credit hours to be selected from the following checked University approved GEP course lists)
   - Humanities/Social Sciences/Visual and Performing Arts.
   - Interdisciplinary Perspectives (5-6 credit hours)

G. Interdisciplinary Perspectives (5-6 credit hours)
   Choose from the University approved GEP Interdisciplinary Perspectives course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: IDS 201 or STS 302 or PHI 340

H. Introduction to Writing (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following Co-Requisites must be satisfied to complete the General Education Program requirements:

I. U.S. Diversity (USD)
   Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite.

J. Global Knowledge (GK)
   Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement: IDS 201 or STS 302 or PHI 340

K. Foreign Language proficiency - Proficiency at the FL_ 102 level is required for graduation.
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<td><strong>FALL SEMESTER</strong></td>
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<td>SMT 202 Wood Anatomy &amp; Properties¹</td>
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<td>MA 114 Intro. Finite Math with Applications</td>
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<tr>
<td>NR 100 Introduction to Natural Resources¹</td>
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<td>PB 200 Plant Life</td>
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<td>GEP Elective*</td>
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<th>SOPHOMORE YEAR</th>
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<td><strong>FALL SEMESTER</strong></td>
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<td><strong>CREDITS</strong></td>
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<tr>
<td>or PY 211 College Physics I</td>
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<td>FOR 172 Forest Sys. Mapping &amp; Mensuration I¹</td>
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<td>FOR 339 Dendrology¹</td>
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<td>Technical Elective³</td>
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<tr>
<td>FOR 204 Silviculture¹</td>
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<td>FOR 261 Forest Communities¹</td>
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<tr>
<td>FOR 264 Forest Wildlife¹</td>
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<tr>
<td>FOR 265 Fire Management¹</td>
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<tr>
<td>FOR 273 Forest Sys. Mapping &amp; Mensuration II¹</td>
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<tr>
<td>FOR 204 Silviculture¹</td>
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<tr>
<td>FOR 261 Forest Communities¹</td>
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<tr>
<td>FOR 264 Forest Wildlife¹</td>
</tr>
<tr>
<td>FOR 265 Fire Management¹</td>
</tr>
<tr>
<td>FOR 273 Forest Sys. Mapping &amp; Mensuration II¹</td>
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<tr>
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</thead>
<tbody>
<tr>
<td><strong>FALL SEMESTER</strong></td>
</tr>
<tr>
<td><strong>CREDITS</strong></td>
</tr>
<tr>
<td>FOR 303 Silvics &amp; Forest Tree Physiology¹</td>
</tr>
<tr>
<td>FOR 319 Forest Economics¹</td>
</tr>
<tr>
<td>FOR 334 Operations Research Applications¹</td>
</tr>
<tr>
<td>FOR 353 Air Photo Interp. &amp; Photogrammetry¹</td>
</tr>
<tr>
<td>or GIS 410 Introduction to GIS</td>
</tr>
<tr>
<td>FOR 374 Forest Meas., Modeling &amp; Inventory¹</td>
</tr>
<tr>
<td>GEP Elective</td>
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</thead>
<tbody>
<tr>
<td><strong>FALL SEMESTER</strong></td>
</tr>
<tr>
<td><strong>CREDITS</strong></td>
</tr>
<tr>
<td>FW 404 Forest Wildlife Management¹</td>
</tr>
<tr>
<td>FOR 405 Forest Management¹</td>
</tr>
<tr>
<td>NR 460 Renew. Nat. Res. Management &amp; Policy¹</td>
</tr>
<tr>
<td>GEP Elective*</td>
</tr>
<tr>
<td>HES *** Elective</td>
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<tr>
<td><strong>Total:</strong> 14</td>
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</table>

Minimum Credit Hours Required for Graduation: 128
Major/Program Footnotes:

1. A minimum grade of C- is required.
2. Advised Electives. Select any 200-level or higher course not otherwise required from among the following possibilities: (1) courses with the prefix ACC, ARE, BAE, CH, CS, EC, ENT, ET, FOR, FW, HS, MA, NR, PB, PP, PY, ST, SSC, or SMT; (2) any FL* course not needed to fulfill the language co-requisite; or (3) courses taken in partial fulfillment of an academic minor.
3. Technical Electives. Select any 200-level or higher course not otherwise required from among the following prefixes: ET, FOR, FW, GIS or NR.

* General Education Program (GEP) requirements and GEP Footnotes:
To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at http://oucc.dasa.ncsu.edu/general-education-program/.

A. Mathematical Sciences (6 credit hours – one course with MA or ST prefix) 
Choose from the University approved GEP Mathematical Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: MA 114, MA 121

B. Natural Sciences (7 credit hours – include one laboratory course or course with a lab) 
Choose from the University approved GEP Natural Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: CH 101/102, PB 200

C. Humanities (6 credit hours selected from two different disciplines/course prefixes) 
Choose from the University approved GEP Humanities course list.

D. Social Sciences (6 credit hours selected from two different disciplines/course prefixes) 
Choose from the University approved GEP Social Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: (ARE 201 or EC 205) and NR 460

E. Health & Exercise Studies (2 credit hours – at least one 100-level Fitness and Wellness Course) 
Choose from the University approved GEP Health Exercise & Studies Course List.

F. Additional Breadth - (3 credit hours to be selected from the following checked University approved GEP course lists) 
Choose from the University approved GEP Humanities/Social Sciences/Visual and Performing Arts or ___ Mathematical Sciences/Natural Sciences/Engineering

G. Interdisciplinary Perspectives (5 credit hours) 
Choose from the University approved GEP Interdisciplinary Perspectives course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement:

H. Introduction to Writing (4 credit hours satisfied by completing ENG 101 with a C- or better )

The following Co-Requisites must be satisfied to complete the General Education Program requirements:

I. U.S. Diversity (USD) 
Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement:

J. Global Knowledge (GK) 
Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement:

K. Foreign Language proficiency - Proficiency at the FL_102 level is required for graduation.
### FRESHMAN YEAR

<table>
<thead>
<tr>
<th>FALL SEMESTER</th>
<th>CREDITS</th>
<th>SPRING SEMESTER</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HES_*** Health &amp; Exercise Study Course¹</td>
<td>1</td>
<td>CH 102 General Chemistry Lab</td>
<td>1</td>
</tr>
<tr>
<td>ENG 101 Acad. Writing &amp; Research¹</td>
<td>4</td>
<td>MEA 101 Geology I: Physical</td>
<td>3</td>
</tr>
<tr>
<td>Math Elective ²</td>
<td>2</td>
<td>MEA 110 Geology I Lab</td>
<td>1</td>
</tr>
<tr>
<td>NR 100 Introduction to Natural Resources</td>
<td>4</td>
<td>Math Elective ²</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ARE 201 Intro to Agric &amp; Resource Econ or</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FOR 150 Critical Thinking &amp; Data Analysis</td>
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<td><strong>Total:</strong></td>
<td><strong>15</strong></td>
<td><strong>Total:</strong></td>
<td><strong>16</strong></td>
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### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>FALL SEMESTER</th>
<th>CREDITS</th>
<th>SPRING SEMESTER</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics Elective ³</td>
<td>4</td>
<td>FOR 252 Introduction to Forest Science</td>
<td>3</td>
</tr>
<tr>
<td>Chemistry Elective ⁴</td>
<td>3</td>
<td>SSC 200 Soil Science</td>
<td>4</td>
</tr>
<tr>
<td>FOR 339 Dendrology</td>
<td>4</td>
<td>PS 201 Intro to American Government or</td>
<td>3</td>
</tr>
<tr>
<td>General Education Electives ¹</td>
<td>4</td>
<td>PS 202 State and Local Government</td>
<td></td>
</tr>
<tr>
<td>HES_*** Health &amp; Exercise Studies ¹</td>
<td>1</td>
<td>COM 110 Public Speaking or COM 112 Interpersonal Communication</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General Education Elective ¹</td>
<td>3</td>
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<tr>
<td><strong>Total:</strong></td>
<td><strong>16</strong></td>
<td><strong>Total:</strong></td>
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### JUNIOR YEAR

<table>
<thead>
<tr>
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<th>CREDITS</th>
<th>SPRING SEMESTER</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecology Elective ⁵</td>
<td>4</td>
<td>ARE 336 Agriculture &amp; Resource Economics</td>
<td>3</td>
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<tr>
<td>NR 301 Practicum for Prof. Development ²</td>
<td>1</td>
<td>ENG 333 Comm. For Science &amp; Research</td>
<td>3</td>
</tr>
<tr>
<td>Spatial Technology Elective ²</td>
<td>3</td>
<td>NR 300 Natural Resource Measurements</td>
<td>4</td>
</tr>
<tr>
<td>ST 311 Intro to Statistics</td>
<td>3</td>
<td>General Education Elective ¹</td>
<td>2-3</td>
</tr>
<tr>
<td>Technical Elective</td>
<td>4</td>
<td>Technical Elective ²</td>
<td>3</td>
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<tr>
<td><strong>Total:</strong></td>
<td><strong>15</strong></td>
<td><strong>Total:</strong></td>
<td><strong>15-16</strong></td>
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</table>

### SUMMER

| NR360 Internship Experience ³                       | 3       |                                           |        |

### SENIOR YEAR

<table>
<thead>
<tr>
<th>FALL SEMESTER</th>
<th>CREDITS</th>
<th>SPRING SEMESTER</th>
<th>CREDITS</th>
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<tbody>
<tr>
<td>NR 401 Practicum for Prof. Development III</td>
<td>1</td>
<td>NR 400 Natural Resources Management</td>
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</tr>
<tr>
<td>NR 460 Renew Resource Pol. &amp; Mgmt.</td>
<td>3</td>
<td>General Education Electives ¹</td>
<td>5-6</td>
</tr>
<tr>
<td>NR 484 Practice of Environ Impact Assessment</td>
<td>4</td>
<td>Technical Electives ²</td>
<td>6</td>
</tr>
<tr>
<td>FW 353 Wildlife Management or</td>
<td>3</td>
<td></td>
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<tr>
<td>FW404 Forest Wildlife Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Elective ²</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>15</strong></td>
<td><strong>Total:</strong></td>
<td><strong>15-16</strong></td>
</tr>
</tbody>
</table>

Minimum Credit Hours Required for Graduation: **127**
Footnotes:

¹ General Education Program (GEP) requirements and GEP Footnotes:
To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found here: http://oucc.dasa.ncsu.edu/general-education-program/.

A. **Mathematical Sciences** (6 credit hours – one course with MA or ST prefix)
Curriculum requirements automatically fulfill this category.

B. **Natural Sciences** (7 credit hours – include one laboratory course or course with a lab)
Curriculum requirements automatically fulfill this category.

C. **Humanities** (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list.

D. **Social Sciences** (6 credit hours selected from two different disciplines/course prefixes)
Curriculum requirements in economics and political science automatically fulfill this category.

E. **Health & Exercise Studies** (2 credit hours – at least one 100-level Fitness and Wellness Course)
Choose from the University approved GEP Health & Exercise Studies course list.

F. **Additional Breadth** - (3 credit hours to be selected from the following checked University approved GEP course lists)
X Humanities/Social Sciences/Visual and Performing Arts or ___Mathematical Sciences/Natural Sciences/Engineering.

G. **Interdisciplinary Perspectives** (5-6 credit hours)
Choose from the University approved GEP Interdisciplinary Perspectives course list. ARE 336 meets 3 hours of this requirement.

H. **Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following **Co-Requisites** must be satisfied to complete the General Education Program requirements:

I. **U.S. Diversity** (USD)
Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity co-requisite.

J. **Global Knowledge** (GK)
Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite.

K. **Foreign Language proficiency** - Proficiency at the FL_102 level is required for graduation

² Math Elective – 6 credit hours from: MA 114, MA 121, MA 131, MA 141, MA 231, MA 241

³ Physics Elective – 4 credit hours from: PHY 131, PHY 205 + 206, PHY 211

⁴ Chemistry Elective – 4 credit hours from: CH 201+ 202, CH 220, CH 221 + 222

⁵ Ecology Elective – 4 credit hours from: BIO 360, FOR 260, PB 360

⁶ A professional development program integrated into the curriculum consists of a required summer work experience between the junior and senior years and two professional development courses. Students take NR 301 in the junior year to prepare for NR 360 and seek a summer job for the following summer and will participate in presentations made by seniors enrolled in NR 401 that focus on the previous summer’s work experience. A member of the teaching faculty will assist students in finding an appropriate summer job. NR 401 for the seniors will consist of written and oral reports on summer work experiences and professional development activities.

⁷ Spatial Technology Elective – 3 credit hours from: FOR 353, GIS 410, SSC 440

⁸ Technical Electives – 21 credit hours: Ecosystem Assessment students select 15 credit hours from the resource science courses and 6 credit hours from the management science courses shown on the following table, selecting at least one course from each of the resource science categories.

⁹ Wildlife Elective – 3 credit hours from: FW 333, FW 353, FW 404

For elective categories 2-5 and 7-9, students may select courses not shown in these lists after consulting with, and receiving permission, from their academic advisors prior to enrolling in the course.
## TECHNICAL ELECTIVES

### RESOURCE SCIENCES

<table>
<thead>
<tr>
<th>Flora</th>
<th>Fauna</th>
<th>Earth Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 414 Weed Science</td>
<td>AEC 419 Freshwater Ecology</td>
<td>FOR 420/520 Watershed &amp; Wetlands Hydrology</td>
</tr>
<tr>
<td>FOR 204 Silviculture*</td>
<td>AEC 420 + 423 Fisheries Science + Lab</td>
<td>GEO 200 Principles of Geography</td>
</tr>
<tr>
<td>FOR 261 Forest Communities *</td>
<td>AEC 441 + 442 Biology of Fishes + Lab</td>
<td>MEA 200/210 Intro. Oceanography/Lab</td>
</tr>
<tr>
<td>FOR 265 Fire Management *</td>
<td>AEC 460 Field Ecology &amp; Methods</td>
<td>MEA 250/251 Intro. Coastal Environments &amp; Lab</td>
</tr>
<tr>
<td>FOR 273 Mapping &amp; Mensuration *</td>
<td>AEC 501 Ornithology</td>
<td>MEA 300 Environmental Geography</td>
</tr>
<tr>
<td>FOR 303 Silvics &amp; Forest Tree Physiology</td>
<td>AEC 586 Aquaculture I</td>
<td>NR 421 Wetland Assessment, Delineation &amp; Regulation</td>
</tr>
<tr>
<td>FOR 318 Forest Pathology</td>
<td>BIO 333 Captive Animal Biology</td>
<td>SSC 361 Role of Soils in Envir. Mgmt.</td>
</tr>
<tr>
<td>FOR 330 North Carolina Forests</td>
<td>ENT 425 General Entomology</td>
<td>SSC 452 Soil Classification</td>
</tr>
<tr>
<td>FOR 411 Forest Tree Genetics/Biology</td>
<td>FOR 264 Forest Wildlife</td>
<td>SSC 461 Soil Phys. Properties &amp; Plant Growth</td>
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<tr>
<td>PB 220 Local Flora</td>
<td>FOR 402 Forest Entomology</td>
<td>SSC 470 Wetland Soils</td>
</tr>
<tr>
<td>PB 345 Economic Botany</td>
<td>FOR 430 Forest Health &amp; Protection</td>
<td>SSC 472 Forest Soils</td>
</tr>
<tr>
<td>PB 400 Plant Structure/Diversity</td>
<td>FW 344 Fisheries &amp; Wildlife Inventory &amp; Management **</td>
<td>BIO 419 Limnology</td>
</tr>
<tr>
<td>PB 403 Systematic Botany</td>
<td>FW 312 Fisheries Techniques **</td>
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<tr>
<td>PB 405 Wetland Plants</td>
<td>FW 313 Mountain Wildlife Ecology **</td>
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<tr>
<td>PB 421 Plant Physiology</td>
<td>FW 314 Marine Fisheries **</td>
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<tr>
<td>PB 464 Rare Plants of North Carolina</td>
<td>FW 353 Wildlife Management</td>
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<td></td>
<td>FW 373 Vertebrate Natural History</td>
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<tr>
<td></td>
<td>FW 403 Urban Wildlife Management</td>
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<tr>
<td></td>
<td>FW 404 Forest Wildlife Management</td>
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<td></td>
<td>FW 405 Tropical Wildlife Ecology in Nicaragua</td>
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<td>FW 444 Mammalogy</td>
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<td></td>
<td>MEA 220 Marine Biology</td>
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<tr>
<td></td>
<td>ZO 509 Biology of Aquatic Insects</td>
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</tbody>
</table>

* These courses are part of the 9-credit Forest Management Summer Camp series.

