

# Forestry Course Descriptions – Washington State University

Please go to <http://www.natural-resources.wsu.edu/Teaching/course-descriptions1.htm> for more information.

## Natural Resources (NATRS) Courses

### **100 Introduction to Natural Resource Management I 1 cr.**

Nature and significance of natural resources; types of renewable natural resource systems; goals and principles of natural resource management.

### **101 Introduction to Natural Resource Management II 1 cr.**

Professionals fields of natural resource management. Field trip required.

### **204 Introduction to Measurements and Computers in Natural Resources 2 cr. (1-3)**

Prereq Math 107, sophomore standing. Introduction to basic concepts, field techniques and the use of spread sheets in natural resources. Field trips required.

### **275 Leisure in Society 3 cr. Same as RLS 275.**

### **280 Introductory Wildlife Management 3 cr. (2-3)**

Prereq Bio S 104 or Bot 120. An introductory course in the principles of wildlife management. Field trip required.

### **300 Natural Resource Ecology 4 cr. (3-3)**

Prereq Bio S 103; Bio S 104 or Bot 120. Ecology as applied to management of natural resource ecosystems; biological diversity, conservation biology, global climate change in natural resource ecology. Field trips required.

### **301 Forest and Range Plant Resources I 3 (2-3)**

Prereq Bio S 104 or Bot 120. Identification and ecology of important forest and range plants with emphasis on woody plant; attributes significant to vegetation management. Field trips required.

### **302 [M] Forest and Range Plant Resources II 3 (2-3)**

Prereq NATRS 301. Identification and ecology of important forest and range plants with emphasis on herbaceous plants; attributes significance to vegetation management. Field trips required.

### **303 [B] Conservation of Renewable Resources 3 (2-3)**

Prereq completion of Tier I science requirement. A series of case studies of international natural resource conservation issues that emphasizes ecological concepts and human decision making.

### **304 Forest and Range Biology 3**

Prereq Bio S 372 or NATRS 300; NATRS 302 or c//. Structure and functions of forest and range plants; influence of biotic and environmental factors on plant and stand growth.

### **305 Silviculture 3**

Prereq NATRS 204, 300, 302. Stand dynamics, natural regeneration methods, intermediate stand treatment, relationships of natural resource management to silvicultural practice.

### **311 Natural Resource Economics 3 Same as Ag Ec 311.**

### **312 Natural Resources and Society 3;**

Prereq NATRS 100; junior standing. Social Views of natural resources, processes by which these views are developed and expressed, social conflict over natural resources.

### **313 Forest Measurements 2 (1-3)**

Prereq NATRS 204. Theory and application of forest measurements. Field trips required. Cooperative course taught jointly by WSU and U I (For 374).

### **320 Timber Harvesting 3**

Prereq NATRS 204. Current practices and problems; planning and coordinating timber harvesting with forest management. Field trips required. Cooperative course taught by UI (ForPr 430), open to WSU students.

**321 Introduction to Wood Technology 3**

Prereq Bio S 103. Anatomy of woody plants, identifying characteristics and properties of woods; relation of wood properties to processing and use. Field trips required. Cooperative course taught by UI (ForPr 277), open to WSU students.

**331 Forest Pathology 2 (0-6) Same as P1 P 331.****348 Forest Entomology 2 (1-3)**

Principles and concepts of forest entomology; integration and application of basic knowledge; processes in dealing with forest insect problems.

**349 Forest Pest Management 1**

Principles and practice of forest pest management. Web-based course.  
Prereq: NATRS/Entom 348 or Entom 343. [Same as Entom 349.]

**351 Principles of Range Management 3**

Prereq NATRS 301. Basic concepts in range management; range history; physiology of range productivity and utilization; grazing management; range improvements. Field trip required.

**353 Range Plant Identification Laboratory 1 (0-3)**

May be repeated for credit; cumulative maximum 6 hours. Identification, forage value, and habitats of North American range plants. S,F grading.

