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 has a long tradition of offering educational programs that prepare graduates for employment in a wide variety of natural resource professions. Natural areas, forests and their associated resources play a unique and increasingly important role in contemporary society. They enhance both economic development and environmental quality. The College's programs emphasize a comprehensive understanding of interrelationships between the functions and values of diverse renewable natural resources. This awareness is essential to effective management and, ultimately, to meeting society's needs.

In keeping with the University's land-grant mission, the College's goals are to pursue excellence in education, research, and extension (including outreach and public service activities) focused on the forests, wildlife, and associated resources of Alabama and the southeastern United States. With respect to undergraduate education, this focus is on preparing graduates who have the necessary skills for initial 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 wild lands for the betterment of both the local and global communities.

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.

Web Site

Students are encouraged to visit the college's website (https://cfwe.auburn.edu), which provides information on the college's programs and faculty, as well as updates on courses, scheduling, practicum details, and events of interest to College.

Course Prefixes for the College of Forestry, Wildlife and Environment

Course prefixes for courses in the College of Forestry, Wildlife and Environment (CFWE) are BIOP (Sustainable Biomaterials and Packaging),FOEN (Forestry Engineering), FOPR (Forest Products), FORY (Forestry), FOWS (CFWE common courses), GSEI (Geospatial and Environmental Informatics), NATR (Natural Resources), PARK (Parks and Recreation), and WILD (Wildlife).

Accreditation

The bachelor's programs in Forestry and the Forest Engineering option in Biosystems Engineering (the latter with addition of the Forest Resources minor) are accredited by the Society of American Foresters (SAF). SAF is the accrediting body recognized by the Council on Higher Education Accreditation as the accrediting agency for forestry education in the United States. Graduation from such SAF-accredited programs is required of all applicants for Registered Forester status in Alabama and several other states. The Biosystems Engineering program with the Forest Engineering option is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). Completion of the Wildlife Ecology and Management degree program qualifies the graduates for certification as associate wildlife biologists by The Wildlife Society. Completion of the Wildlife Pre-Vet degree prepares students for continuing to a college of veterinary medicine or other health-oriented study.

Curricula and Options

The College of Forestry, Wildlife and Environment offers undergraduate curricula leading to Bachelor of Science (BS) degrees in Forestry (FORB), Sustainable Biomaterial and Packaging (BIOP), Geospatial and Environmental Informatics (GSEI), Natural Resources Management (NATR), Wildlife Ecology and Management (WLDE), Wildlife Sciences Pre-Veterinary Medicine (WLPV), and Wildlife Enterprise Management (WLEM). A Forest Engineering option is available under the Bachelor of Biosystems Engineering (BSEN) degree program. It is offered in conjunction with the Samuel Ginn College of Engineering.

Students in the CFWE with exceptional academic qualifications should also consider enrollment in the University's Honors College. This opportunity is described under Special Academic Opportunities in the Academic Polices section of the Bulletin and carries a number of significant benefits to qualified students.

Forest Engineering Option

The Department of Biosystems Engineering in conjunction with the Samuel Ginn College of Engineering and the College of Forestry, Wildlife and Environment offers an accredited degree in Biosystems Engineering with a Forest Engineering option. Graduates are

qualified to pursue Professional Engineering (PE) credentials. To receive a Society of American Foresters accredited degree and be eligible to become a registered forester in the state of Alabama, students must complete the forest track in Biosystems Engineering and the Forest Resources minor in the College of Forestry, Wildlife and Environment.

This program is committed to preparing students for productive professional careers in the forest products industry and related natural resource and environmental systems sectors. Specific educational objectives of the program are: 1) graduates solve engineering problems such as those associated with the environment and natural resources, and the production, processing, storage, manufacture, utilization, and recycling of biological products; 2) graduates develop solutions to problems that combine engineering and biological sciences; 3) graduates develop environmentally and economically feasible and practical design solutions; and 4) graduates expand the role of engineering in society, communicate effectively, practice in a professional and ethical manner, and provide leadership in the profession.