** These courses are part of the 6-credit Fisheries, Wildlife & Conservation Biology Summer Camp series.

### MANAGEMENT SCIENCES

<table>
<thead>
<tr>
<th>Management</th>
<th>Economics</th>
<th>Policy</th>
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</thead>
<tbody>
<tr>
<td>ACC 200 Managerial Accounting</td>
<td>ARE 301 Intermediate Microeconomics</td>
<td>ARE 309 Envir. Law &amp; Econ. Policy</td>
</tr>
<tr>
<td>FOR 220 Urban &amp; Community Forestry</td>
<td>ARE 304 Agribusiness Management</td>
<td>BUS 305 Legal &amp; Regulatory Envir.</td>
</tr>
<tr>
<td>FOR 221 Conservation of Natural Resources</td>
<td>ARE 436 Environmental Economics</td>
<td>FOR 414 World Forestry</td>
</tr>
<tr>
<td>FOR 248 Forest History, Technology &amp; Society</td>
<td>EC 348 Introduction to International Economics</td>
<td>FW 411 Human Dimensions &amp; Wildlife</td>
</tr>
<tr>
<td>FOR 325 Forest Health &amp; Protection</td>
<td>EC 410 Public Finance</td>
<td>NR 406 Conservation of Biological Diversity</td>
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<tr>
<td>FW 333 Conservation Biology in Practice</td>
<td>EC 448 International Trade</td>
<td>PS 201 Intro. To American Government</td>
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<tr>
<td>LAR 430 Site Planning</td>
<td>FOR 319 Forest Economics</td>
<td>PS 202 State &amp; Local Government</td>
</tr>
<tr>
<td>GIS 295 GIS Concepts</td>
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<td>PS 203 Introduction to Nonprofits</td>
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<tr>
<td>GIS 410 Introduction to GIS</td>
<td></td>
<td>PS 312 Intro. To Public Administration</td>
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<tr>
<td>NR 350 International Sustainable Resources Use</td>
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<td>PS 320 US Environmental Law &amp; Politics</td>
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<td>PRT 350 Outdoor Recreation Management</td>
<td>PS 401 American Parties &amp; Interest Groups</td>
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<tr>
<td>PRT 451 Recreation Planning/Facility Development</td>
<td>PS 408 Urban Politics</td>
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</table>
### FALL SEMESTER | SPRING SEMESTER | CREDITS | CREDITS
--- | --- | --- | ---
BIO 181 Intro Biology: Ecology, Evol. & Biodiversity | CH 101 Chemistry-A Molecular Science | 4 | 3
HES_***Health & Exercise Study Course | CH 102 General Chemistry Lab | 1 | 1
ENG 101 Acad. Writing & Research | MEA 101 Geology I: Physical | 4 | 3
Math Elective | MEA 110 Geology I Lab | 3 | 1
NR 100 Introduction to Natural Resources | Math Elective | 2 | 3
| ARE 201 Intro to Agric & Resource Econ | 2 | 3
| FOR 150 Critical Thinking & Data Analysis | EC 201 Principles of Microeconomics | 2 | 2

**Total:** 14

### SOPHOMORE YEAR

| FALL SEMESTER | SPRING SEMESTER | CREDITS | CREDITS
--- | --- | --- | ---
Physics Elective | FOR 252 Introduction to Forest Science | 3 | 3
Chemistry Elective | SSC 200 Soil Science | 4 | 4
FOR 339 Dendrology | PS 201 Intro to American Government | 3 | 3
General Education Electives | PS 202 State & Local Government | 3 | 3
HES_ *** Health & Exercise Studies | COM 110 Public Speaking or COM 112 | 1 | 3
| Interpersonal Communications | General Education Electives | 3 | 3

**Total:** 16

### JUNIOR YEAR

| FALL SEMESTER | SPRING SEMESTER | CREDITS | CREDITS
--- | --- | --- | ---
Ecology Elective | ARE 336 Agricultural & Resource Economics | 5 | 3
NR 301 Practicum for Prof. Development I | ENG 333 Comm. For Science & Research | 1 | 3
Spatial Technology Elective | NR 300 Natural Resource Measurements | 3 | 4
ST 311 Intro to Statistics | General Education Elective | 3 | 2-3
Technical Elective | Technical Elective | 4 | 3

**Total:** 15

### SUMMER

NR360 Internship Experience | 6 | 3 | 3

### SENIOR YEAR

| FALL SEMESTER | SPRING SEMESTER | CREDITS | CREDITS
--- | --- | --- | ---
NR 401 Practicum for Prof. Development II | NR 400 Natural Resources Management | 1 | 4
NR 460 Renew Resource Pol. & Mgmt. | General Education Electives | 3 | 3
NR 484 Practice of Environ Impact Assessment | Technical Electives | 4 | 9
Wildlife Elective | Technical Elective | 3 | 5
Technical Elective | 8 | 5 | 8

**Total:** 16

Minimum Credit Hours Required for Graduation: 127
1 General Education Program (GEP) requirements and GEP Footnotes:

To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at http://oucc.dasa.ncsu.edu/general-education-program/

**A. Mathematical Sciences** (6 credit hours – one course with MA or ST prefix)
Curriculum requirements automatically fulfill this category.

**B. Natural Sciences** (7 credit hours – include one laboratory course or course with a lab)
Curriculum requirements automatically fulfill this category.

**C. Humanities** (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement.

**D. Social Sciences** (6 credit hours selected from two different disciplines/course prefixes)
Curriculum requirements in economics and political science automatically fulfill this category.

**E. Health & Exercise Studies** (2 credit hours – at least one 100-level Fitness and Wellness Course)
Choose from the University approved GEP Health & Exercise Studies course list.

**F. Additional Breadth** (3 credit hours to be selected from the following checked University approved GEP course lists)
Choose from the University approved GEP Additional Breadth course list.

**G. Interdisciplinary Perspectives** (5-6 credit hours)
Choose from the University approved GEP Interdisciplinary Perspectives course list.

**H. Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following Co-Requisites must be satisfied to complete the General Education Program requirements:

**I. U.S. Diversity** (USD)
Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite.

**J. Global Knowledge** (GK)
Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite.

**K. Foreign Language proficiency** - Proficiency at the FL_102 level is required for graduation.

2 Math Elective – 6 credit hours from: MA 114, MA 121, MA 131, MA 141, MA 231, MA 241

3 Physics Elective – 4 credit hours from: PHY 131, PHY 205 + 206, PHY 211

4 Chemistry Elective – 4 credit hours from: CH 201 + 202, CH 220, CH 221 + 222

5 Ecology Elective – 4 credit hours from: BIO 360, FOR 260, PB 360

6 A professional development program integrated into the curriculum consists of a required summer work experience between the junior and senior years and two professional development courses. Students take NR 301 in the junior year to prepare for NR 360 and seek a summer job for the following summer and will participate in presentations made by seniors enrolled in NR 401 that focus on the previous summer's work experience. A member of the teaching faculty will assist students in finding an appropriate summer job. NR 401 for the seniors will consist of written and oral reports on summer work experiences and professional development activities.

7 Spatial Technology Elective – 3 credit hours from: FOR 353, GIS 410, SSC 440

8 Technical Elective – 21 credit hours: Ecosystem Assessment students select 15 credit hours from the resource science courses and 6 credit hours from the management science courses shown on the following table, selecting at least one course from each of the resource science categories.

9 Wildlife Elective – 3 credit hours from: FW 333, FW 353, FW 404

For elective categories 2-5 and 7-9, students may select courses not shown in these lists after consulting with, and receiving permission, from their academic advisors prior to enrolling in this course.
## TECHNICAL ELECTIVES

### RESOURCE SCIENCES

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<td>AEC 420 + 423 Fisheries Science + Lab</td>
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<tr>
<td>FOR 261 Forest Communities *</td>
<td>AEC 441 + 442 Biology of Fishes + Lab</td>
<td>MEA 200/210 Intro Oceanography &amp; Lab</td>
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<td>FOR 265 Fire Management *</td>
<td>AEC 460 Field Ecology &amp; Methods</td>
<td>MEA 250/251 Intro Coastal Environments &amp; Lab</td>
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<td>FOR 273 Mapping &amp; Mensuration *</td>
<td>AEC 501 Ornithology</td>
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<td>AEC 586 Aquaculture I</td>
<td>NR 421 Wetland Assessment, Delineation &amp; Regulation</td>
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<td>FOR 318 Plant Pathology</td>
<td>BIO 333 Captive Animal Biology</td>
<td>SSC 452 Soil Classification</td>
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<td>FOR 264 Forest Wildlife</td>
<td>SSC 470 Wetland Soils</td>
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<td>FOR 402 Forest Entomology</td>
<td>SSC 472 Forest Soils</td>
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<td>PB 345 Economic Botany</td>
<td>FOR 430 Forest Health &amp; Protection</td>
<td>BIO 419 Limnology</td>
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<td>PB 421 Plant Physiology</td>
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<td>FW 373 Vertebrate Natural History</td>
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* These courses are part of the 9-credit Forest Management Summer Camp series.
** These courses are part of the 6-credit Fisheries, Wildlife & Conservation Biology Summer Camp series.

### MANAGEMENT SCIENCES

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<th>Management</th>
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<td>ACC 200 Managerial Accounting</td>
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<td>ARE 309 Envir. Law &amp; Econ. Policy</td>
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<td>LAR 430 Site Planning</td>
<td>EC 448 International Trade</td>
<td>PS 202 State &amp; Local Government</td>
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<td>PS 203 Introduction to Nonprofits</td>
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<td>PS 320 US Environmental Law &amp; Politics</td>
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<td>PS 401 American Parties &amp; Interest Groups</td>
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### College of Natural Resources, NCSU
Forestry and Environmental Resources Department
Fisheries, Wildlife & Conservation Biology – Conservation Biology Concentration
Effective: 01/2014

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| SUMMER | | |
| Summer Camp (courses listed to the right) | FW 311 Wildlife Inventory & Management | 3 |
| OR | FW 312 Fisheries Techniques & Management | 1 |
| Combination of Study Abroad & Internships 7 | FW 313 Mountain Wildlife Ecology & Mgmt. | 1 |
| | FW 314 Coastal Fish Ecology & Management | 1 |
| **Total:** 6 | |

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<td>FW 333 Conservation Biology in Practice</td>
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<td>CH 221 &amp; CH 222 Organic Chemistry &amp; Lab</td>
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<td>FW 453 Principles of Wildlife Science</td>
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<td>FW 411 Human Dimensions of Wildlife</td>
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<td>Conservation Biology Elective9</td>
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Minimum Credit Hours Required for Graduation*: 124

Major/Program Footnotes:
1 Select from FOR 339, PB 220, PB 250, PB 403, PB 405
2 Select from CH 201/202, CH 223, MEA 100, MEA 130, MEA 200, MEA 210, MEA/BIO 220, MEA 250, MEA 323, PY 212
3 Select from ARE 201, EC 201, or EC 205
4 Select from BIO 360, PB 360 or FOR 260
5 Select from CSC 200, MA 231, MA 241, NR 300, ST 312
6 Select from AEC 419, ENT 201, ENT/FOR 402, BIO/ENT 425, ET 252, FOR 252, FOR 304, FW 403, FW/FOR 404, FW 465, SSC 200
7 Internships or study abroad experiences can be completed at any point during the curriculum.
8 Select from AEC 420, BIO 410, BIO 441, FW 420, FW 453, ZO 501, ZO 542, ZO 544
9 Select from ARE 309, NR 460, PS 320, PS 336
10 Select from BIO 561, FW 460, NR 406

* General Education Program (GEP) requirements and GEP Footnotes:
To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at http://oucc.dasa.ncsu.edu/general-education-program/.

*Courses/groupings in the above display with an asterisk may fulfill all or part of a GEP requirement. See categories below.

A. Mathematical Sciences (6 credit hours – one course with MA or ST prefix)
Choose from the University approved GEP Mathematical Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: MA 131, ST 311

B. Natural Sciences (7 credit hours – include one laboratory course or course with a lab)
Choose from the University approved GEP Natural Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: CH 101 and CH 102, PY 131, BIO 181, BIO 183, FW 221

C. Humanities (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: None

D. Social Sciences (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Social Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: ARE 201 or EC 201, EC 205, Policy Elective (footnote 9).

E. Health & Exercise Studies (2 credit hours – at least one 100-level Fitness and Wellness Course)
Choose from the University approved GEP Health & Exercise Studies course list.

F. Additional Breadth - (3 credit hours to be selected from the following checked University approved GEP course lists)
X Humanities/Social Sciences/Visual and Performing Arts

G. Interdisciplinary Perspectives (5-6 credit hours)
Choose from the University approved GEP Interdisciplinary Perspectives course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: None

H. Introduction to Writing (4 credit hours satisfied by completing ENG 101 with a C- or better )

The following Co-Requisites must be satisfied to complete the General Education Program requirements:

I. U.S. Diversity (USD)
Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement: None

J. Global Knowledge (GK)
Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement: FW 221

K. Foreign Language proficiency - Proficiency at the FL_102 level is required for graduation.
## FRESHMAN YEAR

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<td>NR 100 Intro to Natural Resources</td>
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## SOPHOMORE YEAR

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<td>BIO 260 Evolution, Behavior, and Ecology or</td>
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Minimum Credit Hours Required for Graduation: 122-125
Major/Program Footnotes:

1. Students with appropriate math skills are encouraged to take the math sequence MA 141 & 241
2. Students wishing to take a 2-course organic chemistry sequence should take CH 221/222 & CH 223/224
3. Select from ENG 214, ENG 215, ENG 216, COM 201, COM 211, COM 226, COM 301, COM 302
4. Students wishing to take a 2-course physics sequence should take PY 211 & PY 212
5. Select from ARE 201, EC 201 or EC 205
6. Select from FOR 252, FOR 304, FOR 420, FW 404, FW 453, MEA 200/210, MEA 220, MEA 250/251, MEA 549, PB 200, ZO 515, ZO 586/587
7. Select from MA 231, MA 241, CSC 200
8. Select from NR 460, ARE 309, PS 320 or PS 336
9. Select from PY 121, CH 223, CH 323, MEA 100, MEA 130/135, MEA 200/210, MEA 220, MEA 250/251
10. Select from ARAE 201, EC 201 or EC 205

* General Education Program (GEP) requirements and GEP Footnotes:

To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at [http://oucc.dasa.ncsu.edu/general-education-program/](http://oucc.dasa.ncsu.edu/general-education-program/).

* Courses/groupings in the above display with an asterisk may fulfill all or part of a GEP requirement. See categories below.

A. Mathematical Sciences (6 credit hours – one course with MA or ST prefix)
   Choose from the University approved GEP Mathematical Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: MA 131, ST 311

B. Natural Sciences (7 credit hours – include one laboratory course or course with a lab)
   Choose from the University approved GEP Natural Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: CH 101 and CH 102, PY 131, BIO 181, BIO 183, FW 221, PB 360 and PB 365 or BIO 260

C. Humanities (6 credit hours selected from two different disciplines/course prefixes)
   Choose from the University approved GEP Humanities course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: None

D. Social Sciences (6 credit hours selected from two different disciplines/course prefixes)
   Choose from the University approved GEP Social Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: ARE 201 or EC 205, NR 460

E. Health & Exercise Studies (2 credit hours – at least one 100-level Fitness and Wellness Course)
   Choose from the University approved GEP Health & Exercise Studies course list.

