

# FOREST ECOSYSTEMS AND SOCIETY (FES)

---

## FES 115. ECOLOGY OF OREGON COAST FOREST. (1 Credit)

A combination of lecture, lab, and field exercises to explore the ecology and development of Oregon coastal forests. Lec/lab. Graded P/N.

**Equivalent to:** FS 115

## FES 199. SPECIAL TOPICS. (1-16 Credits)

**Equivalent to:** FS 199

*This course is repeatable for 16 credits.*

## FES 202. SOFTWARE TOOLS IN QUANTITATIVE SOCIAL SCIENCE RESEARCH. (3 Credits)

Develop and apply software skills to analyze quantitative social science data, then interpret and present results. Using software, students will conduct statistical analysis of primary and/or secondary data (for example, their own survey data or data from sources such as the US Census American Community Survey).

**Prerequisites:** ST 201 with C or better

## FES 240. \*FOREST BIOLOGY. (4 Credits)

Structure, function, development and biology of forest vegetation and their relationships to forestry and natural resource applications. Field trips required. Lec/lab/rec. (Bacc Core Course)

**Attributes:** CPBS – Core, Pers, Biological Science

**Equivalent to:** FES 240H, FOR 240

## FES 240H. \*FOREST BIOLOGY. (4 Credits)

Structure, function, development and biology of forest vegetation and their relationships to forestry and natural resource applications. Field trips required. Lec/lab/rec. (Bacc Core Course)

**Attributes:** CPBS – Core, Pers, Biological Science; HNRS – Honors Course Designator

**Equivalent to:** FES 240

## FES 241. DENDROLOGY. (3 Credits)

Learn to identify the principal forest trees of North America, and the principal trees and shrubs of the Pacific Northwest. Also learn about forested regions of the world. Lec/lab/rec.

**Equivalent to:** FES 141

## FES 242. FOREST PLANTS OF THE PACIFIC NORTHWEST. (3 Credits)

Field course on the identification and ecology of forest trees, shrubs, and herbs of the Pacific Northwest. Overnight camping required. Students should be prepared to hike 3-5 miles per day.

## FES 341. FOREST ECOLOGY. (3 Credits)

Basic physiological characteristics of trees, succession, climax, and related concepts. Vegetation classification. Stand structure, diversity, competition, growth, soils-forests interactions, biomass and nutrient distribution, energy relations, nutrient element dynamics, ecology of disturbances.

**Equivalent to:** FOR 341

## FES 342. FOREST TYPES OF THE NORTHWEST. (3 Credits)

Forest trees in nature are aggregated into stable or transitory associations known as forest cover types. Knowledge of forest cover types, their species composition and ecology, is applicable to the fields of forestry, fire management, wildlife management, and forest ecology.

**Equivalent to:** FOR 342

## FES 343. FORESTS OF THE EASTERN UNITED STATES. (3 Credits)

Major Southeast US forest types will be visited and morphological, geographic, ecological and economic characteristics of important forest tree species examined.

**Prerequisites:** FES 141 with C or better or FES 241 with C or better  
*This course is repeatable for 3 credits.*

## FES 350. URBAN FORESTRY. (3 Credits)

Introduction to principles and practices of planting and managing trees as a system of urban environment; understanding the economic, environmental, social aspects of urban forests, and an overview of contemporary land use issues and societal perspectives between people and plants. CROSSLISTED as HORT 350.

**Equivalent to:** FOR 350

**Recommended:** Foundational forestry and horticulture courses

## FES 355. MANAGEMENT FOR MULTIPLE RESOURCE VALUES. (3 Credits)

Management of a variety of resource attributes in multiple use context, including considerations for recreation, fish, wildlife, aesthetics, watersheds, and forest products.

