

DEPARTMENT OF FOREST AND RANGELAND STEWARDSHIP



Office in Forestry Building, Room 123
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warnercnr.colostate.edu/frs/ (<https://warnercnr.colostate.edu/frs/>)

Dr. Troy Ocheltree, Interim Department Head

Cassie Mattson, Assistant to the Department Head
Tiara Marshall, Undergraduate Program Coordinator and Academic Advisor
Rebekah Pichotta, Fire and Emergency Services Administration (FESA) Academic Advisor
Sonya Le Febre, Graduate Program Coordinator

Undergraduate Majors

- Major in Fire and Emergency Services Administration (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/fire-emergency-services-administration-major/>)
- Major in Forest and Rangeland Stewardship (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/forest-rangeland-stewardship-major/>)
 - Major in Forest and Rangeland Stewardship, Forest Biology Concentration (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/forest-rangeland-stewardship-major/forest-biology-concentration/>)
 - Major in Forest and Rangeland Stewardship, Forest Fire Science Concentration (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/forest-rangeland-stewardship-major/forest-fire-science-concentration/>)
 - Major in Forest and Rangeland Stewardship, Forest Management Concentration (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/forest-rangeland-stewardship-major/forest-management-concentration/>)
 - Major in Forest and Rangeland Stewardship, Rangeland and Forest Management Concentration (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/forest-rangeland-stewardship-major/rangeland-forest-management-concentration/>)

- Major in Forest and Rangeland Stewardship, Rangeland Conservation and Management Concentration (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/forest-rangeland-stewardship-major/rangeland-conservation-management-concentration/>)
- Major in Natural Resources Management (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/natural-resources-management-major/>)
- Major in Restoration Ecology (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/restoration-ecology-major/>)

Minors

- Minor in Ecological Restoration (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/ecological-restoration-minor/>)
- Minor in Forestry (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/forestry-minor/>)
- Minor in Range Ecology (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/range-ecology-minor/>)

Graduate Graduate Programs in Forest and Rangeland Stewardship

The department offers graduate programs leading to Master of Science and Doctor of Philosophy degrees in Forest Sciences and Rangeland Ecosystem Science, and to Master of Natural Resources Stewardship with specializations in Ecological Restoration, Forest Sciences, and Rangeland Ecosystems. Students interested in graduate work should refer to the Graduate and Professional Bulletin (<http://catalog.colostate.edu/general-catalog/graduate-bulletin/>) and the Department of Forest and Rangeland Stewardship (<http://warnercnr.colostate.edu/frs-graduate-study/graduate-program/>).

Certificates

- Advanced Silviculture for the Practicing Forester (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/graduate-certificate-advanced-silviculture-practicing-forester/>)
- Climate Adaptation and Risk Management (CARMA) (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/graduate-certificate-climate-adaptation-risk-management/>)

Master's Programs

- Master of Science in Forest Sciences, Plan A*
- Master of Science in Forest Sciences, Plan B*
- Master of Natural Resources Stewardship, Plan C, Ecological Restoration Specialization (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/plan-c-mnrs-ecological-restoration-specialization/>)
- Master of Natural Resources Stewardship, Plan C, Forest Sciences Specialization (<http://catalog.colostate.edu/general-catalog/>)

colleges/natural-resources/forest-rangeland-stewardship/plan-c-mnrs-forest-sciences-specialization/)

- Master of Natural Resources Stewardship, Plan C, Rangeland Ecology and Management Specialization (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/plan-c-rangeland-ecology-management-specialization/>)
- Master of Natural Resources Stewardship, Plan C, Western Ranch Management and Ecosystem Stewardship (<http://catalog.colostate.edu/general-catalog/colleges/natural-resources/forest-rangeland-stewardship/plan-c-mnrs-western-ranch-management-ecosystem-stewardship/>)
- Master of Science in Rangeland Ecosystem Science, Plan A*
- Master of Science in Rangeland Ecosystem Science, Plan B*

Ph.D.

- Ph.D. in Forest Sciences*
- Ph.D. in Rangeland Ecosystem Science*

* Please see department for program of study.

Courses

Subjects in this department include: Fire and Emergency Service Administration (FESA), Forest and Rangeland Stewardship (F), select Natural Resources (NR), and Rangeland Ecosystem Science (RS).

Fire and Emergency Service Administration (FESA)

FESA 310 Fire Service Leadership Credits: 3 (0-0-3)

Course Description: Theory, practice, and application of ethical leadership in public safety; developing personal ethics and leadership skills and abilities.

