

FOREST RESOURCES (FOR)

FOR 1300 Careers in Forest Nursery Management and Technology (1 credit)

Course promotes student success in college and preparation for a career in forest nursery management and technology, and explores personal and career interests, needs, and goals. Students are introduced to a variety of careers in the forest nursery industry through class presentations and guest speakers. Typically Offered: Fall.

FOR 1400 Introduction to Forest Management (2 credits)

Intro to forestry, current management issues, timber and non-timber resources, and educational and professional opportunities. Includes regional field trips ranging in length from one afternoon to one weekend. Cooperative: open to WSU degree-seeking students.

FOR 1700 Introduction to Computer Applications in Natural Resources (1 credit)

Introduction to basic software programs used in natural resources, including Microsoft Office. Typically Offered: Fall.

FOR 1800 Forest Nurseries Tour (1 credit)

Course provides opportunity for students to experience commercial forest nursery operations across the Northern Rockies and learn about the challenges and opportunities in working for, owning, and managing a commercial forest nursery. May involve field trips. Typically Offered: Fall.

FOR 2000 (s) Seminar (1-16 credits, max 99)

Credit arranged

FOR 2030 (s) Workshop (1-16 credits, max 99)

Credit arranged

FOR 2040 (s) Special Topics (1-16 credits, max 99)

Credit arranged

FOR 2100 Principles of Ecology (3 credits)

Cross-listed with REM 2210, WLF 2200

Principles of ecology and their relevance to management of natural resources. Major topics include plant and wildlife population, community, ecosystem, and landscape level processes and how these processes interact with the environment. Exploration of how ecosystems are affected by humans and global change. Introduction to the types of questions asked by ecologists, the principal concepts and theories that guide ecological inquiry, and the methods that are used to answer ecological questions. Both terrestrial and aquatic systems are considered. Typically Offered: Spring.

Prereqs: BIOL 1020/BIOL 1020L or BIOL 1140 or BIOL 1150 or PLSC 2050; or Permission.

FOR 2110 Forest Biology & Dendrology (3 credits)

Phylogenetic approach to understanding the systematics, morphology, geography, and ecology of the major species of North American woody plants. Includes identification and classification of important tree species of North American and other important woody plants of the Pacific Northwest and northern Rocky Mountains. Recommended preparation: BIOL 1140. Typically Offered: Fall.

FOR 2200 Forest Mapping and GIS Applications (2 credits)

Methods and techniques for surveying, mapping, and navigation in forested environments using traditional tools and advanced technologies. Concepts include field surveying, orienteering, industry relevant GIS applications, and real-time mobile mapping processes and technologies. This course includes 2-3 early morning field trips. Typically Offered: Spring.

FOR 2210 Forest Mensuration I (3 credits)

Practical methods used to measure tree, stand, and forest-level attributes for guiding silvicultural management decisions. Provides fundamental skills in the use of technology for inventory data analytics. Field trips required. Typically Offered: Fall. Prereqs or

Coreqs: MATH 1143 and MATH 1144; or SAT math score of 610 or above, or ACT math score of 27 or above

FOR 2220 Forest Mensuration II (2 credits)

Principles and practice of forest sampling and data analytics. Introduction to forest biometrics. Provides experiential learning in quantitative and analytical software packages. Field trips required. Typically Offered: Spring.

Coreqs: FOR 2210 and STAT 2510

FOR 2300 Business of Forestry (2 credits)

Joint-listed with FOR 4300

Technical assessment of forestry from a business perspective at the stand and landscape levels, including an examination of factors that affect public and private landowner decision making regarding management of timberland. Course integrates concepts from silviculture, forest management, and natural resource policy into decision making framework. Requires additional project for upper-division credit.

FOR 2350 Society and Natural Resources (3 credits)

General Education: Social and Behavioral Ways of Knowing

Cross-listed with NRS 2350

An exploration of how people use, value, manage, impact, and are affected by natural resources; course emphasizes social and economic realities and political and legal processes in a context of current and historical natural resource issues. Two lectures and one 1-hour small discussion group meeting per week.

FOR 2500 Forest Operations I (2 credits)

Overview of the primary equipment and harvesting systems used in modern forest operations. Both regionally, nationally, and internationally relevant harvest systems will be examined. Management implications for harvest system selection, infrastructure development, and relationships with subsequent components of the forest products industry will be discussed. There are 2-3 early morning trips. Early eight-week course. Typically Offered: Fall. Cooperative: open to WSU degree-seeking students.