**Equivalent to:** FOR 355

## FES 365. \*ISSUES IN NATURAL RESOURCES CONSERVATION. (3 Credits)

Background of major current issues in natural resources conservation with emphasis on forests, soils, and water and potential sustainable carrying capacity. Focus on evaluating facts and opinions related to issues. Basics of terrestrial and aquatic ecology, recent and current issues of soil, water, and forest use and management. (Bacc Core Course)

**Attributes:** CSGI – Core, Synth, Global Issues

**Equivalent to:** FOR 365

## FES 399. SPECIAL TOPICS. (0-16 Credits)

*This course is repeatable for 16 credits.*

## FES 401. RESEARCH AND SCHOLARSHIP. (1-16 Credits)

**Equivalent to:** FS 401

*This course is repeatable for 16 credits.*

## FES 403. THESIS. (1-16 Credits)

**Equivalent to:** FS 403

*This course is repeatable for 16 credits.*

## FES 405. READING AND CONFERENCE. (1-16 Credits)

**Equivalent to:** FS 405

*This course is repeatable for 16 credits.*

## FES 406. PROJECTS. (1-16 Credits)

*This course is repeatable for 16 credits.*

## FES 407. SEMINAR. (1-16 Credits)

Some sections graded A-F. This course is repeatable for a maximum of 16 credits.

*This course is repeatable for 16 credits.*

## FES 410. INTERNSHIP. (1-16 Credits)

Full-time supervised professional experience emphasizing functional proficiency under joint sponsorship of university and agency personnel. Graded P/N.

*This course is repeatable for 16 credits.*

## FES 412. FOREST ENTOMOLOGY. (3 Credits)

Role of insects in natural and managed forests. Recognition of important forest insect pest groups and species, prediction of forest insect responses to environmental changes, and management strategies and treatments to protect forest resource values.

**Prerequisites:** BI 204 with C or better or BI 211 with C or better or BI 211H with C or better or BI 212 with C or better or BI 212H with C or better

**FES 422. RESEARCH METHODS IN SOCIAL SCIENCE. (4 Credits)**

An introduction to research methods applied to social science issues and problems. Emphasis is on the nature of the research process, how to conduct research, and how to interpret and disseminate research results. Lec/lab.

**Prerequisites:** ST 201 with D- or better or ST 351 with D- or better or ST 351H with D- or better

**Equivalent to:** TOL 422

**FES 430. FOREST AS CLASSROOM. (4 Credits)**

Investigates instructional methods used to teach K-12 students about natural resources. Reveals how forest exploration can be used as a means to teach others about science, ecology, mathematics, social science, and history. Provides an opportunity for future teachers, naturalists, interpreters, and scientists to improve their teaching and communication skills.

**FES 433. PLANNING AGROFORESTRY PROJECTS. (2 Credits)**

Helps forestry and other natural resource students understand various agroforestry concepts, systems and technologies and practices worldwide. Lays the groundwork for students to identify different systems, characterize socio-economic conditions and plan sustainable agroforestry systems. Class activities examine how biological, economic, and social factors influence agroforestry farming decisions.

**Prerequisites:** BOT 341 with D- or better

**FES 435. \*GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)**

A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as MCB 535, TOX 435/TOX 535, TOX 435H. (Bacc Core Course)

**Attributes:** CSST – Core, Synthesis, Science/Technology/Society

**Equivalent to:** FES 435H

**Recommended:** One quarter each of biology and chemistry

**FES 440. WILDLAND FIRE ECOLOGY. (3 Credits)**

Fire histories and ecology of major forest, rangeland, and wetland ecosystems. Includes fire interactions with physical and biotic components of ecosystems, role of fire in ecological processes, and utilization in natural resource management.

**Equivalent to:** FOR 446

**Recommended:** Junior or senior standing, with coursework in ecology and natural resource management

**FES 444. ECOLOGICAL ASPECTS OF PARK MANAGEMENT. (3 Credits)**

Ecological principles applied to the management of park recreation uses. The relationship between biological and physical science information and recreation management decisions is explored.

**Equivalent to:** TOL 444

**Recommended:** An ecology course and completion or concurrent enrollment in FES 251 or FOR 251

**FES 445. ECOLOGICAL RESTORATION. (4 Credits)**

Fundamentals of restoring and reclaiming disturbed landscapes and ecosystems. Topics to be covered include types and assessment of site conditions; determining restoration goals and feasibility; hydrologic, biotic, and soil functions and their importance in restoration; and measures of successful restoration. Lec/lab/rec. CROSSLISTED as FW 445.