Prerequisite: None.

Registration Information: Offered as an online course only.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 330 Industrial Processes and Fire Protection Credits: 3 (0-0-3)

Course Description: Industrial processes and fire protection managed by fire and safety personnel.

Prerequisite: None.

Registration Information: Offered as an online course only.

Term Offered: Summer (even years).

Grade Mode: Traditional.

Special Course Fee: No.

FESA 331 Structure Influence on Tactics and Strategy Credits: 3 (3-0-0)

Course Description: How construction type, alterations, design and materials influence a building's reaction to fire. Fireground influence on tactics and strategy.

Prerequisite: None.

Registration Information: Offered as an online course only.

Terms Offered: Fall, Summer.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 333 Proposals/Reports in Fire Service Management Credits: 3 (0-0-3)

Course Description: Process of preparing reports and developing a proposal supported by research. Introduction to research techniques, Internet and library use; conventions of documentation.

Prerequisite: None.

Registration Information: Offered as an online course only.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 334 Orientation to Experiential Learning Credit: 1 (0-0-1)

Course Description: Demonstration of knowledge, skill, and professional experience for the purpose of enhancing documentation and career development skills.

Prerequisite: None.

Registration Information: Offered as an online course only.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 335 Trends in Fire Science Technologies Credits: 3 (0-0-3)

Course Description: Analytical tools designed to evaluate, align, select, and implement emerging fire science technologies.

Prerequisite: None.

Registration Information: Offered as an online course only.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 336 Fire Emergency Services Administration Credits: 3 (0-0-3)

Course Description: Fire and emergency service administrative structures and processes. Examination of management and leadership models and applications.

Prerequisite: None.

Registration Information: Offered as an online course only.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 337 Policy and Public Administration Credits: 3 (3-0-0)

Course Description: Political and legal foundations of fire and emergency services. Public administration concepts, decision making and policy development.

Prerequisite: FESA 334.

Registration Information: Offered as an online course only.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 338 Essentials of Emergency Management Credits: 3 (3-0-0)

Course Description: Emergency management theory; mitigation, planning, response, and recovery in large-scale incidents. Development/operation of emergency operation centers.

Prerequisite: None.

Registration Information: Offered as an online course only.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 339 Incident Command Systems Credits: 3 (0-0-3)

Course Description: Theory and application of incident command systems (ICS) to the command and coordination of major emergency operations.

Prerequisite: FESA 334.

Registration Information: Offered as an online course only.

Term Offered: Summer.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 341 Fire Officer I-A Credits: 3 (3-0-0)

Course Description: Fire officer competencies at the supervisory level of performance, as confirmed by NFPA Standard 1021, Level I, 4.1 to 4.4.

Prerequisite: None.

Registration Information: Enrollment in FESA program or written consent of instructor. Offered as an online course only.

Term Offered: Fall (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

FESA 342 Fire Officer I-B Credits: 3 (3-0-0)

Course Description: Fire officer competencies at the supervisory level of performance, as confirmed by NFPA Standard 1021, Level II, 4.5 to 4.7.

Prerequisite: FESA 341 with a minimum grade of C.

Registration Information: Offered as an online course only.

Term Offered: Fall (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

FESA 431 Emergency Medical Services Management Credits: 3 (0-0-3)

Course Description: Emergency medical service models, design implementation, evaluation. Interactions with health care systems, public policy and public health systems.

Prerequisite: FESA 432 and FESA 433.

Registration Information: Offered as an online course only.

Term Offered: Spring (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

FESA 432 Fire and Emergency Services Budgeting Credits: 3 (3-0-0)

Course Description: Application of emergency service budgeting systems with emphasis on revenues, public financial controls, capital funding and performance measures.

Prerequisite: FESA 333 and FESA 336.

Registration Information: Offered as an online course only.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 433 Fire and Emergency: Human Resources Credits: 3 (3-0-0)

Course Description: Theory, practice, and models of human resources applied to emergency organizations; workforce development, HR functions, and labor relation.

Prerequisite: FESA 333 and FESA 336.

Registration Information: Offered as an online course only.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 434 Training Program Management Credits: 3 (0-0-3)

Course Description: Development of agency training and education programs. Utilization of training and education practices, resources, facilities and technologies.

Prerequisite: FESA 432 and FESA 433.

Registration Information: Offered as an online course only.

Term Offered: Spring (even years).

Grade Mode: Traditional.

Special Course Fee: No.