FOR 2510 Low Volume Forest Roads (2 credits)

Joint-listed with FOR 4510

Design and field layout of access roads for forest management, through a combination of field labs and use of modern, GIS-based forest road engineering software. Field study includes design of at least one current industry or agency forest road design project. There are 2-3 early morning trips and one Saturday field lab. Requires additional project for upper-division credit. Typically Offered: Fall.

Coreqs: FOR 2500 or Permission

FOR 2520 Steep Slope Logging Systems (2 credits)

Joint-listed with FOR 4520

Overview of the major cable logging and tethered logging systems. Physical mechanics of cable systems, including analysis of forces, tensions, and payload capacity. Field layout and analysis of cable corridors using integrated field planning and GIS-based cable system design software. There are 2-3 early morning trips and one Saturday field lab. Requires additional project for upper-division credit. Typically Offered: Spring.

Prereqs: FOR 2500

FOR 2550 Winter Harvesting (1 credit)

This is an introduction to chainsaw safety and operation, precision timber falling, and winter harvesting methods taught as an intermediate-level forestry field practicum during the final week of winter break. All day classes take place on the University of Idaho Experimental Forest. Safety instruction covers methods taught in state and federal land agencies and other popular faller safety programs.

Prereqs: Instructor Permission

FOR 2560 Logging Safety and Emergency Preparedness (2 credits)

Logging safety and emergency preparedness is an integral component of all forest operations due to the inherent risk associated with the logging, trucking, and forest products industries. Course examines the human and environmental components of risk management, worker safety and emergency response, including personal wellness, safety considerations for mechanized logging operations, natural hazard recognition and mitigation, and workplace communications. Industry specific first-aid and CPR training will also be covered. Typically Offered: Spring.

FOR 2570 Industrial Forest Management and Sawmill Tour (1 credit)

Field tour-based course examining the logging and forest products industries. Course will expose students to timber harvesting and forest product manufacturing processes and careers throughout the Inland Northwest. Introductory scaling, defecting, and merchandizing for harvested timber will also be covered through lecture and field exercises. Typically Offered: Summer.

FOR 2590 Forest Harvesting Practicum (3 credits)

General Education: Capstone Experience

Field-based practicum focused on the planning, implementation, and assessment of manual and mechanized forest operations. Operational considerations for meeting silvicultural prescriptions and maintaining sustainable forest practices will be examined. This course also offers an introduction to the operation and servicing of modern mechanized logging equipment. Classes and field exercises will occur primarily on the University of Idaho Experimental Forest. Typically Offered: Fall.

Prereqs: FOR 2560

FOR 2800 Properties of Artificial Growth Media (1 credit)

Laboratory course that examines the physical and chemical properties of artificial growth media used in forest nurseries, with a focus on understanding the characteristics, functions, and use of common types of growth media for forest and rangeland plants. Recommended preparation: SOIL 2050. Typically Offered: Spring.

FOR 2810 Nursery Irrigation and Fertilization (1 credit)

An introduction to nursery irrigation and fertilization practices commonly found in forest tree seedling and native plant nurseries. This course aims to provide some of the important theory behind the practices used every day in successful crop production. The course will be taught by faculty and staff at the UI Pitkin Forest Nursery and managed as part of the annual Position Description process. The course is developed and is presently offered online.

FOR 2850 Nursery Insects and Disease (2 credits)

Course examines the principles and practices of diagnosing and treating common insects and diseases affecting forest and rangeland plants in nurseries and greenhouses, including the application of pesticides. Typically Offered: Fall.

FOR 2880 Sustainable Nursery Design and Management (3 credits)

Course focuses on the principles of sustainable nursery management, marketing, and production operations of commercial nurseries with an emphasis on nursery and greenhouse facilities and practices necessary to produce bare root or container nursery stock. Typically Offered: Spring.

FOR 2980 Forest Technology Internship (1 credit)

Paid or unpaid employment in forest industry at an approved facility or organization structured to provide varied occupational experiences. Graded Pass/Fail. Typically Offered: Summer.