The curriculum is coordinated by the Samuel Ginn College of Engineering and the College of Forestry, Wildlife and Environment. Students register in the Samuel Ginn College of Engineering and are assigned academic advisors in Biosystems Engineering and in Forestry. Beginning students should apply to the Samuel Ginn College of Engineering and complete the Pre-Forestry Engineering, program. (See the Samuel Ginn College of Engineering, Department of Biosystems Engineering section for the curriculum model, and detailed admission and degree requirements.)

Military Science

In all curricula within the College of Forestry, Wildlife and Environment, electives may include any number of Basic ROTC or Advanced ROTC. In curricula which do not provide sufficient electives for this purpose, ROTC may be taken in lieu of required courses outside of the major and not in the university core, to be selected with the approval of a college advisor. Common courses selected are Natural Resource Electives in the Wildlife curriculum, and forestry restricted electives.

Admission Requirements and Academic Standards

General Requirements

Freshman eligibility for the College of Forestry, Wildlife and Environment is determined by Undergraduate Admissions. They may be reached at their website or by phone at (334) 844-6425. However, since the requirements for forestry and wildlife education necessitate high school preparatory work of high intellectual quality and considerable breadth, the following program is recommended: English (4 units), mathematics (including algebra, geometry, trigonometry and analytic geometry) (4 units), chemistry (1 unit), biology (1 unit), physics (1 unit), history, literature or social science (2 or 3 units), and foreign languages (1 unit). Freshmen in Forestry are admitted to the Pre-Forestry (PFOR) curriculum. Freshmen students are admitted directly into the following programs: Sustainable Biomaterial and Packaging (BIOP), Wildlife Ecology and Management (WLDE), Wildlife Enterprise Management (WLEM), Wildlife Pre-Veterinary Medicine (WLPV), Natural Resources Management (NATR), and Geospatial and Environmental Informatics (GSEI).

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.

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.

Transfer Credits

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 forestry and wildlife courses will be determined by the Dean's Office. Students also may obtain credit for FORY, FOWS, GSEI and WILD courses on the basis of validating examinations. Arrangements for validating examinations must be made with the Dean's Office. Transfer credit for upper-division courses in the major (greater than or equal to 3000-level) generally are not accepted for substitution.

Forestry Specific Requirements

The Professional Curriculum in Forestry (FORB) begins the summer prior to their junior year. Forestry Summer Practicum is held at the Solon Dixon Forestry Education Center near Andalusia, Alabama for nine weeks each summer. Pre-Forestry (PFOR) students apply to this curriculum once a year during spring semester. Students ready to begin Forestry Practicum will be sent a "Summer Practicum Application Link" in the month of January to apply to Summer Practicum for the upcoming summer. To be considered for admission, a student must have completed or be currently enrolled in all prerequisite coursework, which must include the following courses: ENGL 1100 and ENGL 1120, BIOL 1020 and BIOL 1021, BIOL 1030 and BIOL 1030 and BIOL 1031, STAT 2510 and

MATH 1130. **Completion of CHEM 1030/CHEM 1031 andCHEM 1040/CHEM 1041 are highly recommended prior to the start date.** All students accepted to the program must attend a required orientation the first Monday in April.

Attention Transfer Students: If this will be your first semester at Auburn — you must be accepted to the University first and indicate you plan to start in the Summer term. After you receive your admission acceptance to Auburn, contact the College of Forestry, Wildlife and Environment Student Services Office at 334-844-1050 to notify your intent to apply to Practicum. Student Services will then review your transcripts and send you the "Summer Practicum Application Link." All transfer students accepted to the program must attend a required orientation the first Monday in April.

To remain enrolled in the professional Forestry curriculum, students must maintain minimum GPA standards established by Auburn University. Students also must complete designated courses in the major with at least a 2.0 cumulative GPA.