**Equivalent to:** FOR 445, FW 445

**Recommended:** BI 370 or BI 370H

**FES 447. ARBORICULTURE. (4 Credits)**

The principles and practices of arboriculture, the art and science of selecting, planting, establishing and maintaining trees in urban, suburban, commercial and residential landscapes. Lec/lab. CROSSLISTED as HORT 447.

**Equivalent to:** FOR 447

**Recommended:** (FES 141 or FES 241 or HORT 226 or HORT 228) and (FOR 111 or HORT 112)

**FES 452. BIODIVERSITY CONSERVATION IN MANAGED FORESTS. (3 Credits)**

Designed for students in forestry, wildlife, fisheries and related fields. Introduces the concepts of, and approaches to, managing forest stands, landscapes and regions to achieve desired habitat conditions for indicator species and conservation of biological diversity. CROSSLISTED as FW 452.

**Equivalent to:** FS 453, FW 452

**Recommended:** FES 240 or FES 341 or BI 370

**FES 454. MANAGING AT THE WILDLAND-URBAN INTERFACE. (3 Credits)**

Course targets fire-prone communities where resource professionals need to work cooperatively with local and federal agencies and citizens to gain acceptance for fire management programs and build joint responsibility for fuel reduction activities.

**Equivalent to:** FOR 454

**Recommended:** FOR 111 for non-Ecampus students

**FES 455. URBAN FOREST PLANNING, POLICY AND MANAGEMENT. (4 Credits)**

Examination of planning, policy, and management strategies used in the stewardship of urban natural resources. Fundamentals for developing effective programs to maximize the economic, environmental, and social values and benefits of urban forest landscapes. CROSSLISTED as HORT 455.

**Equivalent to:** FOR 455

**Recommended:** FES 350 or HORT 350

**FES 477. \*AGROFORESTRY. (3 Credits)**

Theory and worldwide practice of multiple-crop low input sustainable systems involving concurrent production of tree and agricultural products. Biological, economic, social, and political factors that underlie the application of agroforestry technology. CROSSLISTED as NR 477. (Bacc Core Course)

**Attributes:** CSGI – Core, Synth, Global Issues; CSST – Core, Synthesis, Science/Technology/Society

**Equivalent to:** FS 477

**Recommended:** Introductory course in biology.

**FES 485. \*CONSENSUS AND NATURAL RESOURCES. (3 Credits)**

Students will use a working group approach. They will select a natural resource topic, study the team process and interaction as a method of learning, explore the issue using systems practice, and strive for consensus on solutions to their issue. (Bacc Core Course)

**Attributes:** CSST – Core, Synthesis, Science/Technology/Society

**Equivalent to:** FS 485

**FES 486. \*PUBLIC LANDS POLICY AND MANAGEMENT. (3 Credits)**

Examines public lands policy and management in the Western U.S. Overview of historical and current federal land management agency laws, regulations, and policies. Highlights political, legal, economic, ecological, and social context of public land management decisions. (Writing Intensive Course)

**Attributes:** CWIC – Core, Skills, WIC

**Recommended:** Sophomore standing

**FES 499. SELECTED TOPICS IN FOREST SCIENCE. (0-16 Credits)**

In-depth studies of specific topics within a field of specialization. Examples include biotechnology in forestry, mycorrhizal ecology, tree improvement, landscape ecology, global climatic change in relation to forestry, advanced silviculture prescriptions, agroforestry, and others.

**Equivalent to:** FS 499

*This course is repeatable for 16 credits.*

**FES 500. MARKET TOOLS FOR MANAGING GREENHOUSE GAS EMISSIONS. (3 Credits)**

Examines the use of market-based approaches to managing greenhouse gas emissions; the role of forestry and natural resource management in mitigating greenhouse gas emissions; and the design of carbon and offset markets in the context of broader climate change policies.