FOR 2990 (s) Directed Study (1-16 credits, max 99)

Credit arranged

FOR 3100 Terrestrial Ecosystem Ecology (3 credits)

Ecosystem ecology integrates the interactions between organisms and their environment as a complex system, quantifying the biological and physical factors controlling ecosystem processes. Emphasis is on terrestrial ecosystems, particularly carbon, water, and nutrient cycling. Process-based modeling is used to illustrate effects of complex interactions on carbon budgets. Applications include effects of disturbance (fire, pests, climate change, and land management) on ecosystem productivity, biodiversity, and resilience. Two lectures and one lab per week, including field trips. Typically Offered: Spring.

Prereqs: MATH 1143 or MATH 1160; PHYS 1000 and PHYS 1000L or PHYS 1111 and PHYS 1111L; and FOR 2100 or REM 2210 or WLF 2200 or BIOL 2130 or PLSC 1020

FOR 3400 Forest Regeneration (3 credits)

Natural and artificial regeneration of forest ecosystems; reproduction methods; selection of seed source and stock type; nursery cultural practices; tree improvement; site preparation methods to establish regeneration. One lecture and one 2-hr lab per week. Two all-day field trips. A semester-long project requires time spent weekly in a nursery to regularly monitor plant development under varied environmental conditions (approximately 45 hours over the 18-week spring semester in addition to lectures, labs and out-of-class studying).

Coreqs: FOR 2210 Cooperative: open to WSU degree-seeking students

FOR 3700 Fundamentals of Geomatics (3 credits)

Methods and techniques for obtaining quantitative and qualitative geospatial information from aerial and satellite images, maps, and the Global Positioning System for input into geographic information systems. Analysis of geospatial data for mapping, monitoring, and planning associated with all aspects of natural resource management. Two lectures and one 2-hour lab per week. Typically Offered: Fall and Spring.

Prereqs: College algebra

FOR 3980 (s) Renewable Natural Resources Internship (1-16 credits, max 99)

Credit arranged. Supervised field experience with an appropriate public or private agency. Required for cooperative education students. Graded Pass/Fail.

Prereqs: Permission of department Cooperative: open to WSU degree-seeking students.

FOR 4000 (s) Seminar (1-16 credits, max 99)

Credit arranged

FOR 4030 (s) Workshop (1-16 credits, max 99)

Credit arranged

FOR 4040 (s) Special Topics (1-16 credits, max 99)

Credit arranged

FOR 4050 (s) Professional Development (1-16 credits, max 99)

Credit arranged. Professional education and enrichment of forestry personnel. Credit earned in this course will not be accepted toward graduate degree programs but may be used for undergraduate programs.

Prereqs: Permission

FOR 4101 Forest Production Ecology (3 credits)

Joint-listed with FOR 5100

Considers how plant production, carbon, and energy accumulation are influenced by availability of light, water and nutrient resources. Includes study of use efficiency, allocation, and turnover of captured resources at organ, tree, and stand level that are applicable to increased management intensity. Examples emphasize forests but include other wildland and agricultural ecosystems. Stand-level process models are used to synthesize understanding of environmental and management factors controlling forest production. Two 1-hour lectures and one 3-hour lab per week. Requires additional research project and presentation for graduate credit. Typically Offered: Varies.

Prereqs: FOR 2100 or REM 2210; SOIL 2050, SOIL 2060

FOR 4101L Forest Production Ecology Lab (1 credit)

Joint-listed with FOR 5100L

Practical lab activities associated with forest production ecology and companion laboratory with FOR 4101. One 3-hour lab per week. Requires additional effort for graduate credit. Typically Offered: Fall. Prereqs or

Coreqs: FOR 4101

FOR 4110 Woody Plant Physiology (3 credits)

Joint-listed with FOR 5180

Examine woody plant interactions with their environment and tolerance or avoidance of stress. This course covers quantitative analysis of environmental biophysics, gas exchange, water relations, and nutrition in woody plants. Students will also learn to use all of the major methods/equipment used in woody plant physiology research. Includes two weekly 1-hour lectures and one weekly 3-hour lab. Students registered for 5000-level credit must complete a research project and presentation in addition to the requirements for the 4000-level credit.

FOR 4120 Plant Population Ecology (4 credits)

Ecological aspects of plant form and reproduction; demography and population modeling; species interactions, including competition, mutualism, and herbivory. Typically Offered: Fall.