F. Additional Breadth (3 credit hours to be selected from the following checked University approved GEP course lists)

G. Interdisciplinary Perspectives (5-6 credit hours)
   Choose from the University approved GEP Interdisciplinary Perspectives course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: FW 221

H. Introduction to Writing (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following Co-Requisites must be satisfied to complete the General Education Program requirements:

I. U.S. Diversity (USD)
   Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement: None

J. Global Knowledge (GK)
   Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement: None

K. Foreign Language proficiency - Proficiency at the FL_102 level is required for graduation.
# College of Natural Resources, NCSU
## Forestry and Environmental Resources Department
### Fisheries, Wildlife & Conservation Biology – Wildlife Science Concentration

**Effective: 01/2014**

<table>
<thead>
<tr>
<th>FRESHMAN YEAR</th>
<th>SPRING SEMESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FALL SEMESTER</strong></td>
<td><strong>CREDITS</strong></td>
</tr>
<tr>
<td>NR 100 Intro to Natural Resources</td>
<td>2</td>
</tr>
<tr>
<td>ENG 101 Academic Writing &amp; Research*</td>
<td>4</td>
</tr>
<tr>
<td>MA 131 Elements of Calculus*</td>
<td>3</td>
</tr>
<tr>
<td>BIO 181 Intro Biology: Ecology, Evol &amp; Biodiversity*</td>
<td>4</td>
</tr>
<tr>
<td>HES_*** Health &amp; Exercise Studies Course*</td>
<td>1</td>
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</tbody>
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Total: 14

<table>
<thead>
<tr>
<th>SOPHOMORE YEAR</th>
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<tbody>
<tr>
<td><strong>FALL SEMESTER</strong></td>
<td><strong>CREDITS</strong></td>
</tr>
<tr>
<td>PB 200 Plant Life</td>
<td>4</td>
</tr>
<tr>
<td>FW 221 Conservation of Natural Resources*</td>
<td>3</td>
</tr>
<tr>
<td>Communications Elective*</td>
<td>3</td>
</tr>
<tr>
<td>PY 131 Conceptual Physics*</td>
<td>4</td>
</tr>
<tr>
<td>FOR 172 Forest Systems Map and Mensuration</td>
<td>2</td>
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Total: 16

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<thead>
<tr>
<th>SUMMER</th>
<th>SPRING SEMESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW 311 Wildlife Ecology &amp; Management</td>
<td>3</td>
</tr>
<tr>
<td>FW 312 Fisheries Techniques &amp; Management</td>
<td>1</td>
</tr>
<tr>
<td>FW 313 Mountain Wildlife Ecology &amp; Management</td>
<td>1</td>
</tr>
<tr>
<td>FW 314 Coastal Fish Ecology &amp; Management</td>
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Total: 6

<table>
<thead>
<tr>
<th>JUNIOR YEAR</th>
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<tbody>
<tr>
<td><strong>FALL SEMESTER</strong></td>
<td><strong>CREDITS</strong></td>
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<tr>
<td>FOR 339 Dendrology</td>
<td>4</td>
</tr>
<tr>
<td>FW 353 Wildlife Management</td>
<td>3</td>
</tr>
<tr>
<td>GN 301 Genetics in Human Affairs</td>
<td>3</td>
</tr>
<tr>
<td>ST 311 Introduction to Statistics*</td>
<td>3</td>
</tr>
<tr>
<td>GEP Interdisciplinary Perspectives Requirement*</td>
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Total: 15-16

<table>
<thead>
<tr>
<th>SENIOR YEAR</th>
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<tbody>
<tr>
<td><strong>FALL SEMESTER</strong></td>
<td><strong>CREDITS</strong></td>
</tr>
<tr>
<td>Wildlife Elective*</td>
<td>3</td>
</tr>
<tr>
<td>GIS 410 Introduction to GIS</td>
<td>3</td>
</tr>
<tr>
<td>Policy Elective*</td>
<td>3</td>
</tr>
<tr>
<td>FW 404 Forest Wildlife Management</td>
<td>3</td>
</tr>
<tr>
<td>FW 415 Professional Development</td>
<td>1</td>
</tr>
</tbody>
</table>

Total: 13

Minimum Credit Hours Required for Graduation*: 124-125
Major/Program Footnotes:

1. Students with appropriate math skills are encouraged to take the math sequence MA 141 & 241.
3. Students wishing to take a 2-course physics sequence should take PY 211 & PY 212.
4. Select from ARE 301, EC 201 or EC 205.
5. Select from MA 231, MA 241, CSC 200, ET 312.
6. Students wishing to take a 2-course organic chemistry sequence should take CH 221/222 & CH 223/224.
7. Select from FW 333, FW 403, FW 405, FW 444, FW 460, ZO 501, ZO 542, BIO 250, BIO 410, ENT 201, ENT 402, ENT 425, FOR 304, SSC 200, NR 300.
8. Select from NR 460, ARE 309, PS 320 or PS 336.
9. Select from CH 201/202, CH 223, CH 323, MEA 100/100L, MEA 130/135, MEA 200, MEA 210, MEA 220, MEA 250/251, PY 212.

General Education Program (GEP) requirements and GEP Footnotes:

To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at http://oucc.dasa.ncsu.edu/general-education-program/.

A. Mathematical Sciences (6 credit hours – one course with MA or ST prefix)
Choose from the University approved GEP Mathematical Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: MA 131, ST 311

B. Natural Sciences (7 credit hours – include one laboratory course or course with a lab)
Choose from the University approved GEP Natural Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: CH 101 and CH 102, PY 131, BIO 181, BIO 183, FW 221, PB 360 and PB 365 or BIO 260

C. Humanities (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: None

D. Social Sciences (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Social Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: ARE 201, EC 201 or EC 205, NR 460, ARE 309, PS 320 or PS 336

E. Health & Exercise Studies (2 credit hours – at least one 100-level Fitness and Wellness Course)
Choose from the University approved GEP Health & Exercise Studies course list.

F. Additional Breadth: (3 credit hours to be selected from the following checked University approved GEP course lists)
X Humanities/Social Sciences/Visual and Performing Arts or ___ Mathematical Sciences/Natural Sciences/Engineering

G. Interdisciplinary Perspectives (5-6 credit hours)
Choose from the University approved GEP Interdisciplinary Perspectives course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: FW 221

H. Introduction to Writing (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following Co-Requisites must be satisfied to complete the General Education Program requirements:

I. U.S. Diversity (USD)
Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement: None

J. Global Knowledge (GK)
Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement: FW 221

K. Foreign Language proficiency - Proficiency at the FL_102 level is required for graduation.
B. Transfer Students

The Department of Forestry and Environmental Resources accepts NCSU students with a minimum 2.1 GPA and students from other accredited colleges and universities with good academic records (minimum 2.1 GPA on a 4.0 scale is preferred) as transfers into its ES, ETM, FOM, NR and FWCB curricula. Students at community colleges, junior colleges, or other baccalaureate institutions who plan to transfer to one of the department’s degree programs should closely follow the desired curriculum by taking the equivalent courses available. Only equivalent courses will be credited to the appropriate degree program after enrolling at NCSU and the time required to complete the degree will depend on the courses remaining in the degree track. Students applying for the Forest Management curriculum must have at least 30 credits equivalent to those in the freshman and sophomore years and must transfer to NCSU in the fall of the sophomore year in order to complete the courses required for summer camp. Questions about transfer procedures or courses should be directed to the following faculty and staff members:

- Gary Blank, Director of Undergraduate Programs  
  5229 Jordan Addition, 919-515-7566, gblank@ncsu.edu

- Christi Standley, Undergraduate Program Coordinator  
  3136C Jordan Hall, 919-513-2582, cmstandl@ncsu.edu

- George Hess, Coordinator of the Natural Resources Program  
  5233 Jordan Addition, 919-515-7437, grhess@ncsu.edu

- Terrie Litzenberger, Coordinator of the Environmental Technology & Management Program, 2227 Jordan Addition, 919-515-7581, thlitzen@ncsu.edu

- Lara Pacifici, Undergraduate Coordinator of the Fisheries, Wildlife, and Conservation Biology Program, Turner House, 919-513-0408, llbrongo@ncsu.edu

- Chris Moorman, Coordinator of the Fisheries, Wildlife, and Conservation Biology Program, Turner House, 919-515-7586, moorman@ncsu.edu

- Erin Champion, Coordinator of the Environmental Sciences Program  
  3136B Jordan Hall, 919-513-2520, eachampi@ncsu.edu

C. Placement Procedures, 2016-2017

This information can be found at:  
http://admissions.ncsu.edu/apply/credit-opportunities/advanced-placement-ap/
* Students that have a disability and need testing accommodations for placement tests should first register with the Disability Services Office. Once registered, students should email the placement exam contact person and copy the DSO service provider so a verification email can be sent.

1. Mathematics Placement (Deadline May 21, 20**)

Successful completion of freshman year mathematics is one of the best early indicators of ultimate graduation from NC State. For that reason, we require admitted freshmen to take a test to determine proper placement in math prior to attending New Student Orientation and registering for fall classes.

One option is to take the SAT Math Level 2 Subject Test (not the math portion of the SAT) prior to attending orientation and have your scores reported electronically to NC State (code #5496). More information about test registration and deadlines is available at [http://www.collegeboard.org](http://www.collegeboard.org).

Alternatively, you may take the NC State Placement Test online. To ensure proper course placement, you should plan to **complete this assessment by May 21**.

To login and take the test you will need your Unity ID and password, which is assigned upon acceptance and displayed on your WolfPAW application status screen. There is no charge for this test, it is available at [https://www.webassign.net/ncsu/math.html](https://www.webassign.net/ncsu/math.html). Your raw score will be determined by the number of correct answers minus one-fourth times the number of incorrect answers. Your scaled score will then be determined based on your raw score. “Wild guessing” is not advised because it might actually lower your score and does take time that could be spent on other questions. Omissions neither help nor hurt your score. Testing time is one hour. Longer testing times can invalidate your test score.

If you do not take the "SAT Math Level 2 Subject Test or the NC State Math Placement Test, you will not be allowed to register for a math course, which could result in a math placement not representative of your ability or impede the formation of your fall schedule.

The only exceptions to the test requirements listed above will be for:

- students who have College Board Advanced Placement Calculus scores of 2 or higher
- students who have completed transferable math credits through dual enrollment at a college or university which serve as necessary pre-requisite
- students enrolled in a 2-year Agricultural Institute program (separate math placement testing will be conducted at Orientation).

For more information about placement in Mathematics contact

- Dr. Molly Fenn, Department of Mathematics, at 919-513-2288 or at mafenn2@ncsu.edu.
2. First Year Writing Placement (Deadline: Before Orientation If Needed)

As part of the University’s General Education Plan, most NC State students will take either ENG 101: Academic Writing and Research or ENG100: Introduction to Academic Writing AND ENG 101: Academic Writing and Research during your first year at the university, unless they are exempt from the university-wide ENG 101 requirement based on standardized test scores submitted to the university as part of their application process. Students who are exempt from ENG 101 are not required to participate in the self-directed placement assessment.

Students who are not exempt from ENG 101, but have exceptionally high scores on certain standardized tests, may choose to participate in the portfolio review process for possible exemption from the first-year writing requirement. Students eligible to participate in the portfolio review process should do so during their first semester at NC State. Students whose portfolios do not pass the review process are expected to enroll in ENG 101 in their second semester at NC State. Those who meet eligibility requirements for portfolio submission at the First-Year Writing Program’s webpage:

http://english.chass.ncsu.edu/undergraduate/first_year_writing/fy_portfolio.php

All students should visit the placement chart at http://english.chass.ncsu.edu/undergraduate/first_year_writing/fy_writing_placement.php to determine:

- If they are exempt from the first-year writing requirement (ENG 101) based on SAT, ACT, AP, or IB scores submitted to NCSU as part of their application process.
- If they are eligible to apply for exemption from the first-year writing requirement by submitting a portfolio of their writing for faculty review, OR
- If they should complete online, directed self-placement assessments for possible enrollment in ENG 100, ENG 101, or ENG 105 (The placement chart will guide students to applicable self-placement assessments).

Although most students’ questions can be addressed by their assigned academic advisors during their summer orientations, issues or concerns related to placement in and/or credit for first-year writing courses at NC State may be directed to Roy Stamper, Associate Director of the First-Year Writing Program, at rtstampe@ncsu.edu.

3. Foreign Language Requirement and Placement (Taken during Orientation if needed)

Students enrolling in the College of Humanities and Social Sciences, Exploratory Studies, or the Poole College of Management are encouraged to take the SAT II in a Foreign Language (along with their Math SAT II) so that they will know their foreign language placement before attending Orientation. Students should make arrangements with their high school guidance counselor to take the Math and Foreign Language SAT II Tests.
Students enrolling in Humanities and Social Sciences, Exploratory Studies, or Management who have not taken the SAT II or the AP test in a Foreign Language will be directed to take a placement test during Orientation. Students in all other colleges who did not meet the university FL* 102 proficiency requirement (as explained below), or who wish to take a foreign language, also need to take the placement test during Orientation.

Computerized placement tests in French, German, Spanish and Latin are offered during Orientation. For all other languages, students should go to http://fll.chass.ncsu.edu/index.php and contact the appropriate faculty member. If students are beginning a language they have never studied before, they should enroll in FL *101.

All students at NC State must demonstrate competency at the Elementary II level in a foreign language (FL* 102) as a requirement for graduation. Students who do not meet the proficiency requirement as determined by a review of the student’s high school record by the Office of Undergraduate Admissions, two years of high school study of the same language with a grade of “C” or better in each of the two years, must take a placement test. Students enrolling in programs in which the Intermediate I level (FL *201) is required (CHASS and PCOM), or students in other programs who wish to take a foreign language, must also take a placement test.

For further details regarding the foreign language requirement, and placement testing, please visit:

http://chasslabs.chass.ncsu.edu/fll_placement_tests.php

If you have further questions, please contact Dr. Dudley Marchi, Associate Department Head of the Department of Foreign Languages & Literature, at dmm@ncsu.edu

4. Chemistry Placement Exam (Deadline May 21, 20**)

The chemistry placement exam (CPE) is a tool and process used to help place students into a general chemistry course appropriate for their background. Students with sufficient chemistry background as indicated by a “passing” mark on the CPE satisfy the required prerequisite to enroll in CH 101 Chemistry: A Molecular Science. Those students for whom remedial work is indicated have the following options to satisfy the prerequisites for enrolling in CH 10: (1) taking and passing with a C- or better, CH 111 Preparatory Chemistry or (2) electing to satisfactorily complete a series of online “modules” and subsequent evaluative examinations.

The CPE is composed of a 4 question survey and 36 questions on chemistry and math topics. The CPE is deployed online via Moodle, a course management system. Students must have their NCSU-issued unity ID and password to log into the Moodle site. Students will have 60 minutes upon accessing the exam to complete the questions. Only a single log-in is permitted and each question allows for one submission. Students will need a calculator capable of exponential and logarithmic computations. The CPE will be available from February 22, 2017 to August 21, 2017. Students who need to take the exam should do so by May 21, 2017.
Please note the following:

- The CPE is mandatory for all students planning, or required, to take CH 101. One cannot enroll in CH 101 without satisfactory completion of the CPE. (To determine if you need to take the CPE, go to https://newstudents.dasa.ncsu.edu/chemistry-placement-test/)
- Prepare for the CPE – you have only one attempt at the examination. Chemistry and math topics covered by the CPE and other suggestions may be found at our CPE support website located at https://www.ncsu.edu/chemistry/classes/cpe.html
- The earlier one sits the CPE, the earlier one can register for the appropriate course. Delaying the CPE may result in being enrolled in a course section that is not convenient for your schedule or finding sections unavailable.

Specific instructions for accessing the Chemistry Placement Exam, along with score interpretation guidelines, options subsequent to taking the CPE, and other information (including contact information) may be found at https://www.ncsu.edu/chemistry/classes/cpe.html.

5. Advanced Placement Opportunities at NC State

Students at NC State may receive placement in advanced courses and accelerate their studies through the College Board Advanced Placement Program (AP), the International Baccalaureate Program (IB), the College Level Examination Program (CLEP), or NC State University departmental placement exams.

