

## FOR

## Forestry

### **FOR 100 INTRODUCTION TO FORESTRY. (3)**

A brief coverage of the general fields of forestry; development and importance; tree growth; principal forest regions and important timber species; forest management practices; utilization and products; state and federal forestry programs.

### **FOR 101 INTRODUCTION TO WILDLIFE CONSERVATION. (3)**

An introduction to the history, concepts, and principles of wildlife biology and management. The role of wildlife in ecological systems and human-altered environments will be discussed. Lecture, two hours; laboratory, two hours per week.

### **FOR 200 MAP READING AND PHOTOGRAMMETRY. (2)**

Use of topographic maps and aerial photos to determine distances, heights, directions, and areas. Location of ground features on maps and photos and of map and photo features on the ground. Laboratory, four hours per week. Prereq: MA 109 and MA 112 or high school equivalents.

### **FOR 205 FOREST AND WILDLAND SOILS AND LANDSCAPES. (4)**

A study of soil-plant-landscape relationships as related to forestry and the management of natural ecosystems. Emphasis will be on properties and processes of wildland soils, and on interrelationships between soils; composition and productivity of plant communities; and the structure, form, and functioning of landscapes. Lecture, three hours; laboratory, three hours per week. Prereq: At least three credits of biology and three credits of chemistry.

### **FOR 219 SILVICS AND TREE IDENTIFICATION. (3)**

Silvics, taxonomy, and preparation of woody plants native to the U.S. Lecture, two hours per week; laboratory, three hours per week, with field trips to local forests. Prereq: One semester of botany.

### **FOR 221 WINTER DENDROLOGY. (1)**

Identification of 100 species of trees, shrubs, and lianas based upon bark, form, twig, and bud characteristics. Laboratory; four hours per week for one-half semester. Prereq: FOR 219.

### **FOR 300 FOREST MEASUREMENTS. (4)**

Basic forest surveying; units of measure and their application in determining volume in forest stands and products; statistical techniques and photogrammetry in volume estimate; site classification and growth determinations; continuous forest inventory and data processing techniques. Lecture, three hours; laboratory, two hours. Prereq: MA 123 and STA 291.

### **FOR 315 CONSERVATION BIOLOGY. (3)**

This course is a multidisciplinary science designed to deal with the global crisis confronting natural biological systems. This course will review the scientific evidence demonstrating loss of biological diversity across all taxonomic groups. Various strategies for conserving biological diversity will be presented, including single-species, ecosystem, and landscape level approaches. Emphasis will be placed on strategies for managing small populations. Additional topics to be addressed include habitat fragmentation, restoration ecology, and sustainable development. Prereq: BIO 150 and 152 or consent of the instructor.

### **FOR 325 ECONOMIC BOTANY: PLANTS AND HUMAN AFFAIRS. (3)**

Plants have played a major role in human affairs. Course will relate plant life processes and chemistry to human uses: food crops, spices, medicinals, and materials. Major units are the origins agriculture and early domesticates, ethnobotany, and a selection of plants and plant products with major historical impacts — potato, nutmeg, pepper, chocolate, sugar cane, cotton, quinine, rubber, tobacco. Contemporary themes include herbal medicine and plant-based pharmaceuticals. Prereq: PLS 104, PLS 210, one year of introductory biology, or permission of the instructor.

### **FOR 340 FOREST ECOLOGY. (3)**

The study of the forest as a biological community with emphasis on the interrelationships between trees and other organisms comprising the community, and the interrelationships between these organisms and the physical environment. Lecture, two hours; laboratory, three hours per week. Prereq: FOR 205 and FOR 219, or consent of instructor.

### **FOR 350 SILVICULTURE. (4)**

Principles and techniques of intermediate cutting, natural and artificial regeneration, systems of reproduction, application of genetics and tree improvement to intensive forest management, and silviculture of some of the major forest types of the United States. Lecture, three hours; laboratory, two hours with occasional extended field trips. Prereq: FOR 205, FOR 219, FOR 340, or consent of instructor.