Prereqs: FOR 2100/WLF 2200

FOR 4130 Mountain Ecology (3 credits)

Joint-listed with FOR 5130

This interdisciplinary course uses frameworks grounded in ecosystem ecology and insular biogeography theory to examine the influence of mountains on population and community ecology, including interconnected social, biological, and physical components. There will be an emphasis on morphological, physiological, and behavioral adaptations of terrestrial and aquatic organisms. Other topics may include orogeny, geomorphology, human dimensions, biogeography, diversification, adaptive pressures, speciation, climatology, and climate change. Topics presented will apply to mountain systems universally; however, much of the emphasis is placed on issues within the Western United States. Additional projects and assignments required for graduate credit. Typically Offered: Fall and Summer.

FOR 4150 Forest and Plant Pathology (2 credits)

A survey of plant diseases. Emphasis on forest trees and other woody plants. Organisms that cause diseases. Strategies to minimize negative effects. Symbiotic roles of microbes in plants. Two hours of lecture and two hours of lab per week, in addition to multiple field trips (as weather allows) to observe diseases and their effects. Typically Offered: Spring.

Prereqs: FOR 2110 and FOR 3100

FOR 4151 The Resilient Landscape (3 credits)

General Education: Capstone Experience

Cross-listed with LARC 4800

A capstone course addressing the concept of trade-offs in coupled social ecological technological systems, where landscapes and the communities they support are adaptive and evolving, but the ideal is rarely attainable. This is a reading, critical thinking, and discussion course with assessment based on class participation in a term project, problem solving, verbal and written communication, collegiality, and collaboration. Typically Offered: Spring.

Prereqs: ENGL 1102 and Junior standing

FOR 4160 Hydrologic Effects of Forest Management (1 credit)

Joint-listed with FOR 5160, WR 5160

Evaluation and discussion of how management activities affect hydrological processes, flow regimes, and water quality in forested watersheds. Seminar based on primary literature. Recommended preparation: Basic knowledge of hydrology. Additional assignments and exams required for graduate credit. Graded Pass/Fail. Typically Offered: Spring (Even Years).

FOR 4300 Business of Forestry (2 credits)

Joint-listed with FOR 2300

Technical assessment of forestry from a business perspective at the stand and landscape levels, including an examination of factors that affect public and private landowner decision making regarding management of timberland. Course integrates concepts from silviculture, forest management, and natural resource policy into decision making framework. Requires additional project for upper-division credit.

FOR 4310 Forest Policy and Administration (2 credits)

Cross-listed with NRS 4840

Evaluation of land and forest problems and policies in the U. S. ; analysis of current conditions and policies; historical development of governmental and private agencies concerned with the administration of forest conservation program. Recommended Preparation: FOR 2350.

Prereqs: Junior standing.

FOR 4400 Silviculture Principles and Practices (4 credits)

General Education: Capstone Experience

Theory underlying silvicultural practices to control forest composition and growth, including forest stand dynamics, tree growth and quality, and growth-density relationships. Study of intermediate stand treatments and reproduction methods. Final project required involving field data collection and forest modeling to develop and mark silvicultural prescriptions. 3 hours of lecture and 2 hours of lab per week.

Prereqs: Senior standing and FOR 2210, FOR 2110, or other plant identification course, FOR 3400, FOR 3100, or Instructor Permission

FOR 4500 Forest Operations II (2 credits)

Overview of the field design, layout, and administration of timber harvesting operations, production and cost estimation, laws, best management practices, and hazard management. A brief introduction to quantitative forest planning methods is also provided. There are 2-3 early morning trips and one Saturday field lab. Late 8-week course. Typically Offered: Fall.

Prereqs: FOR 2500 Cooperative: open to WSU degree-seeking students.

FOR 4510 Low Volume Forest Roads (2 credits)

Joint-listed with FOR 2510

Design and field layout of access roads for forest management, through a combination of field labs and use of modern, GIS-based forest road engineering software. Field study includes design of at least one current industry or agency forest road design project. There are 2-3 early morning trips and one Saturday field lab. Requires additional project for upper-division credit. Typically Offered: Fall.