Each year nearly fifty percent of incoming freshmen at NC State present College Board Advanced Placement (AP) scores to receive advanced placement and/or credit. Typically, students who score 3, 4, or 5 on AP exams can receive advanced placement and/or credit. (Some exams may require a higher minimum score for placement or credit.)

NC State also recognizes the International Baccalaureate (IB) program. Typically, students can earn advanced placement and/or college credit with scores of 5, 6, or 7 on Higher Level exams. (Some exams may require a higher minimum score for placement or credit.) Students will be granted placement or credit on a course-by-course basis, depending upon individual exam scores, rather than on the basis of completion of the IB Diploma.

Students may also earn credit through the College Board's College Level Examination Program (CLEP). Students may earn placement or credit for exam scores of 50 or higher, although credit is not awarded for many CLEP tests.

In order to receive placement or credit for AP, IB, and/or CLEP exams, students must have their official exam scores submitted to the Office of Undergraduate Admissions directly from the testing agency. Scores will not be accepted from high school or college transcripts.
D. Science Requirements

Because forestry, environmental sciences, environmental technology and natural resources management apply scientific principles to the management of natural ecosystems, the FOM, ES, ETM, FWCB and NR curricula require a solid foundation in the basic physical and biological sciences. Courses in biology, physics, botany, chemistry and zoology are required to provide a foundation needed for the core courses in forestry. It is important that all of the basic science courses be taken before the end of the sophomore year because mastery of their contents is fundamental to an understanding of the advanced technical courses that follow in the junior and senior years.

E. FOM Freshman and Sophomore Courses, Course Sequences, and Prerequisites

NR 100 (Introduction to Natural Resources) and SMT 202 (Wood Anatomy and Properties) are taken in the Fall of the Freshman year. FOR 172 (Forest Systems Mapping and Mensuration I) and FOR 339 (Dendrology) are taken in the Fall of the sophomore year. FOR 260 (Forest Ecology) is taken in the Spring of the sophomore year. The Spring semester of each year, forestry students are required to take a professional development course from the following: FOR 150, FOR 250 and FOR 350.

Note:
Students enrolled in the Forest Management curriculum must follow the curriculum and make reasonable progress toward the degree to complete their degree requirements in four years.

A prerequisite course is one that provides important background knowledge that is essential to success in a course. The prerequisite courses listed in the course descriptions in the Undergraduate Catalog for a specific course must be successfully completed (with a C or better grade in many cases) before a student may enroll in the specific course.

The FOM curriculum has a "building block" progression based on sequencing courses in several topical areas and meeting the prerequisites required for many courses. All courses should be taken in the semester scheduled and in the order noted in the curriculum insofar as possible. Deviations should be discussed and cleared with your advisor. The courses in each semester of the junior year must be taken as a concurrent group. Students should be aware of the prerequisites for all courses and be aware of courses that are taught only once per year in a particular semester; see course descriptions in the Undergraduate Catalog. Absolute prerequisites are listed below:

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>MA 114</td>
<td>MA 101</td>
</tr>
<tr>
<td>MA 121</td>
<td>MA 107 or 111</td>
</tr>
<tr>
<td>CH 101</td>
<td>Eligibility for MA 107 or MA 111 with a C or better</td>
</tr>
<tr>
<td>CH 201</td>
<td>CH 101 with C or better</td>
</tr>
<tr>
<td>SSC 200</td>
<td>CH 101</td>
</tr>
<tr>
<td>ARE 201</td>
<td>MA111</td>
</tr>
</tbody>
</table>

Students who must take a remedial math should discuss curriculum planning with your advisor.
prior to the Fall pre-registration period and work out a plan for the freshman and sophomore years. Rising sophomores who have not completed all freshman courses are urged to attend summer school to catch up with the curriculum schedule.

F. Forestry and Fisheries, Wildlife, and Conservation Biology Summer Camp

The Forest Management curriculum requires that each student attend a summer camp after their Sophomore year. Students in the Fisheries, Wildlife, & Conservation Biology curricula are required to attend summer camp after their Junior year. This camp is a full-time residential program that lasts 9 weeks. Students register for the regular NCSU summer school session but live, learn, and work on the University’s 2,400-acre Hill Demonstration Forest, located 14 miles north of Durham, NC. Specific objectives of this Camp experience include:

1) To provide instruction in ecosystem concepts, structure and function of plant and animal communities, management practices, and practical field skills.

2) To introduce students to a variety of realistic work environments and practices to enable them to better evaluate forestry as a career.

3) To expand the students’ practical knowledge in a variety of subjects related to the curriculum, and enhance their ability to understand and apply subjects covered in the advanced professional courses.

4) To enhance students’ leadership abilities and professionalism and provide practical experience in teamwork.

At the Camp, students live in rustic but modern cottages and eat in a mess hall which serves three hot meals daily. Coursework is a combination of classroom instruction and applied outdoor exercises that meet 8 hours/day Monday - Friday. The Camp program consists of the following courses, depending on your curriculum. Students must achieve a C or better in each:

<table>
<thead>
<tr>
<th>Course #</th>
<th>Course Title</th>
<th>Credits</th>
<th>Weeks</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>FOR 204</td>
<td>Silviculture</td>
<td>2</td>
<td>7,8</td>
<td>Snider</td>
</tr>
<tr>
<td>FOR 261</td>
<td>Forest Communities</td>
<td>2</td>
<td>5,10</td>
<td>Braham</td>
</tr>
<tr>
<td>FOR 264</td>
<td>Forest Wildlife</td>
<td>1</td>
<td>4</td>
<td>Moorman</td>
</tr>
<tr>
<td>FOR 265</td>
<td>Fire Management</td>
<td>1</td>
<td>6</td>
<td>Roise</td>
</tr>
<tr>
<td>FOR 273</td>
<td>Mapping &amp; Mensuration</td>
<td>3</td>
<td>1,2,3</td>
<td>Catts/Haunsperger</td>
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<table>
<thead>
<tr>
<th>Course #</th>
<th>Course Title</th>
<th>Credits</th>
<th>Weeks</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW 311</td>
<td>Fisheries/Wildlife Inventory &amp; Mgmt</td>
<td>3</td>
<td>2,3,4</td>
<td>DePerno</td>
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<tr>
<td>FW 312</td>
<td>Fisheries Techniques &amp; Mgmt</td>
<td>1</td>
<td>5</td>
<td>Kwak</td>
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<td>FW 313</td>
<td>Mountain Wildlife</td>
<td>1</td>
<td>6</td>
<td>Pacifici</td>
</tr>
</tbody>
</table>
Grading is based on the student's performance both individually and as a member of a team, on written reports, and on examinations.

Costs include summer school tuition and fees for 9 credits, a camp fee for costs of meals at Slocum Camp and room and board for trips to the Coastal Plain and Mountains and required equipment, textbooks, and supplies. For planning purposes, Forestry/Fish & Wildlife Summer Camp 2016 costs are shown below. **These costs are estimated using Spring 2016 rates and fees, as Tuition is not set by the Department.**

<table>
<thead>
<tr>
<th>Camp Fees:</th>
<th>FOM</th>
<th>FWCB</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>$1527.00</td>
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<table>
<thead>
<tr>
<th>Tuition and Fees:</th>
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<tr>
<td>Non-Resident FOM</td>
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<tr>
<td>Resident FWCB</td>
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<tr>
<td>Non-Resident FWCB</td>
<td>$5057.00</td>
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<table>
<thead>
<tr>
<th>Misc. charges for textbooks, supplies, etc.</th>
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<th>FWCB</th>
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<tbody>
<tr>
<td>FOM</td>
<td>~$560.00</td>
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</tr>
<tr>
<td>FWCB</td>
<td>~$466.00</td>
<td></td>
</tr>
</tbody>
</table>

Camp instruction is by faculty of the College of Natural Resources, assisted by qualified assistants.

**Administrative & Instructional Staff are:**

- Dr. Jeffrey Buckel   Marine Fisheries
- Dr. Richard R. Braham Forest Communities
- Ms. Elizabeth Snider  Silviculture
- Dr. Chris DePerno    Wildlife
- Dr. Thomas Kwak      Inland Fisheries
- Dr. Chris Moorman    Forest Wildlife
- Dr. Joe Roise        Fire Management
- Matthew Haunsperger  Mapping and Mensuration
- Dr. Lara Pacifici    Mountain Wildlife

Because Forestry Summer Camp is a critical element of the "building block" progression of the Forest Management Curriculum, adequate preparation for the camp is important to succeed there, as well as for preparation for the core junior - senior courses. The students attending summer camp should try to complete all Freshman and Sophomore courses.
FOM sophomores who are eligible for Summer Camp, are notified in January-February of each year. Arrangements for enrollment into Summer Camp are announced at a meeting held during March each year. Students expecting to attend summer camp must attend this meeting.

A student receiving a grade of D or F in any course at summer camp must make up those hours in order to satisfy graduation requirements. The make-up can be done by retaking the course or portions thereof or a substitute course as required by the course instructor.

G. FOM Junior-Senior Course Sequences and Prerequisites

Forestry Summer Camp is a General Prerequisite for all Junior and Senior Forestry courses. As with the freshman-sophomore courses, the junior-senior courses have a building block sequence to which the student must adhere. All of the courses of the Fall semester of the junior year must be taken as a concurrent group and that whole group of courses is prerequisite to the courses of the Spring semester of the junior year that also must be taken as a concurrent group. In turn, the group of Spring semester junior courses are prerequisite to FOR 405.

Absolute prerequisites for junior-senior core courses are outlined below. Forestry core courses require a C or better.

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOR 303</td>
<td>CH 101 &amp; 103 &amp; CH 201 &amp; 202 or CH 203 &amp; 204 or PY 205 or PY 211; Summer Camp</td>
</tr>
<tr>
<td>FOR 304</td>
<td>FOR 260</td>
</tr>
<tr>
<td>FOR 319</td>
<td>ARE 201 or EC 205 or EC 201; Summer Camp</td>
</tr>
<tr>
<td>FOR 353</td>
<td>MA 114 or MA 121 or MA 131 or MA 141; Summer Camp</td>
</tr>
<tr>
<td>FOR 374</td>
<td>FOR 273</td>
</tr>
<tr>
<td>FOR 318</td>
<td>PB 200</td>
</tr>
<tr>
<td>FOR (ENT) 402</td>
<td>Junior Standing</td>
</tr>
<tr>
<td>FOR 405</td>
<td>FOR 304, 319, 374</td>
</tr>
<tr>
<td>FOR 406</td>
<td>FOR 405, 460</td>
</tr>
</tbody>
</table>

H. NR Course Sequences and Prerequisites

The NRE and NRP curricula have a broader complement of upper level courses and are somewhat more flexible than ES, FOM and ETM. However, the curriculum structure is purposeful and should be followed as closely as possible. Many of the 100, 200, and 300 level courses are taught both semesters (and some in summer school) but some of the 300 level courses and all of the 400 level courses are taught only in the semester shown on the curriculum.

<table>
<thead>
<tr>
<th>Course</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH 101</td>
<td>One year of high school chemistry and successful completion of the CPE or Chem Modules Exam, or completion of CH 111 with C- or better.</td>
</tr>
</tbody>
</table>
CH 201
CH 101 with C- or better, CH 102 and eligibility for MA 121 or higher
MA 131
C- or better in MA 107 or MA 111, or 520 or better on the SAT subject test in Mathematics Level 2 or the NCSU Math Skills Test or 2 or better on an AP Calculus exam. Credit is not allowed for both MA 131 and MA 121 or MA 141
MA 231
MA 131 or MA 141; Credit is not allowed for both MA 231 and MA 241
SSC 200
CH 100 or CH 101
ARE 336
ARE 201 or EC 201 or EC 205
NR 300
PB 360 or BIO 360 and ST 311
NR 360
NR 301 and Junior standing
NR 401
NR 360
NR 484
NR 300 or ET 310 or FOR 260 or SSC 442

The 400 level courses of the senior year in NRE and NRP are a capstone group that requires completion of the majority of the lower level courses.

I. Additional Graduation Requirements

Students in the FOM curriculum must earn a minimum grade of C- in ENG 101 and maintain a Major Grade Point Average (MGPA) of 2.0 or better in all forestry courses. A student with an MGPA less than a C will be allowed to proceed with the curriculum, but must improve his/her average to a C or better in order to graduate. If the student has more than one F in his/her forestry courses in a given semester, that student will not be allowed to proceed with the curriculum until those courses are repeated with a C or better grade in order to meet the MGPA requirement.
CH. 4. ELECTIVE COURSES AND PROGRAMS: ELECTIVES, DEGREE MINORS, DUAL DEGREES, COOPERATIVE EDUCATION PROGRAM

A. General

The Environmental Science; Environmental Technology and Management; Forest Management; Fisheries, Wildlife, and Conservation Biology and the Natural Resources curricula are designed to provide students with a broad education that prepares them not only for a career but to face the complexities of modern life, to enjoy its many amenities and to serve as good citizens of society. The Humanities and Social Science electives in the curricula provide students the opportunities to take courses that support their major, broaden their education, or expand their knowledge in areas of personal interest. Degree Minors, Dual Degrees, and the Cooperative Education Program provide specific opportunities for broadening the scope of the major, for developing a specialty associated with the major, or in the case of the Co-op Program, gaining valuable on-the-job experience. A certain degree of flexibility may allow certain students, particularly those with good academic records, in making course substitutions within the major to support dual degrees, specializations, or graduate school planning.

B. NCSU Foreign Language Requirement for 2016-2017

1) Students are required to demonstrate competency at the FL*102 level in a modern or classical foreign language as a requirement for graduation from NCSU.

2) Freshmen may satisfy this requirement before entering NCSU in one of the following ways:

   a) Score of 510 or above on the College Board Foreign Language Achievement Test (SAT II)
   b) Completing 2 years of high school study of the same language with a grade better than a C- in each of the 2 years
   c) Passing grade at the FL*102 level (letter-grade required)
   d) Placement into FL*201 by examination

3) Proficiency at the FL*102 level after entering NCSU may be demonstrated as follows:

   a) Completion of a FL*102 course with a passing grade of S, D or better.
   b) Transfer credit equivalent to FL*102 from an accredited institution or University-approved study abroad program.
   c) Placement into FL*201 or higher on the placement test in the languages offered by the Department of Foreign Languages and Literatures

4) Advanced placement credit will be awarded as follows:

   a) Students earning a score of 4 on the Advanced Placement Foreign Language Test in high school will have met the university proficiency requirement and will obtain three hours of advanced placement credit for FL*201 upon completion of
FL*202 with a grade of C- or better on the first attempt. Students earning a score of 5 on the Advanced Placement Foreign Language Test can obtain six hours of advanced placement credit for FL*201 and 202 upon completion of a 300-level course with a grade of C- or better on the first attempt.

b) Students who place into FL*201 on the basis of the SAT II Test or the NCSU Placement Test will have met the FL*201 requirement and are eligible to receive three hours of advanced placement credit by enrolling in the course into which they placed and earned a grade of C- or better on the first attempt. Students completing FL*202 with a C- or better on the first attempt will receive credit for FL*201 and FL*202.

5) Native speakers of languages other than English do not take the NCSU Placement Test and do not receive credit for FL 101-102 in their native language. They do, however, fulfill the foreign language proficiency requirement and can receive certification by contacting the Associate Department Head.

6) FL*101 or 102 in a foreign language other than the one in which proficiency is certified may be used to fulfill the one semester advanced writing/speech/foreign language general education requirement or may be counted as a free elective.

7) American Sign Language (ASL) is accepted in satisfying the foreign language proficiency requirement with 2 years of ASL in high school with a grade “C” or better in each year.

8) The Cherokee language is an accepted language for satisfying the foreign language requirement.