CROSSLISTED as MNR 500.

**Equivalent to:** MNR 500

**Recommended:** MTH 111

**FES 501. RESEARCH AND SCHOLARSHIP. (1-16 Credits)**

**Equivalent to:** FS 501

*This course is repeatable for 16 credits.*

**FES 503. THESIS. (1-16 Credits)**

**Equivalent to:** FS 503

*This course is repeatable for 999 credits.*

**FES 505. READING AND CONFERENCE. (1-16 Credits)**

Some sections graded P/N.

**Equivalent to:** FS 505

*This course is repeatable for 16 credits.*

**FES 506. PROJECTS. (1-16 Credits)**

**Equivalent to:** FS 506

*This course is repeatable for 16 credits.*

**FES 507. SEMINAR. (1-16 Credits)**

Some sections graded A-F.

**Equivalent to:** FS 507

*This course is repeatable for 16 credits.*

**FES 508. WORKSHOP. (1-16 Credits)**

**Equivalent to:** FS 508

*This course is repeatable for 16 credits.*

**FES 511. COMMUNITIES AND NATURAL RESOURCES. (5 Credits)**

Provides students from diverse backgrounds with interdisciplinary, experiential learning exposure to contemporary community and natural resource issues in rural Oregon. Social science concepts are employed to critically appraise current conditions and future prospects for rural, natural resource-dependent communities.

**Equivalent to:** FS 511

*This course is repeatable for 15 credits.*

**FES 512. FOREST ENTOMOLOGY. (3 Credits)**

Role of insects in natural and managed forests. Recognition of important forest insect pest groups and species, prediction of forest insect responses to environmental changes, and management strategies and treatments to protect forest resource values.

**Recommended:** BI 204 or BI 211 or BI 211H or BI 212 or BI 212H or equivalent.

**FES 520. POSING RESEARCH QUESTIONS. (3 Credits)**

Acquaints beginning graduate students in the natural resources to the scientific method and formation of good researchable questions. The course consists of lectures, readings and discussions. Concepts in the course are reinforced and amplified by discipline-specific companion modules. Students prepare and orally present a researchable question in their area of interest that is critiqued by the class and instructors.

**Equivalent to:** FS 520

**FES 521. NATURAL RESOURCE RESEARCH PLANNING. (3 Credits)**

Research planning and study plan development, investigative procedures, the principles and ethics of natural resource science, principles and practices in scientific communication.

**Equivalent to:** FS 521

**FES 522. RESEARCH METHODS SOCIAL SCIENCE. (4 Credits)**

An introduction to research methods applied to social science issues and problems. Emphasis is on the nature of the research process, how to conduct research, and how to interpret and disseminate research results. Lec/lab.

**Equivalent to:** FOR 522, MNR 522

**Recommended:** ST 201 or ST 351 or ST 351H plus graduate level statistics course

**FES 523. QUANTITATIVE ANALYSIS IN SOCIAL SCIENCE. (4 Credits)**

Application and interpretation of statistical approaches to human dimensions of natural resources, recreation, and other social sciences. Emphasis is on an applied approach focusing on understanding data, selecting appropriate statistics for theoretical and managerial problems, using statistical software for analyses, and interpreting findings.

**Recommended:** (FES 522 or FOR 522) and ST 511

**FES 524. NATURAL RESOURCES DATA ANALYSIS. (4 Credits)**

Hands-on experience in applied statistical modeling and data analysis for natural resources. Emphasis is on understanding of statistical models and the application and actual implementation of statistical analysis techniques, use of statistical software for analyses (e.g., R), and interpretation of findings. Students analyze data from their own research for final projects.

**Prerequisites:** ST 511 with B or better and ST 512 [B]

**FES 525. INTERDISCIPLINARY APPROACHES TO SOCIO-ECOLOGICAL PROBLEMS. (3 Credits)**

Inter-, multi- and transdisciplinary approaches to socio-ecological problems, including terminology, assumptions, and analytical frameworks of different scientific fields. How disciplines have been integrated to approach specific case studies. Teams apply concepts, tools, and approaches in a final integrated analysis, resulting in proposed actions or policies.