Coreqs: FOR 2500 or Permission

FOR 4520 Steep Slope Logging Systems (2 credits)

Joint-listed with FOR 2520

Overview of the major cable logging and tethered logging systems. Physical mechanics of cable systems, including analysis of forces, tensions, and payload capacity. Field layout and analysis of cable corridors using integrated field planning and GIS-based cable system design software. There are 2-3 early morning trips and one Saturday field lab. Requires additional project for upper-division credit. Typically Offered: Spring.

FOR 4600 Watershed Science and Management (3 credits)

Influence of land management practices on hydrologic processes, water quality, and riparian habitat w/emphasis on wildland watersheds. One day field trip. Typically Offered: Varies.

Prereqs: MATH 1143; and PHYS 1000/PHYS 1000L or PHYS 1111/PHYS 1111L, or high school equivalent.

FOR 4610 Ecophysiology Lab (3 credits)

A lab-based course studying functional responses and adaptations of individual species to their environment, emphasizing the physiological mechanisms that influence the interactions between organisms and the major environmental factors (e. g. , solar radiation, energy balance, temperature, water and nutrients, climate), and how this affects the interactions among species and their growth and survival (e. g. , competition, herbivory, and allelopathy). Typically Offered: Spring.

Prereqs: FOR 2100/WLF 2200

FOR 4720 Remote Sensing of the Environment (4 credits)

Cross-listed with NRS 4720

Current airborne and satellite systems, data acquisition on ground and from remote locations, instrumentation, imagery interpretation and digital analysis, applications for natural resource science and management. Two 75-minute lectures and one two-hour lab per week. Recommended Preparation: MATH 1143. Typically Offered: Fall. Cooperative: open to WSU degree-seeking students.

FOR 4730 ECB Senior Presentation (1 credit)

General Education: Capstone Experience

Cross-listed with FISH 4730, FSP 4730

, NRS 4730, REM 4730, WLF 4730. Reporting and presenting the senior project (thesis or internship); taken after or concurrently with REM 4970. Serves as the senior capstone course for Ecology and Conservation Biology (ECB).

Prereqs: Instructor Permission

FOR 4830 Senior Project Presentation (1 credit)

Cross-listed with NRS 4830

Reporting and presenting the senior project (thesis or internship); taken after or concurrently with FOR 4970.

FOR 4970 (s) Senior Thesis (1-4 credits, max 4)

Independently plan and conduct a thesis project; write and defend the thesis under supervision of an advisor.

Prereqs: Senior standing and minimum 3. 20 GPA or Permission

FOR 4980 (s) Renewable Natural Resources Internship (1-16 credits, max 99)

Credit arranged. Supervised field experience with an appropriate public or private agency. Required for cooperative education students.

Prereqs: Permission of department Cooperative: open to WSU degree-seeking students.

FOR 4990 (s) Directed Study (1-16 credits, max 99)

Credit arranged. For the individual student; conferences, library, field, or lab work.

Prereqs: Senior standing, GPA 2. 5, and Permission

FOR 5000 Master's Research and Thesis (1-16 credits, max 99)

Credit arranged

FOR 5010 (s) Seminar (1-16 credits, max 99)

Presentations and discussion of current research in the academic disciplines embraced by the Department of Forest, Rangeland and Fire Sciences. Typically Offered: Fall and Spring.

Prereqs: Permission

FOR 5020 (s) Directed Study (1-16 credits, max 99)

Credit arranged

FOR 5030 (s) Workshop (1-16 credits, max 99)

Credit arranged. Selected topics in the conservation and management of natural resources.

Prereqs: Permission

FOR 5040 (s) Special Topics (1-16 credits, max 99)

Credit arranged

FOR 5050 (s) Professional Development (1-16 credits, max 99)

Credit arranged

FOR 5100 Forest Production Ecology (3 credits)

Joint-listed with FOR 4101

Considers how plant production, carbon, and energy accumulation are influenced by availability of light, water and nutrient resources. Includes study of use efficiency, allocation, and turnover of captured resources at organ, tree, and stand level that are applicable to increased management intensity. Examples emphasize forests but include other wildland and agricultural ecosystems. Stand-level process models are used to synthesize understanding of environmental and management factors controlling forest production. Two 1-hour lectures and one 3-hour lab per week. Requires additional research project and presentation for graduate credit. Typically Offered: Varies.