FESA 435 Volunteer/Combination Organization Management Credits: 3 (0-0-3)

Course Description: Development and management of fire and emergency service organizations with volunteer and combination resources.

Prerequisite: FESA 432 and FESA 433.

Registration Information: Offered as an online course only.

Term Offered: Fall (even years).

Grade Mode: Traditional.

Special Course Fee: No.

FESA 436 Fire Protection Through Model Building Codes Credits: 3 (0-0-3)

Course Description: Overview of the most current fire codes that are used across the United States. Discussion of fire inspection methodology and enforcement practices.

Prerequisite: None.

Registration Information: Offered as an online course only.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 437 Fire and Emergency: Legal Considerations Credits: 3 (0-0-3)

Course Description: Fire Service in relation to the complex legal system of the United States, individual states and local jurisdictions.

Prerequisite: FESA 432 and FESA 433.

Registration Information: Offered as an online course only.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 438 Prevention Program Management Credits: 3 (3-0-0)

Course Description: Design, implementation, and evaluation of fire and risk prevention programs using education, engineering, and enforcement approaches.

Prerequisite: FESA 432 and FESA 433.

Registration Information: Offered as an online course only.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 441 Fire Officer II-A Credits: 3 (3-0-0)

Course Description: Fire officer competencies at the supervisory/managerial level of performance, as confirmed by NFPA Standard 1021, Level II, 5.1 to 5.4.

Prerequisite: FESA 342 with a minimum grade of C.

Registration Information: Offered as an online course only.

Term Offered: Fall (even years).

Grade Mode: Traditional.

Special Course Fee: No.

FESA 442 Fire Officer II-B Credits: 3 (3-0-0)

Course Description: Fire officer competencies at the supervisory/managerial level of performance, as confirmed by NFPA Standard 1021, Level II, 5.5 to 5.7.

Prerequisite: FESA 441 with a minimum grade of C.

Registration Information: Offered as an online course only.

Term Offered: Fall (even years).

Grade Mode: Traditional.

Special Course Fee: No.

FESA 467 Integrated Management Simulation Credits: 3 (0-0-3)

Course Description: Integration management and administrative knowledge and skills in the development of a fire and emergency service management simulation.

Prerequisite: FESA 432 and FESA 433.

Registration Information: Offered as an online course only.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

FESA 492 Seminar Credits: Var[1-3] (0-0-0)

Course Description: Discussion and documentation of professional experience in fire and emergency services.

Prerequisite: None.

Registration Information: Written consent of instructor. Offered as an online course only.

Terms Offered: Fall, Spring.

Grade Mode: S/U Sat/Unsat Only.

Special Course Fee: No.

FESA 495 Independent Study Credits: Var[1-6] (0-0-0)

Course Description:

Prerequisite: None.

Registration Information: Admission to the FESA B.S. program; written consent of instructor. Offered as an online course only.

Terms Offered: Fall, Spring, Summer.

Grade Mode: S/U Sat/Unsat Only.

Special Course Fee: No.

Forest and Rangeland Stewardship (F)

F 101 Intro to Forest and Rangeland Stewardship Credit: 1 (1-0-0)

Course Description: Introduce both first year and transfer students to the faculty, and expertise within the department of Forest and Rangeland Stewardship. Gain an appreciation for the majors selected.

Prerequisite: None.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

F 209 Introduction to Forest and Rangeland Ecology Credits: 3 (3-0-0)

Course Description: Ecological concepts pertaining to natural resources and the management of forests and rangelands. Analysis of species, population, and community interactions within an applied framework.

Prerequisite: (BZ 100 to 199 - at least 3 credits or LIFE 100 to 199 - at least 3 credits) and (MATH 118 or MATH 120 or MATH 124 or MATH 125 or MATH 126 or MATH 127 or MATH 141 or MATH 155 or MATH 159 or MATH 160).

Registration Information: Credit allowed for only one of the following:

F 209, LAND 220, LIFE 220 or LIFE 320.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

F 224 Wildland Fire Measurements Credit: 1 (0-2-0)

Course Description: Wildland fire control and use measurements: fuels, weather, topography, fire behavior, and fire ecology.

Prerequisite: None.

Registration Information: Required field trips.

Term Offered: Fall.

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: No.

F 230 Forestry Field Measurements Credits: 2 (0-4-0)

Course Description: Develop field skills using maps, compasses, and aerial photos; photo interpretation; tree and stand measurements; stand volume and value estimates.

Prerequisite: None.

Term Offered: Summer.

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: Yes.