**FES 526. EFFECTIVE COMMUNICATION & PRESENTATION SKILLS FOR SCIENTISTS. (1 Credit)**

Provides an overview of communication principles and effective scientific communication skills for producing a seminar on proposed research presented to fellow scientists. Students evaluate strengths and weaknesses of communication styles; develop their ability to provide fair, timely feedback; and apply communication principles to evaluate strengths and weaknesses of presentations and proposed research.

*This course is repeatable for 3 credits.*

**FES 527. FOREST CARBON ANALYSIS FOR ASSESSMENTS AND POLICY AGREEMENTS. (3 Credits)**

Role of forests in mitigating greenhouse gas emissions. International GHG policies and recommendations for monitoring emissions and forest carbon. Measurement, modeling, and projections of forest ecosystem carbon. Evaluation of policies for reducing GHG emissions and increasing forest carbon stores.

**Prerequisites:** FES 536 with C or better

**Recommended:** MNR 538 or MNR 550

**FES 530. FOREST AS CLASSROOM. (4 Credits)**

Investigates instructional methods used to teach K-12 students about natural resources. Reveals how forest exploration can be used as a means to teach others about science, ecology, mathematics, social science, and history. Provides an opportunity for future teachers, naturalists, interpreters, and scientists to improve their teaching and communication skills.

**FES 533. PLANNING AGROFORESTRY PROJECTS. (2 Credits)**

Helps forestry and other natural resource students understand various agroforestry concepts, systems and technologies and practices worldwide. Lays the groundwork for students to identify different systems, characterize socio-economic conditions and plan sustainable agroforestry systems. Class activities examine how biological, economic, and social factors influence agroforestry farming decisions.

**Recommended:** BOT 341 and/or equivalent course in ecology.

**FES 535. GENES AND CHEMICALS IN AGRICULTURE: VALUE AND RISK. (3 Credits)**

A multidisciplinary course that examines the scientific, social, political, economic, environmental, and ethical controversies surrounding agricultural and natural resource biotechnologies. Lec/rec. CROSSLISTED as MCB 535, TOX 435/TOX 535, TOX 435H.

**Equivalent to:** BI 535, FS 535, MCB 535, TOX 535

**Recommended:** One quarter each of biology and chemistry

**FES 536. CARBON SEQUESTRATION IN FORESTS. (2 Credits)**

Examines processes controlling the sequestration of carbon in the forest system including the forest itself and wood products. Also examines how forests can be managed to sequester carbon as well as the important economic, policy, and other constraints. Lectures, readings, discussion, simulation models, and home work will be used to cover the material.

**Recommended:** Undergraduate-level biology or ecology.

**FES 537. BELOWGROUND ECOSYSTEMS. (3 Credits)**

Physical and biological components and their interactions in different soil ecosystems with description and examination of the relationships between producers and decomposers in the soil.

**Recommended:** Undergraduate biology or ecology courses

**FES 538. VALUATION OF NON-MARKET RESOURCES. (3 Credits)**

Focuses on the theory and methods for estimating the economic value of non-market resources (e.g. clean air and water, biodiversity, nature-based recreation, etc.). Blends the theory and econometrics of non-market valuation through hands-on applications of methods with real datasets. The valuation of non-market resources is a burgeoning field within applied economics and should continue to grow in both importance and applications.

**Recommended:** AREC 512 or ECON 512

**FES 540. WILDLAND FIRE ECOLOGY. (3 Credits)**

Fire histories and ecology of major forest, rangeland, and wetland ecosystems. Includes fire interactions with physical and biotic components of ecosystems, role of fire in ecological processes, and utilization in natural resource management.

**Recommended:** Coursework in ecology and natural resource management

**FES 542. WILDLIFE LANDSCAPE ECOLOGY. (3 Credits)**

Explores the interaction between spatial pattern and scale and ecological processes with particular emphasis on biodiversity in forests. The focus is on theory, methods and conservation applications in landscape ecology.