**357 Range Measurements 2 (1-3)**

Prereq NATRS 204. Theory and application of rangeland ecosystem measurements. Field trip required.

**371 Wildland Recreation 3**

Prereq junior standing. Historic development; benefits; federal, state, and local involvement; current problems and trends in the field of wildland recreation.

**372 Wildland Recreation Field Laboratory 1 (0-3)**

Prereq NATRS 371 or c//. Field observation of recreation practices. Field trips required.

**373 Environmental Interpretive Methods 3**

Prereq NATRS 371. Introduction to environmental interpretation; communication psychology and media applied to noncaptive audiences in leisure and natural resource settings. Cooperative course taught by UI (RRT 387), open to WSU students.

**374 Remote Sensing and Airphoto Interpretation 3 (2-3) Same as Soils 374.****403 Natural Resource Planning 3 (2-3)**

Prereq Bot 372, NATRS 204, 300, 301, or by interview only, junior standing. Rec NATRS 438. Natural resource management planning processes to include public and private lands; inventory, public involvement, implementation, monitoring, assessing resource values. Credit not granted for both NATS 403 and 503. Field trip required.

**407 Forest Populations 1**

Prereq enrollment in CEFES Program. Concepts of genetics, population dynamics and pest management applied to forest management.

**410 Forest Finance and Valuation 3**

Prereq Ag EC 201 or Econ 101; Math 107; NATRS 204. Economic and finance principles applied to forest management and appraisals. Credit not granted for both NATRS 410 and 510.

**413 Forest Nursery Management 2**

Forest nursery design; seed processing and quality; nursery equipment and cultural practices; seeding quality. Field trips required. Credit not granted for both NATRS 413 and 513. Cooperative course taught by UI (For 413/513), open to WSU students.

**414 [M] Ecosystem Surveys and Inventories 3 (2-3)**

Prereq Dec S 215, Stat 212, or 412; NATRS 313 or 357.

The application of sampling theory in natural resource inventories and surveys.

**416 Principals of Fisheries Management 4 (3-3)**

Application of principles toward managing recreational and commercial aquatic resources. Field trips required. Cooperative course taught jointly by WSU and UI (Fish 418).

**417 Special Topics V 1-3**

May be repeated for credit; cumulative maximum 6 hours.

**418 Forest Growth and Yield 2**

Prereq Dec S 215, Stat 212, or 412.

Factors influencing forest yields, traditional prediction methods; development and application of growth and yield simulators. Credit not granted for both NATRS 418 and 518.

**419 Topics in Natural Resource Sciences V 1-3**

May be repeated for credit; cumulative maximum 9 hours. Topical issues in natural resource sciences.

**420 Wood, Wood Products and Marketing 2**

Wood science and its role in the manufacture and marketing of forest products. Field trip required. Credit not granted for both NATRS 420 and 520.

**421 Fish Diseases 3 (2-3)**

Epidemiology, diagnostics, prevention, and treatment of infectious and noninfectious diseases of free living and confined finfish. Cooperative course taught jointly by WSU and UI (Fish 420).

**422 Tropical Dendrology and Ecology 3 (2-3)**

Distribution, physiognomy and climate of world tropical and subtropical vegetation types. Credit not granted for both NATRS 422 and 522. Cooperative course taught by UI (For420), open to WSU students.

**426 Population Analysis 1**

Analysis, diagnosis, interpretation, and forecasting of population change. Credit not granted for both NATRS 426 and 526.

**429 Population Theory 1**

Prereq general ecology. Development of the theory of population dynamics from Malthus to the present. Credit not granted for both NATRS 429 and 529.

**430 Introduction of Wildland Fire 3**

Prereq NATRS 300. Physical nature and behavior of wildland fire; the fire environment; fire ecology; practice of wildland fire management. Field trip required.

**431 Wildlife Nutrition 3 (2-3)**

Nutritional requirements and interactions of wildlife populations. Credit not granted for both NATRS 431 and 531.

**432 Low-volume Forest Roads 3**

Prereq NATRS 320. Road classification; design of forest roads; construction techniques; costing, environmental consideration, design project. Three days of field trips. Cooperative course taught by UI (ForPr 432), open to WSU students.

