

# RANGELAND ECOLOGY & MANAGEMENT (RNG)

## **RNG 121. \*INTRODUCTION TO WILDLAND ECOLOGY. (4 Credits)**

Ecological principles will be applied to understand contemporary issues related to wildlands, specifically the rangeland biomes that comprises over 50% of the Earth's surface (FAO, SRM, USDA ERS). Topics to be covered fall into the following categories: Fundamentals of Ecology; Animals (wildlife & livestock); Disturbance (e.g., invasive species, fire, mineral extraction, etc.); Ecosystem Goods & Services (e.g., carbon sequestration, watersheds, biodiversity, recreation, etc.). The course will largely focus on U.S. wildlands, however a portion will examine the ecology and issues of international rangelands in Africa, Eurasia, Australia, and South America. (Bacc Core Course)

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

## **RNG 299. SPECIAL TOPICS. (1-16 Credits)**

**Equivalent to:** RNG 299H

*This course is repeatable for 16 credits.*

## **RNG 299H. SPECIAL TOPICS. (1-16 Credits)**

**Attributes:** HNRS – Honors Course Designator

**Equivalent to:** RNG 299

*This course is repeatable for 16 credits.*

## **RNG 341. RANGELAND ECOLOGY AND MANAGEMENT. (3 Credits)**

Nature and management of rangelands. Integrated land use with emphasis on plant-animal-soil interactions.

**Equivalent to:** RNG 241

## **RNG 351. RANGE ECOLOGY I-GRASSLANDS. (3 Credits)**

Principles and terminology of grassland ecology. Addresses the spatial-temporal dynamics of structure, function, and process in North American grassland ecosystems. Water, nutrient cycles and energy pathways are explored in context of the variable driving forces of climate (drought), herbivory, and fire.

**Recommended:** (BOT 313 [D-] and RNG 341 [D-])

## **RNG 352. RANGE ECOLOGY II-SHRUBLANDS. (3 Credits)**

Introduces the ecology of shrublands using an autecological approach. Explores the effects of stressors such as temperature, drought, fire, and herbivory on plant morphology, physiology, reproduction, and growth. Covers life histories of common shrubs and descriptions of shrubland communities used to promote understanding of autecological principles.

**Recommended:** BOT 313 and RNG 341

## **RNG 353. WILDLAND PLANT IDENTIFICATION. (4 Credits)**

Students will learn how to identify approximately 100 plant species found in wildlands of North America and Mexico. Individual plant species ecology, basic plant anatomy and identification characteristics observable only through a microscope or dissecting scope, and how to use a dichotomous key for plant ID will also be covered.

**Equivalent to:** RNG 253

## **RNG 355. DESERT WATERSHED MANAGEMENT. (4 Credits)**

A systems-based understanding of hydrologic processes in arid and semiarid landscapes. The class is focused on gaining knowledge of multiple ecological and hydrological interactions occurring in dryland watersheds and on discussing practical methodology aimed to enhance site productivity and ecosystem resilience. Emphasis is placed on land use effects on watershed function; monitoring of soil, water, and vegetation variables; and methods of rehabilitation of degraded landscapes. The course has a strong experiential learning component through a series of 'hands-on' practicums and a field trip to a semiarid location in eastern Oregon. Lec/lab.

## **RNG 399. SPECIAL TOPICS. (1-16 Credits)**

May be repeated for a total of 16 credits.

*This course is repeatable for 16 credits.*

## **RNG 403. SENIOR THESIS. (1-16 Credits)**

*This course is repeatable for 16 credits.*

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

*This course is repeatable for 16 credits.*

## **RNG 406. PROJECTS. (1-16 Credits)**

*This course is repeatable for 16 credits.*

## **RNG 411. ADVANCED PLANT ID. (2 Credits)**

Advanced rangeland plant taxonomy.

*This course is repeatable for 16 credits.*

## **RNG 421. WILDLAND RESTORATION AND ECOLOGY. (4 Credits)**

Emphasis is placed on understanding the ecology of arid and semi-arid ecosystems through the study of ecological processes responsible for ecosystem function. Range improvement practices for stabilizing and repairing degraded wildlands by directing autogenic recovery mechanisms are discussed. This involves manipulating plants, soil, animals and microenvironments for improved ecosystem function.

**Recommended:** Course work in soils and ecology

## **RNG 441. RANGELAND ANALYSIS. (4 Credits)**

Techniques used to describe vegetation in shrub-lands, grasslands, and forests. Use of measurements in resource management. Course is field-oriented, emphasizing both theory and practice of wildland inventory methods.

