

College of Forestry, Wildlife and Environment

JANAKI ALAVALAPATI, Dean

TODD STEURY, Associate Dean of Academic Affairs

DAOWEI ZHANG, Associate Dean of Research

THE COLLEGE OF FORESTRY, WILDLIFE AND ENVIRONMENT (CFWE) has a long tradition of offering undergraduate and graduate programs that prepare students for employment in a wide variety of natural resources and environmentally focused professions. Our planet's diverse ecosystems, forests, and associated natural resources play a critical role in contemporary society. The sustainable management of those resources protects our health and quality of life, preserves the biological diversity of our environment, and contributes to our economy. The College's programs emphasize a comprehensive understanding of the interrelationships between the functions and values of our diverse renewable natural resources and environment. This awareness is essential to effective management and, ultimately, to meeting society's needs.

Curricula offered in the CFWE include environmental conservation and management, forestry, geospatial information science, parks and recreation management, sustainable packaging, wildlife ecology and management, wildlife enterprise management, and wildlife sciences pre-veterinarian medicine. The CFWE also provides courses required to attain a degree in forest engineering.

Within these disciplines, graduates can anticipate abundant employment opportunities within the public and private sectors, including positions within federal, state, and municipal agencies, consulting firms, and nonprofit organizations such as land trusts, conservancies, etc. Depending on a student's major, potential careers include conservation biologist, ecologist, ecosystem modeler, eco-tourism manager, environmental consultant, data and information specialist, forester, land and resource manager, operations manager, parks and recreation director, regulatory compliance officer, and supply chain manager.

In keeping with the University's land-grant mission, the College of Forestry, Wildlife and Environment pursues excellence in education, research, and extension (including outreach and public service activities) focused on forests, wildlife, and the associated natural resources and environment of Alabama and beyond. With respect to undergraduate education, this focus is on preparing graduates with the necessary skills for post-graduation employment, with the breadth and depth of educational background to support professional growth and continued career advancement. The result of this directed effort from an energized faculty and administration are motivated graduates who have the foundation to master the art and science of managing our natural resources and environment for the betterment of local and global communities.

Students are encouraged to visit the CFWE website (<http://cfwe.auburn.edu/>), which provides information on its programs and faculty, as well as updates on courses, scheduling, practicum details, and events of interest within the College.

If you would like to speak to someone about the programs in the College of Forestry, Wildlife and Environment, please call the director of student services at (334) 844-1050, the coordinator of student recruitment at (334) 844-1094 or send an email to workingwithnature@auburn.edu.

Transfer Requirements

Transfers from other institutions must apply through Enrollment Services. The exact placement of transfer students can be determined only upon review of their transcripts by the Registrar's Office and the College of Forestry, Wildlife and Environment.

Transfer credit for forestry and wildlife courses not considered equivalent to those required in the chosen curriculum may be substituted for elective credit. However, duplication of credit will not be allowed. Equivalency of College of Forestry, Wildlife and Environment courses will be determined by the Dean's Office.

Credit toward a degree in the College of Forestry, Wildlife and Environment will not be allowed for mathematics or chemistry courses at a lower level than those specified in the curriculum for the degree sought. Students who are not prepared to take the courses prescribed should take lower-level remedial courses without degree credit.

Pre-Veterinary Medicine

The Wildlife Science Pre-Veterinary curricula within the CFWE enables students to complete requirements for admission to colleges of veterinary medicine after a student's third year of undergraduate studies. If students are admitted to a college of veterinary medicine after the completion of their third year, they may obtain a Bachelor of Science degree in Wildlife Sciences Pre-Veterinary Medicine after successful completion of their first year in a college of veterinary medicine and completion of all major courses. The specific graduation requirements may be obtained from a program advisor or academic advisor for the CFWE. The minimum requirements for admission to

most colleges of veterinary medicine are incorporated in the first three years of the options listed within the degree curricula. (See also the curriculum in Pre-Veterinary Medicine in the College of Science and Mathematics and College of Agriculture).

Degree Requirements and Courses

For degree specific requirements, courses, and accreditation information, review the desired major via the below links.

Majors

- Environmental Conservation and Management (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/environmentalconservationandmanagement_major/) (ENVC, NATR)
- Forestry (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/preforestry_major/forestry/) (FORP, FORW, FOWS)
 - Forest Engineering Option (https://bulletin.auburn.edu/undergraduate/samuelginncollegeofengineering/departentofbiosystemsengineering/forestengineering_major/) (FOEN)
- Geospatial Information Science ([https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/parksandrecreationmanagement_major/](https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/preforestry_major/geospatialandenvironmentalinformatics/>(GSEI)
• Parks and Recreation Management (<a href=)) (PARK)
- Sustainable Packaging (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/forestryandwildlifescience/sustainablebiomaterialsandpackaging_major/) (BIOP)
- Wildlife Ecology and Management (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/forestryandwildlifescience/wildlifeecologyandmanagement_major/) (WLDE)
- Wildlife Enterprise Management (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/forestryandwildlifescience/wildlifeEnterprisemanagement_major/) (WLEM)
- Wildlife Sciences — Pre-Veterinary Medicine (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/forestryandwildlifescience/wildlifescience-prevetconcentration_major/) (WLPV)

Minors

- Coastal Management (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/coastalmanagement_minor/)
- Conservation Social Sciences (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/conservsocsoci_minor/)
- Environmental Law (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/environmentallaw_minor/)
- Forest Health (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/foresthealth_minor/)
- Forest Resources (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/forestresources_minor/)
- Forest Seedling Nursery Management (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/forestseedling_minor/)
- Natural Resources Ecology (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/naturalresourcesecology_minor/)
- Nature-Based Recreation (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/naturebasedrecreation_minor/)
- Restoration Ecology (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/restorationecology_minor/)
- Tropical Conservation and Sustainable Development (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/tropicalconservation_minor/)
- Urban Forestry (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/urbanenvirsience_minor/)
- Watershed Sciences (https://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/watershedsciences_minor/)

Graduate Programs

- Applied Economics (Forestry) — PhD (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/economicsphd_forestry/)

- Earth System Science — Interdisciplinary — PhD (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/interdisciplinaryprograminearthssystem_phd/)
- Forestry — MNR, MS, PhD (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/)
 - Professional Forester Option — MNR (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/naturalresourcesmnrms_major/professionalforester_mnr/)
 - Forestry — MS (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/MS/)
 - Forestry — PhD (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/PHD/)
- Forest Business & Investment — MS (Online) (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/businessandinvestms/)
- Forest Finance & Investment — Online Graduate Certificate (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/fingcrt/)
- Natural Resources — MNR, MS (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/naturalresourcesmnrms_major/)
 - Natural Resources — MNR (On-campus or Online) (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/MNR/)
 - Natural Resources — MS (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/naturalresourcesmnrms_major/naturalresources_ms/)
- One Health — Online Graduate Certificate (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/onehealth_major/)
- Restoration Ecology — Online Graduate Certificate (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/restorationecology_gcrt/)
- Wildlife Sciences — MS, PhD (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/wildlifesciencesmsphd_major/)
 - Wildlife Sciences — MS (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/wildlifesciencesmsphd_major/wildlifesciences_ms/)
 - Wildlife Sciences — PhD (https://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/wildlifesciencesmsphd_major/wildlifesciences_phd/)
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Biomaterials and Packaging Courses

BIOP 1390 INTRODUCTION TO FOREST PRODUCTS AND PACKAGING (3) LEC. 2. LAB. 4. Basic properties of wood and their impact on the manufacture of forest products. Identification of important products and woods.

BIOP 2120 FRONTIERS FOR SUSTAINABLE BIOMATERIALS (3) LEC. 3. Introduction to the sustainability of biomaterials and resource efficiency to produce materials, food, energy and services, that decrease society's dependency on fossil fuels.

BIOP 2140 FUNDAMENTALS OF PACKAGING TECHNOLOGY (3) LEC. 3. An introduction into basic concepts and theories of packaging design, manufacturing, characterization, and development. The packaging materials covered in this course include paper and paperboard, metal, and plastics.

BIOP 3391 FOREST AND MANUFACTURING OPERATIONS (1) LEC. .5. LAB. 2. Introduction to basic field operations in Forestry including site preparation and planting, harvesting and primary manufacturing processes relative to specific geographic locations.

BIOP 3840 SUSTAINABLE PACKAGING CONCEPTS (3) LEC. 3. Examines the performance and durability of products and packaging, including sustainability of raw materials and society energy needs, the use of sustainable materials to meet these needs and reduce impact on environment, and associated methods.

BIOP 4060 ECONOMICS OF SUSTAINABLE BIOMATERIALS AND PACKAGING (3) LEC. 3. Pr. ECON 2020. The course will familiarize students with the economic theory of resource allocation in a market economy as applied to the specific sustainable biomaterials and packaging industry. This will include; production and consumption theory, engineering and financial decision making.

BIOP 4080 BUSINESS MANAGEMENT FOR SUSTAINABLE BIOMATERIALS (3) LEC. 3. Introduction to key forest products and sustainable biomaterials business management topics including supply chain management policies and limitations specific to the forest products, sustainable biomaterials and packaging industry.

BIOP 4360 SUSTAINABLE BIOMATERIALS TRADE AND MARKETING (3) LEC. 3. Covers the general structure of the sustainable bioproducts/biomaterials industry and the major product markets. Students will be provided an overview of structure of both traditional forest products as well as emerging sustainable biomaterial industry segments.

BIOP 4400 SUSTAINABLE BIOMATERIALS & PRODUCT DEVELOPMENT (4) LEC. 4. Pr. BIOP 5080 or BIOP 5800. Examines the stages of product development, providing a blend of economics, engineering, marketing, and sustainability to design a product that meets the needs of a chosen/participating customer.

BIOP 4410 SUSTAINABLE BIOMATERIALS & PRODUCT DEVELOPMENT II (2) LAB. 2. Pr. BIOP 4400. Continues and completes the final stages of product development (initiated in BIOP 4400), providing a blend of economics, engineering, marketing, and sustainability to finalize the product design that meets the needs of a chosen/participating customer.

BIOP 4700 PACKAGING FOR DISTRIBUTION SYSTEMS (3) LEC. 3. Pr. BIOP 3000. This course explores the role of sustainable raw materials in packaging for distribution systems. Students will learn about the properties, design, and optimization of renewable and recyclable materials to ensure product protection, efficiency, and environmental responsibility throughout the supply chain. Emphasis is placed on material selection, performance in distribution environments, and innovative solutions for sustainable packaging.

BIOP 4920 INTERNSHIP IN SUSTAINABLE PACKAGING (4) INT. 4. Pr. FOWS 3850. Supervised work experience in a Sustainable Packaging (BIOP) setting for a minimum of 50 hours/credit hour. BIOP major, 2.2 cumulative GPA, and senior standing required. Department approval.

BIOP 5050 BIOMASS PROCESSING CHEMISTRY (3) LEC. 3. Wood and fiber morphology, cellulose, hemicellulose and lignin chemistry; biodegradations of cellulose, hemicellulose and lignin. Emphasis on bioenergy and bio-products.

BIOP 5060 PRODUCTION PACKAGING EVALUATION LAB (1) LAB. 3. Pr. BIOP 2140. This lab course provides hands-on experience in evaluating packaging materials and products made from wood, cellulose fibers, and plastics. Students will assess the performance of packaging materials, focusing on real-world applications in product packaging design and manufacturing. The evaluation lab mainly focusses on testing physical, mechanical, and chemical properties of the packaging materials.

