

## FOR

## Forestry

### **FOR 100 FORESTS AND FORESTRY. (3)**

This course covers the interrelated components of forests as well as their growth and importance. Also covered are the general fields of professional forestry including policies, management practices and utilization.

### **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 110 NATURAL RESOURCE ISSUES. (1)**

A communication intensive course in which students will learn to research current forestry and natural resource issues, interpret popular press and professional publications, evaluate opposing viewpoints, and discuss issues in a clear, effective and professional manner through a variety of communication media.

### **FOR 150 COMPUTER APPLICATIONS IN NATURAL RESOURCE PROFESSIONS. (2)**

Use and application of standard computer software to solve problems. Emphasis will be placed on decision processes and algorithm construction. Additionally, students will learn to construct aesthetic graphs, diagrams, maps and other visual material and will gain experience communicating results in a variety of written formats.

### **FOR 200 BASICS OF GEOSPATIAL TECHNOLOGY. (3)**

A basic introduction to the various types of maps and their uses, field navigation skills, and map making. The course is heavily field and laboratory based, with an emphasis on hands-on learning and practice. Both traditional technologies, such as compasses, U.S. Geological Survey maps, and aerial photographs as well as newer technologies, such as global positioning systems and geographic information system databases will be employed in carrying out course exercises.

### **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 DENDROLOGY. (4)**

A study of the basic concepts of botany related to woody species and their use, along with basic soil and site characteristics in the identification of trees and forest vegetation.

### **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 240 FORESTRY AND NATURAL RESOURCE ETHICS. (2)**

A study of the key ethical concepts of conservation, preservation, deep ecology, land ethic, spiritualism/religion, and multiple value systems as applied to forestry and natural resource issues. Students will gain an understanding of the ethical dilemmas faced by natural resource professionals, and will be able to identify ways of handling these dilemmas, including application of professional associations' codes of ethics.

### **FOR 250 STATISTICS AND MEASUREMENTS I. (4)**

The application of statistical concepts, computations, and software to forestry sampling and inventory problems. Land, individual tree and timber stand measurement techniques will be covered as will the design and implementation of sampling systems to derive information necessary to meet landowner objectives. Prereq: MA 109 or calculus.

### **FOR 255 FOREST FIRE. (1)**

Basic wildland fire behavior including factors that impact the start and spread of wildfires. Learn foundational skills needed for wildland firefighters. Topics also include an introduction to the incident command and incident management systems. A day-long field day is required as part of the course.

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### **FOR 260 FOREST PRODUCTS AND WOOD SCIENCE. (4)**

An examination of basic material properties of wood, methods by which it is used, and issues and economic conditions in which domestic and global wood markets operate. Concepts covered include species identification, chemical and mechanical properties and their effect on utilization, utilization technologies and their linkage to silvicultural practices, and affiliated issues such as recycling, product certification, environmental concerns, and alternative products.

### **FOR 261 WOOD SCIENCE AND ANATOMY. (2)**

A 2 credit hour course examining the basic structure of wood and how it affects wood's physical properties. Topics include macroscopic wood properties, composition and structure of wood cells, hardwood and softwood structure, juvenile wood, reaction wood, wood and water relationships, wood deterioration and prevention, and specific gravity and density.

### **FOR 262 WOOD IDENTIFICATION. (2)**

A 2 credit hour course covering the methods and techniques necessary for identifying common wood species. Topics include macroscopic wood properties, hardwood and softwood structure, and the systematic thought processes for successful identification of 27 wood species.

### **FOR 280 FOREST RESOURCE POLICY AND LAW. (3)**

This course provides a basic knowledge of United States policy and law as it applies to management and administration of forests and related resources on public and private land. Topics include the sources, development, and analysis of relevant laws, administrative regulations, and other policies. Judicial decisions addressing the management of National Forests, biodiversity, water resources, and other specific issues will be discussed.

### **FOR 285 COMMUNICATION AND PROFESSIONAL DEVELOPMENT IN FORESTRY AND NATURAL RESOURCES I. (1)**

Course provides students with the knowledge and skills to communicate effectively in a variety of professional situations. Leaders from the forestry sector will meet with students in open seminar settings to discuss various internship and career opportunities, job requirements, and career paths. A key component of these presentations will emphasize the ideas, concepts, and skill sets students need to succeed in various forestry careers.

### **FOR 286 COMMUNICATION AND PROFESSIONAL DEVELOPMENT IN FORESTRY AND NATURAL RESOURCES II. (1)**

The course provides students with the knowledge and skills to communicate effectively, written and orally, in a variety of professional settings. Students will meet with forestry and natural resource professionals at their place of business, professional conferences, and in class. Prereq: FOR 219, FOR 250, FOR 330, FOR 340, FOR 350, FOR 370, and PLS 366, or consent of the field semester coordinator.