Forest Engineering Option Specific Requirements

Students are admitted to the professional Biosystems Engineering with Forest Engineering Option curriculum (FOEN) upon successful completion of the Pre-Forest Engineering (PFOE) program in the Samuel Ginn College of Engineering. Additional details on the Forest Engineering Option are available on the Samuel Ginn College of Engineering Biosystem page. Students pursuing the Forest Engineering Option must meet College of Forestry, Wildlife and Environment requirements for admission to the Forestry Summer Field Practicum and must attend the Forestry Practicum. This summer hands-on experience is scheduled for the summer term preceding the junior year and is held at the Solon Dixon Forestry Education Center near Andalusia, Alabama. Students should contact the College of Forestry, Wildlife and Environment Student Services Office at 334-844-1050 to notify your intent to apply to Practicum.

Geospatial and Environmental Informatics Specific Requirements

Admission requirements for the Geospatial and Environmental Informatics curriculum (GSEI) are the same as for other CFWE majors and are set to match the requirements of Auburn University for any given year. To remain enrolled in the GSEI curriculum, students must maintain minimum GPA standards established by Auburn University. Students also must complete designated courses in the major with at least a 2.0 cumulative GPA.

Natural Resources Management Specific Requirements

Admission requirements for the Natural Resources Management curriculum (NATR) are the same as for other CFWE majors and are set to match the requirements of Auburn University for any given year. Students in the NATR curriculum must have a sequence of courses and selected Auburn University minor approved by their faculty advisor embedded in the curriculum. See https://cfwe.auburn.edu/programs/minors (https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fcfwe.auburn.edu%2Fprograms%2Fminors&data=05%7C01%7Cckc0023%40auburn.edu%7Cafb0f4a9ed924bf43b4408db4748d19c%7Cccb6deedbd294b388979d72780f62d3b%7C1%7C0%7C638182150307615749%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=5LVf%2B0VNLUOmnIAUG8h1tEeO9whBMQ2m%2FV%2BECek7s44%3D&reserved=0) for College of Forestry, Wildlife and Environment approved minors or http://bulletin.auburn.edu/undergraduate/minors/ for the entire list of Auburn University approved minors. This highly flexible curriculum should be customized to include the coursework for individual outdoor careers within the increasingly large number of jobs outside of the traditional forestry and wildlife fields.

To remain enrolled in the NATR curriculum, students must maintain minimum GPA standards established by Auburn University. Students also must complete designated courses in the major with at least a 2.0 cumulative GPA.

Wildlife Specific Requirements

Admission requirements for the Wildlife Ecology and Management (WLDE), Wildlife Sciences, Pre-Veterinary Medicine (WLPV) and Wildlife Enterprise Management (WLEM) curricula are the same as for other CFWE majors and are set to match the requirements of Auburn University for any given year.

Wildlife Ecology and Management curricula (WLDE) must attend Wildlife Summer Practicum. Students ready to begin Wildlife Summer Practicum will be sent a "Summer Practicum Application Link" in the month of January to apply to Summer Practicum for the upcoming summer. To be considered for admission, a student must have completed or be currently enrolled in all prerequisite coursework including the following courses: FORY 3100, WILD 4400, WILD 5750, BIOL 5750, and BIOL 3060. All students accepted to the program must attend a required orientation the first Monday in April.

To remain enrolled in Wildlife Ecology and Management (WLDE), or the Wildlife Science, Pre-Veterinary Medicine (WLPV) curricula, students must maintain minimum GPA standards established by Auburn University. In addition to these standards, students in Wildlife Ecology and Management or Wildlife Science, Pre-Veterinary Medicine must complete all major courses designated with a (M) with a

grade of C or better. Grades lower than a C will not satisfy prerequisite requirements of successive listed courses and the course must be re-taken for credit toward the degree.

To remain enrolled in the Wildlife Enterprise Management (WLEM) curriculum, students must maintain minimum GPA standards established by Auburn University. In addition, students must also complete courses in the major with at least a 2.0 cumulative GPA.