BIOP 5070 PERFORMANCE AND DURABILITY OF PRODUCTS AND PACKAGING (3) LEC. 3. Examines the performance and durability of products and packaging, including physics and mechanics properties of solid wood and wood- and bio-based products and packaging materials, as well as notions about durability, thermal, electric and acoustic properties.

BIOP 5080 FIBER-BASED PRODUCTS IN PACKAGING (3) LEC. 3. Pr. BIOP 2140. The manufacturing process of fiber-based products and the applications of the products in packaging industry. Characteristics of wood fibers, including the chemical composition of wood and fibers. Various pulping processes used to separate fibers from other components of the renewable materials. Fiber preparation for papermaking. Property characterization methods for fibers and their products.

BIOP 5250 WOOD COMPOSITES FOR BIOMATERIALS & PACKAGING (3) LEC. 3. Pr. BIOP 3390. Relationships between various biomass feedstock properties and the physical, chemical, and mechanical properties of the biocomposite from various manufacturing processes.

BIOP 5800 BIOPOLYMERS FOR SUSTAINABLE BIOMATERIALS AND PACKAGING (3) LEC. 3. Students will learn packaging functions, classification, and regulations; polymers classification and properties; as well as engineering principles applied to biomaterials and packaging materials. Thermo-mechanical properties and polymers processing methods of natural and sustainable biomaterials will be discussed. An understanding of the advantages and limitations/challenges of bio-based polymers for packaging systems will be gained through the course.

BIOP 6050 BIOMASS PROCESSING CHEMISTRY (3) LEC. 3. Wood and fiber morphology, cellulose, hemicellulose and lignin chemistry; biodegradations of cellulose, hemicellulose and lignin. Emphasis on bio-energy and bio-products.

BIOP 6060 PRODUCTION PACKAGING EVALUATION LAB (1) LAB. 3. This lab course provides hands-on experience in evaluating packaging materials and products made from wood, cellulose fibers, and plastics. Students will assess the performance of packaging materials, focusing on real-world applications in product packaging design and manufacturing. The evaluation lab mainly focusses on testing physical, mechanical, and chemical properties of the packaging materials.

BIOP 6070 PERFORMANCE AND DURABILITY OF PRODUCTS AND PACKAGING (3) LEC. 3. Examines the performance and durability of products and packaging, including physics and mechanics properties of solid wood and wood- and bio-based products and packaging materials, as well as notions about durability, thermal, electric and acoustic properties.

BIOP 6080 FIBER-BASED PRODUCTS IN PACKAGING (3) LEC. 3. The manufacturing process of fiber-based products and the applications of the products in packaging industry. Characteristics of wood fibers, including the chemical composition of wood and fibers. Various pulping processes used to separate fibers from other components of the renewable materials. Fiber preparation for papermaking. Property characterization methods for fibers and their products.

BIOP 6250 BIOCOMPOSITES (3) LEC. 3. Relationships between various biomass feedstock properties and the physical, chemical, and mechanical properties of the biocomposite from various manufacturing processes.

BIOP 6800 BIOPOLYMERS FOR SUSTAINABLE BIOMATERIALS AND PACKAGING (3) LEC. 3. Students will learn packaging functions, classification, and regulations; polymers classification and properties; as well as engineering principles applied to biomaterials and packaging materials. Thermo-mechanical properties and polymers processing methods of natural and sustainable biomaterials will be discussed. An understanding of the advantages and limitations/challenges of bio-based polymers for packaging systems will be gained through the course.

Earth System Science Courses

ESSI 7150 SCIENCE COMMUNICATION (3) LEC. 3. This course will provide opportunities for STEM graduate students to practice communicating science to multiple audiences. Students will gain skills by communicating with both stakeholders and the public and presenting information, exploring public opinion on socio-political topics such as climate change, resilience, and adaptation planning, and learning about appropriate framing and messaging techniques for target audiences. Guest speakers, reading discussions, practical tips, communication rubrics, and presentations to refine communication skills will be emphasized.

ESSI 7200 STEM STUDIO (2) LEC. 2. This course will provide opportunities for interdisciplinary STEM graduate students to learn about structured decision-making and the coproduction of science, which aims to undertake science that is actionable and useful to targeted stakeholder groups. Students will gain skills by communicating with stakeholders and develop a proposal to conduct research with a stakeholder group of their choice. Ideally, students would then implement their research in the follow-on Internship course (ESSI 7920) offered by the ESSI Program/NRT project. Guest speakers, reading discussions, written communication, workshops, and meetings with stakeholders will be included in the course. This course aims to: (i) expose students working on climate adaptation (from natural, social, or humanities sciences) to ideas of interdisciplinary climate knowledge, co-production, and structured decision-making; (ii) help students reflect on and relate these ideas to their own research - how their own climate research could connect with other disciplines and meet the decision needs of stakeholders; (iii) support participants in designing a climate adaptation research project for review by their peers and future implementation with their chosen stakeholder group.

ESSI 7300 SOCIAL-ECOLOGICAL-ENGINEERED SYSTEMS (3) LEC. 3. This course explores foundational scholarship on the Social-Ecological Systems (SES) approach to understanding complex environmental problems with emphasis on the role of engineering in human interactions with natural systems. Students are expected to apply SES concepts and theories to analyses in their own areas of research.

ESSI 7420 NATURAL HAZARDS RISK AND DISASTER RESILIENCE (3) LEC. 3. The purpose of this course is to present students with an approach to understanding adverse natural hazard impacts and disasters grounded in the analysis of disaster risk, vulnerability, and resilience. The course will use a multidisciplinary perspective to examine factors and conditions that put people differentially at risk before, during, and following a disaster event. The course will also introduce students to the metrics, methodologies, and tools necessary for both quantitative and qualitative resilience assessments and benchmarking methods. Specific topics that are an integral part of the resilience concept will include: climate-related hazard risk assessment; disaster resilience assessment covering ecological, social, economic, infrastructural, and institutional components; community capital; hazard mitigation and planning for fostering resilient communities; social vulnerability, and recovery. The course materials, lectures, and assignments will reflect the emerging emphasis on resilience to climate-induced natural hazards and disasters.

ESSI 7920 CLIMATE INTERNSHIP (1) INT. 1. This course will provide graduate Trainees with an opportunity to gain knowledge and skills from a planned work experience in the area of resilience to climate-related natural hazards and disasters. In addition to meeting core learning objectives, jointly developed learning outcomes that are specific to each Trainee will be selected and evaluated by a faculty internship advisor, a stakeholder sponsor, and the Trainee. It is expected that the internship will afford Trainees the opportunity to: 1) explore career paths related to climate resilience outside of academia, 2) conduct research to solve real-world problems, and 3) to understand the research needs of stakeholders. The experience will also give students the opportunity to build professional networks.

ESSI 8000 EARTH SYSTEM SCIENCE AND GLOBAL CHANGE (3) LEC. 3. The course explores the Earth system as a whole, with an emphasis on the interrelationships between geological, biological, climatological, and human systems on regional and global scales.

ESSI 8040 URBAN CLIMATOLOGY (3) SEM. 3. This seminar will explore past, current, and emerging textbooks and literature to introduce (1) the fundamental concepts of the urban-climate system, (2) observational and modeling strategies for studying the urban-climate system, and (3) the context for how the urban-climate system feedbacks fit into the climate change discussion. Students will be graded based on class participation, examinations, a small group project, and an individual project.

ESSI 8100 EARTH SYSTEM OBSERVATIONS AND ANALYSIS (3) LEC. 2. LAB. 2. Pr. GSEI 1200 and GSEI 2070. Course reviews recent advances in earth system observations and provides students opportunity to develop holistic understanding of key parameters and processes of the earth system including biosphere, atmosphere, and oceans processes using observations.

ESSI 8200 EARTH SYSTEM SCIENCE SEMINAR (1) SEM. 1. SU. Students deliver oral presentations based upon their research and provide constructive criticism of their peers' presentations. Topics of presentations may include student's dissertation research areas or critical examination of current research problems in Earth system science.

ESSI 8990 RESEARCH AND DISSERTATION (1-6) DSR. Theoretical and practical aspects of designing dissertation research in the interdisciplinary Earth System Science program. The course is designed to assist students through the proposal and dissertation writing and presentation processes and to prepare for the dissertation defense. Course may be repeated for a maximum of 15 credit hours.

Forest Engineering Courses

FOEN 3040 FOREST SURVEYING (2) PRA. 2. Basic land surveying concepts and procedures as applied to Forestry. Use of basic surveying instruments and calculations for land areas, boundaries, and topographic features. Summer.

FOEN 4970 SPECIAL TOPICS (1-4) LEC. Departmental approval. Individual or small group study of a specialized area in forest engineering. Fall, Spring, and Summer. Course may be repeated for a maximum of 8 credit hours.

FOEN 5700 HARVESTING (3) LEC. 2. LAB. 3. Pr. FORY 3180. Analysis of the administration of timber harvest, equipment choice, planning methods, movement of timber products, machine and system costs, balancing of harvesting systems, logging safety, and environmental impact.

FOEN 5710 SYSTEMS ANALYSIS FOR FORESTRY AND BIOLOGICAL OPERATIONS (3) LEC. 2. LAB. 3. Pr. BSEN 2210 and (STAT 3010 or STAT 2510). Junior standing or greater. Analysis methods for timber harvesting productivity and costs including gathering of time and production data, preparation of data for analysis and statistical modeling.

FOEN 6230 ENGINEERED WOOD STRUCTURE DESIGN (3) LEC. 2. LAB. 3. Pr. ENGR 2070. Load, deflection criteria; engineering characteristics of wood; designing wood components and mechanical connections; shear walls and diaphragms; trusses; bridges; post-frame construction.

FOEN 6700 HARVESTING (3) LEC. 2. LAB. 3. Pr. FORY 3180. Analysis of the administration of timber harvest, equipment choice, planning methods, movement of timber products, machine and system costs, balancing of harvesting systems, logging safety, and environmental impact.

FOEN 6710 OPERATIONS ANALYSIS IN BIOSYSTEMS AND FORESTRY (3) LEC. 2. LAB. 3. Analysis methods for timber harvesting productivity and costs including gathering of time and production data, preparation of data for analysis and statistical modeling.

FOEN 7970 SPECIAL TOPICS (1-4) LEC. Departmental approval. Individual or small group study of an advanced specialized area in forest engineering. Fall, Spring, and Summer. Course may be repeated for a maximum of 12 credit hours.

Forest Products Courses

FOPR 7970 SPECIAL TOPICS (1-4) IND. Departmental approval. Analysis of a problem in forest products or wood science involving library research, laboratory or field work and a report on the findings. Fall, Spring, and Summer. Course may be repeated for a maximum of 12 credit hours.

FOPR 7990 RESEARCH AND THESIS (1-15) MST. Credit to be arranged. Course may be repeated with change in topics.

FOPR 8970 SPECIAL TOPICS (1-4) IND. Departmental approval. Analysis of a problem in forest products or wood science involving library research, laboratory or field work and a report on the findings. Course may be repeated for a maximum of 12 credit hours.

Forestry Courses

FORY 3010 FOREST SOILS (3) LEC. 2. LAB. 3. Pr. CHEM 1010 or CHEM 1030. Overview of forest soil composition, formation, biota, classification, chemistry, ecology, and management.

FORY 3020 FOREST BIOLOGY (3) LEC. 1. LAB. 3. Field exposure to important principles of forest biology and some examples of their applications to forest resources; identification of major tree species and critical analysis of forest stand structure. Summer.

FORY 3050 FIELD MENSURATION (4) LEC. 1. LAB. 3. Basic concepts and procedures for measuring trees, stands and other forest resources; units of measure, log rules, volume tables, condition class mapping and timber estimation. Summer.