F 310 Forest and Rangeland Ecogeography Credits: 3 (2-2-0)

Also Offered As: RS 310.

Course Description: Distribution of wildland plant communities and identification of important grasses, forbs, shrubs, and trees common in North America.

Prerequisite: BZ 101 or BZ 104 or BZ 110 or BZ 120 or LIFE 102.

Registration Information: Must have concurrent registration in F 312.

Must register for lecture and laboratory. Credit not allowed for both F 310 and RS 310.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

F 311 Forest Ecology Credits: 3 (3-0-0)

Course Description: Relationships of ecological concepts to the dynamics of forest ecosystems.

Prerequisite: F 209 or LAND 220 or LIFE 220 or LIFE 320.

Terms Offered: Fall, Spring.

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: No.

F 312 Dendrology Credits: 2 (1-2-0)

Course Description: Identification, classification, nomenclature, morphology, phenology, ecology, geographic ranges, and natural history of trees. Explore the historical and current importance of trees to society. Focus on major forest tree species of North America, and includes several exotic species that commonly occur in urban areas.

Prerequisite: BZ 120.

Registration Information: Required field trips.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

F 321 Forest and Natural Resource Biometry Credits: 3 (2-2-0)

Course Description: Measure and calculate the structure of different ecosystems. Sampling and statistical techniques to quantify ecosystem structure. Methods to model ecosystem structure to predict potential future conditions.

Prerequisite: (MATH 117 to 160 - at least 3 credits) and (NR 220) and (STAT 201 or STAT 301).

Registration Information: Must register for lecture and laboratory.

Required field trips.

Term Offered: Fall.

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: Yes.

F 322 Economics of the Forest Environment Credits: 3 (3-0-0)

Course Description: Economic principles and techniques applied to forested environments.

Prerequisite: AREC 202 or ECON 202 or ECON 240 or AREC 240.

Terms Offered: Fall, Spring.

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: No.

F 324 Fire Effects and Adaptations Credits: 3 (3-0-0)

Course Description: Introduction to fire ecology including fire history, ecosystem effects, and organism responses.

Prerequisite: F 209 or LAND 220 or LIFE 220 or LIFE 320.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

F 325 Silviculture Credits: 3 (3-0-0)

Course Description: Principles of silviculture and the application to ecologically-based management and restoration of forests ecosystems.

Prerequisite: NR 220.

Term Offered: Spring.

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: No.

F 326 Wildland Fire Behavior and Management Credits: 3 (3-0-0)

Course Description: Physical and managerial principles influencing fire, how fires shape our forests and approaches used to manage wildland fire.

Prerequisite: F 209 or LAND 220 or LIFE 220 or LIFE 320.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

F 330 Timber Harvesting and the Environment Credit: 1 (1-0-0)

Course Description: Principles of timber harvesting and effects of logging on the environment.

Prerequisite: F 321.

Registration Information: Sophomore standing. Credit not allowed for both F 330 and F 380A1.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

F 331 Wood Products in Society Credits: 3 (2-2-0)

Course Description: Role of wood products in society; spectrum of wood products; some field trips.

Prerequisite: None.

Registration Information: Must register for lecture and laboratory. Required field trips.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

F 335 Applications of Silviculture Credit: 1 (0-3-0)

Course Description: Laboratory and some field experience in utilization of ecologically-based silvicultural practices for sustainable timber production, maintenance or restoration of biological diversity, and protection of aesthetic quality and site productivity.

Prerequisite: F 325, may be taken concurrently.

Registration Information: Enrollment in Forest and Rangeland Stewardship major. Required field trips.

Term Offered: Spring.

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: No.

F 421 Ecological Forest Management Credits: 3 (3-0-0)

Course Description: Preparation of forest management plans to achieve integrated environmental and economic goals based upon principles of forest ecology; evaluation of alternative prescriptions; adaptive management and monitoring.

Prerequisite: F 311 and F 321 and F 325 and F 335.

Term Offered: Fall.

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: Yes.

F 422 Quantitative Methods in Forest Management Credits: 3 (2-2-0)

Course Description: Design and analysis of optimization and nonoptimization models in forest managerial operations.

Prerequisite: F 321 and F 322.

Registration Information: Must register for lecture and laboratory.

Term Offered: Fall.

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: No.

F 425 Advanced Wildland Fire Behavior and Management Credits: 3 (3-0-0)

Course Description: Advanced strategies, tools, and techniques for wildland fire management: prediction, prevention, suppression, and use for resource benefit.