### **FOR 310 INTRODUCTION TO FOREST HEALTH AND PRODUCTION. (1)**

Introduction to common forest health challenges in the central Appalachians. Identify symptoms associated with common biotic agents (e.g., hemlock woolly adelgid, emerald ash borer, chestnut blight, etc.) and abiotic stressors that affect the health of forested ecosystems. Understand and assess the effects these problems have on ecosystem processes and different methods for conserving forest resources while addressing the impacts. Course incorporates components of forest entomology, forest pathology, abiotic stressors, and invasive species. Prereq: FOR 219, FOR 250, FOR 330, FOR 340, FOR 350, FOR 370, and PLS 366, or consent of the field semester coordinator.

### **FOR 320 FOREST VALUATION AND ECONOMICS. (3)**

Apply economic concepts to silvicultural practices, land values, and values affiliated with various forest uses. Apply supply and demand concepts and financial computations to identify and quantify economic consequences of silvicultural actions or management practices. Taxation and monetizing ecosystem services will be discussed. Prereq: MA 109 or Calculus.

### **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.

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### **FOR 330 GIS AND SPATIAL ANALYSIS.**

**(3)**

Principles and operations of Geographic Information Systems (GIS) applied to forestry and natural resources. Students will learn to collect necessary field data to create GIS maps and digital spatial data sets, perform basic spatial analysis, and integrate social and economic data to solve spatially related natural resource problems. Prereq: MA 109 or Calculus, and FOR 200, or consent of instructor.

### **FOR 340 FOREST ECOLOGY.**

**(4)**

The study of the forest as a biological community, covering ecosystem concepts such as energy flow, forest nutrition, nutrient cycling, and decomposition. Interrelationships between trees and other organisms comprising the community is also examined through concepts of disturbance, succession, population dynamics, biological and ecosystem diversity, ecosystem management, and ecosystem services. Prereq: BIO 103 or BIO 150.

### **FOR 350 SILVICULTURE.**

**(4)**

A study of ecologically based manipulations of forests to achieve desired management objectives. Develop and apply silvicultural prescriptions and learn the effects of these prescriptions on timber and non-timber forest benefits, forest health and biodiversity, soil, and water resources as well as their effect on broader social, economic, and ecological issues. Prereq: FOR 219 and FOR 250.

### **FOR 356 FOREST SOILS AND HYDROLOGY.**

**(1)**

Students will learn to assess the physical environment of forested ecosystems by examining soil-plant-water relationships across a variety of landscape settings. Prereq: FOR 219, FOR 250, FOR 330, FOR 340, FOR 350, FOR 370, and PLS 366, or consent of the field semester coordinator.

### **FOR 357 INVENTORY AND MEASUREMENTS II.**

**(2)**

This is a practical course designed to provide students with knowledge and skills related to the collection of forest inventory data and the preparation of a forest inventory report required to manage forests and natural resources. Students will become familiar with statistical concepts used in forest measurements; use mapping and navigation procedures to locate sampling areas; conduct forest inventories; and develop inventory reports. Prereq: FOR 219, FOR 250, FOR 330, FOR 340, FOR 350, FOR 370, PLS 366 or consent of the field semester coordinator.

### **FOR 358 SILVICULTURAL PRACTICES.**

**(3)**

A study of the silvicultural practices for altering the forest canopy and regenerating the forest. Students will learn to apply these practices to meet multiple use objectives such as forest products, wildlife, health and protection, watershed, and recreation and develop silvicultural prescriptions. Prereq: FOR 219, FOR 250, FOR 330, FOR 340, FOR 350, FOR 370, PLS 366 or consent of the field semester coordinator.

### **FOR 359 FOREST OPERATIONS AND UTILIZATION.**

**(3)**

Plan and design timber harvests, mark a stand for harvest, and describe the effects of harvesting. Use herbicides and pesticides to eradicate invasive species, perform tree planting, conduct thinnings, and participate in prescribed burns. Learn timber utilization technology and determine value added in converting trees to lumber. Prereq: FOR 219, FOR 250, FOR 330, FOR 340, FOR 350, FOR 370, PLS 366 or consent of the field semester coordinator.