FORY 3060 INTRODUCTION TO FOREST MANAGEMENT STRATEGIES (1) LEC. 1. LAB. 3. Biological, social, and economic principles underlying forest management strategies, the diversity of forestry enterprises, and the complexities facing forest managers. Summer.

FORY 3100 DENDROLOGY (3) LEC. 2. LAB. 3. Pr. (BIOL 1030 or BIOL 1037) or FORY 3020. Taxonomy and identification of important forest trees of the U.S., including cover types of forest regions.

FORY 3180 FOREST RESOURCE SAMPLING (3) LEC. 2. LAB. 3. Pr. FORY 3050. Theoretical and empirical estimates of tree and log volumes, tree taper, and yield tables. Sampling design and analysis to estimate current conditions of timber stands.

FORY 3200 FOREST TREE PHYSIOLOGY (3) LEC. 3. Pr. FORY 3020. Relationship between cultural, environmental and genetic factors that affect metabolism and growth of individual trees.

FORY 3500 FORESTRY FOR SMALL WOODLAND OWNERS (3) LEC. 3. An appreciation of forest trees and the environment, the environmental functions of trees, and the economic potential of a balanced land-use plan.

FORY 4190 FOREST BIOMETRICS (3) LEC. 2. LAB. 3. Pr. FORY 3180. Factors affecting and mathematical principles of tree-volume and stand growth.

FORY 4230 FOREST ECOLOGY (3) LEC. 3. Pr. BIOL 1030 or BIOL 1037. Forests as functional systems, the biotic and abiotic environment, temporal changes in ecosystem structure and function, application of ecological information.

FORY 4260 LONGLEAF PINE: HISTORY, ECOLOGY, MANAGEMENT, AND RESTORATION (2) LEC. 2. History of forestry in the south, focusing on the longleaf pine ecosystem. Also, information on species that are part of the longleaf ecosystem, comparisons with other southern pines, and management and restoration techniques.

FORY 4450 FOREST SECTOR ECONOMICS (3) LEC. 3. Pr. FORY 5400. Status, trend, employment and other fundamentals of forest industry. Timber supply and demand, forest products supply and demand, technological change, international trade.

FORY 4830 INDUSTRIAL WOOD PROCUREMENT PRACTICUM (1) PRA. 2. SU. Pr. FORY 3050. Strategies, field and office procedures involved in purchasing wood for an industrial forestry firm. Taught as a weekend field exercise at Solon Dixon Forest Education Center. Course may be repeated for a maximum of 2 credit hours.

FORY 4930 DIRECTED STUDY (1-3) AAB/IND. Departmental approval. Fall, Spring, and Summer. Course may be repeated for a maximum of 6 credit hours.

FORY 4967 HONORS SPECIAL PROBLEMS (1-3) IND. Pr. Honors College. Departmental approval. Topics of an undergraduate nature pertinent to Forestry. Course may be repeated for a maximum of 3 credit hours.

FORY 4970 SPECIAL TOPICS (1-4) AAB/LEC. Course may be repeated for a maximum of 8 credit hours.

FORY 4980 SENIOR CAPSTONE PROJECT (1-4) LAB. 1-4. Pr. FORY 5230 and FORY 5410. Integrated study of Forest Resource Management using a case-study approach through development of a comprehensive plan related to the declared emphasis. Spring. Course may be repeated for a maximum of 4 credit hours.

FORY 5140 FOREST REGENERATION AND SEEDLING PRODUCTION (3) LEC. 3. Pr. P/C FORY 4230 or P/C HORT 3220. Principles of forest nursery seedling culture. Evaluation of activities to improve out planting performance. Plantation establishment problems and practices in Southern US.

FORY 5150 FOREST HEALTH (3) LEC. 3. Pr. FORY 3020 or BIOL 3060. Importance, taxonomy, identification and integrated pest management strategies of principle disease, insect and abiotic disorders of forest and shade trees from seedlings to maturity and forest products.

FORY 5151 FOREST HEALTH LABORATORY (1) LAB. 1. Coreq. FORY 5150. Identification of basic diseases and insects that affect forest health along with identification of their damage; the processes of pathogen infection and symptomology; and the process of wood decay studied in a laboratory and field environment. Credit will not be given for both FORY 5151 and FORY 6151.

FORY 5230 SILVICULTURE (4) LEC. 3. LAB. 3. Pr. FORY 4230 or BIOL 5140 or BIOL 3060 or BSEN 3230. Principles and methods of controlling establishment, growth and quality of forest stands. Application of ecological principles to manipulation of forest ecosystems to meet specific objectives.

FORY 5360 CONSULTING FORESTRY (2) LEC. Business and professional requirements of forest resource management consulting. Presentations will be provided by consulting foresters, and analyses of the services they provide will be covered.

FORY 5400 FOREST ECONOMICS (3) LEC. 2. LAB. 3. Pr. FORY 3180. Marginal analysis, investment theory, resource supply, economics of conservation, and taxation principles applied to forestry. Structure and performance of forest products markets.

FORY 5410 FOREST MANAGEMENT AND ADMINISTRATION (3) LEC. 2. LAB. 3. Pr. FORY 5400 and FORY 4190. Quantitative approaches to decision making in Forestry with an emphasis on the interests of large scale firms and agencies.

FORY 5440 INTERNATIONAL FORESTRY (3) LEC. 3. Survey global forest location, characteristics, management systems, international forest products trade, current issues, and international forest governance.

FORY 5460 FOREST FIRE MANAGEMENT (3) LLB. Pr. FORY 4230 or BIOL 3060. The management of fire, both as a tool and wildfire suppression in the management of forested ecosystems. Emphasis placed on experience, technique and administration.

FORY 5470 GIS APPLICATIONS IN NATURAL RESOURCES (2) LEC. 1. LAB. 3. Basic understanding of GIS through discussion of the basic components of a GIS and how GIS are used in forestry applications.

FORY 5480 GIS DATABASE DESIGN AND ANALYSIS (3) LEC. 3. Pr. GSEI 5800 or COMP 1220 or GEOG 5890. Departmental approval. Geographic information system database planning, design, creation, management and analysis using a project oriented approach.

FORY 5540 ENVIRONMENTAL LAW (3) LEC. 3. A review of environmental law including common and administrative law, land use, and Federal statutes on water, air, toxins and waste. May count either FORY 5540 or FORY 6540.

FORY 5550 PROPERTY LAW (3) LEC. 3. Land ownership, transfer and management including trespass, nuisance, adverse possession, easements, concurrent ownership, land use regulations and regulatory takings. May count either FORY 4550 or FORY 5550/6550.

FORY 5620 FOREST FINANCE AND INVESTMENT (3) LEC. 3. Pr. ECON 2020 or ECON 2023 or ECON 2027. Principles of corporate and real estate finance as applied to commercial timberland and its place in individual and institutional portfolios. May count either FORY 5620 or FORY 6620.

FORY 5650 URBAN FORESTRY (3) LEC. 2. LAB. 3. Pr. FORY 3100 or HORT 3200. Principles and concepts of tree establishment, management and health in an urban environment. Case studies of urban forestry programs are presented.

FORY 5820 FORESTRY IN THE PRIVATE SECTOR (3) SEM. 3. Pr. FORY 3050. Management systems and practices used in wood purchasing, timber harvesting and timberland management including public relations, forest sustainability, certification and personal business skills.

FORY 6140 FOREST REGENERATION AND SEEDLING PRODUCTION (3) LEC. 3. Pr. P/C FORY 4230 or P/C HORT 3220. Principles of forest nursery seedling culture. Evaluation of activities to improve out planting performance. Plantation establishment problems and practices in Southern US.

FORY 6150 FOREST HEALTH (3) LEC. 3. Importance, taxonomy, identification and integrated pest management strategies of principle disease, insect and abiotic disorders of forest and shade trees from seedlings to maturity and forest products.

FORY 6151 FOREST HEALTH LABORATORY (1) LAB. 1. Coreq. FORY 6150. Identification of basic diseases and insects that affect forest health along with identification of their damage; the processes of pathogen infection and symptomology; and the process of wood decay studied in a laboratory and field environment. Credit will not be given for both FORY 5151 and FORY 6151.

FORY 6230 SILVICULTURE (4) LEC. 3. LAB. 3. Pr. FORY 4230 or BIOL 3060 or BIOL 5140 or BIOL 6140 or BSEN 3230. Principles and methods of controlling establishment, growth and quality of forest stands. Application of ecological principles to manipulation of forest ecosystems to meet specific objectives.

FORY 6360 CONSULTING FORESTRY (2) LEC. Business and professional requirements of forest resource management consulting. Presentations will be provided by consulting foresters, and analyses of the services they provide will be covered.

FORY 6400 FOREST ECONOMICS (3) LEC. 2. LAB. 3. Pr. FORY 3180. Marginal analysis, investment theory, resource supply, economics of conservation, and taxation principles applied to forestry. Structure and performance of forest products markets.

FORY 6410 FOREST MANAGEMENT AND ADMINISTRATION (3) LEC. 2. LAB. 3. Pr. (FOR 5400 or FORY 6400) and (FOR 4190). Quantitative approaches to decision making in Forestry with an emphasis on the interests of large scale firms and agencies.

FORY 6440 INTERNATIONAL FORESTRY (3) LEC. 30. Survey global forest location, characteristics, management systems, international forest products trade, current issues, and international forest governance.

FORY 6460 FOREST FIRE MANAGEMENT (3) LLB. The management of fire, both as a tool and wildfire suppression in the management of forested ecosystems. Emphasis placed on experience, technique and administration.

FORY 6470 GIS APPLICATIONS IN NATURAL RESOURCES (2) LEC. 1. LAB. 3. Basic understanding of GIS through discussions of the components of a GIS and how GIS are used in natural resource applications.

FORY 6480 GIS DATABASE DESIGN AND ANALYSIS (3) LEC. 3. Departmental approval. Geographic information system database planning, design, creation, management and analysis using a project oriented approach.

FORY 6540 ENVIRONMENTAL LAW (3) LEC. 3. A review of environmental law including common and administrative law, land use, and Federal statutes on water, air, toxins and wastes. May count either FORY 5540 or FORY 6540.

FORY 6550 PROPERTY LAW (3) LEC. 3. Land ownership, transfer and management including trespass, nuisance, adverse possession, easements, concurrent ownership, land use regulations and regulatory takings. May count either FORY 4550 or FORY 5550/6550.

FORY 6650 URBAN FORESTRY (3) LEC. 2. LAB. 3. Pr. FORY 3100 or HORT 3200. Principles and concepts of tree establishment, management and health in an urban environment. Case studies of urban forestry programs are presented.

FORY 6820 FORESTRY IN THE PRIVATE SECTOR (3) SEM. 3. Management systems and practices used in wood purchasing, timber harvesting and timberland management including public relations, forest sustainability, certification and personal business skills.

FORY 7110 FOREST BIOGEOCHEMISTRY (3) LEC. 2. LAB. 3. Pr. FORY 6230. Fundamental and applied aspects of forest biogeochemical processes at scales of the individual tree, forest community, and forest ecosystem.

FORY 7160 ECOSYSTEM RESPONSES TO CHEMICAL CLIMATE CHANGE (3) LEC. 2. LAB. 3. Plant responses to changes in the chemical climate. Emphasis on sources, effects, methodologies used and ecosystem and global effects.

FORY 7170 ECOPHYSIOLOGY OF FOREST TREES (3) LEC. 3. Pr. BIOL 3100 or FORY 3200. Interactions among the environment, silvicultural practices, physiological mechanisms and tree growth. Integration of root, shoot and foliar functions and leaf, tree and stand level processes.