FOR 5100L Forest Production Ecology Lab (1 credit)

Joint-listed with FOR 4101L

Practical lab activities associated with forest production ecology and companion laboratory with FOR 4101. One 3-hour lab per week. Requires additional effort for graduate credit. Typically Offered: Fall. Prereqs or

Coreqs: FOR 4101

FOR 5130 Mountain Ecology (3 credits)

Joint-listed with FOR 4130

This interdisciplinary course uses frameworks grounded in ecosystem ecology and insular biogeography theory to examine the influence of mountains on population and community ecology, including interconnected social, biological, and physical components. There will be an emphasis on morphological, physiological, and behavioral adaptations of terrestrial and aquatic organisms. Other topics may include orogeny, geomorphology, human dimensions, biogeography, diversification, adaptive pressures, speciation, climatology, and climate change. Topics presented will apply to mountain systems universally; however, much of the emphasis is placed on issues within the Western United States. Additional projects and assignments required for graduate credit. Typically Offered: Fall and Summer.

FOR 5150 Belowground Processes (3 credits)

Belowground Processes considers current advancements in understanding of root growth and development, water and nutrient acquisition, rhizosphere functions, soil microbial community composition and functions, organic matter decomposition, and symbiotic associations between plants and microbes. Examples focus mainly on forest and wildland terrestrial ecosystems. Students learn various techniques for studying belowground processes and apply them in self-directed, hypothesis-driven projects. Offered every other year during fall semester. **Prereqs:** Graduate standing or instructor permission

FOR 5160 Hydrologic Effects of Forest Management (1 credit)

Cross-listed with WR 5160

Joint-listed with FOR 4160

Evaluation and discussion of how management activities affect hydrological processes, flow regimes, and water quality in forested watersheds. Seminar based on primary literature. Recommended preparation: Basic knowledge of hydrology. Additional assignments and exams required for graduate credit. Graded Pass/Fail. Typically Offered: Spring (Even Years).

FOR 5180 Woody Plant Physiology (3 credits)

Joint-listed with FOR 4110

Examine woody plant interactions with their environment and tolerance or avoidance of stress. This course covers quantitative analysis of environmental biophysics, gas exchange, water relations, and nutrition in woody plants. Students will also learn to use all of the major methods/equipment used in woody plant physiology research. Includes two weekly 1-hour lectures and one weekly 3-hour lab. Students registered for 5000-level credit must complete a research project and presentation in addition to the requirements for the 4000-level credit.

FOR 5200 Forest Biometrics (3 credits)

This course provides a broad overview of forest biometrics, including forestry-specific sampling approaches, development of allometric relations, and use of remote sensing datasets.

Prereqs: STAT 4310 or equivalent

FOR 5300 Natural Resource Policy Development (3 credits)

This course is an online course only. The development of natural resource policy with emphasis on the policy process at the federal level in the U. S. ; the role of and interrelationships between staff, committees, agencies and elected officials; the relationship of science and scientists with policy and politicians in the development of natural resource policy, including preparation of testimony related to natural resource science and policy issues; implementation of policy within the natural resource agencies and judicial interpretation of major natural resource policies in the U. S. Recommended Preparation: An upper-division course in natural resource and/or environmental policy Typically Offered: Spring.

FOR 5600 Physical Hydrology (3 credits)

A quantitative treatment of the physical processes that control water fluxes in the environment. Specific emphasis on evaporation, transpiration, snow processes, and soil water flow. Typically Offered: Fall and Varies.

FOR 5900 Science Synthesis and Communication (3 credits)

This course is an online course only. Critically review science literature and write both brief and in-depth syntheses to address applied questions in science and management. Learn best practices for summarizing and communicating science effectively. Discuss challenges for application of science in management. Examples will focus on wildland fire science and management.

FOR 5970 (s) Practicum (1-16 credits, max 99)

Credit arranged

FOR 5980 (s) Internship (1-16 credits, max 99)

Credit arranged

FOR 5990 (s) Non-thesis Master's Research (1-16 credits, max 99)

Credit arranged. Research not directly related to a thesis or dissertation.

Prereqs: Permission

FOR 6000 Doctoral Research and Dissertation (1-45 credits, max 99)

Credit arranged

Prereqs: Admission to the doctoral program in Natural Resources and Department, Permission

FOR 6010 (s) Seminar (1-16 credits, max 99)

Credit arranged

FOR 6980 Internship (1-16 credits, max 99)