**Recommended:** Undergraduate courses in ecology and concurrent enrollment in ST 511

**FES 543. ADVANCED SILVICULTURE. (3 Credits)**

The scientific basis of forest regeneration and silvicultural practices and prescriptions in immature and mature stands. Field trips are required. Lec/lab.

**Equivalent to:** FS 543

**Recommended:** FOR 442 and FOR 443

**FES 545. ECOLOGICAL RESTORATION. (4 Credits)**

Fundamentals of restoring and reclaiming disturbed landscapes and ecosystems. Topics to be covered include types and assessment of site conditions; determining restoration goals and feasibility; hydrologic; biotic, and soil functions and their importance in restoration; and measures of successful restoration. CROSSLISTED as FW 545.

**Equivalent to:** FOR 545, FW 545

**Recommended:** BI 370 or BI 370H

**FES 546. ADVANCED FOREST COMMUNITY ECOLOGY. (4 Credits)**

Fundamental concepts of community including disturbance, diversity and succession. Strong emphasis on field skills and data interpretation. Saturday field trip required. Lec/lab.

**FES 547. ARBORICULTURE. (4 Credits)**

The principles and practices of arboriculture, the art and science of selecting, planting, establishing and maintaining trees in urban, suburban, commercial and residential landscapes. Lec/lab. CROSSLISTED as HORT 547.

**Equivalent to:** HORT 547

**Recommended:** (FES 141 or FES 241 or HORT 226 or HORT 228) and (FOR 111 or HORT 112)

**FES 548. INVASIVE PLANTS: BIOLOGY, ECOLOGY AND MANAGEMENT. (3 Credits)**

Concepts of plant physiology, genetics and population dynamics are used to understand how plant invasions occur and some communities continue to exist. Management implications are explored.

**Equivalent to:** FS 548

**FES 550. TROPHIC CASCADES. (2-3 Credits)**

Theory and empirical analysis of terrestrial carnivore effects on plants and ecosystems as mediated through herbivores. Emphasis on large carnivores, frequency/strength of trophic cascades, implications for ecosystem function, management, and restoration. Lectures, current literature, discussions, field exercise, term paper, and student presentations. CROSSLISTED as FW 550.

**Equivalent to:** FOR 547, FW 547, FW 550

*This course is repeatable for 3 credits.*



**FES 552. FOREST WILDLIFE HABITAT MANAGEMENT. (4 Credits)**

Management of terrestrial vertebrates in forest ecosystems. Effects on silvicultural practices and landscape pattern on habitats and populations. Lec/lab. CROSSLISTED as FW 552.

**Equivalent to:** FW 552

**Recommended:** FOR 341 or equivalent course in ecology.

**FES 554. MANAGING AT THE WILDLAND-URBAN INTERFACE. (3 Credits)**

Course targets fire-prone communities where resource professionals need to work cooperatively with local and federal agencies and citizens to gain acceptance for fire management programs and build joint responsibility for fuel reduction activities.

**Equivalent to:** FOR 554

**Recommended:** FOR 111 for non-Ecampus students

**FES 555. URBAN FOREST PLANNING, POLICY AND MANAGEMENT. (4 Credits)**

Examination of planning, policy, and management strategies used in the stewardship of urban natural resources. Fundamentals for developing effective programs to maximize the economic, environmental, and social values and benefits of urban forest landscapes. CROSSLISTED as HORT 555.

**Equivalent to:** FOR 555

**Recommended:** FES 350 or HORT 350

**FES 558. CONCEPTS OF FOREST RECREATION PLANNING AND MANAGEMENT. (3 Credits)**

Examines research that forms the conceptual basis for tools, techniques, and approaches used in recreation planning and management.

**Equivalent to:** FOR 558

**FES 560. GREEN INFRASTRUCTURE. (4 Credits)**

Explores the relationship between the natural and built environments in cities and examines how planning for and managing green infrastructure assets (such as urban tree canopy, watersheds, and natural areas) increases economic health, community livability and ecological resilience in cities.