FORY 7210 ECOSYSTEM ECOLOGY (3) LEC. 3. Pr. BIOL 3060 or FORY 4230 or BIOL 5140 or BIOL 6140. To create a conceptual model of the terrestrial ecosystem including spatial distributions over time; and the impact of human activity and natural disturbance.

FORY 7250 ADVANCED ECOSYSTEM MODELING (3) LEC. 3. Pr. FORY 4230 or BIOL 3060. Exploration of the theory and rationale in modeling the structure and functions of ecological ecosystems.

FORY 7300 FOREST BUSINESS AND INVESTMENTS SEMINAR (1) LAB. 1. This course is designed to prepare Forest Business and Investments students with the processes, practices, values, actions, and visions associated with finance and investment in commercial timberland.

FORY 7320 FOREST GROWTH, SILVICULTURE, AND MANAGEMENT (3) LEC. 3. Understanding of forest growth and yield, measurements, management practices and methods, and optimization techniques necessary to make management decisions that maximize objectives.

FORY 7330 ECOLOGY AND SILVICULTURE OF EASTERN HARDWOOD FORESTS (3) LEC. 2. LAB. 3. Pr. FORY 4230. Silvical characteristics of major hardwood species and community composition, dynamics, site relationships, and silviculture of Southern and Eastern deciduous forests, emphasizing oaks.

FORY 7350 APPLIED STATISTICS FOR FOREST BUSINESS (3) LEC. 3. Gain an understanding of applied statistics related to forest business and statistical software to make informed and accurate business and investment decisions.

FORY 7400 FOREST VALUATION AND ECONOMICS (3) DSL. Forest valuation and the economic theory of forest resource allocation. Topics covered include forest valuation and appraisal, analysis of consumer behavior, production, market structure and the role of government, economics of forest management and policy, international trade, and financial analysis.

FORY 7450 FOREST SECTOR ECONOMICS (4) LEC. 4. Pr. FORY 5400 or FORY 6400. Fundamentals of forest industry, timber supply and demand, forest products supply and demand, technological change, international trade and development, sophisticated forest sector modeling.

FORY 7460 LAND ECONOMICS (3) LEC. 3. Evolution of the role of economics in forestry, policy and production analysis methods, non-market valuation, and regional analysis.

FORY 7510 RESEARCH METHODS (2) LEC. 1. LAB. 3. Overview of the scientific method and its application in forestry/natural resources research. Evaluation and preparation of project proposals with emphasis on research quality and written communication skills.

FORY 7620 FOREST FINANCE, ACCOUNTING AND TAXATION (3) LEC. 3. Course will provide students with an overview of core concepts in finance, accounting and taxation and how these concepts can be specifically applied to various types of forest operations.

FORY 7650 FOREST OPERATIONS AND WOOD SUPPLY CHAIN MANAGEMENT (3) DSL. 3. This course will review all the intricacies of the wood supply chain, from the diverse landowner base (private landowners, TIMO's and REIT's and government) to the independent logger to the wood supplier and then the consuming mill.

FORY 7850 URBAN FORESTRY SEMINAR (1) SEM. 1. Presentation and discussion of research, scientific papers and issues related to urban forest establishment, care and planning. Credit will not be given for both FORY 7850 and HORT 7850. Fall.

FORY 7910 PRACTICUM IN COLLEGE TEACHING (1) PRA. 1. SU. Techniques and practice of collegiate teaching at the level of Graduate Assistant. Students work under direct supervision and tutelage of the instructor. Fall, Spring, and Summer.

FORY 7930 DIRECTED STUDIES (1-3) AAB/IND. Course may be repeated for a maximum of 9 credit hours.

FORY 7950 CFWE SEMINAR (1) SEM. SU. Participation in the College of Forestry, Wildlife and Environment Seminar Series. Students will learn about research being conducted in various field and by various individuals internal and external to the university. Course may be repeated for a maximum of 3 credit hours.

FORY 7970 SPECIAL TOPICS (1-4) IND. Departmental approval. Analysis of a problem in Forestry or wood utilization involving library research, laboratory or field work and a report on the findings. Course may be repeated for a maximum of 12 credit hours.

FORY 7980 MASTER OF NATURAL RESOURCES PAPER (2) IND. In-depth study involving library review, data collection and/or data analysis. Departmental Program.

FORY 7990 RESEARCH AND THESIS (1-15) MST. Credit to be arranged.

FORY 8930 DIRECTED STUDIES (1-3) IND. Course may be repeated for a maximum of 9 credit hours.

FORY 8970 SPECIAL TOPICS (1-4) IND. Departmental approval. Analysis of a problem in Forestry or wood utilization involving library research, laboratory or field work and report on the findings. Course may be repeated for a maximum of 12 credit hours.

FORY 8990 RESEARCH AND DISSERTATION (1-15) DSR. Credit to be arranged.

Forestry Wildlife Sci. Courses

FOWS 1010 INTRODUCTION TO RENEWABLE NATURAL RESOURCES (1) LEC. 1. Introduction to the wealth and breadth of renewable natural resources in the state, region, nation, and world. Speakers cover topics in forestry, wildlife, water, and soil.

FOWS 1020 SCIENCE OF NATURE I (3) LEC. 3. Coreq. FOWS 1021. Introduction to how the natural world is relevant to society. Lectures will focus on connections using the scientific method to assess ecosystems and the effects human use has on them. The course will develop engaged citizens for our planet by helping students to see how science helps identify and solve real natural resources problems.

FOWS 1021 SCIENCE OF NATURE I LABORATORY (1) LAB. 1. Coreq. FOWS 1020. Hands on learning using both laboratory and field exercises to introduce students to how the natural world is relevant to society and its success.

FOWS 1030 SCIENCE OF NATURE II (3) LEC. 3. Pr. FOWS 1020. Coreq. FOWS 1031. In depth exposure for students to think critically about the issues in the natural world, including the history of natural resource use in North America. Students will delve deeper into specific natural resource topics with a focus on the habitats and ecosystems of Alabama including issues on how the natural world is relevant to society.

FOWS 1031 SCIENCE OF NATURE II LABORATORY (1) LAB. 1. Coreq. FOWS 1030. In depth exposure using both laboratory and field exercises to introduce students to how the natural world is relevant to society. As part of the course students will collect real-world data, analyze it, summarize it, and disseminate it for use by the public.

FOWS 1040 CLIMATE SCIENCE I (3) LEC. 3. LAB. 0. Coreq. FOWS 1041. Basics of the Earth's climate system including atmospheric environment, the energy budget, and biogeochemical cycles. Knowledge of the greenhouse effect, major greenhouse gases (GHG), and their sources and the consequences on Climate Change.

FOWS 1041 CLIMATE SCIENCE I - LABORATORY (1) LEC. 0. LAB. 3. Coreq. FOWS 1040. A field and laboratory course with student exercises designed to introduce students to the basics of Climate Science.

FOWS 1050 CLIMATE SCIENCE II (3) LEC. 3. LAB. 0. Pr. FOWS 1040 and FOWS 1041. Coreq. FOWS 1051. Enhanced examination of the Climate Science and causes of climate change and its impacts on natural and managed ecosystems, natural resources, wildlife, and human health, locally, regionally and internationally.

FOWS 1051 CLIMATE SCIENCE II - LABORATORY (1) LAB. 3. Pr. FOWS 1040 and FOWS 1041. Coreq. FOWS 1050. A field and laboratory course with student exercises designed to bring together concepts discussed and examined in lecture (FOWS 1050) for students to analyze and summarize for decision making.

FOWS 2030 INTRO TO ENVIRON EDUCATION (3) LEC. 3. Students will learn about the historical and theoretical foundations of environmental education while participating in experiential learning exercises.

FOWS 2060 INTRODUCTION TO FORESTED LANDSCAPES (2) LEC. 2. Pr. BIOL 1020 or BIOL 1027. This course will serve as an introduction to forest tree biology, forest types of North America, forest ecology and tree identification. The overall course objective is to introduce students to important concepts in forest ecosystem science and management.

FOWS 3500 FORESTRY, ENVIRONMENT & WILDLIFE LEADERSHIP ACADEMY I (1) LEC. 1. SU. Departmental approval. FEWL Academy I is designed to introduce students to the basic leadership styles that are necessary for critical problem solving in issues related to the management, utilization, and stewardship of natural resources.

FOWS 3510 FORESTRY, ENVIRONMENT & WILDLIFE LEADERSHIP ACADEMY II (1) LEC. 1. SU. Pr. FOWS 3500. Departmental approval. FEWL Academy II is designed to allow students to apply the leadership styles introduced in FOWS 3500 necessary for critical problem solving in issues related to the management, utilization, and stewardship of natural resources.

FOWS 3800 INTRODUCTION TO THE ROLE OF FORESTS ON HUMAN HEALTH AND LIVELIHOODS IN SOUTH AFRICA AND MA (1) LEC. 1. This course is intended to prepare students for the study abroad trip to South Africa and Madagascar (FOWS 3810). Students will gain knowledge as to cultural practices of South Africa and Madagascar, issues faced by communities and the role forests play in livelihoods and human health. Knowledge and theoretical approaches to various issues to ensure the well-being of people, animals and environment through collaborative multidisciplinary problem solving will be introduced and discussed.

FOWS 3810 ROLE OF FORESTS ON HUMAN HEALTH AND LIVELIHOODS IN SOUTH AFRICA AND MADAGASCAR (4) AAB. 4. Pr. FOWS 3800. This is a study abroad course, students will travel to South Africa and Madagascar to learn about the importance of trees for rural community livelihood and human health. Using the knowledge obtained in the pre-requisite theoretical course (FOWS 3800) students will interact with communities and researchers in South Africa and Madagascar to witness and learn about putting theory into action. Students will witness how issues, discussed in FOWS 3800, are addressed through collaborative, multi-disciplinary problem solving that results in unique approaches to ensure the well-being of people, animals and the environment.

FOWS 3850 PROFESSIONAL PREPARATION IN FORESTRY, WILDLIFE, AND THE ENVIRONMENT (1) LEC. 1. Assessment of career opportunities. Prepares students for their CFWE internship and post-graduation employment and career development.

FOWS 3950 UNDERGRADUATE SEMINAR (1) LEC. 1. Students will practice speaking in front of a scientific audience, learn to research topics, and organize presentations for professional audiences, faculty, and other students.

FOWS 4970 SPECIAL TOPICS (1-4) LEC. 1-4. Overview of forest soil composition, formation, biota, classification, chemistry, ecology, and sustainable management. Course may be repeated for a maximum of 8 credit hours.

FOWS 4980 UNDERGRADUATE RESEARCH (1-4) IND. Departmental approval. Directed research in the area of specialty under faculty supervision. Course may be repeated for a maximum of 4 credit hours.

FOWS 5210 RESTORATION ECOLOGY (3) LEC. 3. Pr. BIOL 1030. Overview of the history, science, ethics, and current practice of restoration ecology to recognize and understand the need for restoration.

FOWS 5220 LANDSCAPE ECOLOGY (3) LEC. 3. Pr. BIOL 3060 or FORY 4230. Ecological effects and management of heterogeneous spatial pattern on ecosystems over large areas. May count either FOWS 5220 or FOWS 6220.

FOWS 5230 FOREST STAND DYNAMICS (3) LEC. 3. Pr. BIOL 1030. Forest stand dynamics studies the changes in stand structure over time. Examines phases of stand development and how we can help and aid forest, wildlife, and restoration management decisions.

FOWS 5240 FIRE ECOLOGY (3) LEC. 3. Pr. BIOL 1030. Examines the history of fire management, fire behavior, fuel management and models, ignition techniques, fire suppression techniques, urban interface, smoke management, fire weather, elements of a prescribed burn plan, fire and wildlife, and outreach.