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- FOR 360 WOOD TECHNOLOGY AND UTILIZATION. (4)**  
General anatomy of wood and study of its properties. Identification of major species based on microscopic and macroscopic features. Sources, processing, and utilization of wood products. Lecture, three hours; laboratory, two hours per week. Prereq: BIO 106 and 107, PHY 151, or consent of instructor.
- FOR 375 TAXONOMY OF FOREST VEGETATION. (1)**  
Field study of the identification and silvics of forest vegetation. One week summer field course. Prereq: FOR 205, FOR 219, and FOR 340; grade of C or better required in FOR 205 and FOR 219.
- FOR 376 SILVICULTURAL PRACTICES. (2)**  
Field study of the relationship between specific site characteristics and yield of forest stands and the application of cultural practices to forest stands. Two week summer field course. Prereq: FOR 205, FOR 219, FOR 340, and FOR 350; grade of C or better required in FOR 205 and FOR 219.
- FOR 377 FOREST SURVEYING. (1)**  
The application of surveying principles and techniques to forest land areas. One week summer field course. Prereq: FOR 200 and FOR 300; grade of C or better required in FOR 200.
- FOR 378 FOREST MENSURATION. (2)**  
The application of mensurational principles and techniques in determining tree and stand volumes and growth; timber cruising; development of volume and stand tables. Two week summer field course. Prereq: FOR 200 and FOR 300; grade of C or better required in FOR 200.
- FOR 379 HARVEST AND UTILIZATION OF WOOD. (2)**  
Study and use of harvesting and milling equipment in the harvest and manufacture of wood and wood products. Two week summer field course. Prereq: FOR 360.
- FOR 399 FIELD-BASED EDUCATION IN FORESTRY. (1-6)**  
The use of field experience as an educational complement to classroom work. May be repeated to a maximum of 12 credits which are to be used as electives. Prereq: Permission of instructor and department chairperson. A departmental learning agreement must be completed prior to registration.
- FOR 402 FOREST ENTOMOLOGY. (3)**  
The principles of forest entomology, including the detection, collection, identification, appraisal of damage, and control of forest insect pests. Lecture, two hours; laboratory, two hours. Prereq: One year of biology or consent of instructor. (Same as ENT 402.)
- FOR 425 TIMBER MANAGEMENT. (4)**  
The principles of sustained yield timber management, organization of the forest area, management objectives, timber valuation, regulation of the cut, and timber management plans. Lecture, three hours; laboratory, two hours. Prereq: MA 162, FOR 201, and Summer Camp (FOR 375, 376, 377, 378, and 379), or consent of instructor. (Same as AEC 425.)
- FOR 430 FOREST WILDLIFE MANAGEMENT. (3)**  
The principles and practices of wildlife ecology and management with emphasis on the forest environment. Lecture, two hours; laboratory, two hours with occasional extended field trips. Prereq: Summer Camp (FOR 375, 376, 377, 378, and 379) or consent of instructor.
- FOR 440 FOREST RESOURCES FOR RECREATION. (3)**  
Study of resource-oriented recreation in the forest. The recreational development of forest lands and waters and basic forest land management policies and principles related thereto. Lecture, two hours; laboratory, two hours with occasional extended field trips. Prereq: Summer Camp (FOR 375, 376, 377, 378, and 379) or consent of instructor.
- FOR 460G FOREST WATERSHED MANAGEMENT. (3)**  
Principles and techniques involved in forest watershed management as related to the water resource. The influence of forestry practices on water movement into and through the watershed; water storage; water loss, vegetation and water yields; water quality. All-day field trip required. Prereq: Summer Camp (FOR 375, 376, 377, 378, and 379); or consent of instructor.

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**FOR 461 INTRODUCTION TO POPULATION GENETICS. (3)**

This survey course examines the population dynamics and equilibria of genes in nuclei, chloroplasts and mitochondria. Emphasis will be on biological relevance (in plants, animals, and micro-organisms), but some theoretical derivations will also be introduced. Prereq: ABT 360 (or equivalent) and one course in probability/statistics. (Same as ABT/BIO/ENT 461.)

**FOR 480 INTEGRATED FOREST RESOURCE MANAGEMENT. (5)**

This is the capstone course in the forestry curriculum. Students will be presented with a real life management scenario in a forested location in Kentucky. They will be required to collect data, determine management objectives, and develop action plans for managing the forest according to the desires of the owner and subject to realistic legal, economic, and social constraints. Students will be required to present their management plans at the end of the semester to the faculty of the Department of Forestry. Lecture, three hours; laboratory, four hours per week. Prereq: FOR 425, FOR 430, FOR 440, and FOR 460G.