**FES 561. PHYSIOLOGY OF WOODY PLANTS. (3 Credits)**

The structure, growth and physiological processes of trees and shrubs.

**Equivalent to:** FS 561

**Recommended:** ((CH 231 or CH 231H) and (CH 232 or CH 232H) and (CH 233 or CH 233H)) and CH 331 and CH 332 and BOT 331

**FES 565. URBAN FORESTRY LEADERSHIP. (2 Credits)**

Examines the application of leadership theories and principles to the decision-making, policy creation, and effective administration of urban forestry programs in the public, private, and non-profit sectors. Taught via Ecampus only.

**FES 577. AGROFORESTRY. (3 Credits)**

Theory and worldwide practice of multiple-crop low input sustainable systems involving concurrent production of tree and agricultural products. Biological, economic, social, and political factors that underlie the application of agroforestry technology.

**Equivalent to:** FS 577, NR 577

**Recommended:** Introductory course in biology.

**FES 580. WRITING SCIENTIFIC MANUSCRIPTS. (1 Credit)**

Discussion of parts of a scientific manuscript and the submission, review, and publication process. Brief presentations and discussion of examples provided by the instructor and students. Students write their own manuscripts and work in teams to provide feedback on manuscript components.

**FES 585. CONSENSUS AND NATURAL RESOURCES. (3 Credits)**

Students will use a working group approach. They will select a natural resource topic, study the team process and interaction as a method of learning, explore the issue using systems practice, and strive for consensus on solutions to their issue.

**Equivalent to:** FS 585

**FES 586. PUBLIC LANDS POLICY AND MANAGEMENT. (3 Credits)**

Examines public lands policy and management in the Western U.S. Overview of historical and current federal land management agency laws, regulations, and policies. Highlights political, legal, economic, ecological, and social context of public land management decisions.

**FES 599. SELECTED TOPICS IN FOREST SCIENCE. (0-16 Credits)**

In-depth studies of specific topics within a field of specialization. Examples include biotechnology in forestry, mycorrhizal ecology, tree improvement, landscape ecology, global climatic change in relation to forestry, advanced silviculture prescriptions, agroforestry, and others.

**Equivalent to:** FS 599

*This course is repeatable for 16 credits.*

**FES 600. GLOBAL CHANGE ECOLOGY: IMPACTS, MITIGATION, AND ADAPTATION. (3 Credits)**

An interdisciplinary discourse on what is known about global change and dynamics of the earth system, including principles of climate, influences on ecosystem functioning and connectivity needed to understand responses of the earth system to human activities.

**Equivalent to:** FS 600

**FES 601. RESEARCH AND SCHOLARSHIP. (1-16 Credits)**

**Equivalent to:** FS 601

*This course is repeatable for 16 credits.*

**FES 603. THESIS. (1-16 Credits)**

*This course is repeatable for 999 credits.*

**FES 605. READING AND CONFERENCE. (1-16 Credits)**

**Equivalent to:** FS 605

*This course is repeatable for 16 credits.*

**FES 606. PROJECTS. (1-16 Credits)**

**Equivalent to:** FS 606

*This course is repeatable for 16 credits.*

**FES 629. TEACHING PRACTICUM IN FOREST SCIENCE. (1 Credit)**

Preparation of graduate students in forest science and related disciplines for their first teaching experiences. Using concepts and information introduced in the class, students will develop the curriculum for one credit of college-level instruction (or an equivalent approved by the instructor) in a topic of their choice.

**Equivalent to:** FS 629

**FES 646. FOREST ECOSYSTEMS ANALYSIS AND APPLICATION. (4 Credits)**

The structure and function of forests and associated streams in natural and managed landscapes; application of ecosystem analysis to policy management decisions; roles of models; scaling from individual processes to ecosystems, landscapes, and beyond. Required classroom discussions, field trip.

**Equivalent to:** FS 646

**Recommended:** College-level ecology/biology, chemistry, and math; familiarity with Excel.

**FES 699. SELECTED TOPICS. (1-16 Credits)**

*This course is repeatable for 16 credits.*