FOWS 5250 LONGLEAF PINE ECOLOGY, MANAGEMENT, AND RESTORATION (3) LEC. 3. Pr. BIOL 1030. Covers the ecology of the once-dominant species, the role fire played in maintaining these ecosystems, management possibilities, conversion to longleaf pine, and an overview of the current restoration efforts.

FOWS 5260 FOREST WETLANDS RESTORATION ECOLOGY (3) LEC. 3. Pr. BIOL 3060 or FORY 4230. History and policy of wetlands destruction and restoration, wetland classification and inventory, techniques for assessing wetland functions, and techniques for forest wetlands restoration.

FOWS 5270 NATURAL RESOURCE POLICY (3) LEC. 3. Departmental approval. Examination of attitudes, philosophies and policies that govern management of the natural resource.

FOWS 5340 INVASION ECOLOGY (3) LEC. 3. The history, ecology, and management issues pertaining to non-native invasive species will be examined and discussed.

FOWS 5450 CONFLICT AND COLLABORATION IN NATURAL RESOURCES MANAGEMENT (3) DSL. Overview of issues, theories, and approaches to conflict management and collaboration in natural resources. Topics include conflict management, collaborative processes, and negotiation; tools and frameworks for analyzing conflict; and evolving management approaches to natural resource conflict.

FOWS 5620 NATURAL RESOURCE FINANCE AND INVESTMENT (3) LEC. 3. Pr. (ECON 2020 or ECON 2023 or ECON 2027). Principles of corporate and real estate finance as applied to natural resources and the place of natural resources in individual and institutional portfolios. May count one of: FORY 6620, FOWS 5620, FOWS 6620.

FOWS 6210 RESTORATION ECOLOGY (3) LEC. 3. Overview of the history, science, ethics, and current practice of restoration ecology to recognize and understand the need for restoration.

FOWS 6220 LANDSCAPE ECOLOGY (3) LEC. 3. Ecological effects and management of heterogeneous spatial pattern on ecosystems over large areas. May count either FOWS 5220 or FOWS 6220.

FOWS 6230 FOREST STAND DYNAMICS (3) LEC. 3. Forest stand dynamics studies the changes in stand structure over time. Examines phases of stand development and how we can help and aid forest, wildlife, and restoration management decisions.

FOWS 6240 FIRE ECOLOGY (3) LEC. 3. Examines history of fire management, fire behavior, fuel management and models, ignition techniques, fire suppression techniques, urban interface, smoke management, fire weather, elements of a prescribed burn plan, fire and wildlife, and outreach.

FOWS 6250 LONGLEAF PINE ECOLOGY, MANAGEMENT, AND RESTORATION (3) LEC. 3. Covers the ecology of the once-dominant species, the role fire played in maintaining these ecosystems, management possibilities, conversion to longleaf pine, and an overview of the current restoration efforts.

FOWS 6260 FOREST WETLANDS RESTORATION ECOLOGY (3) LEC. 3. This course will cover the history and policy of wetlands destruction and restoration, wetland classification and inventory, techniques for assessing wetland functions, and techniques for forest wetlands restoration.

FOWS 6270 NATURAL RESOURCE POLICY (3) LEC. 3. Departmental approval. Examination of attitudes, philosophies and policies that govern management of the natural resource.

FOWS 6340 INVASION ECOLOGY (3) LEC. 3. The history, ecology, and management issues pertaining to non-native invasive species will be examined and discussed.

FOWS 6450 CONFLICT AND COLLABORATION IN NATURAL RESOURCE MANAGEMENT (3) DSL. 45. Overview of issues, theories, and approaches to conflict management and collaboration in natural resources. Topics include conflict management, collaborative processes, and negotiation; tools and frameworks for analyzing conflict; and evolving management approaches to natural resource conflict.

FOWS 6620 NATURAL RESOURCE FINANCE AND INVESTMENT (3) LEC. 3. Principles of corporate and real estate finance as applied to natural resources and the place of natural resources in individual and institutional portfolios. May count either FORY 5620 or FORY 6620.

FOWS 7150 SPATIAL STATISTICS FOR NATURAL RESOURCES (3) LEC. 3. LAB. 1. Applications of spatial statistics in the natural resources. Three types of spatial data including point pattern data, geostatistical data and lattice (areal) data will be covered to introduce basic concepts, theories and methodology of spatial (spatial-tempo) data analyses and modeling.

FOWS 7200 DISEASE ECOLOGY (3) LEC. 3. Discusses the critical importance of relationships between human and animal diseases and the ecology of vectors, pathogens and the environment.

FOWS 7220 FOREST HISTORY OF ALABAMA AND THE SOUTHEASTERN UNITED STATES (3) LEC. 3. This course will focus on the natural, human and societal factors that influenced forests and land management in the southeastern United States from the 1700s to present. FOWS 7220 or FOWS 7226.

FOWS 7260 FOREST WETLANDS RESTORATION ECOLOGY (3) DSL. This course will cover the history and policy of wetlands destruction and restoration, wetland classification and inventory, techniques for assessing wetland functions, and techniques for forest wetlands restoration.

FOWS 7270 WETLANDS POLICY (3) LEC. 3. This course will cover historical development of wetland protection and will discuss current U.S. and international wetland policies.

FOWS 7300 CURRENT TOPICS IN ONE HEALTH (1) LEC. 1. The One Health concept refers to connections among health of people, animals and ecosystems and is used as a framework for addressing health related problems. Course explores the concept from the perspective of current and relevant health issues. Course may be repeated for a maximum of 2 credit hours.

FOWS 7400 INTRODUCTION TO PUBLIC HEALTH (3) DSL. 3. This is a survey course intended to provide an introduction to and overview of the wide-ranging field of Public Health.

FOWS 7480 ADVANCED NATURAL RESOURCE POLICY (3) LEC. 3. Pr. FORY 5400 or FORY 6400. Policy process and players, theory and evolution of property rights, public choice theory, land ethics, policy analysis, programs and statutory laws, forest policy in an international context.

FOWS 7500 OUTBREAKS TO PANDEMICS: EMERGING INFECTIOUS DISEASES IN A MODERN WORLD (2) DSL. This course explores modern and historical disease outbreaks, particularly zoonotic emerging infectious diseases. Students will understand key approaches necessary to contain and halt infectious diseases. Students will learn about multisectoral emergency responses to outbreaks and about the strengths and weaknesses of health systems during epidemics.

FOWS 7950 GRADUATE SEMINAR (1) SEM. 1. Students develop ability and confidence in making oral presentations based upon research and provide constructive criticism of their peers' presentations.

FOWS 7970 SPECIAL TOPICS (1-4) IND. Analysis of a problem in the natural resources, forestry, wildlife arena involving lectures, discussions, laboratory for field work. Department approval and agreement with faculty and students. Course may be repeated for a maximum of 12 credit hours.

Geospatial and Env Informatics Courses

GSEI 1200 INTRODUCTION TO GEOSPATIAL TECHNOLOGY (3) LEC. 2. LAB. 2. Introduction to geospatial technologies, spatial thinking, and job markets in these areas. Exploration of location-based services, global positioning systems, geographic information systems, remote sensing, virtual globes, and web based mapping. Skills and techniques for spatial thinking and environmental analysis.

GSEI 2070 INTRODUCTION TO ENVIRONMENTAL INFORMATICS (3) LEC. 2. LAB. 2. Pr. GSEI 1200. Introduction to the environment as a system of linked, interactive components. Application of information science to environmental management. Skills and techniques required for collecting, collating, archiving, modeling, analyzing, visualizing, and communicating information in support of natural resource management.

GSEI 5150 SPATIAL STATISTICS FOR NATURAL RESOURCES (3) LEC. 3. Pr. (GSEI 1200 or GSEI 2070) and (WILD 5750). Applications of spatial statistics in natural resources. Introduction of basic concepts, theories, and methodologies of spatial and spatio-temporal data analyses and modeling. Topics include spatial correlation, spatial interpolation, detection of clusters/hotspots/patterns of interest, and spatial prediction.

GSEI 5360 ENVIRONMENTAL MODELING (3) LEC. 2. LAB. 1. Pr. FORY 5470 and FORY 5480 and GSEI 1200. Students will build models of environmental systems such as ecological, climatic, hydrologic, geochemical, and human systems, explore the basic concepts of systems modeling, and use models to test hypotheses and assumptions, evaluate system behavior, and predict changes in system behavior under different climate scenarios.

GSEI 5430 APPLICATIONS IN ENVIRONMENTAL INFORMATICS (3) LEC. 2. LAB. 1. Pr. GSEI 1200 and FORY 5470. This course emphasizes applications of earth observations to forestry, wildlife, environment and natural resources and covers both the technology and application of observing earth from space as well data acquired from airborne platforms.

GSEI 5800 PYTHON PROGRAMMING FOR THE ENVIRONMENT (4) LEC. 3. LAB. 2. Fundamental conceptual, methodological, and operational issues in Python programming with respect to environmental applications. Topics include Python programming concepts, scripting, and skills; data processing and management; data manipulation, visualization, and analysis; and connection to spatial data analysis.

GSEI 6150 SPATIAL STATISTICS FOR NATURAL RESOURCES (3) LAB. 3. Applications of spatial statistics in natural resources. Introduction of basic concepts, theories, and methodologies of spatial and spatio-temporal data analyses and modeling. Topics include spatial correlation, spatial interpolation, detection of clusters/hotspots/patterns of interest, and and spatial prediction.

GSEI 6360 ENVIRONMENTAL MODELING (3) LEC. 2. LAB. 1. Students will build models of environmental systems such as ecological, climatic, hydrologic, geochemical, and human systems, explore the basic concepts of systems modeling, and use models to test hypotheses and assumptions, evaluate system behavior, and predict changes in system behavior under different climate scenarios.

GSEI 6430 APPLICATIONS ENVIRONMENTAL INFORMATICS (3) LEC. 2. LAB. 1. This course emphasizes applications of earth observations to forestry, wildlife, environment and natural resources and covers both the technology and application of observing earth from space as well data acquired from airborne platforms.

GSEI 6800 PYTHON PROGRAMMING FOR THE ENVIRONMENT (4) LEC. 3. LAB. 2. Fundamental conceptual, methodological, and operational issues in Python programming with respect to environmental applications. Topics include Python programming concepts, scripting, and skills; data processing and management; data manipulation, visualization, and analysis; and connection to spatial data analysis.

GSEI 7200 LAND PROCESSES AND CLIMATE INTERACTIONS (3) LEC. 2. LAB. 2. This is an advanced graduate level course designed to teach the modeling of land surface processes and study its impact on local, regional and global climate. Students will also perform global/regional climate model simulations using supercomputers.

GSEI 7500 DIGITAL EARTH AND BIG DATA (3) LEC. 2. LAB. 2. This is an advanced graduate-level course designed to teach the modeling of digital earth and study its impact on local, regional and global climate. Students will also perform global/regional geographic model simulations using supercomputers.

GSEI 7600 CLIMATE MODELING (3) LEC. 2. LAB. 2. Teaches modeling of the Earth's climate system. Students will also perform global climate model simulations using supercomputers, and analyze climate model outputs using NCAR Command Language.

Natural Resources Management Courses

NATR 2020 NATURAL RESOURCES FIELD METHODS (3) LEC. 2. LAB. 4. Sampling methods relevant to the evaluation of the environment. Topics include sampling methods, quality assurance procedures, and data management.