**FOR 599 INDEPENDENT WORK IN FORESTRY. (1-3)**

Study and independent work on selected problems related to allocation and utilization of natural resources. May be repeated to a maximum of six credits. Any combination of FOR 599 and FOR 781 cannot exceed six credits. Prereq: Senior or graduate standing and consent of instructor.

**FOR 601 RESEARCH METHODS IN FORESTRY. (3)**

A study of research methods, procedures, and techniques used in forestry. Major emphasis will be placed on problem analysis and methods of conducting organized research. Prereq: Graduate standing.

**FOR 602 RENEWABLE NATURAL RESOURCES IN A GLOBAL PERSPECTIVE. (3)**

An advanced course that examines world and transboundary issues related to renewable natural resources. Students will attend a series of lectures, discuss assigned readings, and identify issues for further study. Student research papers related to those issues will be presented and discussed in a seminar format. Prereq: Graduate standing.

**FOR 605 EMPIRICAL METHODS IN ECOLOGY AND EVOLUTION. (2)**

This course provides students with hands-on experience in a diverse array of modern research methods used by ecologists and evolutionary biologists, including techniques used in: molecular genetics, chemical ecology, behavioral studies, motion analyses, using high-speed video, image analyses for morphometrics and color, and field techniques in both aquatic and terrestrial systems. Lecture, one hour; laboratory, three hours per week. Prereq: BIO 325 or FOR 340 or ENT 665, or consent of instructor. (Same as BIO/ENT 605.)

**FOR 606 CONCEPTUAL METHODS IN ECOLOGY AND EVOLUTION. (3)**

This course provides students with hands-on experience in a diverse array of conceptual research techniques used by ecologists and evolutionary biologists. The focus will be on optimization methods used for predicting animal and plant behaviors and life histories, and on methods for assessing population trends and dynamics. Mathematical techniques used will include graphical analyses, matrix algebra, calculus, and computer simulations. The latter part of the course will consist of collaborative modeling projects, in which small groups of students will work with the instructor to address an important contemporary research problem and will report their results in a public talk and a project writeup. Prereq: One year of calculus and BIO 325 or FOR 340 or ENT 665, or consent of instructor. (Same as BIO/ENT 606.)

**FOR 607 ADVANCED EVOLUTION. (2)**

This course covers advanced topics in evolution, concentrating on questions central to the understanding of general evolutionary processes. Phenomena occurring both within populations (e.g., selection, inheritance, population subdivision) and between populations (e.g., gene flow, competition) will be addressed. Special attention will be given to modern research approaches and techniques including quantitative genetics, measurement of selection, phylogenetic analyses of comparative data and molecular systematics. Prereq: One year of calculus, genetics (BIO 304 or BIO 461) and BIO 508 or consent of instructor. (Same as BIO/ENT 607.)

**FOR 608 BEHAVIORAL ECOLOGY AND LIFE HISTORIES. (2)**

This course uses an evolutionary approach to examine behavior and life histories. Topics addressed include: the optimality approach, constraints on optimality, kin and group selection, predator and prey behaviors, social and mating behaviors, and life history evolution. Prereq: BIO 325 and one semester of calculus; or consent of instructor. (Same as BIO/ENT 608.)

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**FOR 609 POPULATION AND COMMUNITY ECOLOGY. (3)**

This course discusses the processes that determine population distributions and dynamics and community structure for both plants and animals. Topics addressed include: population regulation and population stability, community diversity and stability, ecological succession, population interactions (competition, predation, mutualism), coevolution, and the effects of spatial and temporal heterogeneity on population and community patterns. Prereq: BIO 325 or FOR 340 or consent of instructor. (Same as BIO/ENT 609.)

**FOR 612 FOREST ECOSYSTEM DYNAMICS. (3)**

The study of ecosystem structure and function with emphasis upon eastern deciduous forest ecosystems. Topics discussed will include energy flow, mineral cycling, the influence of disturbance upon ecosystem properties and dynamic processes in the development of ecosystems. Prereq: FOR 340 or BIO 451G and consent of instructor.

