

RANGELAND ECOLOGY & MANAGEMENT (REM)

REM 151 Rangeland Principles (3 credits)

Rangelands are vast landscapes that cover most of western North America and the earth. Students will examine the ecological principles that cause these grasslands, shrublands, woodlands and deserts to change or stay the same. How humans use and manage these ecosystems will also be explored. The modern challenges of rangeland management must be met with broad thinking and new, sustainable practices to maintain and restore rangelands and the human communities that rely on them. Course requires in-class projects and field experience(s).

REM 200 (s) Seminar (1-16 credits)

Credit arranged

REM 203 (s) Workshop (1-16 credits)

Credit arranged

REM 204 (s) Special Topics (1-16 credits)

Credit arranged

REM 252 Wildland Plant Identification (2 credits)

Develop skills to identify and classify major rangeland plants. Focus is on identification of grasses, forbs, and shrubs. Discussions will also encompass the ecological roles of wildland plants and the ecosystem classification. This course includes a 1-day field trip. Required for REM majors. (Spring only)

REM 253 Wildland Plant Identification Field Studies (1 credit)

Develop skills to identify rangeland plants in the field. Focus is on identification of grasses, forbs, and shrubs in natural settings. Exploration will include ecosystem roles of wildland plants and developing site descriptions. This course includes a 4-day field trip at the beginning of the fall semester. Recommended to take REM 252 (Wildland Plant Identification) before or after this field class.

Prereqs: REM 252

REM 280 Introduction to Wildland Restoration (2 credits)

History and overview of the ecological, social, and economic aspects of wildland restoration using case studies. Students will explore approaches and philosophies towards restoring and rehabilitating wildlands that have been damaged through natural forces and human activities such as wildfire, overgrazing, cultivation, and weed invasion.

REM 299 (s) Directed Study (1-16 credits)

Credit arranged

REM 341 Systematic Botany (3 credits)

Phylogenetic approach to understanding plant systematics and evolution with a primary focus on the flora of the Pacific Northwest. Includes identification of important plant families and the use of dichotomous keys for species identification. (Spring only)

Prereqs: BIOL 114 or BIOL 115; and BIOL 213 or PLSC 205.

REM 398 Renewable Natural Resources Internship (1-16 credits, max arranged)

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

Prereqs: Department Permission

REM 400 (s) Seminar (1-16 credits)

Credit arranged

REM 403 (s) Workshop (1-16 credits)

Credit arranged

REM 404 (s) Special Topics (1-16 credits)

Credit arranged

REM 405 (s) Professional Development (1-16 credits)

Credit arranged

REM 410 Principles of Vegetation Monitoring and Measurement (3 credits)

Introduces theory and application of quantitative and qualitative methods for measuring and monitoring vegetation in grasslands, shrublands, woodlands, and forests. Students will gain a solid understanding of how to measure and evaluate vegetation attributes and design and implement monitoring programs relative to wildlife habitat, livestock forage, fire fuel characteristics, watershed function, and many other wildland values. Recommended Preparation: A basic understanding of how to use computer spreadsheets such as Excel. Students are encouraged to also enroll in REM 460 for field experience in collecting vegetation data that will be used in this course. Graduate students should enroll in REM 520 - Advanced Vegetation Measurements and Monitoring. Typically Offered: Fall.

Prereqs: STAT 251

REM 411 Wildland Habitat Ecology and Assessment (2 credits)

Cross-listed with WLF 411

Joint-listed with REM 511, WLF 511

This course integrates theoretical concepts with field sampling related to scientific research, wildlife habitat, and land management practices. Students collect, analyze, and report on ecological data in various formats, and learn specific protocols used by professionals to assess wildlife habitat. Class field trips are required for on-campus students, and alternative field assignments will be required for remote, online students. Additional assignments required for graduate credit. Recommended preparation: REM 252 and REM 253, REM 341, or other plant identification class; introductory statistics course; ability to use excel. Co-enrollment in REM 410 is recommended. Typically Offered: Varies.