NATR 2050 PEOPLE AND THE ENVIRONMENT: AN INTRODUCTION TO CONSERVATION SOCIAL SCIENCES (3) LEC. 3. Introduction to the variety of social sciences used to understand the relationships of people and their environment. Students will develop a deeper and broader understanding of the challenges and potential solutions to natural resource issues facing society today.

NATR 2100 INTRO TO LANDSCAPE ECOLOGY (4) LEC. 3. LAB. 2. An introduction to the study of spatial patterns and interactions between ecosystems within a landscape, focusing on how these patterns influence ecological processes, biodiversity, and environmental change.

NATR 2200 CURRENT TOPICS IN ENVIRONMENTAL CONSERVATION AND MANAGEMENT (2) LEC. 2. Comprehensive examination of the scientific challenges associated with environmental conservation and management. Through an exploration of contemporary environmental issues, students will gain foundational knowledge of the ecological and biological factors contributing to these challenges. The course emphasizes the development of a robust scientific vocabulary pertinent to environmental conservation, enabling students to engage effectively in advanced studies and professional dialogues.

NATR 3320 ECOSYSTEM SERVICES IN COSTA RICA (3) AAB. Coreq. NATR 4250 and PARK 3630 and GEOG 3720. The environment provides many services critical to our survival and well-being, such as food and fuel, climate regulation, water purification, and recreational and aesthetic opportunities. In this class, students examine the environmental services that ecosystems provide, their connection to human well-being and livelihoods, and the market mechanism and payment programs designed to provide incentives for their maintenance. Costa Rica was one of the first countries to establish a payment program for Ecosystem Services.

NATR 4240 WATERSHED MANAGEMENT (3) LEC. 3. Introduction to watersheds, effects of land management on erosion and water quality, and mitigation techniques to reduce adverse effects.

NATR 4250 WATERSHED MANAGEMENT IN TROPICAL REGIONS (3) AAB. Coreq. GEOG 3720 and NATR 3320 and PARK 3630. This intensive 3-week course focuses on the principles and practices of watershed management in tropical regions, with a specific emphasis on Costa Rica's unique ecosystems. Students will gain a comprehensive understanding of the hydrological, ecological, and socio-economic factors that influence watershed dynamics in tropical environments. The course combines classroom lectures, field studies, and hands-on projects to provide a holistic learning experience.

NATR 4535 COASTAL ZONE MANAGEMENT (2) LEC. 2. Pr. BIOL 1030 or BIOL 1037. Management of shorelines and flood plains, and current legislation. Water quality and ecosystem quality management. Taught at Dauphin Island Sea Laboratory.

NATR 4930 DIRECTED STUDIES (1-3) IND. Departmental approval. Independent Study. Course may be repeated for a maximum of 6 credit hours.

NATR 4970 SPECIAL TOPICS (1-4) LEC. Overview of natural resources, classification, chemistry, ecology and sustainable management. Department approval and agreement with faculty and student. Course may be repeated for a maximum of 8 credit hours.

NATR 5050 URBAN ECOLOGY (3) LEC. 3. Examination of urban ecosystems and the influence of urbanization on rural and forested lands. Junior standing. May count either NATR 5050 or NATR 6050.

NATR 5250 WETLAND ECOLOGY AND MANAGEMENT (3) LEC. 3. Pr. BIOL 3060 or FORY 4230. Wetland ecology in the southeastern U.S. with emphasis on soils, hydrology, biology, and policies and practices related to agriculture, forestry, wildlife.

NATR 5310 ENVIRONMENTAL ETHICS (3) LEC. 3. Critical examination of environmental ethics: historical development and various ethical perspectives. Examination of current environmental issues using perspectives covered in course.

NATR 5320 ECOSYSTEM SERVICES (3) LEC. 3. Ecosystem services are the benefits that people obtain from ecosystems. Human well-being, livelihoods, and markets are covered with emphasis on watershed, biodiversity, carbon, and tourism services.

NATR 5350 WATER RESOURCE MANAGEMENT AND POLICY (3) DSL. This course examines social contexts, ecological contexts, human behaviors, institutions, laws, and policies that guide water management practices. Impacts of critical issues, including climate change, demand, conflict, and pollution, on water resources and water management behaviors are discussed.

NATR 5430 HUMAN DIMENSIONS OF WILDLIFE AND NATURAL RESOURCES (3) LEC. 3. Forests, wildlife, wetlands, and wilderness - sustaining and managing our natural resources ultimately depends on understanding people. Students will investigate the paradigms and theoretical foundations regarding our values, beliefs, attitudes and behaviors concerning human-environment interactions.

NATR 5450 COASTAL LAW (3) DSL. Course will provide students with a firm understanding of the principles of coastal and ocean law and policy and the legal and regulatory structures that are in place to protect people and the environment.

NATR 5550 WATERSHED HYDROLOGY (3) LEC. 3. Departmental approval. In depth focus on components of the hydrologic cycle in forested landscapes and how changes in the landscape and management practices impact the hydrologic regime in the watershed.

NATR 5560 ENERGY LAW (3) LEC. 3. Core principles of energy law, including various legal and regulatory structures that protect people and the environment, particularly as applied to the production, distribution, and consumption of different forms of energy within the US and other regions of the world.

NATR 5630 CONSERVATION PLANNING (3) LEC. 3. Trains students in how to build plans for conservation and management of natural resources. Covers established processes associated with developing conservation plans while addressing human concerns. Includes how to establish measurable objectives, utilize data, frame problems, and determine uncertainty/risk.

NATR 5880 ECOLOGICAL ECONOMICS (3) LEC. 3. Foundations, principles and empirical application of ecological economics to address current social and economic issues.

NATR 6050 URBAN ECOLOGY (3) LEC. 3. Examination of urban ecosystems and the influence of urbanization on rural and forested lands. May count either FOWS 5050 or FOWS 6050.

NATR 6250 WETLAND ECOLOGY AND MANAGEMENT (3) LEC. 3. Pr. BIOL 3060. Wetland ecology in the southeastern U.S. with emphasis on soils, hydrology, biology, and policies and practices related to agriculture, forestry, wildlife.

NATR 6310 ENVIRONMENTAL ETHICS (3) LEC. 3. Critical examination of environmental ethics. Historical development and various ethical perspectives. Examination of current environmental issues using perspectives covered in course.

NATR 6320 ECOSYSTEM SERVICES (3) LEC. 3. Ecosystem services are the benefits that people obtain from ecosystems. Human well-being, livelihoods, and markets are covered with emphasis on watershed, biodiversity, carbon, and tourism services.

NATR 6350 WATER RESOURCE MANAGEMENT AND POLICY (3) DSL. This course examines social contexts, ecological contexts, human behaviors, institutions, laws, and policies that guide water management practices. Impacts of critical issues, including climate change, demand, conflict, and pollution, on water resources and water management behaviors are discussed.

NATR 6430 HUMAN DIMENSIONS OF WILDLIFE AND NATURAL RESOURCES (3) LEC. 3. Forests, wildlife, wetlands, and wilderness - sustaining and managing our natural resources ultimately depends on understanding people. Students will investigate the paradigms and theoretical foundations regarding our values, beliefs, attitudes and behaviors concerning human-environment interactions.

NATR 6450 COASTAL LAW (3) DSL. Course will provide students with a firm understanding of the principles of coastal and ocean law and policy and the legal and regulatory structures that are in place to protect people and the environment.

NATR 6550 WATERSHED HYDROLOGY (3) LEC. 3. In depth focus on components of the hydrologic cycle in forested landscapes and how changes in the landscape and management practices impact the hydrologic regime in the watershed.

NATR 6560 ENERGY LAW (3) LEC. 3. Core principles of energy law, including various legal and regulatory structures that protect people and the environment, particularly as applied to the production, distribution, and consumption of different forms of energy within the US and other regions of the world.

NATR 6630 CONSERVATION PLANNING (3) LEC. Trains students in how to build plans for conservation and management of natural resources. Covers established processes associated with developing conservation plans while addressing human concerns. Includes how to establish measurable objectives, utilize data, frame problems, and determine uncertainty/risk.

NATR 6880 ECOLOGICAL ECONOMICS (3) LEC. 3. Foundations, principles and empirical application of ecological economics to address current social and economic issues.

NATR 7250 SURVEYING AND INTERVIEWING FOR SCIENTISTS (3) LEC. 3. A research design and methods course aimed at interdisciplinary students working on research with one foot in the biological or ecological sciences, and one foot in the social sciences.

NATR 7300 NATURAL RESOURCE MANAGEMENT FUNDAMENTALS (3) DSL. This course is a foundational overview of natural resource management systems. Topics include history, trends, innovations, administration, law, policy, and social-ecological connections. Focus is on exploring core concepts that guide contemporary natural resource management practices.

NATR 7560 MODELING ENVIRONMENTAL CHANGE AT MULTIPLE SCALES (3) LEC. 3. LAB. 1. Pr. FORY 7550 and FORY 6480. Modeling fundamentals to solve environmental change problems at multiples scales driven by (i) climate variability/change and (ii) land use/cover change. Problems will be tackled at both temporal (event-based and continuous) and spatial (small and large watersheds) scales to predict streamflow and water quality and develop abatement strategies. Spring, odd years. Department Approval Required or Instructor Permission.

NATR 7930 DIRECTED STUDIES (1-3) IND. Departmental approval. Directed studies in subject matter not covered by an existing course or to supplement knowledge gained from existing course offerings. Course may be repeated for a maximum of 9 credit hours.

NATR 7970 SPECIAL TOPICS (1-4) IND. Analysis of a problem in the natural resources management area involving lectures, discussions, laboratory for field work. Department approval and agreement with faculty and students. Course may be repeated for a maximum of 12 credit hours.

NATR 7990 RESEARCH AND THESIS (1-15) RES. 0. Credit to be arranged. Course may be repeated for a maximum of 15 credit hours.

PARK Courses

PARK 1050 AMERICA'S NATIONAL PARKS (3) LEC. 3. Introduces America's National Parks and the National Park Service from their origins to current day. Students will understand the places, politics, people, controversies, and conservation ethics embodied in the National Park system.

PARK 2010 INTRODUCTION TO NATURE-BASED RECREATION AND MANAGEMENT (3) LEC. 3. Introduction to fundamentals of nature-based recreation; recreationists' motivations, society benefits, and management of the outdoor recreational environment.

PARK 2020 INTRODUCTION TO COMMUNITY PARKS AND RECREATION (3) LEC. 3. This course is an introduction to all the elements for successful community parks, recreation, and sport-facility management, administration, and programming by public agencies.

PARK 3010 ENVIRONMENTAL INTERPRETATION (3) LEC. 3. Communication theory as management and public relations tool for natural resource management.

PARK 3050 SAFETY, RISK AND LEGAL ASPECTS OF PARKS, RECREATION, AND SPORT FACILITY MANAGEMENT (3) LEC. The delivery of safe services, facilities, and activities in areas designated as parks, recreation areas, and community sporting facilities is presented from a legal, risk management, and liability perspective.

PARK 3100 LEADERSHIP IN PARKS AND RECREATION (3) LEC. 3. Introduces leadership theories and practices as applied to parks and recreation. Students examine leadership and communication skills and tools to help develop positive relationships, attitudes, motivations, and group dynamics. Leadership in outdoor recreation and adventure is highlighted.

PARK 3350 PROGRAMMING IN PARKS AND RECREATION (3) LEC. 3. The parks and recreation programmer is responsible for the development and delivery of recreation, leisure, and sport programs and activities that provide opportunities and promote healthy lifestyles for all constituents. Students will be introduced to and learn how to develop a range of park and recreation programming, including activities such as ropes courses and backcountry travel, arts and crafts such as jewelry making and photography classes, health and wellness classes, dance, drama, art, and music summer camps, sports leagues, service learning, environmental education, and birdwatching trips.