Prerequisite: F 326 and NR 319.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

F 430 Forestry Field Practices Credits: 3 (1-4-0)

Course Description: Forestry field course, S212 saw certification, collect stand inventory data, develop and implant stand prescription, and harvest and process trees.

Prerequisite: F 330 and F 421.

Registration Information: Must register for lecture and laboratory. Required field trips.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

F 466 Urban and Community Forestry Credits: 3 (3-0-0)

Also Offered As: HORT 466.

Course Description: Policies and management of publicly and privately owned community forests in urbanized areas.

Prerequisite: F 310 or RS 310 or HORT 221.

Registration Information: Credit not allowed for both F 466 and HORT 466.

Term Offered: Fall (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

F 487 Professional Forestry Internship Credits: Var[3-12] (0-0-0)

Course Description: Professional-level field experience with forestry organization.

Prerequisite: None.

Registration Information: Written consent of department chair.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

F 495 Independent Study Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

F 510 Ecophysiology of Trees Credits: 3 (2-3-0)

Course Description: Environmental factors affecting physiology of woody plants; emphasis on water relations in trees and importance of water in physiological processes.

Prerequisite: BZ 440.

Registration Information: Must register for lecture and laboratory.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

F 520 Advanced Quantitative Methods in Forestry I Credits: 3 (3-0-0)

Course Description: Design and analysis of optimization models in forest management operations: linear, goal, and dynamic programming.

Prerequisite: F 322 and MATH 160.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

F 521 Advanced Quantitative Methods in Forestry II Credits: 3 (2-2-0)

Course Description: Analysis of forest inventory information; dynamic and stochastic models oriented to decision making and research in forestry.

Prerequisite: F 520.

Registration Information: Must register for lecture and laboratory.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

F 522 Advanced Forest Economics Credits: 3 (3-0-0)

Course Description: Analysis of forestry issues: financial maturity, management intensity, federal policy, taxation, natural environments, and silviculture.

Prerequisite: ECON 306.

Term Offered: Spring.

Grade Modes: S/U within Student Option, Trad within Student Option.

Special Course Fee: No.

F 524 Forest Fire Meteorology and Behavior Credits: 3 (2-2-0)

Course Description: Effects of atmospheric processes on wild and prescribed fires; interrelationships of weather, fuels, and topography on forest and range fires.

Prerequisite: None.

Registration Information: Must register for lecture and laboratory.

Term Offered: Fall (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

F 525 Silvicultural Practices Credits: 4 (3-0-1)

Course Description: Comprehensive coverage of silvicultural practices as applied in US forestry.

Prerequisite: F 311.

Registration Information: Must register for lecture and recitation. Credit not allowed for both F 525 and F 526.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

F 526 Multiple Resources Silviculture Credits: 3 (3-0-0)

Course Description: Concepts and techniques of silviculture and their application to forest ecology to meet a wide range of desired conditions and resource objectives. Develops knowledge of ecological applications directed at the management of forests with multiple considerations, including wildlife, recreation, forest health, and timber production.

Prerequisite: F 311 or LIFE 320 or NR 565 or NR 578.

Registration Information: Offered as an online course only. Credit allowed for only one of the following: F 525, F 526, or F 581A3.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

F 540 Fuels, Vegetation, and Fire Management Credits: 3 (2-3-0)

Course Description: Develop, test and display the impact of alternative fuels and vegetation treatments on vegetation development, fuels and fire behavior.

Prerequisite: None.

Registration Information: Admission to the Continuing Education in Fuels Management program through the Office of Conference Services.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Traditional.

Special Course Fee: No.

F 571 Applied Forest Ecology Credits: 2 (2-0-0)

Course Description: Concepts and theory of stand dynamics in relation to advanced ecological concepts within the Rocky Mountain Region and Intermountain West and applications of these concepts to natural disturbance-based management.

Prerequisite: F 311.

Restriction: Must be a: Graduate.

Registration Information: Bachelor's degree required. Offered as an online course only.

Term Offered: Fall (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

F 572 Advanced Silviculture Practices Credits: 3 (3-0-0)

Course Description: Application of forest ecology principles and silvicultural techniques to meet a wide range of desired conditions and resource objectives.

Prerequisite: F 571.

Restriction: Must be a: Graduate.

Registration Information: Bachelor's degree required. Offered as an online course only.

Term Offered: Spring (even years).

Grade Mode: Traditional.

Special Course Fee: No.