**433 Forest Tractor System Analysis 3**

Prereq NATRS 320. Planning, layout, and cost analysis of forest tractor systems, production estimating, machine capabilities, and options; layout project. Three days of field trips. Cooperative course taught by UI (ForPr 433), open to WSU students.

**434 Cable Systems Analysis 3**

Prereq NATRS 320. Layout, planning, and design for cable logging systems; analysis of forces involved in cable logging; crew and terrain requirements; layout and design project; cost and equipment analysis. Three one-day field trips. Cooperative course taught by UI (ForPr 434), open to WSU students.

**435 Wildlife Ecology 4 (3-3)**

Prereq Bio S 372 or NATRS 300. The ecology of wildlife species and the contributing biological processes. Overnight field trip required. Credit not granted for both NATRS 435 and 535.

**436 [M] Advanced Wildlife Management 4 (3-3)**

Prereq NATRS 435, Management criteria for wild vertebrate populations. Field trips required. Credit not granted for both NATRS 436 and 536.

**437 Wildland Fire Management Laboratory 1 (0-3)**

Prereq NATRS 430, Wildland fuel combustion; fire behavior; fuel evaluation; fire effects; application to fire management. Field trips required. Credit not granted for both 437 and 537.

**438 [M] Natural Resource Policy and Administration 3 (2-2)**

Prereq Engl 402, NATRS 312, junior standing. Development, content, and implementation of federal public land and natural resource policies emphasizing forest, range, wildlife, and wildland recreation. Credit not granted for both NATRS 438 and 538.

**439 Production and Cost Control in Forest Industry 3**

Prereq NATRS 420. Introduction to production planning and cost control for timber harvesting and forest products processing operation; development and application of machine rates and system production rates; break even analysis; machine replacement; cash flow in investment decision; use of microcomputers in analysis. Cooperative course taught by UI (ForP 431) open to WSU students.

**440 Integrated Forest Management Models 3 (2-3)**

Prereq NATRS 313; 410 or 510. Mathematical programming techniques for decisions in forest planning; coordinate site projects, area analysis, strategic forest plans, and regional forest resource policies. Credit not granted for both NATRS 440 and 540. Cooperative course taught by UI (For 477), open to WSU students.

**441 Population Ecology and Conservation 4 (3-3)**

Prereq Bio S 104 & NATRS 300 or Bio S 372, NATRS 280 & 435 or permission. Ecology, conservation, management of vertebrate populations, especially threatened and endangered species. Designed for wildlife and conservation biology majors.

**445 Nongame Management 2 Same as Zool 445.****450 [M] Conservation Biology 3**

Prereq by interview only. Patterns of biological diversity, factors producing changes in diversity, values of diversity, management principles applied to small populations, protected areas, landscape linkages, biotic integrity, restoration, legal issues and funding sources. Credit not granted for both NATRS 450 and 550. Cooperative course taught jointly by WSU and UI (WLF 440).

**452 Range Development and Improvements 3 (2-3)**

Prereq NATRS 351. Developing and improving rangeland forage resources; ecological considerations; plant control, seeding, fertilization, fire, facilitating animal use. Field trips required. Credit not granted for both NATRS 452 and 552.

**453 Range Livestock Management 3**

Rec NATRS 351. Range livestock management, nutrition and behavior; plant responses to grazing; grazing systems; stocking variables. Field trip required. Credit not granted for both NATRS 453 and 553.

**459 Rangeland Ecology 3**

Prereq NATRS 302. Application of ecological principles in rangeland management; stressing response and behavior of range ecosystems to various kinds and intensities of disturbance and management practice. Field trips required. Cooperative course taught by UI (Range 459), open to WSU students.

**460 Watershed Management 3**

Prereq NATRS 204, completion of department requirement in Bio S, Chem, and Ph S, Math and Stat; or by interview only. Principles and practices of management of forest and rangelands for protection, maintenance, and improvement of water resource values. Field trip required. Credit not granted for both NATRS 460 and 560.