**Recommended:** ST 351 or ST 351H

## **RNG 442. RANGELAND-ANIMAL RELATIONS. (4 Credits)**

Domestic and wild animal use of rangelands as related to environmental factors, palatability, food habits, nutrition, physiography, and their effects on management of rangeland-animal resources.

## **RNG 448. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)**

Focusing on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSLISTED AS ANS 448/CROP 448/RNG 448.

**Equivalent to:** ANS 448, CROP 448

**RNG 455. RIPARIAN ECOHYDROLOGY AND MANAGEMENT. (4 Credits)**

A systems approach to study ecological and hydrological relationships occurring in riparian ecosystems. The class is focused on gaining knowledge of multiple connections between soil, water, and terrestrial vegetation occurring in riparian systems. Emphasis is placed on land use effects on the riparian ecologic and hydrologic function, methods of rehabilitation, and theories of the proper use of riparian ecosystems under a multiple-use philosophy (i.e., fish, wildlife, livestock, aesthetics, recreation, and silviculture).

**Recommended:** RNG 355

**RNG 457. HABITAT ANALYSIS 1: HABITAT USE AND MOVEMENT. (3 Credits)**

Effective habitat management necessitates an understanding of how animals use and move through the landscape, including rangelands. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on site selection of terrestrial animals (wild and domestic). However, topics covered in this course are broadly analogous to other ecosystems. Emphasis will be placed on analysis of habitat use (space use) and animal movement from multiple study designs.

**Prerequisites:** FW 251 with D- or better and RNG 341 [D-] and MTH 241 [D-] and (ST 201 [D-] or ST 351 [D-])

**RNG 458. HABITAT ANALYSIS 2: ABUNDANCE, OCCUPANCY AND DEMOGRAPHY. (3 Credits)**

Habitat influences abundance, occupancy, and demographic rates of wildlife. Wildlife management is often a component of land management and both benefit from land stewards that have an understanding of how habitat characteristics influence the occupancy, abundance, and performance of wildlife within an area. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on abundance, occupancy, and demographic rates of terrestrial animals.

**Prerequisites:** FW 251 with D- or better and RNG 341 [D-] and MTH 241 [D-] and (ST 201 [D-] or ST 351 [D-])

**RNG 470. PASTORAL SYSTEMS OF THE WORLD. (4 Credits)**

Description and evaluation of ecosystems which support grazing animals and pastoralists. Biology, ecology and management of these landscapes will be explored through climate, soils, and plant communities and human-livestock interactions. The historic role of trade and contemporary challenges to the ecological, social and economic sustainability of pastoral systems will be examined.

**RNG 490. RANGELAND MANAGEMENT PLANNING. (4 Credits)**

Administration and management of rangelands; planning processes involving goal setting, inventories, personnel management, environment, conflict resolution, and other constraints necessary for decision-making. Use of data collected from field problems to support the execution of class plans. Field trip required. Lec/lab.

**RNG 499. SPECIAL TOPICS. (1-16 Credits)**

*This course is repeatable for 16 credits.*

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

*This course is repeatable for 16 credits.*

**RNG 503. MASTER'S THESIS. (1-16 Credits)**

*This course is repeatable for 999 credits.*

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

*This course is repeatable for 16 credits.*

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

*This course is repeatable for 16 credits.*

**RNG 507. SEMINAR. (1-2 Credits)**

*This course is repeatable for 16 credits.*

**RNG 521. WILDLAND RESTORATION AND ECOLOGY. (4 Credits)**

Emphasis is placed on understanding the ecology of arid and semi-arid ecosystems through the study of ecological processes responsible for ecosystem function. Range improvement practices for stabilizing and repairing degraded wildlands by directing autogenic recovery mechanisms are discussed. This involves manipulating plants, soil, animals and microenvironments for improved ecosystem function.

**RNG 541. RANGELAND ANALYSIS. (4 Credits)**

Techniques used to describe vegetation in shrub-lands, grasslands, and forests. Use of measurements in resource management. Course is field-oriented, emphasizing both theory and practice of wildland inventory methods.

**Recommended:** ST 351

**RNG 542. RANGELAND-ANIMAL RELATIONS. (4 Credits)**

Domestic and wild animal use of rangelands as related to environmental factors, palatability, food habits, nutrition, physiography, and their effects on management of rangeland-animal resources.