F 574 Climate Adaptive Forest Management Credit: 1 (1-0-0)

Course Description: Application of climate science and adaptive silviculture strategies to real-world forest management scenarios.

Prerequisite: F 325.

Restriction: Must be a: Graduate.

Registration Information: Bachelor's degree required. This is a partial semester course. Offered as an online course only.

Term Offered: Fall (even years).

Grade Mode: Traditional.

Special Course Fee: No.

F 575 Monitoring for Advanced Silviculture Credits: 2 (2-0-0)

Course Description: Best practices and principles for evaluating forest management effectiveness at various scales across the landscape.

Prerequisite: F 421.

Restriction: Must be a: Graduate.

Registration Information: Bachelor's degree required. Offered as an online course only.

Term Offered: Fall (even years).

Grade Mode: Traditional.

Special Course Fee: No.

F 576 Advanced Silviculture Capstone Credits: 3 (3-0-0)

Course Description: Application of ecological principles, climate change science, and regional silvicultural principles to the management of a local forest stand.

Prerequisite: F 572 and F 575.

Restriction: Must be a: Graduate.

Registration Information: Bachelor's degree required. Offered as an online course only.

Term Offered: Spring (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

F 592 Advanced Silviculture Seminar Credit: 1 (0-0-1)

Course Description: Forestry professionals and faculty present different aspects of advanced silviculture skills to prepare students for the rigor of online, graduate-level courses and to create a plan and portfolio for their final project at the culmination of the certificate.

Prerequisite: None.

Restriction: Must be a: Graduate.

Registration Information: Bachelor's degree required. This is a partial semester course. Offered as an online course only.

Term Offered: Fall (odd years).

Grade Mode: S/U Sat/Unsat Only.

Special Course Fee: No.

F 593 Seminar-Fire Science Credit: 1 (0-0-1)

Course Description:

Prerequisite: None.

Term Offered: Fall.

Grade Mode: Instructor Option.

Special Course Fee: No.

F 610 Advanced Forest Ecology Credits: 3 (1-0-2)

Course Description: Patterns of tree mortality and their consequences for ecological communities, disturbance regimes, and ecosystem processes. The literature included is diverse ranging from ecophysiology to dendroecology to climate science, and the goal is to integrate this diverse literature to understand the ecological consequences of climate variability on forest ecosystems of the southern Rocky Mountains and globally.

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: At least one undergraduate or graduate course in ecology. Must register for lecture and recitation. Required field trips. Credit not allowed for both F 610 and F 680A1.

Term Offered: Spring (odd years).

Grade Mode: Traditional.

Special Course Fee: No.

F 624 Fire Ecology Credits: 3 (3-0-0)

Course Description: Fire in forest and range ecosystems; principles and techniques for evaluating fire effects on vegetation, soils, watersheds, and wildlife.

Prerequisite: ECOL 505 or F 310 or F 311 or LIFE 320 or NR 565 or NR 578 or RS 300 or RS 310 or RS 452.

Restriction: Must be a: Graduate, Professional.

Registration Information: Sections may be offered: Online.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

F 625 Ecology of Forest Production Credits: 3 (3-0-0)

Also Offered As: ESS 625.

Course Description: Develops student expertise in understanding carbon and nutrient flows in forests.

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Registration Information: Must have completed one 300-level course in ECOL. Credit not allowed for both F 625 and ESS 625. Sections may be offered: Online.

Term Offered: Spring (even years).

Grade Mode: Traditional.

Special Course Fee: No.

F 693 Seminar Credit: 1 (0-0-1)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring.

Grade Mode: Instructor Option.

Special Course Fee: No.

F 695 Independent Study Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

F 698 Research Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

F 699 Thesis Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

F 721 Forest Policy Credits: 3 (3-0-0)

Course Description: Policies and institutions affecting management of forest lands in U.S.

Prerequisite: NR 567.

Restriction: Must be a: Graduate, Professional.

Registration Information: Sections may be offered: Online.

Term Offered: Spring (even years).

Grade Mode: Traditional.

Special Course Fee: No.

F 798 Research Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

F 799 Dissertation Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

Natural Resources (NR)

NR 565 Principles of Natural Resources Ecology Credits: 3 (3-0-0)

Course Description: Overview of ecological fundamentals examined from the perspective of forest, rangeland, wildlife and fisheries science and management.

Prerequisite: None.

Registration Information: Admission to the Master of Natural Resources Stewardship or written consent of instructor. Offered as an online course only.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

NR 566 Natural Resource Inventory and Data Analysis Credits: 3 (3-0-0)

Course Description: Sampling designs, implementation and analysis for inventory and monitoring of forests, rangelands, wetlands and streams.