**FOR 620 SPECIAL TOPICS IN FORESTRY (Subtitle required). (1-3)**

Special topical or experimental courses in forestry for advanced graduate students. Special title required and must be approved by the chairperson of the Department of Forestry. May be repeated to a maximum of nine credits. Students may not repeat under the same subtitle. Prereq: Consent of instructor.

**FOR 622 PHYSIOLOGY OF PLANTS I. (3)**

A physiological/biochemical treatment of central topics in modern plant physiology. Topics will include: plant-cell biology, ion transport, water and translocation, respiration and photosynthesis. Prereq: BIO 430G or equivalent or consent of coordinator. Prereq or concur: BCH 607. (Same as BIO/PLS 622.)

**FOR 623 PHYSIOLOGY OF PLANTS II. (3)**

A physiological/biochemical treatment of central topics in modern plant physiology. Topics will include: plant hormones, an introduction to plant biotechnology, senescence and abscission, stress physiology, phytochrome-photomorphogenesis-phototropism nitrogen and sulfur metabolism. Prereq: BIO 430G or equivalent or consent of coordinator. Prereq or concur: BCH 607. (Same as BIO/PLS 623.)

**FOR 630 WILDLIFE HABITAT ANALYSIS. (3)**

The components and structure of wildlife habitats and associated wildlife communities. Univariate and multivariate statistical methods of habitat analysis will be described and applied to data collected during laboratory periods to identify important habitat characteristics for selected wildlife species. The importance of habitat complexity will be demonstrated in laboratory and field situations. Lecture, three hours; laboratory, two hours. Prereq: FOR 430 and basic courses in statistics and ecology.

**FOR 662 QUANTITATIVE METHODS IN RENEWABLE AND NONRENEWABLE RESOURCE MANAGEMENT. (3)**

Application of dynamic optimization methods to renewable and nonrenewable resource management. Includes problem formulation, mathematical problem solving, Matlab programming, simulations and optimal policies analysis. Case examples are used to demonstrate applicability and problem formulation in finance and general and partial equilibrium. Prereq: MA 113 and MA 162 or equivalent, and AEC 661 or equivalent. (Same as AEC 662.)

**FOR 667 INVASIVE SPECIES BIOLOGY. (3)**

This course will examine circumstances that allow introduced species to become invasive, how invasive species threaten our resources, and approaches to minimizing the incidence and impact of invasions. Prereq: Graduate standing or consent of instructor. (Same as BIO/ENT 667.)

**FOR 695 FIELD RESEARCH IN FORESTRY. (0)**

Full-time research that requires the student to remain off-campus for extended periods. Students enrolled in this course remain in full-time academic status. May be repeated to a maximum of 2 semesters. Prereq: Graduate standing in the Forestry Graduate Program. For students whose research precludes them from taking courses on campus for a semester. Registration requires (a) approval of Research Contract by a committee of at least three Forestry faculty members established to consider a particular student's Research Contract, (b) approval of Research Contract by Director of Graduate Studies, and (c) approval of Research Contract by Associate Dean for Academic Programs.

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**FOR 748 MASTER'S THESIS RESEARCH.**

**(0)**

Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

**FOR 768 RESIDENCE CREDIT FOR MASTER'S DEGREE.**

**(1-6)**

May be repeated to a maximum of 12 hours. Prereq: Consent of adviser and chairperson of the department.

**FOR 770 FORESTRY SEMINAR (Subtitle required).**

**(1)**

Reports and discussions on recent research and current literature. Credit is given to those who satisfactorily present papers. Required of all graduate students. Can be repeated to a maximum of three credits. Prereq: Graduate standing.

**FOR 781 SPECIAL PROBLEMS IN FORESTRY.**

**(1-3)**

Advanced study of selected problem areas in forestry. May be repeated for a total of six credits; any combination of FOR 781 and FOR 791 cannot exceed six credits. Prereq: Consent of graduate adviser.

**FOR 791 RESEARCH IN FORESTRY.**

**(1-3)**

Involves original research in selected areas of interest in forestry. May be repeated for a total of six credits; any combination of FOR 781 and FOR 791 cannot exceed six credits. Prereq: Consent of graduate adviser.