Students successfully completing the Wildlife Enterprise Management (WLEM) curriculum will have an understanding of the principles of wildlife managements as they apply to consumptive enterprises and will appreciate the ecological principles that lie at the foundation of conservation biology and ecotourism. The objective of this degree program is to prepare students to manage a wildlife or outdoor enterprise, providing a set of baseline skills related to customer service, food and lodging, and legal issues to enable graduates to effectively operate, market, and advertise a wildlife or outdoor enterprise. In addition, students who follow the curriculum will qualify for a Business Minor offered by the Harbert College of Business.

Sustainable Biomaterial and Packaging Specific Requirements

Admission requirements for the Sustainable Biomaterials and Packaging (BIOP) curriculum are the same as for other CFWE majors and are set to match the requirements of Auburn University for any given year.

To remain enrolled in the Sustainable Biomaterials and Packaging (BIOP) curriculum, students must maintain minimum GPA standards established by Auburn University. In addition, students must also complete courses in the major with at least a 2.0 cumulative GPA.

Students successfully completing the Sustainable Biomaterials and Packaging (BIOP) curriculum will have an understanding of the chemical, physical, and mechanical properties of solid wood and bio-based products and packaging materials. Students within this degree program will be exposed to an overview of to trade and marketing knowledge and the structure of both traditional forest products as well as emerging sustainable biomaterial industry segments, the trade patterns and marketing, the role of private industry and government organizations in development and trade of the segments, and the potential contribution of economic development. They will know the thermal, electric and acoustic properties of the bio-based products and packaging materials and understand the relationships between anatomical structure and physical/mechanical behavior of materials.

The Sustainable Biomaterials and Packaging (BIOP) degree is appropriate for students who seek employment in any aspect of forest product development that uses the sustainable fiber resources from the forest industry. The curriculum emphasizes biological, ecological, environmental, social, economic, and ethical considerations in sustainable biomaterials and packaging markets.

Minors

- Coastal Management (http://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/coastalmanagement_minor/)
- Environmental Law (http://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/environmentallaw_minor/)
- Forest Health (http://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/foresthealth_minor/)
- Forest Resources (http://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/forestresources_minor/)
- Forest Seedling Nursery Management (http://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/forestseedling_minor/)
- Natural Resources Ecology (http://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/naturalresourcesecology_minor/)
- Nature-Based Recreation (http://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/naturebasedrecreation_minor/)
- Urban Forestry (http://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/urbanenvirscience_minor/)
- Watershed Sciences (http://bulletin.auburn.edu/undergraduate/schoolofforestryandwildlifesciences/minors/watershedsciences_minor/)

Graduate Programs

- Forestry — Graduate Certificate, MNR, MS, PhD (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/)
  - Applied Economics (Forestry) — PhD (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/PHDapecon/)
  - Forest Business & Investment — MS (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/businessandinvestms/)

- Forest Finance & Investment — Graduate Certificate (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/fingcrt/)
- Forestry — MS (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/MS/)
- Forestry — PhD (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/PHD/)
- Forestry — PhD Interdisciplinary Earth System Science (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/interdisciplinaryprograminearthsystem_phd/)
- Natural Resources — MNR, MS (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/naturalresourcesmnrms_major/)
  - Natural Resources — MNR (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/forestrymnrmsphd_major/MNR/)
  - Natural Resources — MS (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/naturalresourcesmnrms_major/naturalresources_ms/)
  - Professional Forester Option — MNR (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/naturalresourcesmnrms_major/professionalforester_mnr/)
- Restoration Ecology — Graduate Certificate (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/restorationecology_gcrt/)

- One Health — Graduate Certificate (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/onehealth_major/)
- Wildlife Sciences — MS, PhD (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/wildlifesciencesmsphd_major/)
  - Wildlife Sciences — MS (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/wildlifesciencesmsphd_major/wildlifesciences_ms/)
  - Wildlife Sciences — PhD (http://bulletin.auburn.edu/thegraduateschool/graduatedegreesoffered/wildlifesciencesmsphd_major/wildlifesciences_phd/)

Biomaterials and Packaging Courses

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 3390 INTRODUCTION TO FOREST PRODUCTS AND PACKAGING (3) LEC. 3. LAB. 2. Basic properties of wood and their impact on the manufacture of forest products. Identification of important products and woods.