Prerequisite: STAT 301 or STAT 311 or STAT 312.

Registration Information: Admission to the Master of Natural Resources Stewardship or written consent of instructor. Offered as an online course only.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

NR 568 Economics of Forests, Restoration and Fire Credits: 3 (3-0-0)

Course Description: Overview of basic microeconomics principles as applied to forestry, restoration, and wildland fire management.

Prerequisite: None.

Registration Information: Admission to the Master of Natural Resources Stewardship or written consent of instructor. Offered as an online course only.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

NR 578 Ecology of Disturbed Lands Credits: 3 (3-0-0)

Course Description: Analysis of basic and applied ecological principles involved in the restoration of drastically disturbed lands.

Prerequisite: (LAND 220 or LIFE 220 or LIFE 320 or NR 565) and (SOCR 240).

Registration Information: Sections may be offered: Online. Credit not allowed for both NR 578 and RS 578.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

Rangeland Ecosystem Science (RS)

RS 300 Rangeland Conservation and Stewardship Credits: 3 (3-0-0)

Course Description: Conservation and management of rangeland-ecosystem values using sustainable practices.

Prerequisite: BZ 120 or LIFE 102.

Registration Information: Sections may be offered: Online.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

RS 310 Rangeland and Forest Ecogeography Credits: 3 (2-2-0)

Also Offered As: F 310.

Course Description: Distribution of wildland plant communities and identification of important grasses, forbs, shrubs, and trees common to North America.

Prerequisite: BZ 101 or BZ 104 or BZ 110 or BZ 120 or LIFE 102.

Registration Information: Must have concurrent registration in RS 312. Must register for lecture and laboratory. Credit not allowed for both RS 310 and F 310.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

RS 312 Rangeland Plant Identification Lab Credit: 1 (0-2-0)

Course Description: Identification of characteristic grasses, forbs, and shrubs common to North American rangelands.

Prerequisite: None.

Registration Information: Must have concurrent registration in RS 310.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: Yes.

RS 329 Rangeland Assessment Credit: 1 (0-3-0)

Course Description: Five-day intensive field-based course on principles of rangeland ecosystem assessment.

Prerequisite: (F 310 or RS 310) and (RS 300 and SOCR 240).

Term Offered: Summer.

Grade Mode: Traditional.

Special Course Fee: Yes.

RS 331 Wildland Plants and Plant Communities Credits: 3 (2-2-0)

Course Description: Distribution of non-forested wildland plant communities and important plant species in the western United States.

Prerequisite: BZ 223 or NR 220.

Registration Information: Must register for lecture and laboratory. Required field trips. Sections may be offered: Online.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

RS 351 Wildland Ecosystems in a Changing World Credits: 3 (2-2-0)

Course Description: Understanding and conserving non-forested wildland ecosystems, processes, and services under changing environmental conditions.

Prerequisite: (LIFE 320 or LAND 220 or LIFE 220) and (SOCR 240).

Registration Information: Must register for lecture and laboratory. Required field trips.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

RS 378 Disturbance Ecology Credits: 2 (2-0-0)

Course Description: Foundational knowledge of ecological disturbances, the role of disturbance in biotic communities and ecosystems, and how various communities and ecosystems recover from disturbances.

Prerequisite: F 209 or LAND 220 or LIFE 220 or LIFE 320.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

RS 400 Rangeland Improvements Credits: 2 (2-0-0)

Course Description: Improvement of rangelands through biological and cultural methods; management of improved rangelands.

Prerequisite: RS 300 or SOCR 320.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

RS 420 Grass Taxonomy Credits: 3 (1-4-0)

Course Description: Anatomy, morphology, and identification of grasses.

Prerequisite: BZ 223.

Registration Information: Must register for lecture and laboratory.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

RS 432 Rangeland Measurements and Monitoring Credits: 2 (1-3-0)

Course Description: Vegetation sampling and field measurements emphasizing applications for monitoring and adaptive management.

Prerequisite: (NR 220 and RS 300, may be taken concurrently) and (STAT 201 or STAT 301 or STAT 307).

Registration Information: Credit not allowed for both RS 432 and RS 532.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: Yes.

RS 452 Rangeland Herbivore Ecology and Management Credits: 3 (3-0-0)

Course Description: Ecology and management of large ungulate herbivores including consumer functions at organismal and ecosystem levels.