C. General Education Program Requirements

As of Summer Session II, 2009, undergraduates at NCSU are required to have 39 credit hours in the General Education category. Those requirements are broken down as follows:

GEP Category Requirements:

- Mathematical Sciences – 6 credit hours. At least one course must have an MA or ST prefix.
- Natural Sciences – 7 credit hours. At least one laboratory course or course with a laboratory.
- Humanities – 6 credit hours. Selected courses must be from two different disciplines.
- Social Sciences – 6 credit hours. Selected courses must be from two different disciplines.
- Additional Breadth category – 3 credit hours. Select Additional Breadth course from either the Humanities/Social Sciences/Visual and Performing Arts course lists OR Mathematics/Natural Sciences/Engineering courses lists, depending on your Major.
- Interdisciplinary Perspectives – 5-6 credit hours
- Health and Exercise Studies – 2 credit hours. Must include one Fitness and Wellness HESF 100-level course.
• Introduction to Writing – 4 credit hours satisfied by completing ENG 101 with a C- or better

**GEP Co-Requisite Requirements:**

• U.S. Diversity (USD) – Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite.

• Global Knowledge (GK) – Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite.

• FL* 102 level proficiency is required for graduation.

• Communication in the Major (requirement fulfilled within the curriculum requirements)

• Technology Fluency (requirement fulfilled within the curriculum requirements)

See GEP Requirements online at [https://oucc.dasa.ncsu.edu/general-education-program-gep/gep-category-requirements/](https://oucc.dasa.ncsu.edu/general-education-program-gep/gep-category-requirements/)

The general education course lists are continuously updated. For a complete listing of GEP courses, broken down by category, go to [https://oucc.dasa.ncsu.edu/general-education-program-gep/gep-course-lists-2/](https://oucc.dasa.ncsu.edu/general-education-program-gep/gep-course-lists-2/)

**D. Leadership and Teamwork**

An important component of a professional education is learning how to lead others and how to work effectively in teams. Much of that learning occurs in both formal and informal situations in courses in both the FOM and NR curricula where the students work in teams. A program with more formal educational activities to assist in the development of leadership and teamwork skills has been incorporated into the Forest Management curriculum. Specific instruction and practice in leadership and teamwork concepts and skills are incorporated into several of the courses. Of course, all students are encouraged to consider taking courses in the Leadership Development Series as a routine part of their course selection each semester. There is a nominal fee of $5.00 for each leadership module, but the College of Natural Resources pays a group fee each semester so that students in this college may take an unlimited number of leadership series modules free of charge. Visit the Center for Student Leadership, Ethics & Public Service, 4111 Talley Student Union, to obtain a Leadership Development Series schedule or to use the library of leadership resources and reference materials. All courses completed are recorded on the leadership transcript that is maintained by the University Registrar and is issued as part of the academic transcript. For more information see the web page: [https://csleps.dasa.ncsu.edu/leadership-development-series/](https://csleps.dasa.ncsu.edu/leadership-development-series/)

**E. Degree Minor Programs**

Minor programs are available in a number of academic departments and interdisciplinary programs. Such minors provide the student with the opportunity to take a group of courses so as to develop greater knowledge and expertise in a defined area of study. A minor may be particularly helpful if the student wishes to take course work in a field distantly removed from ES, ETM, FOM,
FWCB or NR, yet which complements the major and provides greater depth than would be obtained by taking a sampling of courses in the other area. If a student minors in a given area, a statement to that effect appears on the university transcript.
A list of approved minors, together with the address and phone number of the sponsoring department can be found at: https://oucc.dasa.ncsu.edu/undergraduate-academic-programs/academic-minors/

Examples of the courses required for popular minors taken by students enrolled in the Department of Forestry and Environmental Resources are:

1. **Minor in Forest Management (15 credit hours)**

Open to all students enrolled at NCSU except FOM majors.

**Requirements:**
- Requires completion of 15 credit hours, selected from each of two categories in one of the following options
- A grade of “C” or better is required in all courses in the minor

**Option 1**

**Required Courses (9 credit hours):**
- FOR 172 Forest System Mapping and Mensuration 1 (2 cr)
- FOR 339 Dendrology (4 cr)
- FOR 252 Introduction to Forest Science (3 cr)

**Elective Courses (6 credit hours) – Take any two (2) of the following courses:**
- FOR 248 Forest History, Technology and Society (3 cr)
- FOR 260 Forest Ecology (3 cr)
- FOR 303 Silvics and Forest Tree Physiology (3 cr)
- FOR 330 North Carolina Forests (3 cr)
- FOR 353 Air Photo Interpretation and Photogrammetry (3 cr)
- FOR 414 World Forestry (3 cr)
- NR 460 Renewable Natural Resource Management and Policy (3 cr)

**Option 2**

**Required Courses (15 credit hours):**
- FOR 172 Forest System Mapping and Mensuration 1 (2 cr)
- FOR 339 Dendrology (4 cr)

**Attend Forestry summer camp and take the following five (5) courses (9 hours):**
- FOR 204 Silviculture (2 cr)
- FOR 261 Forest Communities (2 cr)
- FOR 264 Forest Wildlife (1 cr)
- FOR 265 Fire Management (1 cr)
- FOR 273 Forest System Mapping and Mensuration II (3 cr)
Elective Courses
None

For additional information, contact Dr. Gary Blank, Department of Forestry and Environmental Resources, gary_blank@ncsu.edu, Ph. 919-515-7566.

2. Minor in Wetlands Assessment

The Undergraduate Minor in Wetland Assessment is an interdisciplinary, interdepartmental minor that is designed to provide NCSU students with the requisite knowledge and skills needed for entry level competence in the field of wetland delineation and assessment. Soils, hydrology, and plant identification courses of the minor build the scientific background and skills needed to understand the structure and functions of wetland ecosystems and to apply assessment protocols. The capstone course, NR 421 Wetland Assessment, Delineation, and Regulation, focuses on further development of knowledge and skills in applying wetlands assessment, delineation, and regulation procedures.

Requirements:
- The minor in Wetlands Assessment consists of 17 credit hours (5 courses) as specified below.
- BO 405 and FOR (NR) 420 are prerequisites of NR 421 and therefore must be completed before enrolling in NR 421. NR 421 is the capstone course of the minor and should be taken last.
- Successful completion of 60 credit hours and all courses that are prerequisites to courses in the minor prior to admission to the minor.

Required Courses:
- PB 405 Wetland Flora (3 cr) (Offered in Fall)
- FOR/NR 420 Watershed and Wetlands Hydrology (4 cr) (Fall)
- SSC 452 Soil Classification (4 cr) (Spring)
- SSC 470 Wetland Soils (3 cr) (Fall)
- NR 421 Wetland Assessment, Delineation, and Regulation (3 cr) (Spring)

Students interested in this minor should contact Dr. Ryan Emanuel, Department of Forestry and Environmental Resources, ryan_emanuel@ncsu.edu, Ph. 919-513-2511. Application forms for the minor will serve as the work plan and a copy will be forwarded to the student’s major advisor.

Certification
Certification of the minor should also be completed with Dr. Emanuel. The minor must be completed no later than the semester in which the student expects to graduate from his or her degree program. Paperwork for certification can be found in 2217 Jordan Addition and should be completed no later than during the registration period for the student’s final semester at NC State.
3. Minor in Entomology

The Department of Entomology offers an undergraduate minor in Entomology intended for students who are interested in insects, their management, and their role in the functioning of nature and agricultural ecosystems. Insects represent the single largest group of animal species – they impact every facet of human life and they are a very important part of our environment. This minor provides an opportunity for students to become familiar with the great diversity of insect life, to explore their form and function, to study their impact on and relationships with plants, humans, and other animals, and to learn about various methods of control.

Requirements:
- Program requires 15 semester hours
- A grade of “C-“ or better is required for all courses to fulfill the minor requirements.
- Students must take ENT 425 (General Entomology-3 cr) or ENT 402 (Forest Entomology-3 cr), plus 12 hours from the elective course list below.
- However, of these 12 hours of elective courses, at least 6 hours must be ENT courses.

Required Course (3 credit hours):
- ENT 425  General Entomology (3 cr) or ENT 402 Forest Entomology (3 cr)

Elective Courses (12 credit hours) At least 2 of the 2 courses must be ENT courses:
- ENT 201 Insects and People (3 cr)
- ENT 203 Intro to Honey Bee and Beekeeping (3 cr)
- ENT 207 Insects and Human Disease (3 cr)
- ENT 305 Introduction to Forensic Entomology (3 cr)
- ENT 401/501 Honey Bee Biology and Management (3 cr)
- ENT 402 Forest Entomology (3 cr)
- ENT 425 General Entomology (3 cr)
- ENT 492 External Learning Experience (1-6 cr)
- ENT 493 Special Problems in Entomology (1-6 cr)
- ENT 495 Special Topics in Entomology (1-3 cr)
- ENT 502 Insect Diversity (4 cr)
- ENT 503 Insect Morphology and Physiology (4 cr)
- ENT (ZO) 509 Biology of Aquatic Insects (4 cr)
- ENT 550 Fundamentals of Arthropod Management (3 cr)
- ENT (ZO) 582 Medical and Veterinary Entomology (3 cr)
- ENT 620 Special Problems (Arranged)
- ENT 641 Agricultural Entomology Practicum (3 cr)
- ENT 720 Insect Pathology (3 cr)
- ENT 726 Biological Control of Insects and Weeds (3 cr)
- ENT 731 Insect Ecology (3 cr)
- ENT 741 Immature Insects (3 cr)
- ENT 762 Insect Pest Management in Agricultural Crops (3 cr)
- ENT (FOR) 765 Advanced Forest Entomology (3 cr)
- BIO/PB 360 Ecology (3 cr)
- BO 365 Ecology Laboratory (1 cr)
- PB 403 Systematic Botany (4 cr)
- CS 415 Integrated Pest Management (3 cr)
- ZO 315 General Parasitology (3 cr)
- ZO 402 Invertebrate Biology (3 cr)
- ZO 410 Introduction to Animal Behavior (3 cr)

**Admissions**
The Undergraduate minor program in Entomology is coordinated by Dr. John R. Meyer, the Entomology Undergraduate Teaching Coordinator, who acts as the minor advisor or assigns a minor advisor appropriate to the interests of the student.

For more information about the Entomology Minor, please contact Dr. John Meyer, Entomology Undergraduate Teaching Coordinator, john_meyer@ncsu.edu, ph. 919-515-1659.

**Certification**
Dr. Meyer will certify the minor prior to graduation. The minor must be completed no later than the semester in which the student expects to graduate from his or her degree program. Paperwork for certification should be completed no later than during the registration period for the student’s final semester at NC State.

4. **Minor in Business Administration**

Students who fulfill the requirements for the undergraduate Minor in Business Administration will gain an understanding of the language and basic concepts of business, fundamentals of economics, and core concepts of financial accounting. Expanding on that core foundation, students will pursue a focus in either general management or entrepreneurship. The Minor in Business Administration requires 18 hours of coursework with a 2.0 GPA in minor coursework.

**Course Requirements - Business Administration Core (9 credit hours):**
- MIE 201 Introduction to Business Processes (3 cr)
- EC 205(C- or better) Fundamentals of Economics (3 cr)
- ACC 200 or 210 (C- or better) Introduction to Managerial Accounting or Concepts of Financial Reporting (3 cr)

**EC 205 may be replaced by EC 201 or ARE 201 with C- or better.**

**General Management Focus (9 credit hours):**
- BUS 305/MIE 305 Legal and Regulatory Environment (3 cr)
- MIE 310 Introduction to Entrepreneurship (3 cr)
- BUS 320 Financial Management (3 cr) (ACC 210 a prerequisite)
- MIE 330 Human Resource Management (3 cr)
- BUS 340 Information Systems Management (3 cr) ***
- BUS 360 Marketing Methods (3 cr)
BUS 370 Operations Management (3 cr)

Entrepreneurship Focus (9 credit hours):
- MIE 310 Introduction to Entrepreneurship (3 cr)

Plus any two of the following courses:
- MIE 410 Business Opportunity Analysis (3 cr)
- MIE 411 Managing the Growth Venture (3 cr)
- MIE 412 Finance and Accounting for Entrepreneurs
- MIE 413 New Venture Planning
- MIE 416 The Legal Dynamics of Entrepreneurship
- MIE 418 Social Entrepreneurship Practicum
- MIE 419 Entrepreneurship Practicum

Admissions
Admission to the minor is competitive. Applicants are considered based on overall academic performance. To be eligible for consideration, a student must have completed at least 30 hours of coursework (not including courses currently in progress), with at least 15 successfully completed at NC State. Meeting these eligibility requirements does not guarantee admission to the Minor in Business Administration.

Application deadlines: September 15, February 15 and June 1.

Students will be notified one month after the application deadline regarding the status of their application.

Certification
Students must earn at least a 2.0 GPA in their Minor coursework to be certified for a minor. Students may not take Minor coursework on a credit only (pass/fail) basis. No more than six (6) hours of transfer credit can be counted toward minor requirements. The Office of Undergraduate Programs, 2150 Nelson Hall must approve any transfer credits taken toward the minor. The minor must be completed no later than the semester in which the student expects to graduate from his or her degree program.

Students interested in applying for the Minor in Business Administration the Undergraduate Programs Office at 2150 Nelson Hall, Ph. 515-5565.

5. Minor in Economics

The Department of Economics offers an undergraduate Minor in Economics to all undergraduate majors outside the Department of Economics. The Minor in Economics is designed to help students develop a basic understanding of the principles and applications of economics. By pursuing this minor the student will: develop an understanding of microeconomic and macroeconomic theory and the role of markets, understand the effects of government regulation and policy on economic behavior, learn to apply economics to contemporary social and market issues and develop
analytical skills.

Requirements:
- Requires 15 hours of economics including EC 205, EC (ARE) 301, EC 302, and two economics electives.
- GPA of 2.0 or greater is required in all economics courses (EC, ECG and ARE) attempted at State.
- At least three (3) 300 level and above courses must be completed in residence at NC State.
- Courses for the minor may not be taken for credit only (pass/fail).
- All transfer credits must be approved by the Poole College of Management Office of Undergraduate Programs in 2150 Nelson Hall

Required Courses (9 credit hours):
- EC 205 Fundamentals of Economics (3 cr) **EC/ARE 201 may substitute for EC 205**
- EC/ARE 301 Intermediate Microeconomics (3 cr)
- EC 302 Intermediate Macroeconomics (3 cr)

Elective Courses (6 credit hours):
- Select two courses from any 300, 400, and/or 500 level EC/ECG Economics courses, except EC 310.

Admission
To be admitted into the Economics Minor, students must have a 3.0 or better cumulative NC State GPA and complete a minor declaration form available at [http://poole.ncsu.edu/undergraduate/images/pages/Minor%20declaration%20form.pdf](http://poole.ncsu.edu/undergraduate/images/pages/Minor%20declaration%20form.pdf)

The completed form should be submitted to the Poole College of Management Office of Undergraduate Programs (2150 Nelson Hall). Staff in that office will address providing the Minor Coordinator’s name and signature, and submit the form to Registration and Records for processing.

Certification
The minor must be completed no later than the semester in which the student expects to graduate from his or her degree program. If transfer credits contribute to the completion of the minor, students need to ensure that official transcripts are sent and processed at NC State.

6. Minor in Parks, Recreation, and Tourism Management

The academic minor in Parks, Recreation and Tourism Management is offered to students interested in gaining a basic knowledge of recreation, tourism and park services and an understanding of the benefits of leisure and recreation in our society. To complete the minor, students must take six hours of required courses and nine hours of electives. These courses provide undergraduates with the opportunity to explore recreation, parks and leisure services as a potential for graduate work.
Requirements:
- Minimum of 15 hours (5 courses) are required to complete the minor in Park, Recreation, and Tourism Management.
- Students must take 6 hours of required courses and 9 hours of electives.
- A grade of C- or better is required in all courses to be used towards the minor.
- No more than six (6) hours of transfer credits can be used toward the minor. The Parks, Recreation and Tourism Management Director of Undergraduate Programs must approve all transfer credits.