**Recommended:** RNG 341

**RNG 548. LIVESTOCK PRODUCTION ON PASTURE. (4 Credits)**

Focusing on grazing management in cultivated pastures in Oregon and other regions with similar agro-ecological conditions. Become familiar with the basic principles of pasture production, grazing management and feed planning and management in large and small ruminant production systems. Provides information on the underlying factors affecting pasture and animal production and product quality in pasture-based production systems. CROSSLISTED AS ANS 548/CROP 548/RNG 548.

**Equivalent to:** ANS 548, CROP 548

**RNG 555. RIPARIAN ECOHYDROLOGY AND MANAGEMENT. (4 Credits)**

A systems approach to study ecological and hydrological relationships occurring in riparian ecosystems. The class is focused on gaining knowledge of multiple connections between soil, water, and terrestrial vegetation occurring in riparian systems. Emphasis is placed on land use effects on the riparian ecologic and hydrologic function, methods of rehabilitation, and theories of the proper use of riparian ecosystems under a multiple-use philosophy (i.e., fish, wildlife, livestock, aesthetics, recreation, and silviculture).

**Recommended:** RNG 355

**RNG 557. HABITAT ANALYSIS 1: HABITAT USE AND MOVEMENT. (3 Credits)**

Effective habitat management necessitates an understanding of how animals use and move through the landscape, including rangelands. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on site selection of terrestrial animals (wild and domestic). However, topics covered in this course are broadly analogous to other ecosystems. Emphasis will be placed on analysis of habitat use (space use) and animal movement from multiple study designs.

**Recommended:** ST 511 and ST 512

**RNG 558. HABITAT ANALYSIS 2: ABUNDANCE, OCCUPANCY AND DEMOGRAPHY. (3 Credits)**

Habitat influences abundance, occupancy, and demographic rates of wildlife. Wildlife management is often a component of land management and both benefit from land stewards that have an understanding of how habitat characteristics influence the occupancy, abundance, and performance of wildlife within an area. This is an advanced undergraduate and introductory graduate course designed to familiarize students with multiple techniques of assessing the influence of habitat on abundance, occupancy, and demographic rates of terrestrial animals.

**RNG 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. CROSSLISTED as FES 477/ FES 577, NR 477.

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

**Recommended:** Introductory course in biology.

**RNG 590. RANGELAND MANAGEMENT PLANNING. (4 Credits)**

Administration and management of rangelands; planning processes involving goal setting, inventories, personnel management, environment, conflict resolution, and other constraints necessary for decision-making. Use of data collected from field problems to support the execution of class plans. Field trip required. Lec/lab.

**RNG 599. SPECIAL TOPICS. (1-16 Credits)**

*This course is repeatable for 16 credits.*

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

*This course is repeatable for 16 credits.*

**RNG 603. PH.D. THESIS. (1-16 Credits)**

*This course is repeatable for 999 credits.*

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

*This course is repeatable for 16 credits.*

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

*This course is repeatable for 16 credits.*

**RNG 607. SEMINAR. (1-2 Credits)**

*This course is repeatable for 16 credits.*

**RNG 608. WORKSHOP. (1-16 Credits)**

*This course is repeatable for 16 credits.*

**RNG 643. WILDLAND PLANT ECOPHYSIOLOGY. (4 Credits)**

Emphasizes the physiological ecology of plants living in arid and semi-arid ecosystems. Primary class emphasis will include photosynthesis, respiration, water stress and water use efficiency, stable isotopes, root structure and function, nutrient uptake and stress, and defoliation.

Offered every other winter, odd years.

**RNG 662. RANGELAND ECOLOGY. (3 Credits)**

Studies ecological theory and related resource management implications in rangelands and arid wildlands. Topics include the history and development of rangeland ecology, plant demography, invasive species, plant population dynamics, disturbance theory, succession, vegetation classification and range condition assessments. Offered every other winter, even years.

**Recommended:** Basic ecology course

**RNG 670. ECOLOGICAL INVASIVE PLANT MANAGEMENT. (2 Credits)**

Logic of ecologically based invasive plant management. Ecological processes of invasion. Management of plant succession with emphasis on augmentive restoration. Adaptive management of weed invasions into natural ecosystems. Development of ecologically based management plans for natural ecosystems. Offered odd-numbered years only.

**RNG 699. SPECIAL TOPICS. (1-16 Credits)**

*This course is repeatable for 16 credits.*