REM 429 Landscape Ecology (3 credits)

Ecological relationships and conservation issues for biotic communities across the landscape, including spatial and temporal dynamics and patterns, and importance of landscapes in maintenance of ecosystem diversity and function. One or more field trips; one 2-3 hour lab period per week. Recommended Preparation: Familiarity with spreadsheet programs and problem solving using computers. (Spring only)

Prereqs: FOR 221 or REM 221

REM 440 Restoration Ecology (3 credits)

Cross-listed with NRS 440

The ecological restoration of disturbed ecosystems. Fundamental principles from ecology, ecophysiology, and community ecology are used in a systems ecology approach to examine how the structure and function of damaged ecosystems can be restored – with the goal of establishing a stable and self-sustaining ecosystem.

Prereqs: NR 321, FOR 221, REM 221, WLF 220, BIOL 314, or Permission

REM 451 Rangeland Issues and Management Principles (2 credits)

Advanced discussion of ecological principles and challenges associated with managing rangelands, including sustainable practices to maintain and restore rangelands and the human communities that rely on them.

Typically Offered: Fall.

REM 456 Integrated Rangeland Management (3 credits)

General Education: Senior Experience

Management strategies for integrating grazing with other natural resource values such as wildlife, water, timber, recreation, and aesthetics; emphasis on herbivore ecology including ecological impacts of grazing, ways to manage grazing, and nutritional relationships between plants and free-ranging ungulates on rangeland, pastureland, and forest ecosystems. One 4 to 5 day field trip. Recommended Preparation: REM 151. (Spring only)

Prereqs: ENGL 313 or ENGL 317

REM 459 Rangeland Ecology (3 credits)

Application of ecological principles in rangeland management; stressing response and behavior of range ecosystems to various kinds and intensity of disturbance and management practice. Recommended Preparation: courses in general ecology (e. g. , REM 221), technical writing (e. g. , ENGL 317), and vegetation assessment (e. g. , REM 410 or FOR 274) or Permission. Students are encouraged to also enroll in REM 460 for field experience in collecting vegetation data that will be used in this course.

REM 460 Integrated Field Studies in Rangelands (1 credit)

Field experiences in rangeland ecology, vegetation measurements, and habitat assessment. The course consists of preparatory lectures and a four-day field trip to rangelands. The course integrates concepts from Principles of Vegetation Monitoring and Measurement (REM 410), Wildland Habitat Ecology and Assessment (REM 411), and Rangeland Ecology (REM 459). Students should take this course concurrently with or before REM 410, REM 411, and REM 459. Required for REM majors. (Fall only)

Prereqs: Permission

REM 473 ECB Senior Presentation (1 credit)

General Education: Senior Experience

Cross-listed with FISH 473, FOR 473

, FSP 473, NRS 473, WLF 473. Reporting and presenting the senior project (thesis or internship); taken after or concurrently with REM 497. Serves as the senior capstone course for Ecology and Conservation Biology (ECB).

Prereqs: Instructor Permission

REM 475 Remote Sensing Application with Unmanned Aerial Systems (UAS) (3 credits)

Cross-listed with ASM 476

This course introduces students to the fundamental components of UAS, sensors and platforms, UAS operational concepts, the principles of UAS data collection, the legal framework for UAS operations, photogrammetric theory, image processing software, and the generation and analysis of orthomosaics and 3D point clouds. The course emphasizes the use of UAS in the context of natural resource science, technology and applications. Typically Offered: Varies.

Prereqs: FOR 375 or equivalent

REM 476 Unmanned Aerial Systems (UAS) Operations (1 credit)

This course covers the material necessary for students to pass the FAA Part 107 Remote Pilot Certificate test needed to legally fly UAS for business, research, or resource management purposes. Additionally, the course reviews state and local laws and University policies for UAS operation and provides opportunities for students to gain operations experience through planning and executing UAS flights.

REM 480 Ecological Restoration (3 credits)

Joint-listed with REM 580

Planning and implementing restoration projects in conjunction with land agencies and stakeholders. Includes service-learning projects. Field trip(s) required. Additional literature review, reports, discussion, and/or a class project are required for graduate credit.

Prereqs: REM 440 or Permission

REM 497 Senior Research and Thesis (1-16 credits)

Credit arranged. A research investigation, selected and designed jointly by the student and professor, during which the student has the opportunity to learn research techniques of experimental design, proposal writing, data collection and analysis, scientific writing, and publication; at completion, the student will produce a publishable journal manuscript and/or a conference presentation.

REM 498 (s) Internship (1-16 credits)

Credit arranged. Supervised field experience where students define specific topics and skills in rangeland management they wish to gain, develop a learning plan, and present a final report of knowledge gained or project outcomes. The internships will be overseen by an on-site field supervisor and a faculty mentor. Instructor Permission required.