PARK 3630 COSTA RICA PROTECTED AREA CONSERVATION MANAGEMENT (3) AAB. Coreq. NATR 4250 and NATR 3320 and GEOG 3720. This class will introduce the different protected area (PA) management categories (IUCN and other co-management approaches), focusing on examples of Costa Rican PAs to showcase these different approaches. Guest lectures and tours will allow students to experience firsthand how PA management schemes work in practice, and the challenges they may face, based on the diversity of social and ecological conditions unique to each PA.

PARK 3850 PROFESSIONAL PREPARATION IN PARKS AND RECREATION (1) LEC. 1. Assessment of career opportunities. Prepares students for their parks and recreation internship and post-graduation employment and career development.

PARK 3910 FIELD SKILLS PRACTICUM (3) PRA. SU. Departmental approval. Micro-credentials for leading outdoor adventure recreation. Hands-on training in tools and applications for Parks and Recreation Management. Sophomore standing or higher. PARK majors ONLY. Course instruction will extend into semester break.

PARK 4200 NATURE, RECREATION, AND HEALTH (3) LEC. 3. Nature is a prescription for better mental and physical health. This class explores the many ways that healthy parks and recreation areas can contribute to a healthier society.

PARK 4300 PARKS AND RECREATION ADMINISTRATION, FINANCE, AND MANAGEMENT (3) LEC. 3. Pr. (PARK 2010 or PARK 2020) and PARK 3050. Provides an advanced understanding of the administration and management critical to operating park, recreation, and community sports facilities. Topics include organizational structure, personnel management and supervision, working with community partners, interaction with customers, and managing personnel, finances, evaluation, and decision-making.

PARK 4310 SUSTAINABLE NATURE TOURISM (3) LEC. 3. Ecotourism, responsible tourism, wildlife tourism are all forms of nature tourism that can contribute positively to environmental conservation, community development, and cultural awareness, while maintaining viable businesses. A systems approach for sustainable nature tourism analysis is applied.

PARK 4400 PARK AND RECREATION FACILITIES AND INFRASTRUCTURE PLANNING AND MANAGEMENT (3) LEC. 3. Pr. (PARK 2010 or PARK 2020) and PARK 3050. This course introduces students to the management of park and recreation facilities (i.e., national or community parks, trails, interpretative centers, campgrounds, restrooms, and community sports facilities), emphasizing planning, support, and maintenance.

PARK 4500 SUSTAINABLE PLANNING AND DESIGN OF COMMUNITY PARKS AND RECREATION (3) LEC. 3. A planning approach for viewing parks, recreation, and community sports facilities and programs as an organizing system to promote community connections, health, sustainability, and resilience. Students develop practical grant writing skills for recreation project funding.

PARK 4920 INTERNSHIP IN PARKS AND RECREATION (2-12) INT. Departmental approval. Supervised work experience in a Parks and Recreation (PARK) setting for a minimum of 50 hours/credit hour. PARK major, 2.2 cumulative GPA, and senior standing required. Course may be repeated for a maximum of 12 credit hours.

PARK 5250 ACCESS AND PARTICIPATION IN PARKS AND RECREATION (3) LEC. 3. This course examines access-to and participation-in outdoor recreation based on differences in location, gender, age, income, race, ethnicity, and physical abilities. Supply and demand analysis and the recreation constraints model to participation are used to frame class analysis.

PARK 6250 ACCESS AND PARTICIPATION IN PARKS AND RECREATION (3) LEC. 3. This course examines access-to and participation-in outdoor recreation based on differences in location, gender, age, income, race, ethnicity, and physical abilities. Supply and demand analysis and the recreation constraints model to participation are used to frame class analysis.

Wildlife Sciences Courses

WILD 1050 INTRODUCTION TO FIREARMS, HUNTING, AND CONSERVATION (2) LEC. 2. Introduction to firearms, proper and safe use of firearms for hunting, how and why people hunt, the important social, economic, and biological role hunting plays in the conservation of wildlife. Course will provide students with basic technical knowledge of firearms and safe handling practices for completion of the Alabama Hunter Education program.

WILD 1100 WILDLIFE FOOD PLOT ESTABLISHMENT (2) LEC. 2. Fundamental concepts, issues, and concerns related to wildlife food plots and practical procedures for establishment of wildlife food plots.

WILD 1200 HUNTING AND FISHING THE WORLD (3) LEC. 3. Provides students with an introduction to the diversity of hunting and fishing opportunities available worldwide, the types of businesses that cater to these opportunities, and how these recreational activities contribute to game conservation and management.

WILD 1300 WILDLIFE: PEOPLE, ANIMALS, AND THEIR INTERACTIONS (3) LEC. 3. This course offers a general survey of wildlife, including basic ecology, characteristics of wildlife, their habitats, and methods of conserving species. Human interactions with wildlife, as well as the impacts of human activities on wildlife, will be explored.

WILD 1400 BIODIVERSITY IN A CHANGING WORLD (3) LEC. 3. The science of biodiversity focuses on understanding patterns and trends in the variability of life on Earth. This course explores how this diversity arose, the ecological forces that shape it, the consequences of its loss, and the steps we can take to conserve it.

WILD 2050 WILDLIFE CONSERVATION HISTORY AND LAW (3) LEC. 3. The history of wildlife conservation in North America, the conservation problems that have arisen since European settlement, and the laws and practices that have evolved to remedy them.

WILD 2310 BIOLOGY OF PLANTS IMPORTANT TO WILDLIFE (2) LEC. 1. LAB. 1. Introduction to taxonomy, structure, function, and distribution of plants that are important for wildlife species, with an emphasis on why those characteristics make them important.

WILD 2400 SPORTING FIREARMS AND ARCHERY (2) LEC. 2. Provides students with a thorough understanding of the role of sporting firearms and archery equipment in hunting and the wildlife enterprise management field, including the variety of equipment available and their effectiveness with different game species. WLEM students only.

WILD 2410 INTRODUCTION TO PISTOL (2) LLB. This course introduces the students to the basic knowledge, skills, and attitude necessary for owning and using a pistol safely. Through this course, the students will learn about pistol parts and operation, ammunition, gun safety, pistol shooting fundamentals, and pistol shooting activities. Instruction will primarily utilize air-powered pistols and move up to .22 rimfire pistols the last few weeks of class.

WILD 2420 INTRODUCTION TO ARCHERY (2) LEC/LLB. This course introduces the students to the basic knowledge, skills, and attitude necessary for owning and using archery equipment safely. Through this course, the students will learn about archery equipment and operation, archery safety, shooting fundamentals, and shooting activities. Instruction will primarily utilize Genesis (compound) and recurve bows.

WILD 3280 WILDLIFE ECOLOGY, CONSERVATION, AND MANAGEMENT (3) LEC. 3. Pr. BIOL 1030 or BIOL 1037. Fundamentals of wildlife management theory, application, and administration.

WILD 3281 WILDLIFE MANAGEMENT LABORATORY (1) LAB. 3. Pr. P/C WILD 3280. Laboratory/Field experiences in wildlife management. Optional, hands-on course that explores the application of topics covered in WILD 3280.

WILD 3287 HONORS WILDLIFE ECOLOGY, CONSERVATION, AND MANAGEMENT (3) LEC. 3. Pr. Honors College. BIOL 1030 or BIOL 1037. Fundamentals of wildlife management theory, application, and administration.

WILD 3500 OUTDOOR SAFETY AND LIABILITY (1) LEC. 1. Exposes students to the safety and liability risks associated with outdoor activities that are common in the wildlife enterprise industry. Students will learn techniques to meet the needs of clientele, while maximizing revenue and minimizing risks.

WILD 3600 WILDLIFE ENTERPRISE FIELD TECHNIQUES (4) LEC. 3. LAB. 2. Pr. WILD 3280. Equip students majoring in wildlife enterprise management with the technical skills to complete a variety of tasks related to wildlife habitat and population management on private properties used in recreational or lodge enterprises.

WILD 3800 INTRODUCTION TO WILDLIFE MANAGEMENT IN SOUTHERN AFRICA (1) LEC. 1. Pr. WILD 2050 and WILD 3280. Provide students with knowledge of important wildlife management issues in southern Africa. Students will develop an understanding of pressing wildlife management issues in the region and learn how to apply that knowledge to future learning.

WILD 3810 STUDY ABROAD - WILDLIFE MANAGEMENT IN SOUTHERN AFRICA (3) AAB. 60. Pr. WILD 3800. Travel overseas to Swaziland and South Africa to engage in many of southern Africa's most pressing wildlife management issues.

WILD 3920 INTERNSHIP IN WILDLIFE ENTERPRISE MANAGEMENT (3) INT. This class is a supervised work experience in a Wildlife Enterprise Management (WLEM) setting for a minimum of 400 hours for at least 10 consecutive weeks and may be repeated for a maximum of 6 hours credit. The mission of WLEM is to prepare professionally competent individuals who will make a contribution to the Wildlife Enterprise Management industry.

WILD 4340 CONSERVATION GENETICS (3) LEC. 3. Pr. BIOL 1020 or BIOL 1023 or BIOL 1027. The science of how populations genetics have been affected by habitat loss, over-exploitation, or environmental change, with a focus on inheritance and evolution, and with the goal of informing conservation and management.

WILD 4400 PROBLEM SOLVING IN WILDLIFE SCIENCES (2) LEC. 2. Pr. (WILD 3280 or WILD 3287) and P/C WILD 5750. Applied training and tools used to solve problems in wildlife science.

WILD 4500 ADVANCED WILDLIFE ENTERPRISE MANAGEMENT (3) LEC. 3. Pr. (WILD 3280 or WILD 3287) and HOSP 2350. Integration and synthesis of the skills learned throughout the Wildlife Enterprise Management curriculum. Because wildlife enterprises are unique in the business world, students will learn to apply various material from previous courses to managing a wildlife enterprise.

WILD 4750 CONSERVATION BIOLOGY OF THE HAWAIIAN ISLANDS (3) FLD. 1. Pr. BIOL 3060 or WILD 3280 or WILD 3287 or FORY 4230 or FOWS 5220. Hawaii is the endangered species and invasive species capital of the world. As a model system, the course will focus on the management of threatened and endangered species and invasive species. Direct interaction with practitioners and visiting active management locations will be a key component. May need instructor permission.

WILD 4890 WILDLIFE POPULATION SCIENCE (3) LEC. 2. LAB. 2. Pr. (WILD 3280 or WILD 3287) and P/C WILD 5750 and BIOL 3060. WILD 3280 or WILD 3287 & WILD 5750 with a C or better; BIOL 3060. Principles of wildlife population dynamics, estimation of population parameters, and application of these principles and techniques to wildlife conservation and management.

WILD 4910 WILDLIFE SCIENCES SUMMER PRACTICUM (8) PRA. 8. Pr. (WILD 5750 and WILD 4400 and BIOL 3060 and FORY 3100) or (BIOL 5120) and (BIOL 5740 or BIOL 5750 or BIOL 5760 or FISH 5380). Training and tools for wildlife ecology, conservation, and management, with emphasis on applied problem-solving. Summer.

WILD 4920 WILDLIFE MANAGEMENT INTERNSHIP (4) PRA. 4. SU. Departmental approval. Practical job experience under joint supervision of the Internship advisor and appropriate state, federal, or private agency. Training will prepare student for potential career employment.

WILD 4930 DIRECTED STUDIES (1-3) IND. Course may be repeated for a maximum of 6 credit hours.

WILD 4970 SPECIAL TOPICS (1-4) AAB. Course may be repeated for a maximum of 8 credit hours.