Prerequisite: (F 209 or LAND 220 or LIFE 220 or LIFE 320) and (RS 300).

Registration Information: Voluntary field trips. Sections may be offered: Online.

Terms Offered: Fall, Spring.

Grade Mode: Traditional.

Special Course Fee: No.

RS 470 Rangeland Economics and Analysis Credits: 2 (2-0-0)

Course Description: Economics of rangeland resource use; analytical techniques for allocation of rangeland resources.

Prerequisite: (AREC 202 or ECON 202) and (RS 300).

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

RS 471 Rangeland Planning and Grazing Management Credits: 2 (2-0-0)

Course Description: Definition of grazing management, grazing systems. Synthesis of animal, plant responses to grazing management. Structure, function of rangeland planning.

Prerequisite: RS 300 or SOCR 320.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

RS 472 Rangeland Ecosystem Planning Credits: 4 (1-6-0)

Course Description: Range allotment, ranch, and restoration planning.

Prerequisite: RS 471.

Registration Information: Must register for lecture and laboratory. Required field trips.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

RS 478 Ecological Restoration Credits: 3 (3-0-0)

Course Description: Analysis of environmental factors influencing restoration of disturbed lands and practices for successful restoration of disturbed ecosystems.

Prerequisite: (BZ 450 or F 209 or LAND 220 or LIFE 220 or LIFE 320) and (SOCR 240).

Registration Information: Credit not allowed for both RS 478 and NR 678.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

RS 495 Independent Study-Rangeland Ecosystems Credits:

Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

RS 496 Group Study-Rangeland Ecosystem Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

RS 500 Advanced Rangeland Management Credits: 3 (3-0-0)

Course Description: Rangeland management concepts.

Prerequisite: LAND 220 or LIFE 320 or NR 220 or LIFE 220.

Registration Information: Sections may be offered: Online.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Traditional.

Special Course Fee: No.

RS 531 World Grassland Ecogeography Credits: 3 (2-3-0)

Course Description: Distribution, climate, and structure of the world's major grasslands with emphasis on North America.

Prerequisite: BZ 223.

Registration Information: Must register for lecture and laboratory.

Required field trips. Sections may be offered: Online.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: No.

RS 532 Rangeland Ecosystem Sampling Credits: 3 (1-3-1)

Course Description: Measurement, analysis techniques for rangeland vegetation. Applications to management emphasized.

Prerequisite: (STAT 301) and (LAND 220 or LIFE 320 or NR 220 or LIFE 220).

Registration Information: Must register for lecture, lab, and recitation. Required field trips. Credit not allowed for both RS 532 and RS 432.

Term Offered: Fall.

Grade Mode: Traditional.

Special Course Fee: Yes.

RS 552 Range Animal Production and Management Credits: 4 (3-0-1)

Course Description: Biological and ecological basis for production of meat from rangelands.

Prerequisite: LAND 220 or LIFE 320 or NR 220 or LIFE 220.

Registration Information: Must register for lecture and recitation. Sections may be offered: Online.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Traditional.

Special Course Fee: No.

RS 565 Riparian Ecology and Management Credits: 3 (2-2-0)

Course Description: Analysis of interactions among biotic and abiotic processes as relates to the ecology and management of riparian systems, emphasizing case studies.

Prerequisite: LAND 220 or LIFE 220 or LIFE 320.

Registration Information: Must register for lecture and laboratory. Required field trips.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

RS 630 Ecology of Grasslands and Shrublands Credits: 3 (3-0-0)

Course Description: Distributions and climatic controls on grassland and shrubland plant communities.

Prerequisite: NR 565 or NR 578.

Restriction: Must be a: Graduate, Professional.

Registration Information: Sections may be offered: Online.

Term Offered: Spring.

Grade Mode: Traditional.

Special Course Fee: No.

RS 693 Seminar Credit: 1 (0-0-1)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring.

Grade Mode: Instructor Option.

Special Course Fee: No.

RS 695 Independent Study-Rangeland Ecosystem Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

RS 696 Group Study-Rangeland Ecosystem Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

RS 698 Research Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

RS 699 Thesis Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

RS 793 Seminar Credit: 1 (0-0-1)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

RS 795 Independent Study-Rangeland Ecosystem Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

RS 798 Research Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.

RS 799 Dissertation Credits: Var[1-18] (0-0-0)

Course Description:

Prerequisite: None.

Restriction: Must be a: Graduate, Professional.

Terms Offered: Fall, Spring, Summer.

Grade Mode: Instructor Option.

Special Course Fee: No.