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 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 I (2) LEC. 2. Examines the initial 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 4800 BIOPOLYMERS FOR SUSTAINABLE BIOMATERIALS AND PACKAGING (3) LEC. 3. Introduction to engineering principals applied to sustainable biomaterials and packaging materials. Students will analyze the morphological, physical and thermal properties, processing methods, and polymerization of traditional, natural and sustainable biomaterials used in packaging.

BIOP 4840 LIFE CYCLE ASSESSMENT FOR SUSTAINABLE BIOMATERIALS (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 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 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 5250 WOOD COMPOSITES FOR BIOMATERIALS & PACKAGING (3) LEC. 3. Pr. BIOP 3390 and BIOP 3391. Relationships between various biomass feedstock properties and the physical, chemical, and mechanical properties of the biocomposite from various manufacturing processes.

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 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.

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. Spring.

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. Spring.

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. Fall.

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. Spring.

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. Spring.

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 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.

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. or higher. Taxonomy and identification of important forest trees of the U.S., including cover types of forest regions. Fall.

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. Fall.

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. Spring.

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

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. Spring.

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. Spring.

FORY 4820 FORESTRY IN THE PRIVATE SECTOR (2) SEM. 4. Management systems and practices used in wood purchasing, timber harvesting and timberland management including public relations, forest sustainability, certification and personal business skills. Spring.

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. Spring.

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. Fall.

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. Fall.

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. Fall.

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. Spring.

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. Fall.

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. Spring.

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 (2) LEC. 2. Departmental approval. Geographic information system database planning, design, creation, management and analysis using a project oriented approach. Spring.

FORY 5540 ENVIRONMENTAL LAW (3) LEC. 3. A review of environmental law including common and administrative law, land use, and Federal statues 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. Spring. 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. Spring.

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. Spring.

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. Fall.

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. Fall.

FORY 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. Fall.

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. Spring.

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

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. Spring.

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 (2) LEC. 2. Departmental approval. Geographic information system database planning, design, creation, management and analysis using a project oriented approach. Spring.

FORY 6540 ENVIRONMENTAL LAW (3) LEC. 3. A review of environmental law including common and administrative law, land use, and Federal statues 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 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. Even years.

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. Spring odd years.

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. Spring.

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. Fall odd years.

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 modelling. Spring.

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. Spring.

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. Fall.

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 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. Fall, Spring.

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 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 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. Spring Even Years. May count either FOWS 5220 or FOWS 6220.

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. Spring.

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

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. Spring. 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 7210 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 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 7230 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 7240 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 7250 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 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. Spring odd years.

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 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 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 4240 WATERSHED MANAGEMENT (3) LEC. 3. Pr. BIOL 1030. Introduction to watersheds, effects of land management on erosion and water quality, and mitigation techniques to reduce adverse effects. Spring.

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. Spring.

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. Fall.

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. Fall.

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 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. Spring.

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. Spring.

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. Fall.

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. Fall.

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 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. Spring.

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 7550 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. Spring.

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 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. Spring.

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. Fall.

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 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 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 4250 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 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. Spring.

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.

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. Fall.

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 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.

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

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

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. Spring.

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 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. Fall.

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. Spring.

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 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. Spring.

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 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. Fall.

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. Fall.

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. Spring.

WILD 6750 ANALYSIS FOR WILDLIFE SCIENCES (4) LEC. 2. LAB. 2. Applied training in data analysis tools commonly used in wildlife sciences. Spring.

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. Spring of even years.

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. Fall.

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. Fall of odd years.

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. Fall of even years.

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 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 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.