REM 499 (s) Directed Study (1-16 credits)

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

REM 500 Master's Research and Thesis (1-16 credits)

Credit arranged

REM 501 (s) Seminar (1-16 credits)

Credit arranged. Major philosophy, management, and research problems of wildlands; presentation of individual studies on assigned topics.

REM 502 (s) Directed Study (1-16 credits)

Credit arranged

REM 503 (s) Workshop (1-16 credits)

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

REM 504 (s) Special Topics (1-16 credits)

Credit arranged

REM 505 (s) Professional Development (1-16 credits)

Credit arranged

REM 507 Landscape and Habitat Dynamics (3 credits)

Students explore landscape change occurring a variety of spatial and temporal scales, including global change, succession, disturbance events, and change induced by humans. Via scientific readings, models and spatial analysis students will learn how to quantify landscape change and how a change in environmental conditions and disturbance regimes may affect the composition of landscapes, specifically plant and animal habitats. Recommended Preparation: courses in ecology, statistics, and GIS. (Fall, alt/years)

Prereqs: Permission

REM 510 GIS Application in Fire Ecology and Management (2 credits)

Joint-listed with REM 407

Introduces applications of GIS in fire ecology, research, and management including incident mapping, fire progression mapping, GIS overlay analysis, remote sensing fire severity assessments, fire atlas analysis and the role of GIS in the Fire Regime Condition Class concept and the National Fire Plan. Additional assignment/projects required for graduate credit. (Spring only).

Prereqs: FOR 375 or GEOG 385; or Permission

REM 511 Wildland Habitat Ecology and Assessment (2 credits)

Cross-listed with WLF 511

Joint-listed with REM 411, WLF 411

This course integrates theoretical concepts with field sampling related to scientific research, wildlife habitat, and land management practices. Students collect, analyze, and report on ecological data in various formats, and learn specific protocols used by professionals to assess wildlife habitat. Class field trips are required for on-campus students, and alternative field assignments will be required for remote, online students. Additional assignments required for graduate credit. Recommended preparation: REM 252 and REM 253, REM 341, or other plant identification class; introductory statistics course; ability to use excel. Co-enrollment in REM 410 is recommended. Typically Offered: Fall. Cooperative: open to WSU degree-seeking students.

REM 520 Advanced Vegetation Measurement and Monitoring (3 credits)

This course introduces theory and application of quantitative and qualitative methods for measuring and monitoring vegetation in grasslands, shrublands, woodlands, and forests. Students will gain a solid understanding of how to measure and evaluate vegetation attributes and design and implement monitoring programs relative to wildlife habitat, livestock forage, fire fuel characteristics, watershed function, and many other wildland values. Advanced Vegetation Measurements and Monitoring includes a 1-hr weekly discussion of current literature on vegetation measurements and the use of monitoring data for natural resource decision making. Recommended Preparation: A basic understanding of how to use computer spreadsheets such as Excel. Students are encouraged to also enroll in REM 460 for field experience in collecting vegetation data that will be used in this course. (Fall only)

Prereqs: STAT 251 or Permission

REM 529 World Savannas (3 credits)

This course provides a broad overview of world savannas including their characteristics and the ecosystem goods and services they provide. The course focuses on the ecological and biogeochemical characteristics of savannas, how humans use these ecosystems, current problems, and strategies land management are applying to solve them.

REM 570 Presentation Skills for Scientists (2 credits)

A practical course to master the skills required for oral presentations for research, teaching, and outreach. A detailed examination of all elements that must be integrated and mastered for an effective and engaging oral presentation.

REM 580 Ecological Restoration (3 credits)

Joint-listed with REM 480

Planning and implementing restoration projects in conjunction with land agencies and stakeholders. Includes service-learning projects. Field trip(s) required. Additional literature review, reports, discussion and/or a class project are required for graduate credit.

Prereqs: REM 440 or Permission

REM 597 (s) Practicum (1-16 credits)

Credit arranged

REM 598 (s) Internship (1-16 credits)

Credit arranged

REM 599 (s) Non-thesis Master's Research (1-16 credits)

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

Prereqs: Permission

REM 600 Doctoral Research and Dissertation (1-45 credits)

Credit arranged

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