**461 Management of Freshwater Ecosystems 3 (2-3)**

Prereq Bio S 102 or Bot 120; Chem 101. Introduction to the science and management of aquatic ecosystems, emphasizing lakes.

**471 Wildland Recreation Management 3 (2-3)**

Prereq NATRS 371. Planning and management techniques applied to wildland recreation problems and situations. Field trips required. Credit not granted for both NATRS 471 and 571.

**472 [M] Dispersed Recreation Management 3 (2-3)**

Prereq NATRS 371. Inventory systems, monitoring and assessing resources and social impacts associated with dispersed recreational impacts associated with dispersed recreational use of wildlands. Field trips required. Credit not granted for both NATRS 472 and 572.

**473 Interpretive Methods Lab 3**

Prereq NATRS 373. Development and application of interpretive materials and techniques; concentration on equipment and methods commonly used by natural resource agencies for communicating management programs and interpreting natural environments to visitors. Field trip required. Cooperative course taught by UI (RRT488), open to WSU students.

**474 [M] Managing Public Use of Wildland Recreation Settings 3**

Prereq NATRS 371. Techniques for managing public use in dispersed recreation settings. Field trips required. Credit not granted for both NATRS 474 and 574.

**475 Management of Recreation Sites and Leisure Settings 2**

Introduction to theory, processes, and techniques for managing natural resource based recreation and tourism sites; emphasis on site impacts and their management, visitor/customer management, liability and risk management, and the proper care of landscape trees and other amenity resources. Field trips required. Cooperative course taught by UI (RRT 484), open to WSU students.

**476 Field Environmental Education 3**

Concept and techniques of environmental education with emphasis on application at camps, parks, and similar recreation and tourism informal settings. Field trips required. Cooperative course taught by UI (RRT 487), open to WSU students.

**477 Public Involvement in Natural Resource Management 3**

Theoretical and applied concepts of public involvement in both public and private sectors of natural resource management; historical and legal mandates, government agency responsibilities, applied methods and techniques, case studies, and practical experience. Field trips required. Cooperative taught by UI (RRT 486), open to WSU students.

**479 Natural Resource Management Internship V 2-12**

An elective opportunity for select students to supplement their academic training with practical field experience.

**480 Big Game Range Management 3 Prereq NATRS 301.**

Big game habitat management on rangelands and forested ranges; big game habitat rehabilitation. Field trip required. Credit not granted for both NATRS 480 and 580.

**485 Aquatic Ecosystem Assessment Methods for Environmental and Natural Resource Sciences 3 (1-6)**

Prereq NATRS 460, Zool 310, 411. Integrating structural and geomorphic analyses, biologic indicators, water quality, and community-level indices into assessments of ecosystem health and biotic integrity.

**487 [M] Senior Thesis in Wildland Recreation Management V 1-4**

Prereq senior in wildland recreation.

**488 [M] Senior Thesis in Natural Resources V 3-6**

May be repeated for credit; cumulative maximum 6 hours. Prereq senior in NATRS.

**490 Wildlife Science Internship V 2-6**

May be repeated for credit; cumulative maximum 12 hours. A cooperative internship with wildlife agencies. S, F grading.

**491 Integrated Field Studies 2 (1-3)**

Prereq NATRS 204, 302, 374, junior standing. Two week field course at the end of the semester to emphasize interdisciplinary studies of natural resource management.

**499 Special Problems V 1-4 May be repeated for credit. S, F grading.****503 Natural Resource Planning 3 (2-3)**

Graduate level counterpart of NATRS 403; additional requirements. Credit not granted for both NATRS 403 and 503.

**504 Agroforestry Systems 2**

Prereq NATRS 304, Agroforestry systems used in the world including their current use in developing countries. Cooperative course taught by UI (Range 558), open to WSU students.

**510 Forest Finance and Valuation 3**

Graduate level counterpart of NATRS 410; additional requirements. Credit not granted for both NATRS 410 and 510.