WILD 4997 HONORS THESIS (1-6) IND. Pr. Honors College. Departmental approval. Directed research and writing of honors thesis. Course may be repeated for a maximum of 6 credit hours.

WILD 5140 PLANT ECOLOGY (4) LEC. 3. **LAB.** 4. Pr. (BIOL 1030 or BIOL 1037) and BIOL 3060. Exploration of ecological interactions between plants and their environment. Field trips emphasize Southeastern habitats/plant examples. Includes 3-day weekend field trip.

WILD 5200 DISEASE ECOLOGY (3) LEC. 3. Pr. BIOL 1030. An ecological approach to traditional microbiology and parasitology by applying principles of population biology to understand disease dynamics in wildlife. Topics include: classification of infectious disease-causing agents, their life cycles, and transmission patterns; dynamics at the individual and host levels; ecologically informed strategies to control diseases; and current topics.

WILD 5280 AVIAN ECOLOGY AND MANAGEMENT (2) LEC. 2. Pr. (WILD 3280 or WILD 3287 or WILD 3280 or WILD 3287) and BIOL 3060. Intensive study of the ecology and management of selected waterfowl, galliforms, gruiforms, raptors, shorebirds, doves and pigeons, woodpeckers and neotropical migrants.

WILD 5290 MAMMALIAN ECOLOGY AND MANAGEMENT (2) LEC. 2. Pr. (WILD 3280 or WILD 3287 or WILD 3280 or WILD 3287) and BIOL 3060. WILD 3280 or WILD 3287 (C or better) and BIOL 3060. Intensive study of the ecology and management of selected artiodactyls, rodents, lagomorphs, bats, carnivores, and herps.

WILD 5300 CONSERVATION BIOLOGY OF THE HAWAIIAN ISLANDS (3) FLD. 3. Pr. BIOL 3060 or WILD 3280 or WILD 3287 or FORY 4230 or FOWS 5220. Hawaii is the endangered species and invasive species capital of the world. As a model system, the course will focus on the management of threatened and endangered species and invasive species. Direct interaction with practitioners and visiting active management locations will be a key component. May need instructor permission.

WILD 5350 CONSERVATION GENETICS (3) LEC. 3. Pr. BIOL 1020 or BIOL 1023 or BIOL 1027. The science of how populations genetics have been affected by habitat loss, over-exploitation, or environmental change, with a focus on inheritance and evolution, and with the goal of informing conservation and management.

WILD 5410 HUMAN-WILDLIFE CONFLICTS (3) LEC. 2. **LAB.** 1. Pr. WILD 3280. Familiarizes students with basic philosophy, biology, and techniques related to managing negative human wildlife interactions.

WILD 5430 ONE HEALTH PERSPECTIVES: EXPLORING THE HUMAN-WILDLIFE INTERFACE IN INDIA (3) AAB. 30. One Health is an interdisciplinary concept emphasizing the interconnectedness of human, animal, and environmental health. This course provides students with hands-on experience in exploring these connections through case studies, fieldwork, and discussions. Set in the biodiverse Western Ghats region of India, students will examine real-world scenarios to gain practical insights into how human activities, wildlife, and ecosystems interact, shaping health outcomes across species and environments.

WILD 5440 ONE HEALTH CONNECTIONS: HOW DO DISEASES SPREAD BETWEEN ANIMALS AND HUMANS? (2) LEC. 2. The linkages and connections between humans, animals, and the environment they share. Using real-world case studies, we discuss the myriad ways in which pathogens (disease-causing agents) are transmitted between humans and animals. The goal is to develop an understanding of the principles of One Health so that we are better equipped to deal with current and future disease risks and improve the health and security of our society.

WILD 5750 ANALYSIS FOR ENVIRONMENTAL AND HEALTH SCIENCES (4) LEC. 3. **LAB.** 2. Pr. STAT 2010 or STAT 2017 or STAT 2510 or STAT 2513 or STAT 2610 or STAT 3010. Applied training in data analysis tools commonly used in environmental and health sciences.

WILD 5880 WILDLIFE HABITAT ASSESSMENT AND MANAGEMENT (4) LEC. 3. **LAB.** 4. Pr. (WILD 3280 or WILD 3287 or WILD 3280 or WILD 3287) and BIOL 3060. BIOL 3060 and C or better in WILD 3280 or WILD 3287. The wildlife value, management, and restoration of common southeastern habitats.

WILD 5950 SEMINAR (1) SEM. 1. Pr. BIOL 3060 or WILD 3280 or FORY 4230. Discussion of scientific publications from a selected area in wildlife sciences. Course may be repeated for a maximum of 6 credit hours.

WILD 6140 PLANT ECOLOGY (4) LEC. 3. **LAB.** 4. Exploration of ecological interactions between plants and their environment. Field trips emphasize Southeastern habitats/plant examples. Includes 3-day weekend field trip.

WILD 6200 DISEASE ECOLOGY (3) LEC. 3. An ecological approach to traditional microbiology and parasitology by applying principles of population biology to understand disease dynamics in wildlife. Topics include: classification of infectious disease-causing agents, their life cycles, and transmission patterns; dynamics at the individual and host levels; ecologically informed strategies to control diseases; and current topics.

WILD 6280 AVIAN ECOLOGY AND MANAGEMENT (2) LEC. 2. Pr. WILD 3280. Intensive study of the ecology and management of selected waterfowl, galliforms, gruiforms, raptors, shorebirds, doves and pigeons, woodpeckers and neotropical migrants.

WILD 6290 MAMMALIAN ECOLOGY AND MANAGEMENT (2) LEC. 2. Pr. WILD 3280. Intensive study of the ecology and management of selected artiodactyls, rodents, lagomorphs, bats, carnivores, and herps.

WILD 6300 CONSERVATION BIOLOGY OF THE HAWAIIAN ISLANDS (3) FLD. 3. Pr. FOWS 6220. Hawaii is the endangered species and invasive species capital of the world. Using it as a model system, the focus will be on the management of threatened and endangered species and invasive species. Direct interaction with practitioners and visiting active management locations will be a key component of the course. Instructor permission.

WILD 6410 HUMAN-WILDLIFE CONFLICTS (3) LEC. 2. LAB. 1. This course is designed to familiarize students with the basic philosophy, biology, and techniques related to managing negative human wildlife interactions.

WILD 6750 ANALYSIS FOR ENVIRONMENTAL AND HEALTH SCIENCES (4) LEC. 3. LAB. 1. Applied training in data analysis tools commonly used in environmental and health sciences.

WILD 6880 WILDLIFE HABITAT ASSESSMENT AND MANAGEMENT (4) LEC. 3. LAB. 1. Pr. WILD 3280. C or better in WILD 3280. The wildlife value, management, and restoration of common southeastern habitats.

WILD 6950 SEMINAR (1) SEM. Discussion of scientific publications from a selected area in wildlife sciences. Course may be repeated for a maximum of 6 credit hours.

WILD 7100 APPLIED ECOLOGICAL MODELING (2) LEC. 2. Principles and techniques for modeling ecological systems in applied, management decision oriented contexts.

WILD 7150 ADVANCED ANALYSIS FOR ECOLOGICAL SCIENCES (4) LEC. 3. LAB. 2. Pr. STAT 7000 or AGRI 5010 or AGRI 5013 or AGRI 6010 or AGRI 6013 or WILD 5750 or WILD 6750. Departmental approval. Applied training in advanced analytical procedures commonly used in ecological sciences including modeling of survival, reproduction, habitat selection, population growth, density-dependence, and morphometrics.

WILD 7200 WILDLIFE NUTRITIONAL ECOLOGY (3) LEC. 3. Exploration of the basic nutrient requirements of free-ranging wildlife and comparison of requirements to related domestic species.

WILD 7250 WILDLIFE POPULATION ANALYSIS (3) LEC. 2. LAB. 3. Pr. P/C WILD 7150. Estimation of survival and success rates for wildlife and fisheries populations. Theoretical approaches for model selection and population modeling.

WILD 7300 STRUCTURED DECISION MAKING IN NATURAL RESOURCES MANAGEMENT (1-3) LEC. 2. LAB. 1. Structured Decision Making (SDM) is a common-sense framework for addressing decision problems amenable to logical decomposition and analysis. Through this course, students will become familiar with principles and tools of SDM and begin applying skills and concepts to conservation and management decision problems. This course will build a foundation that increasingly is essential for most professional biologists working in resource management positions or conducting applied field research. The intended audience of this course includes graduate students in wildlife, forestry, natural resources, biology, fisheries, or any other field who work with applied natural resource management issues. Course may be repeated for a maximum of 5 credit hours.

WILD 7310 CURRENT TOPICS IN WILDLIFE HEALTH (1) DSL. This course focuses on free-ranging wildlife and wildlife health topics within the broader context of One Health and functional ecosystems. Course may be repeated for a maximum of 2 credit hours.

WILD 7340 CONSERVATION GENETICS (3) LEC. 3. The science of how populations genetics have been affected by habitat loss, over-exploitation, or environmental change, with a focus on inheritance and evolution, and with the goal of informing conservation and management.

WILD 7400 DEVELOPING AGENT-BASED MODELS FOR WILDLIFE (3) LEC. 2. LAB. 1. Departmental approval. Course will use lecture and hands-on coding exercises designed to introduce students to agent-based models in wildlife sciences. The course lectures will include coding best practices such as organization, archiving, and version control, as well as wildlife and evolution-specific factors to consider when creating a models.

WILD 7450 TOOLS AND CHALLENGES FOR THE MODERN SCIENTIST (2) LEC. 2. Contemporary tools used and challenges encountered by modern scientists and how these factors have altered the process of science. Specific topics will be crowdsourced and tailored to students' interests, but examples include: diversity in science, reproducibility crisis, open science practices, version control, online teaching, artificial intelligence, work expectations, ethics of internships and volunteer positions, citizen science, modern computing power, cloud computing, self promotion, and mental health in academia

WILD 7650 INTRODUCTION TO BAYESIAN MODELING IN NATURAL RESOURCES (2) LEC. 1. LAB. 1. Pr. WILD 7150. or instructor approval. Bayesian hierarchical modeling of ecological data. Advantages and criticisms of such models. Use of software for hierarchical modeling.

WILD 7870 SPATIAL ECOLOGY (4) LLB. Explicit consideration for how ecological processes play out over space, and how space feeds back to influence ecological processes. The course is a combination of lectures, discussions, and hands-on lab-based learning to explore the theory, tools, and challenges underlying the spatial aspects of ecology. The course covers a breadth of topics rather than focusing on any one in-depth, although students are provided resources to dig deeper into issues of particular interest.

WILD 7930 DIRECTED STUDIES (1-3) IND/LEC. Departmental approval. Directed studies in subject matter not covered by an existing course or to supplement knowledge gained from existing course offerings. Course may be repeated for a maximum of 9 credit hours.

WILD 7970 SPECIAL TOPICS (1-4) IND. Departmental approval. Provides graduate students seeking the master's degree opportunities to work with individual wildlife science professors to investigate timely research topics. Course may be repeated for a maximum of 12 credit hours.

WILD 7990 RESEARCH AND THESIS (1-12) MST. Credit to be arranged.

WILD 8930 DIRECTED STUDIES (1-3) IND. Course may be repeated for a maximum of 9 credit hours.

WILD 8970 SPECIAL TOPICS (1-4) RES. Departmental approval. Provides graduate students seeking the doctoral degree opportunities to work with individual wildlife science professors to investigate timely research topics. Course may be repeated for a maximum of 12 credit hours.

WILD 8990 RESEARCH AND DISSERTATION (1-12) DSR.