### **FOR 365 WILDLIFE ASSESSMENT.**

**(2)**

An experiential learning opportunity designed to introduce students to basic concepts of forest wildlife management. Become familiar with common techniques to determine wildlife presence and relative abundance. Learn how forest management practices can directly and indirectly impact many wildlife species and their habitats in Kentucky. Understand how forestry and wildlife professionals manipulate forests to meet wildlife management and biodiversity conservation objectives at various spatial scales. Learn the direct and indirect impacts of some wildlife species on forest management. Prereq: FOR 219, FOR 250, FOR 330, FOR 340, FOR 350, FOR 370, and PLS 366, or consent of the field semester coordinator.

### **FOR 370 WILDLIFE BIOLOGY AND MANAGEMENT.**

**(4)**

Applications of basic biological concepts such as physiology, energetics, nutrition, digestive systems, and anatomy to the study of wildlife and wildlife management. In addition to basic wildlife biology, students will also learn taxonomy and identification of wildlife and the principles of wildlife management as well as applied field techniques such as trapping and radio telemetry.

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### **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 400 HUMAN DIMENSIONS OF FORESTRY AND NATURAL RESOURCES. (3)**

In an issues based format, students will study and write about societal trends and their impact on natural systems, the disconnect between society and nature, wildlife-human interactions, as well as problems related to globalization and urbanization. Prereq: This course is approved to fulfill the Graduation Composition and Communication Requirement (GCCR) for forestry majors. To receive GCCR credit for this course, you must 1) already have sophomore status (completed 30 credit hours), 2) earn an average grade of C or better on the designated Composition and Communication intensive assignments, and 3) complete this course and the other approved GCCR course, FOR 480. This course provides partial credit for the written component of the GCCR for the forestry major in conjunction with FOR 480. This course is a Graduation Composition and Communication Requirement (GCCR) course in certain programs, and hence is not likely to be eligible for automatic transfer credit to UK.

### **FOR 425 FOREST MANAGEMENT. (4)**

The principles of sustained yield forest management, management objectives, forest regulation, allowable cut, and timing of timber harvests. Students will identify management objectives for various properties and ownership types and integrate scientific knowledge and both timber and non-timber considerations with landowner objectives to derive management decisions. Prereq: Completion of the Spring Field Semester or consent of instructor. (Same as AEC 425.)

### **FOR 435 CONSERVATION BIOLOGY. (3)**

Review the ethical foundations of conservation biology, discuss the scientific evidence that illustrates recent rapid loss of biological diversity at multiple spatial and temporal scales, identify and elaborate on the causative factors of biodiversity loss, discuss various strategies for conserving biodiversity, and discuss ways that various human cultures and associated resource use influence non-human life and the human societies that depend on them. Conservation biology is multidisciplinary in scope and discussion topics include wildlife management, restoration ecology, economics, ethics, geology, evolution, philosophy, phylogeny, taxonomy, genetics, behavioral ecology, population ecology, disease, sociology, sustainable living, and human dimensions. Conservation topics will be global in scope, with well-studied case examples used to support class activities. Prereq: Introductory biology course, or consent of instructor.

### **FOR 460 FOREST HYDROLOGY AND WATERSHED MANAGEMENT. (3)**

Principles and techniques involved in watershed management as it relates to the practice of forestry. Emphasis is placed on understanding the hydrologic cycle, plant-soil interactions from a land-use and landscape perspective, and the need for implementation of forestry best management practices. Prereq: Forestry spring field semester, or NRE 320, or consent of instructor.

### **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 470 INTERDEPENDENT NATURAL RESOURCE ISSUES. (3)**

Culmination of the student's study of public concerns and problems related to natural resources. Work in teams to find and verify information on diverse topics, listen to and address public concerns, communicate natural resource information to a wide range of audiences, and be effective professionals in working toward solutions. Prereq: Senior Standing. This is a writing-intensive (W) course approved to fulfill the upper tier of the graduation writing requirement (GWR). To receive W credit for this course, you must have successfully completed the first-year writing requirement (ENG 104 or its equivalent) and have completed at least 30 hours of course work. Forestry majors must complete this course and FOR 400 to fulfill the upper tier graduation writing requirements.

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

Capstone course. Students will be presented with a real life management scenario in a forested location in Kentucky. Working in teams, students will collect data, determine management objectives, and develop action plans for managing the forest according to the desires of the owner, subject to realistic legal, economic, ethical, and social constraints. Students will be required to produce a professional management plan and present the plan in a public forum at the end of the semester. Prereq: Completion of Field Semester, FOR 425, FOR 460, and Senior Standing. This course is a Graduation Composition and Communication Requirement (GCCR) course in certain programs, and hence is not likely to be eligible for automatic transfer credit to UK.