**511 Integrated Forest Resource Economics 2**

Microeconomic theory of forest resource production and supply; valuing non-commodity and intangible forest resources; optimizing jointly produced resources; hierarchical decision analysis, case studies and policy evaluation. Cooperative course taught by UI (For 581), open to WSU students.

**513 Forest Nursery Management 2**

Graduate level counterpart of NATRS 413; additional requirements. Credit not granted for both NATRS 413 and 513. Cooperative course taught by UI (For 513), open to WSU students.

**517 Advanced Forest Mensuration 1**

Prereq enrollment in CEFES program. Evaluation of forest growth and yield in forest ecosystem management.

**518 Forest Growth and Yield 2**

Graduate-level counterpart of NATRS 418; additional requirements. Credit not granted for both NATRS 418 and 518.

**519 Advanced Topics V 1-3**

May be repeated for credit; cumulative maximum 6 hours.

**520 Wood, Wood Products and Marketing 2**

Graduate-level counterpart of NATRS 420; additional requirements. Credit not granted for both NATRS 420 and 520.

**521 Human Dimensions of Wildlife Management 2**

Prereq NATRS 435. An exploration of the elements involved in the management of wildlife for non-consumptive activities, the impacts of such activities on wildlife, the role of national parks and protected areas in providing wildlife viewing opportunities, and public attitudes toward wildlife species. Cooperative course taught by UI (WLF 520), open to WSU students.

**522 Tropical Dendrology and Ecology 3 (2-3)**

Graduate-level counterpart of NATRS 422; additional requirements. Credit not granted for both NATRS 422 and 522. Cooperative course taught by UI (For 520), open to WSU students.

**524 Plant Autecology 3**

Prereq course in ecology or plant physiology. Adaptations of individual species in rangeland and forest communities; emphasizing morphological and physiological mechanisms that influence plant establishment, below - and above - ground productivity, plant competition, grazing sensitivity. Field trips required. Cooperative course taught by UI (Range 560), open to WSU students.

**525 Experimental Plant Ecology 3 (1-6)**

Experimental techniques in plant ecology with orientation toward environmental and physiological measurement in field and laboratory research. Cooperative course taught by WSU, open to UI students (Bot 525).

**526 Population Analysis 1**

Graduate-level counterpart of NATRS 426; additional requirements. Credit not granted for both NATRS 426 and 526.

**527 Forest Gene Resource Management 3**

Graduate-level course. Alternate even years. Genetic principles applied to forest ecosystems management; origin and function of genetic diversity; implications of silvicultural practices on gene pools. Cooperative course taught by UI, open to WSU students.

**529 Population Theory 1**

Graduate-level counterpart of NATRS 429; additional requirements. Credit not granted for both NATRS 429 and 529.

**531 Wildlife Nutrition 3 (2-3)**

Graduate-level counterpart of NATRS 431; additional requirements. Credit not granted for both NATRS 431 and 531.

**535 Wildlife Ecology 4 (3-3)**

Graduate-level counterpart of NATRS 435; additional requirements. Credit not granted for both NATRS 435 and 535.

**536 Advanced Wildlife Management 4 (3-3)**

Graduate-level counterpart of NATRS 436; additional requirements. Credit not granted for both NATRS 436 and 536.

**537 Wildland Fire Management Laboratory 1 (0-3)**

Graduate-level counterpart of NATRS 437; additional requirements. Credit not granted for both NATRS 437 and 537.

**538 Natural Resource Policy and Administration 3 (2-2)**

Graduate-level counterpart of NATRS 438; additional requirements. Credit not granted for both NATRS 438 and 538.

**540 Integrated Forest Management Models 3 (2-3)**

Graduate-level counterpart of NATRS 440; additional requirements. Credit not granted for both NATRS 440 and 540.

**541 Population Ecology and Conservation 4 (3-3)**

Graduate-level counterpart of NATRS 441; additional requirements. Credit not granted for both NATRS 441 and 541.