Required Courses (6 credit hours):
- PRT 152 Introduction to Parks, Recreation, and Tourism (3 cr)
- PRT 358 The Recreation Program (3 cr) **Pre-requisite PRT 152**

Elective Courses (9 credit hours):
- PRT 200 Leisure Behavior, Health and Wellness
- PRT 220 Commercial Recreation and Tourism Management **Pre-requisite PRT 152**
- PRT 238 Inclusive Recreation **Pre-requisite PRT 152**
- PRT 250 Managing Park and Recreation Facilities **Pre-requisite PRT 152**
- PRT 266 Introduction to Sport Management
- PRT 315 Organization and Administration of Adventure Programs
- PRT 350 Outdoor Recreation Management **Pre-requisite PRT 152**
- PRT 407 Services, Facilities, and Event Marketing
- PRT 420 Resort Planning and Management **Pre-requisite PRT 152**
- PRT 442 Recreation and Park Interpretive Services **Pre-requisite Junior standing**
- PRT 451 Principles of Recreation Planning and Facility Development **Pre-requisite PRT 358**
- PRT 458 Special Events Planning **Pre-requisite PRT 358**
- GIS 410 Introduction to Geographic Information Systems

Admissions and Certification of Minor
Admission to the minor is competitive and applicants will be considered based on their overall academic performance. To be eligible for consideration, a student must have successfully completed at least 15 hours of coursework at NC State. Meeting the eligibility requirements does not guarantee admission to the Minor in PRTM. Students are encouraged to begin the PRTM Minor prior to their senior year. Seat availability cannot be guaranteed in Minor classes if a student only has two semesters in which to complete the Minor.

Sport Management and Professional Golf Management majors may not complete the Minor in Parks, Recreation and Tourism Management.

Application Deadlines
Interested students should submit a completed Declare a Minor Form to the contact person listed below by one of the following deadlines: September 20, January 20 and June 1. If the application date falls on a weekend, the application is due Monday following the deadline. The form is located on Registration and Records under forms.
Students will be notified one month after the application deadline regarding the status of their application. Once accepted into the PRTM minor, students will be able to sign up for the minor courses. A limited number of minor seats will be reserved in the PRT courses on the minor list.

7. Minor in Sustainable Materials and Technology

The Department of Forest Biomaterials offers a minor in Sustainable Materials and Technology (SMT) to all undergraduates enrolled in the University as degree candidates except those in Forest Biomaterials. The minor will provide students with a basic understanding of the sustainability as applied to materials (e.g., wood, agricultural products, etc.) and the manufacturing processes that are used to convert them into a multitude of different products.

Requirements:
- Minimum of 15 hours is required for completion of the minor, and the minor should be completed no later than the semester in which the student expects to graduate from his/her degree program.
- 3 courses are required as indicated below, other courses are elective.
- An overall GPA of 2.0 in the minor coursework must be achieved.

Required Courses (8 semester hours):
- SMT 201 Sustainable Materials for Green Housing (2 cr)
- SMT 310 Introduction to Industrial Ecology (3 cr)
- PSE/WPS 476 Environmental Life Cycle Analysis (3 cr)

Elective Courses (minimum of 7 semester hours is required):
- SMT 231 Sustainable Manufacturing (2 cr)
- SMT 230 Sustainable Materials & Global Trade (2 cr) OR NR 350 International Sustainable Resources Use (4 cr)
- SMT 232 Recycling to Create a Sustainable Environment (2 cr)
- ET 203 Pollution Prevention (1 cr)
- ET 303 Laboratory Safety Systems & Management (1 cr)
- ET 410 Toxic Substances & Society (3 cr)
- FOR 248 Forestry History, Technology, & Society (3 cr)
- PSE 425 Bioenergy & Biomaterials Engineering (3 cr)
- PRT 250 Management of Parks & Recreation Facilities (3 cr)
- PRT 451 Principles of Recreation Planning & Facility Development (3 cr)

Admission and Certification of Minor
In both instances students should contact the minor advisor, Dr. Perry Peralta. Paperwork for certification can be found in 1022 Biltmore Hall and should be completed no later than the registration period for the student’s final semester at NC State.

Contact Person
Dr. Perry Peralta, 1022 Biltmore Hall, ph. 919-515-5731, perry_peralta@ncsu.edu
8. Minor in Environmental Science

The Environmental Science minor allows students to connect the topics from their major to the compelling, contemporary issues that connect humans to the environment. The minor includes courses in all academic units to provide links between disciplines and to provide a foundation for analysis of environmental issues.

Requirements
To complete the ES minor, students must complete the 15 credit hours by taking three of the ES Core courses earning 9 credits with a C- or better grade in each course. Students must then complete two additional elective courses with a C- or better from the approved list. A student may not major and minor in Environmental Science.

Required Courses (select three courses (9 cr) from the Environmental Science Core Course List):
- ES 100 Introduction to Environmental Science
- ES 200 Climate Change and Sustainability
- ES 300 Energy and the Environment
- ES 400 Analysis of Environmental Issues

Elective Courses (6 credit hours):
Choose two courses from one, or any, of the groups listed below. Course substitutions may be made with minor advisor approval.

Group I – Biological Science:
- MEA (BIO) 220 Marine Biology **this course has a pre-requisite**
- FW (BIO) 221 Conservation of Natural Resources
- PB/BIO 360 Ecology **This course has a pre-requisite**
- BIO 181 Introductory Biology: Ecology, Evolution, and Biodiversity
- FOR 252 Introduction to Forest Science

Group II – Physical Science:
- MEA 101 & MEA 110 Geology I: Physical with Lab
- MEA 130 & MEA 135 Introduction to Weather and Climate with Lab
- MEA 140 Natural Hazards and Global Change
- SSC 200 Soil Science **This course has a pre-requisite**
- MEA 200 Introduction to Oceanography
- CE 373 Fundamentals of Environmental Engineering

Group III – Social Science:
- IDS 201 Environmental Ethics
- NR/IDS 303 Humans and the Environment
- STS 322 Technological Catastrophes
- PHI 422 Philosophical Issues in Environmental Ethics
Group IV – Advanced Courses:

- MEA 300 Environmental Geology **this course has a pre-requisite**
- SSC 361 Role of Soils in Environmental Management
- NR 460 Renewable Resources Policy and Management
- ET 410 Toxic Substances and Society (formerly MDS 410)
- EC 436 Environmental Economics
- FW (BIO) 430 Fisheries and Wildlife Administration
- BIO 402 Invertebrate Zoology
- HI 440 American Environmental History **this course has a pre-requisite**
- NR 406 Conservation of Biological Diversity **this course has a pre-requisite**
- SOC 450 Environmental Sociology **this course has a pre-requisite**

Admission and Certification

Any student with an interest in an Environment Science minor should see the contact person listed below to discuss their interest in the minor, course requirements and complete the Declaration of Minor form to be submitted to the Office of Registration and Records. Students must have a minimum overall grade point average of 2.0 to be admitted to the minor.

The Environmental Science Committee will review the student’s record and certify that the student has completed the requirements for the minor. The minor must be completed no later than the semester in which the student expects to graduate from his or her degree program. Paperwork for certification should be completed no later than during the registration period for the student’s final semester at NC State.

Contact Person
Dr. William E. Winner, 2231 Jordan Addition, ph. 919-515-5780, wewinner@ncsu.edu

9. Wildlife Sciences Minor

This minor will provide basic ecological and management knowledge about, and will cultivate an appreciation for, the value of wildlife resources. The objective of the wildlife sciences minor is to provide students, who might pursue careers in related areas of natural resources management, with basic ecological and management knowledge about wildlife resources. Additionally, the minor will provide students majoring in unrelated fields with an appreciation for the value wildlife resources and the need for sound management.

Requirements

- Completion of 16-17 credit hours.
- Overall GPA must be above 2.5.

Required courses (13-14 credit hours):
• FW 221 Conservation of Natural Resources (3 cr)
• BIO 360/PB 360 Ecology
• FOR 260 Forest Ecology (3-4 cr)
• FW 353 Wildlife Management (3 cr)

**Elective Courses (3 credit hours):**
Choose 1 course from the following list:
• FW 404 Forest Wildlife Management (3 cr)
• FW 411 Human Dimensions in Wildlife (3 cr)
• FW 460 International Wildlife Management and Conservation (3 cr)
• FW 444 Mammalogy (3 cr)
• FW 453 Principles of Wildlife Science (4 cr)
• FW 405 Tropical Wildlife Ecology in Nicaragua (3 cr) or FW 465 African Ecology and Conservation (3 cr) or FW 445 Ecology, Evolution and Sociology of Conservation Biology in the Bahamas (6 cr)

**Admission and Certification of Minor**
Students must have a GPA of 2.5 or above to be admitted into the minor. Any student seeking a minor must consult with the minor advisor on a plan of work and must file the appropriate paperwork to declare the minor through the office of Registration and Records. Declaring a minor too late may result in recognition of the minor NOT appearing on the student’s final transcript.

The wildlife minor is not available to fisheries and wildlife sciences majors.

10. **Renewable Energy Assessment Minor or Certificate**

If you are currently enrolled as an undergraduate student at NCSU, you can choose either the REA Minor or Certificate, depending on which program better suits your schedule and academic goals.

The certificate requires only 12 hours and both ET 120 and ET 262 must be completed. The minor requires all courses, including the Renewable Energy Assessment Practicum (ET 484), which is a 1-credit course that requires meeting with the instructor.

All REA courses are offered by the Environmental Technology and Management (ETM) program in the Department of Forestry and Environmental Resources in the College of Natural Resources. With the exception of ET 484, all courses are available exclusively online.

Please see below for a listing of available courses and any pre-requirements. ET 120 and ET 262 are required regardless of whether you choose the minor or the certificate. ET 120 is a pre-requisite for all other courses in the program. For either the minor or the certificate, you can choose two of the three remaining course (ET 220, ET 240 and ET 255).

**Required Courses**
• ET 120 Introduction to Renewable Energy Technologies and Assessments (3 cr) Spring/Summer (10-week).
• ET 220 Solar Photovoltaic Assessment (3 cr) Fall
• ET 240 Wind/Hydro Energy Assessment (3 cr) Spring
• ET 255 Assessing Lands for Bioenergy Production (3 cr) Spring
• ET 262 Renewable Energy Adoption: Barriers and Incentives (3 cr) Fall
• ET 484 Renewable Energy Assessment Practicum (1 credit- required for minor only) Spring/Fall

**Admission**
Applicants must have a 2.5 GPA overall for application. For completion, students must complete all required courses with a 2.5 GPA. To apply for the minor you must submit a “Declare a Minor” form to Elizabeth Nichols in 2225 Jordan Addition, egnichol@ncsu.edu, ph 919-513-4832.

**Certification**
Students must have an overall GPA of 2.5 to be accepted to the certificate program. A grade of “C” (2.0) or better is required for certificate courses. To apply for the certificate, please contact the REA Curriculum Coordinator Richard Ebershol at rdeberso@ncsu.edu.

**F. Dual Degree Programs**

Students in ES, ETM, FOM, FWCB and NR desiring to major in a second area of interest may develop a dual baccalaureate degree program. You may enroll in a second undergraduate degree in any department of the university that will accept you as a degree candidate in the desired second degree. You should first discuss the second degree option with your assigned advisor or with another Departmental advisor (or another faculty member) who, through background and experience, is familiar with the degree and its advantages/disadvantages to your education and career opportunities.

To enroll in a second degree, contact the department that offers the degree and if accepted, enroll in that program as a second degree. You will be assigned an advisor in the second degree to guide you in course selection. You should also notify Mrs. Yvonne Lee, Dr. Gary Blank, and your assigned advisor in the Department. You should also provide each advisor with a current copy of the curriculum outline for the "other" curriculum and, in conjunction with them, develop a plan for coordinating course selection to complete both degrees as efficiently as possible. Dropping the second degree program is possible at any time without penalty. You will be awarded the diploma for each degree when you complete its requirements.

The number of total additional credits (in addition to the first degree) required to complete a second degree may range from as low as about 25-30 to as high as 60-65 depending on commonality of required courses, appropriate substitutions of similar courses, and use of electives in each curriculum to satisfy core courses in the other. Thus a second degree that is not very dissimilar to the first may easily be completed in one or two additional semesters. The decision to pursue a dual degree should be made as soon as possible to allow scheduling of the proper course sequences in the early semesters of each curriculum.

A specific dual degree program must be planned with the appropriate advisors.

**G. Cooperative Education Program**

1. **General information:**
Cooperative Education gives students the practical experience necessary for them to fully understand the importance of what they are studying for the Cooperative Education Program is a plan created in which the student's educational goals are enhanced by carefully scheduling and integrating periods of academic study with periods of employment related to the student's field of interest.

The Co-op program in the College of Forest Resources is voluntary and includes curricula in Forest Management, Natural Resources, Environmental Technology & Management, Recreation, and Forest Biomaterials. To be eligible, students must achieve a 2.25 grade point average (GPA) out of a possible 4.0. To remain in the program, they must maintain a 2.0 GPA and perform satisfactorily in the work assignments. Most forestry Co-op employers prefer students to begin after Summer Camp is completed, but some employers will take students into the Co-op program after the freshman year.

Mr. Glenn Catts, Co-op Placement Coordinator, glenn_catts@ncsu.edu, Ph. 919-513-3973.

The Co-op program provides students several benefits. Some of these are:

a) **Practical experience.** Students have the opportunity to learn practical applications along with their classroom experiences. This practical experience often helps students with their course work by providing fuller and deeper insight to their classroom exercises as a result of having actually experienced related work. Because employers value this experience, co-op graduates have an advantage when competing for employment and they usually start at salaries higher than those of the non-cooperative education graduate.

b) **Self-confidence.** By the time of graduation, Co-op students have had the opportunity to develop self-confidence in actual work situations in their chosen professional field. As a result, they are not confronted suddenly with an abrupt change from an academic environment to the real world of employment.

c) **Human Relations.** Co-op students have the opportunity to learn directly about human relations in the business and industrial world. Such experiences are of increasing value as professionals from many areas become more involved in dealing with current sociological problems.

d) **Financial.** Co-op students have the opportunity to earn a substantial part of their educational expenses. Thus, the additional time and investment required in the program is offset by the students’ co-op employment earnings.

e) **Improved Employment Opportunities and Earning Power.** Many companies make it a practice only to hire persons with whom they have had some previous work experience through a co-op arrangement. Thus, co-op experience may be of great value in obtaining employment. In addition, University data indicate that co-op participants are more likely to obtain permanent employment immediately upon graduation and they also have higher beginning salaries than students who do not participate in co-op programs.
2. **Program Entry Requirements:**

   a) The Cooperative Education Program is voluntary for students in the College of Natural Resources

   b) Full-time enrollment during the semester prior to first work term

   c) Completion of at least two semesters at NCSU (one semester for transfers and graduate students); NCSU transcript must show grades and admission to a degree program

   d) Minimum GPA of 2.25 (3.00 for graduate students)

   e.) **Attendance at a Cooperative Education orientation** meeting administered by the NCSU Cooperative Education Program located at:

      2100 Pullen Hall
      Box 7303
      Raleigh, NC 27695-7303
      Main Office Number: 919/515-2300
      FAX: 919/515-4210

   f) In addition to meeting the minimum requirements for the Co-op Program, international students (F1 or J1 visa) must:

      i) attend a practical training session at the International Student Office (ISO),

      ii) complete nine months of consecutive enrollment in classes prior to beginning co-op work, and

      iii) obtain written approval of their academic advisor or graduate coordinator.

   Undergraduate international students may not apply for the program once they have attained senior standing unless they already have a job offer.

**H. Study Abroad**

There are opportunities to study abroad for the summer, for the semester, or for an entire year. You can earn credits towards your degree, and financial aid and scholarships are available. If you are interested in study abroad, you should start planning early (preferably two years in advance) in order to find the best program and to plan your courses. Students in the Department of Forestry and Environmental Resources have studied in diverse settings, including Mexico, Nicaragua, Costa Rica, Ecuador, Sweden, Finland, Nepal, and Australia. In some cases, you may want to postpone GER courses and take them while you are abroad; in other cases, you can plan to complete specific requirements of your curriculum while studying abroad. The Department of Forestry and Environmental Resources offers scholarships for study abroad on fund availability. These scholarships are due to the Study Abroad Office at the end of February.