### **FOR 502 FOREST ENTOMOLOGY. (3)**

Lectures primarily address principles and concepts. Laboratories use a hands-on approach to demonstrate insect collecting and identification techniques, ecological concepts and management approaches, and use of reference materials. Prereq: A minimum of 3 credits of basic biology (BIO 103 or BIO 148 or equivalent) or consent of instructor. (Same as ENT 502.)

### **FOR 510 HERPETOLOGY. (4)**

This is a 4-credit, advanced biology and/or wildlife course about amphibians and reptiles for both undergraduate and graduate students. Lectures and labs follow two concurrent themes: 1) a survey of amphibians and reptiles, with special emphasis on Kentucky species, and 2) a general analysis of amphibian and reptile biology, ecology, conservation and management. Prereq: All students enrolled in FOR 510 should have taken at least one college-level Biology course.

### **FOR 520 MAMMALS OF THE EASTERN UNITED STATES. (4)**

Covers the evolution, taxonomy, biogeography, biology, and natural history of mammals, emphasizing North American fauna. All mammalian orders extant (and extinct) in North America will receive coverage, emphasizing major morphological differences among groups, and physiological and behavioral adaptations to North American climates and ecosystems. Lecture discussions will cover major physiological systems (digestive, excretory, reproductive, etc.), energetics, diet and nutrition, reproductive patterns, and anatomical differences unique to each taxonomic order. Laboratory exercises will stress identification of extant mammals occurring in eastern North America, with a heavy emphasis on species occurring in Kentucky and adjacent states. Prereq: Entry level courses in biology (BIO 148 or equivalent), field ecology (FOR 340 or equivalent), and wildlife management (FOR 370 or equivalent) or consent of instructor.

### **FOR 530 FRESHWATER ECOLOGY. (3)**

Advanced biology and natural resources course about the ecology of freshwater environments. Course material covers 1) interactions among freshwater species and between the species and their aquatic environment, 2) how these interactions influence distribution and abundance of freshwater species, and 3) conservation and management of freshwater species and aquatic systems. Prereq: Upper level course in biology, field ecology, wildlife management or consent of the instructor.

### **FOR 540 URBAN ECOLOGY. (3)**

Discussion-based course focused on describing urban ecosystems, the processes determining patterns of abundance and distribution of organisms in urban ecosystems, the interactions among organisms in the urban environment, the interactions between humans (and societies) and nature in urban environments, and some aspects of urban planning and urban forestry as it relates to ecology and the environment. Prereq: Upper level course in biology, ecology, environmental policy or consent of the instructor.

### **FOR 550 U.S. BIODIVERSITY HOTSPOTS. (3)**

This is a 3-hour travel-based experiential learning course designed to immerse students in some of the most biodiverse areas in the U.S. Students will experience and learn about the ecology, geology, conservation, and management activities and policy of these areas by: 1) visiting several representative protected areas (e.g. National Parks, National Forests), and 2) interacting with resource managers and land stewards that work on landscape and local conservation and management issues to get a feel for the challenges and opportunities in protecting biodiversity and accommodating human needs. Student funded domestic travel is embedded with this course. There is a cost of approximately \$600 for this trip. Prereq: At least two upper level (300+) courses in biology, forestry, ecology, wildlife, or natural resources environmental sciences, or consent of instructor.

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**FOR 570 LANDSCAPE ECOLOGY FOR NATURAL RESOURCES. (3)**

Principles of landscape ecology and their applications to contemporary ecological issues. Students will learn and apply the tool of geographic information system (GIS) and spatial analysis to problems in natural resource ecology, management, and conservation. Course covers the following topics: principles of landscape ecology (e.g., patch, mosaic, and scale), quantification of landscape patterns, formation and dynamics of landscape patterns, role of disturbance, landscape models and their applications. Prereq: Any upper level course in GIS or consent of instructor. (Same as GEO 570.)

**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 603 FOUNDATIONS IN FORESTRY, WILDLIFE AND NATURAL RESOURCE SCIENCES. (3)**

Foundations in Forestry, Wildlife and Natural Resource Sciences is a 3-credit, graduate level, seminar-style course focused on evaluating, discussing, and tracking the progression of the science and philosophy behind select topics in forestry, wildlife and other natural resource sciences, as well as environmental management and policy. 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 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.

**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 767 DISSERTATION RESIDENCY CREDIT. (2)**

Residency credit for dissertation research after the qualifying examination. Students may register for this course in the semester of the qualifying examination. A minimum of two semesters are required as well as continuous enrollment (Fall and Spring) until the dissertation is completed and defended.

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**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.