**545 Advanced Ecosystem and Landscape Management 2**

Prereq enrollment in NRI or by interview only. Ecosystems and landscape management principles, assessments, monitoring, design, and practice, incorporating biological and socioeconomic perspectives.

**546 Upland Game Ecology 2**

Prereq NATRS 435. Ecology and management of wildlife species using forest and rangeland habitats; current management problems and procedures. Cooperative course taught by UI (Wlf 546), open to WSU students.

**547 Predator Ecology and Management 3**

Ecology of predators and predator-prey systems with emphasis on mammalian species, discussion of predation theory and contributions of field studies to understanding the role of predation in natural and altered communities; human-predator conflicts and resolution. One three-day field trip required. Cooperative course taught by UI (Wlf 547), open to WSU students.

**550 Conservation Biology 3**

Graduate-level counterpart of NATRS 450; additional requirements. Credit not granted for both NATRS 450 and 550.

**551 Range Ecology Concepts 3**

Prereq two ecology courses. Ecological concepts of dynamics and distribution of plant communities; secondary succession processes, soil-vegetation classification schemes. Cooperative course taught by UI (Range 551), open to WSU students.

**552 Range Development and Improvements 3 (2-3)**

Graduate-level counterpart of NATRS 452; additional requirements. Credit not granted for both NATRS 452 and 552.

**553 Range Livestock Management 3**

Graduate-level counterpart of NATRS 453; additional requirements. Credit not granted for both NATRS 453 and 553.

**554 Restoration Ecology 2**

Prereq NATRS 302. Restoration of disturbed or damaged ecosystems; fundamental principles from stress physiology and community ecology; review of case studies. Cooperative course taught by UI (Range 552), open to WSU students.

**555 International Resource Management Seminar 3**

May be repeated for credit; cumulative maximum 9 hours. An issues-centered analysis of natural resource management in global context. Cooperative course taught by WSU, open to UI students (Range 554).

**559 Advanced Topics in Range Management V 1-3**

May be repeated for credit; cumulative maximum 6 hours. Prereq NATRS 452. Review of current literature and its application in range management.

**560 Watershed Management 3**

Graduate-level counterpart of NATRS 460; additional requirements. Credit not granted for both NATRS 460 and 560.

**571 Wildland Recreation Management 3 (2-3)**

Graduate-level counterpart of NATRS 471; additional requirements. Credit not granted for both NATRS 471 and 571.

**572 Dispersed Recreation Management 3 (2-3)**

Graduate-level counterpart of NATRS 472; additional requirements. Credit not granted for both NATRS 472 and 572.

**574 Managing Public Use of Wildland Recreation Settings 3**

Graduate-level counterpart of NATRS 474; additional requirements. Credit not granted for both NATRS 474 and 574.

**575 Advanced Remote Sensing 3 (1-4) Same as Soils 574.****580 Big Game Management 3**

Graduate-level counterpart of NATRS 480; additional requirements. Credit not granted for both NATRS 480 and 580.

**588 Advanced Topics in Wildlife V 1-3**

May be repeated for credit; cumulative maximum 10 hours. Biology and management of wildlife species. Cooperative course taught jointly by WSU and UI (WLF, For, FWR, Rnge, and RRTT 503).

**593 Special Topics Seminar 1**

May be repeated for credit, Prereq 20 hours NATRS. Literature and problems.

**594 Environmental and Natural Resources Issues and Ethics 3**

Prereq senior standing. May be repeated for credit; cumulative maximum 7 hours. Ethical systems applied to natural resources, issues of professionalism and ethics in natural resource management.

**595 Seminar in Natural Resource Sciences 1**

May be repeated for credit. Literature review; preparation and presentation of reports in natural resource sciences.

**600 Special Projects or Independent Study Variable credit. S.F. grading.****700 Master's Research Thesis, and/or Examination Variable credit. S.F. grading.****702 Master's Special Problems, Directed Study and/or Examination Variable credit. S.F. grading.****800 Doctoral Research, Dissertation, and/or Examination Variable credit. S.F. grading.**