To plan for your study abroad experience, the steps are to:

1. Visit the study abroad web site at https://studyabroad.ncsu.edu/
2. Discuss options with your academic advisor

3. Attend one of the orientation sessions offered by the Study Abroad Office:
   315 University College Commons (formerly First Year College)
   919-515-2087 or email them at study_abroad@ncsu.edu

For general information, you can contact Dr. Erin Sills, Director of International Forestry Programs, 3110 Jordan Hall, erin_sills@ncsu.edu, Ph. 919-515-7784.
CH. 5 ACADEMIC DEVELOPMENT

A. General

This section covers several academic programs and policies that are particularly important to the students' development and advancement. Such policies and programs are covered in depth in the Student Handbook, in the Undergraduate Catalog and in the Advisor's Handbook (which all Advisors have). The Student Handbook and the Advisor's Handbook, available on the web, are updated annually and, thus may be more current than the Undergraduate Catalog. Also discussed here are certain departmental policies that apply to all students.

B. Academic Advising

Each undergraduate student is assigned an academic advisor. The advisor assists the student in three areas:

1) striving for academic excellence,
2) completion of the program in four years, and
3) professional development.

The entire objective of the advisor-advisee relationship is to insure that the student receives the best educational experience possible.

Incoming four-year students are assigned to an advisor when they enter NCSU. The student may stay with that advisor for the duration of his/her program at NCSU. If, for any reason, the student wishes to change advisors, that may be done by contacting Dr. Blank. In addition, when a student makes a decision regarding use of electives, he or she may change to an advisor with particular expertise in that area. In this way the student may gain additional insight and perhaps even learn about job opportunities in the chosen concentration.

Current undergraduate advisors in the Department of Forestry and Environmental Resources, together with office and telephone numbers and areas of expertise, are listed in Chapter 2 of this handbook and also available on the departmental website at https://cnr.ncsu.edu/fer/people.

The major duties of the advisor are related to the academic program. It is the ADVISOR'S DUTY to make sure that students are aware of the Department's academic requirements. In addition it is the advisor's responsibility to provide sufficient information and adequate guidance so that the student can make intelligent decisions about his or her program. THE FINAL RESPONSIBILITY, HOWEVER, FOR MOST DECISIONS REGARDING REGISTRATION AND COMPLETION OF DEGREE REQUIREMENTS IS THE STUDENT'S. Decisions regarding the program should be made in private meetings between the advisor and student. Such meetings between each student and his or her advisor are mandatory during preregistration periods. The student's personal identification number (P.I.N.) required for registration is issued by the advisor only.

During the orientation sessions, an opportunity will be provided for students and advisors to meet, become acquainted, answer questions, and let the advisors explain their responsibilities.
C. Honors Program

The Honors Program provides special challenges and recognition for students with excellent academic records.

**Admission:** The minimum admission requirement is an overall GPA of 3.0 and 3.25 in major after at least 40 credit hours at NCSU or as transfer from another institution. See details at this web site: https://honors.dasa.ncsu.edu

**Coursework:** A minimum of 9 credit hours as required:

1) Three (3) credit hours of 200-level or higher honors courses, or graduate level courses that are electives, or other courses designated as appropriate by the college or department.
2) Two (2) credit hours of CNR 490 Senior Honors Seminar. This will be offered in the Spring Semester each year. In the latter part of the seminar, students will be required to give an oral presentation of their senior honors independent study.
3) Four (4) credit hours of senior honors independent study that includes a written thesis, paper, or laboratory report that is guided by a CNR faculty member. The student and his/her advisor will decide whether the independent study will be for a grade or for credit only.

Interested students should contact Dr. Kirkman or Dr. Blank.

D. Personal Standards of Professionalism and Behavior

Because forestry and natural resources are professions requiring the highest degree of dedication and professionalism in their practitioners, the faculty of the Department of Forestry and Environmental Resources expect that all students enrolled in its programs will behave at all times so as to reflect favorably on themselves, their University and their profession. Conformity to this high standard of personal and professional behavior is extremely important to the student when seeking a job, as many employers rank personal traits as highly as professional skills and technical knowledge when evaluating students as potential employees. Any student who violates the Department's standards of personal and professional behavior is subject to appropriate action by the faculty and/or department head. The student Honor Code and Student Judicial System are listed on the Web at:

http://policies.ncsu.edu/view/policy/all

Students are expected to abide by, and support the Student Honor Code.

E. E-Mail List for Undergraduates

The Department has set up an e-mail list serv for undergraduate students. There is a separate list for each class; i.e., fer_freshmen@lists.ncsu.edu, fer_sophomores@lists.ncsu.edu,
You should monitor your email frequently as messages may be posted which might be of importance to you. You are also subscribed to a curriculum list serv, depending on your major; i.e. fomstudents@lists.ncsu.edu, nrstudents@lists.ncsu.edu, etstudents@lists.ncsu.edu, and fwcbstudents@lists.ncsu.edu. The mailing lists are for official department use only, including academic and research purposes. Personal and commercial uses are not allowed on the listserv. Users are expected to conduct themselves professionally and with courtesy to other users. If you are not receiving departmental information emails, please contact Sydna Willis in 3136H Jordan Hall, 919-515-7560 or sbwillis@ncsu.edu.

F. Use of Tobacco Products

Biltmore Hall, Robertson Wing, Hodges Lab, Jordan Hall and Jordan Addition are smoke free buildings. Use of all tobacco products is prohibited.

G. Grading and Attendance

Departmental requirements for grading and attendance in class are no different from those of the University generally. The grading system is described in the Undergraduate Catalog and on the Web. How grades are determined in each course will be explained in writing by the instructor at the beginning of the course.

Attendance policies are repeated here for emphasis:

NOTE: Unless otherwise stated by the instructor, regular attendance at classes, laboratory periods and examinations is expected of all students.

1. Excuses for anticipated or emergency absences shall be accepted at the discretion of the instructor. When an excuse is accepted, an opportunity shall be provided for making up any work missed. When an excuse is not accepted, there is no obligation to provide an opportunity for makeup work.

   a) Excuses for anticipated absences must be cleared with the instructor before the absence.

   Examples of anticipated absences are:

   i) University duties or university trips as certified by an appropriate member of the faculty or staff
   ii) Required court attendance as certified by the Clerk of Court.
   iii) Religious observations as certified by the Dept. of Student Development
   iv) Required military duty as certified by the student’s commanding officer

   b) Excuses for emergency absences must be reported to the instructor as soon as possible but not more than one week after the return to class.

   Examples of emergency absences:
i) Illness or injury when certified by an attending physician.
ii) Death or serious illness in the family when certified appropriately.

NOTE: Physicians on the Student Health Service staff do not provide written excuses. An instructor may call Clark Hall Infirmary to verify that a student was seen on a given date. The counseling Center does not provide written excuses except in cases of crises. An attempt to verify deaths or serious illness will be made by Student Development at the request of the instructor.

2. Each instructor at the beginning of the semester shall explain how that attendance policy is to be implemented in each class. Procedures for submitting excuses and for scheduling makeup work when the excuses are accepted should be clearly defined.

3. Students who discontinue class attendance without officially dropping the course or withdrawing from the University will receive an F grade.

4. Instructors will counsel directly with students whose absences are adversely affecting their performance.

5. University policy requires that a record of attendance be kept in all 100 and 200 level courses and provides for penalties assessed against grades for poor class attendance. Each instructor's policy will be clearly defined in the course syllabus. When it becomes apparent that excessive absenteeism is contributing to poor performance in a course, the instructor will refer the student to his/her advisor and to the Department Head for counseling.

H. Academic Advancement

All students should be thoroughly familiar with the Academic Warning, Academic Suspension and First-Year Course Repeat policy. They are designed to ensure adequate progress in a degree program.

STUDENTS ARE CAUTIONED TO BECOME VERY FAMILIAR WITH THE UNIVERSITY STEP-WISE GRADE POINT AVERAGE ACADEMIC SUSPENSION POLICY. It can be very difficult for a student whose GPA is near the minimum for good academic standing with a high number of credit hours to achieve the substantial improvement in academic performance needed to remain in good standing. New transfer students in particular should be aware that the credit hour steps include the total of credit hours attempted at NCSU plus those transferred.

First Year Course Repeat Policy

The first-year course repeat policy is a policy of forgiveness that helps new NCSU undergraduate students maintain good academic standing. The policy is necessary because new students lack familiarity with the University, and as a result, they are more likely to make errors in their choice of courses and total course load.

The policy allows each new student to retake up to 8 credits of 100/200 level courses with D or F grades and have the first grade removed from computation of the GPA. It is in your best interest to use this policy if needed. The full policy statement is included below for emphasis.
Course Repeat Policy Effects

1. The eligible student who repeats a course while electing that the first-year course repeat policy apply will have the grade points and the credit hours attempted and earned on the first completion of the course removed from the calculation of the cumulative grade point average and from the calculation of the total hours attempted regardless of the grade earned on the second attempt. The modification of the cumulative grade point average which will result from the removal of the grade points and credit hours attempted and earned on the first completion of the course will be calculated and recorded on the student’s record after the second completion of the course.

2. The course title and grade for the first completion will be shown on the official record with a code (R) to indicate that it was repeated and that the first grade was removed from the computation of the cumulative grade point average.

3. The recorded grade point average of the student for the semester in which the course was originally taken will not be changed.

4. Repeating a course and exercising the first-year course repeat policy does not retroactively change the status of the student as to semester academic honors, academic warning, probation, or suspension in prior semesters.

5. Many graduate and professional schools re-compute grade point averages in the process of considering an applicant for admission to such programs. This re-computation of grade point averages may include restoring the cumulative grade point average effects of initial attempts at courses repeated under this policy.

Eligibility

1. The initial attempt and the repeat under this policy must be a NCSU course;  
2. The course being repeated was completed for the first time after the Summer Session II 1995;  
3. The course being repeated must be at the 100- or 200-level;  
4. The student received a grade below C- in the course that is repeated;  
5. Both attempts of the course were for letter grades; no unsuccessful audits or credit-only attempts may be repeated nor may repeats under the policy be made for audit or credit-only;  
6. The student has not received credit for an advanced course dealing with the same subject matter as the course being repeated; and,  
7. The first attempt of the course must have occurred within 12 months of the student’s initial enrollment in any classification at NCSU; this period is not lengthened by voluntary or involuntary failure to enroll in subsequent semesters or summer sessions, nor by enrolling at less than a minimum full-time load following the initial date of enrollment;  
8. The second attempts is for the same course or for an approved substitute course (see “Listing of Approved Substitute Courses for the First Year Course Repeat Policy”);  
9. The second attempt occurs in a regular semester or summer session which ends within 12 months of the completion of the first attempt of the course; if the course is not available during that period or if the student is not enrolled when it is available, then the second attempt must occur in the next regular semester during which the student is enrolled at NCSU and the
course is available;
10. The total number of courses repeated by the student under this policy will not exceed two (2) courses nor will the total of hours of such courses exceed eight (8) hours, nor will the total number of courses repeated under this policy combined with those repeated under the Course Repeat Without Penalty Policy exceed three (3) courses, nor will the total hours of such courses exceed twelve (12) hours;
11. The Notice of Exercise of First Year Course Repeat Policy is filed by the student with the Department of Registration and Records on or before the “last day to drop a course without a grade for courses at the 400 level and below” of the semester or summer session in which the course is repeated.

Procedures

1. Students are advised to consult with their academic advisors in making the decision to elect a course repeat under this policy.
2. The student must submit a Notice of Exercise of First Year Course Repeat Policy to the Department of Registration and Records on or before the last day to drop a course without a grade at the 400 level or below of the semester or summer session in which the course is repeated. Forms may be obtained from faculty advisors, departmental coordinators of advising, associate deans for academic programs, and the Department of Registration and Records.

Warning Regarding Timing of Filing Necessary Forms

This policy requires the election of the repeat under the policy be made early in the semester during which the repeat of the course is being attempted. Thus, requests to either apply the course repeat policy to a course repeated in a prior semester, or to reverse a prior application of the repeat policy are inconsistent with the policy.

Expected Duration of This Policy

The First-Year Course Repeat Policy has been indefinitely extended unless specific academic policy revisions occur to the contrary. However, eligible courses taken the first year at NCSU may be repeated under this policy within 12 months of the end of the term in which first attempted with provisions consistent with Eligibility Item 9 above.

The First-Year Course Repeat Policy listed on the web at:

http://www.ncsu.edu/uap/resources/courserp/forgive/fycr/oldreg.htm
## Listing of Approved Substitute Courses for the Course Repeat Without Penalty and the First Year Repeat Policies

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I. University Graduation Requirements

1. The student is responsible for completing all the course requirements for graduation in his / her program **prior to applying for graduation.**

2. Undergraduate residence requirement for all students:

   To be eligible for a bachelor's degree, a student must be enrolled in a degree program and must have earned at least 30 of his/her last 45 hours of credit through NCSU courses. Individual departments and/or colleges may have additional residence requirements.

3. Overall grade point average of 2.0 on all courses

4. See curriculum footnotes for additional graduation requirements specific to each curriculum.

J. Computers

The Department requires that all students graduating from the undergraduate program be competent in the use of computers.

To assist the student toward meeting this goal the College of Natural Resources maintains two computer labs; one in room 3032 Biltmore, one in 5103 Jordan Hall and one in 3214 Jordan Addition. The Biltmore lab is available for use seven days a week to provide the student with the facilities necessary to develop and expand computing skills. Because of the intensive use of the computer lab, students who may wish to do so are encouraged to consider purchasing a personal computer. The university bookstore sells computers at significant discounts off retail prices. It is suggested that students discuss computer needs with Dr. Blank (515-7566) prior to making purchases.

Students interested in buying a computer have several options to follow. The following list summarizes options from the minimum to the best. Used computers can also be a good deal, but make sure they are at least 50% less expensive than a comparable new computer.

<table>
<thead>
<tr>
<th>2016-2017 Minimum Recommendations for New Computers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Component</strong></td>
</tr>
<tr>
<td>Type of Machine</td>
</tr>
<tr>
<td>CPU</td>
</tr>
<tr>
<td>System Ram</td>
</tr>
<tr>
<td>Optical Drive</td>
</tr>
<tr>
<td>Storage</td>
</tr>
</tbody>
</table>
### 2016-2017 Minimum Recommendations for a Laptop You Already Own

<table>
<thead>
<tr>
<th>Component</th>
<th>Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>Less than two years</td>
</tr>
<tr>
<td><strong>Processor</strong></td>
<td>Intel i3, i5 or i7</td>
</tr>
<tr>
<td><strong>RAM</strong></td>
<td>4 GB</td>
</tr>
<tr>
<td><strong>Operating System</strong></td>
<td>MS Windows 7 or 8.1, Mac OS X v. 10.11</td>
</tr>
<tr>
<td><strong>Battery Life</strong></td>
<td>2 hours or longer</td>
</tr>
<tr>
<td><strong>Ethernet Adapter</strong></td>
<td>Built-in, Thunderbolt or USB adapter</td>
</tr>
<tr>
<td><strong>Wireless</strong></td>
<td>802.11n</td>
</tr>
<tr>
<td><strong>Antivirus Software (required)</strong></td>
<td>Free copy at <a href="http://oit.ncsu.edu/antivirus">http://oit.ncsu.edu/antivirus</a></td>
</tr>
<tr>
<td><strong>Free Hard Drive Space</strong></td>
<td>100 GB</td>
</tr>
<tr>
<td><strong>Backup for Files</strong></td>
<td>See <a href="https://oit.ncsu.edu/safe-computing/backups">https://oit.ncsu.edu/safe-computing/backups</a></td>
</tr>
</tbody>
</table>

All other information and specifications regarding your personal computer requirements can be found at: [http://oit.ncsu.edu/my-it/hardware-software/your-computer/](http://oit.ncsu.edu/my-it/hardware-software/your-computer/)

### K. Computer Lab

The College of Natural Resources has one of the most modern instructional computer labs on the NCSU campus. Located on the third floor of Biltmore Hall (Room 3032) and third floor of Jordan Addition (Room 3214), these facilities are fully networked to the LAN (local area network) and interfaces with campus network system and all Internet resources. Since all PC’s and workstations are connected to the Internet, students have easy access to web browsers and to their e-mail accounts. Visit [https://cnr.ncsu.edu/it-support-services/classrooms-and-collaborative-spaces/computer-labs/](https://cnr.ncsu.edu/it-support-services/classrooms-and-collaborative-spaces/computer-labs/) for more information.
L. English Communications

The Department also requires that each graduate be competent in English communication. This objective is achieved by requiring grades of C or better in ENG 101 and by stressing communication skills in all forestry and natural resources courses. Papers and exams are graded by the instructor for adequacy of expression and quality of grammar and spelling as well as for their technical content. In cases where instructors detect communication deficiencies that impair a student’s professional development, appropriate remedial steps should be taken, including referral to the English Department.

M. Use of Equipment and Issuance of Keys

In the course of their laboratory and summer camp work, students use large amounts of equipment purchased with public tax funds. Students are responsible for the careful use of equipment and for the return of all items. Appropriate charges are made for lost and/or broken equipment. Failure to pay such charges will result in the withholding of grades and/or diploma. Similar penalties will be applied for failure to return keys to College facilities charged out to individuals.

N. Tutorial Services

Academic support services including individual tutors, review sessions, and group tutoring are available for a wide variety of courses. For assistance with most basic 100 and 200 level courses, contact the appropriate university or department support service listed below. Free tutoring assistance is provided by the College of Natural Resources for ES, ETM, FOM, FWCB or NR courses or for other 300 and 400 level courses for which tutoring services are not available. For more information, contact Mrs. Yvonne Lee, Academic Dean’s office, 2018 Biltmore Hall, Ph. 919-515-6191.

In addition, a number of other University units provide tutorial assistance for students; these units are listed on the web at:

https://tutorial.dasa.ncsu.edu/

O. 25% Tuition Surcharge

All undergraduate students since the Fall of 1995 semester and thereafter are subject to a 25% tuition surcharge for all credit hours attempted in excess of 140 or 110% of the student’s academic program, whichever is greater.

Credit hours to be counted:
- All regular session degree-creditable hours attempted at NCSU; including failed courses, course-repeat-without-penalty courses, and courses dropped with a “W” grade.
- All transfer credit accepted by NCSU, which is used to satisfy degree requirements, as defined by the student’s Automated Degree Audit.

Credit hours to be excluded:
- NCSU summer session courses (Summer Camp)
- Advanced placement credit through AP, CLEP, or credit by examination
- NCSU off-campus extension courses
- ROTC credits earned in reserve officer training courses (AS, MS, NS)
- Summer session and off-campus extension transfer credit from all UNC system institutions.

**Students subject to surcharge:**

Students earning a first baccalaureate degree in a program that requires no more than 128 credit hours will be subject to the surcharge after having completed eight or more regular semesters at any institution. Students enrolled in the cooperative extension program are registered for zero hours, which will not add to the semesters enrolled. Work completed in summer sessions or off-campus extension will not count towards the eight semesters.

For students earning a first baccalaureate degree in a program that requires no more than 128 credit hours, the surcharge shall be applied to all counted credit hours in excess of 140. The surcharge will be applied only to those hours in excess of 140.

**Programs considered to be in excess of 128 credit hours will be limited to the following:**

- Students in the Bachelor of Landscape Architecture (BLA) are required to complete 157 hours. They will be subject to the surcharge after having completed 10 semesters for all counted credit hours in excess of 173.

- Students pursuing multiple degrees and minors will be subject to the surcharge for all counted credit hours in excess of 140 or 110% of that required for the degree(s), whichever is greater. Hours required for the degree(s) are defined as the number of hours required for the primary degree plus all hours completed that are creditable towards the minor(s) or additional degree(s) but are non-degree-creditable towards the primary degree, as defined by the student’s Automated Degree Audit. Students pursuing programs requiring more than 128 hours will be subject to the surcharge only after having completed 10 full-time semesters.

- Students pursuing a baccalaureate degree other than their first will be subject to the surcharge or all counted credit hours in excess of 140 or 110% of that required for the additional degree as defined by the student’s Automated Degree Audit, whichever is greater. Students pursuing a baccalaureate degree other than their first will be subject to the surcharge only after having completed 2 semesters subsequent to the previous baccalaureate degree.

**P. Counseling**

The Counseling Center assists individuals in gaining a better understanding of themselves. Psychologists, professional counselors, and psychiatrists are available to work with students who desire assistance with concerns such as choosing a career, academic planning, identifying and overcoming educational difficulties, developing greater self-understanding, developing more satisfying personal relations, and coping with stress or emotional crisis. All counseling is strictly confidential.
In addition to individual counseling, workshops and support groups are offered throughout the year in a variety of areas, including vocational exploration and stress reduction.

The Counseling Center is located in Room 2401 of the Student Health Center and maintains evening hours several evenings each week. Both day and limited evening appointments may be scheduled by calling 919-515-2563.

More information is available at https://counseling.dasa.ncsu.edu/

Q. Collection of Student Course Work for Use in Program Assessment

The faculty-approved Department of Forestry and Environmental Resources Program Assessment Plans call for samples of student written work to be collected to assess undergraduate program performance. While the Department has not yet initiated portfolio assessment, our assessment plan states that portfolios of student work will be collected and reviewed at five-year intervals. Logistics of that component in the program assessment plan remain to be determined, but individual assignments and examples of work across the curriculum spread may be gathered to evaluate performance concerning any of the learning outcomes articulated for the several curricula in the Department.

All student generated materials collected from professors will be used anonymously, with individual students' names removed. All materials will be reviewed in cohorts to provide generalized evidence of degrees of achievement of program goals. Thus, individual students' work will not be isolated for use as examples; nor will sample review results be traceable to specific individuals. All results will be aggregated whenever reported, and materials will be disposed of in appropriate manner after their usefulness is past.

Further questions about program assessment may be directed to Dr. Gary B. Blank in the Department of Forestry and Environmental Resources.
**CH. 6 SCHOLARSHIPS**

Operating independently from the University Merit Awards Program, the Department of Forestry and Environmental Resources Scholarship Committee annually awards scholarships to FER undergraduate students: Academic, Forestry Summer Camp, Industrial, and Work-Study. Funds for these awards come from alumni donations, the Forestry Foundation, and timber sale receipts from the school’s forests. About 50 Academic Scholarships ranging from $3,000 to $6,000 are awarded annually to FER undergraduates. Academic Scholarships are awarded from applicants with outstanding academic achievement in high school or college. A total grade point average of at least 3.3 is typically required, and academic scholarships are renewable, provided that superior progress is made towards a degree offered by the Department of Forestry.


About eight scholarships that range from $500 to $1500 are available to students attending FER’s Wildlife or Forestry Summer Camp. The Summer Camp Scholarships that were available for Summer 2015 were: Carteret County Wildlife Club Scholarship, Friends of FER Scholarship, Friends of the Forest Scholarship, James L. Goodwin Summer Camp Scholarship, Hare/Hofmann/Huff/Champion Timberlands Scholarship, Victor W. Herlevich Scholarship, Hofmann Forest Summer Cam Scholarship, R. B. and Irene Jordan Endowed Scholarship, Maki-Gemmer-Johnson Scholarship, John M. “Jack” Sherill Summer Camp Scholarship in Forestry and the George and Janice Smith Scholarship in Wildlife.

The Scholarship Committee also awards Work Scholarships, generally to Juniors and Seniors in Forest Management, because knowledge of forest management is required. Work Scholarships, currently at $4,032 each, carry a work requirement, generally satisfied on one of the college forests, and thus some forestry skill is generally required of recipients.

Full-time undergraduate students majoring in Environmental Science (ES), Environmental Technology and Management (ETM); Forest Management (FOM), Fisheries, Wildlife, and Conservation Biology (FWCB) and Natural Resources (NRE and NRP) may apply for scholarships by submitting an application. Applications can be downloaded online, or obtained from Dr.
Richard R. Braham, FER Scholarship Committee Chair, 3003 Biltmore Hall. Applications are accepted at any time, but the Committee selects the next academic year’s scholarship recipients in May/June of each year.

Learn more about Department of Forestry and Environmental Resources scholarships at https://cnr.ncsu.edu/fer/ug/scholarships/
CH. 7 UNDERGRADUATE ORGANIZATIONS

Extracurricular activities of all sorts on the NC State University campus provide opportunities for personal and professional volunteer and service activities, and social events. Undergraduate organizations in the department provide a focal point for students to participate in extracurricular activities associated with their chosen curriculum and profession. All students are encouraged to support the undergraduate organizations of the Department of Forestry and Environmental Resources. Any student interested in an organization may contact the faculty advisor for more information.

For the full online list on on-campus and professional organizations related to our majors, please visit https://cnr.ncsu.edu/fer/current-undergraduates/student-experience/professional-organizations/

CNR Ambassadors

CNR Ambassadors are a group of students who serve as liaisons between CNR and the outside community including prospective students, parents, distinguished guests, and alumni. Their majors cover a wide span of curricula within CNR, and their interests and extracurricular activities are equally diverse. They have a strong commitment to scholarly achievement that fosters academic excellence, maturation and inclusion of all students. Staff Advisor – Tiffany McLean, 2018 Biltmore Hall, 919-515-5510

CNR Council

The CNR Council serves as the unified voice of all students in the College of Natural Resources. The group is composed of representatives from all recognized student organizations in the college. The Council meets monthly to discuss current issues, problems, achievements and concerns, as well as to develop ideas for better serving students. It is responsible for allocating funds each year to CNR organizations to provide support for various activities. It also publishes the college publication, The Pinetum.

Faculty Advisor - Dr. Adrianna Kirkman, 2018 Biltmore Hall, 919-513-7616

Engaging Leaders in Natural Resources

Engaging Leaders is a first-year retention program in the college for freshmen and transfer students designed to help them develop leadership skills, increase their cultural awareness, and improve their communication skills. EL is a partnership between the Community for Diversity and Academic Affairs with a mission to:

- Help students develop their individual leadership skills through engagement in CNR, NC State and the local community.
- Promote involvement in CNR and help students develop relationships with faculty, staff and students.
- Challenge students to engage with new people and try new things.
Each year incoming CNR students must apply for the program and go through an interview process before being selected. Engaging Leaders is student run and consists of a student coordinator and an advisory board. The student coordinator and advisory board members complete the program and then apply to serve in a leadership role.

**Contact Person**
Shaefny Grays, 2022D Biltmore Hall, ph. 919-513-0627, sdgrays@ncsu.edu, http://cnr.ncsu.edu/cfd/

**Leopold Wildlife Club**
The Leopold Wildlife Club is the NCSU student arm of the The Wildlife Society national organization. This club provides opportunities for professional development, networking, and social events for students looking for careers in the wildlife field. Meetings are held twice a month. The meetings generally feature a speaker from some aspect of the wildlife field. Previous speakers have included wildlife biologists, rehabilitators, wildlife veterinarians, and more. The club strives to have at least one field outing or workshop every month, and attend the National Conference each year. NC State hosted the 2013 Southeastern Wildlife Conclave.

Faculty advisor - [Dr. Lara Pacifici](mailto:Dr.Lara.Pacifici)

**Minorities in Agriculture, Natural Resources and Related Sciences**
Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS) was chartered in 1998, and is jointly sponsored by the College of Natural Resources and the College of Agriculture and Life Sciences. The three main objectives are to provide students with professional development, community development, and personal development opportunities, but overall, to strive for the inclusion, achievement, and advancement of all people in the agricultural sciences. They conduct a wide range of activities including, but not limited to, community service, collaborating with fellow student organizations, and fund-raising events.

Faculty Advisor - [Thomas Easley, Director of the CNR Community for Diversity](mailto:Thomas.Easley@ncsu.edu)

**NC State Forestry and Timbersports Club**
The NC State Forest Club competes in timbersports, which involve events such as underhand chop, sawing, chainsaw, axe throw, knife throw, pole climb and archery, to name a few, as well as technical events such as plant and wildlife ID, air photo interpretation, and timber estimation. The club competes in at least three regional competitions throughout the year, leading up to the Southeastern Forestry Conclave, in which students from 15 colleges compete. The Forestry and Timbersports Club is open to any major.

Faculty advisor - [Dr. Joe Roise](mailto:Dr.Joe.Roise)
**NCSU Student American Fisheries Society**

Student Fisheries Society is a sub-unit of the North Carolina Chapter of the American Fisheries Society. It encourages the exchange of fisheries and aquatic science information among students, faculty and regional professionals and provides career guidance to students.

Faculty Advisor - [Dr. Joe Hightower](mailto:joe@ncsu.edu) in the Department of Biology, CALS

**NCSU Student Chapter - International Society of Tropical Foresters**

The NCSU Student Chapter of International Society of Tropical Foresters (ISTF) acts in concert with the Office for International Programs of the College of Natural Resources to enhance the international perspective of forestry studies at NC State. ISTF meets regularly to hear guest speakers and presentations focusing on some issue in the international arena. Topics include current research in the tropics in which students and faculty are involved. ISTF also organizes annual events such as conference attendance, special guest speakers, and a spring symposium. Membership is open to any person with an interest in international forestry and environmental issues.

Faculty advisor - [Dr. Erin Sills](mailto:erin@ncsu.edu)

**NCSU Student Chapter - Society of American Foresters**

The NCSU Student Chapter of the Society of American Foresters is associated with the professional Society of American Foresters organization. Members participate in many activities throughout the year, including community service projects, guest speakers, career development, and hosting a Mentors Dinner. The Student Chapter of SAF has strong affiliations with the Triangle Chapter, the North Carolina Division, and the Appalachian Section (NC, SC, & VA) of SAF and the department helps support attendance of student delegates at the annual regional and national conferences. Traditionally, many of the SAF Student Chapter members participate in a Wilderness Management Leadership Fieldtrip prior to the national convention, which is led by Dr. Roise.

Faculty advisor - [Dr. Joe Roise](mailto:joe@ncsu.edu)

Website - [https://www.eforester.org/](https://www.eforester.org/)

**Roots and Shoots**

Roots and Shoots is a conservation club to raise awareness and promote animal conservation both locally and globally. We're about making positive change happen - for our people, for animals, and for the environment. The Roots & Shoots network connects students who share a desire to create a better world. We identify problems in global and local issues related to conservation and take action. Through service projects, student campaigns and awareness outreach, Roots & Shoots members make an impact in their community and globally.

Faculty Adviser - Dr. Werner Dorgeloh, [wgdorgel@ncsu.edu](mailto:wgdorgel@ncsu.edu), 919-303-1664
Wolfpack Environmental Student Association

The purpose of WESA is to promote campus environmental awareness and environmental protection, to form networks with themes related to the environment and natural resources within NCSU’s colleges, and to engage other universities (both nationally and internationally) in endeavors to manage environmental and natural resources. The club will participate in projects and initiatives that contribute to better use of environmental and natural resource use at NC State University, Wake County, and beyond.

Faculty Adviser – Dr. William Winner, wewinner@ncsu.edu, 919-515-5780

Xi Sigma Pi

Xi Sigma Pi is the National Forestry Honor Society, whose goal is to recognize and promote academic excellence in forestry education. Currently 42 universities have chapters. Mu Chapter at the Department of Forestry at NCSU is the only chapter in North Carolina, and one of only nine chapters in the South. The chapter at NCSU ranks among the oldest in the United States, since in 1940 it was the eleventh school to be granted a charter, and since it was the first school in the South. Membership is by invitation, and it is limited to academically gifted juniors, seniors, graduate students, and faculty.

Faculty advisor - Dr. Richard Braham

Additional networking opportunities:

- More Student Organizations at NC State
- Professional Organizations related to our majors
- FER LinkedIn Group
- CNR Facebook

Additional ways you can put your passion into action through organizations, service, research