

NATURAL RESOURCE SCIENCE AND MANAGEMENT (NRSM)

NRSM 121S - Nature of Montana. 3.000 Credits.

Offered autumn. An exploration of the major natural resource management issues facing the people of Montana and the social processes to manage environmental conflicts. Provides an introduction to the function of ecological systems and the impacts of human uses on the environment and looks at strategies for addressing global climate change, ex-urban population growth, and protecting environmental quality.

Gen Ed Attributes: Social Sciences Course (S)

NRSM 170 - International Envir. Change. 3 Credits.

Offered spring. An introduction to natural and anthropogenic environmental change from ancient to contemporary times. Exploration of the historical role and importance of ecological disturbance on the development and maintenance of terrestrial ecosystems around the world. Introduction to fields of study available in the College of Forestry and Conservation.

NRSM 191 - Special Topics. 1-6 Credits.

(R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one time offerings of current topics.

NRSM 192 - Independent Study. 1-3 Credits.

NRSM 200 - Nat.Resource Professional Wrtg. 3 Credits.

Offered autumn and spring. Prereq., WRIT 101. Students synthesize scientific literature and, using appropriate evidence and APA style, write natural-resources-based documents appropriate for distribution to scientists, managers, and the public.

Gen Ed Attributes: Writing Course-Intermediate

NRSM 210N - Soils, Water and Climate. 3.000 Credits.

Prereq., M 115 or M 121 or M 122 or M 151 or M 162 or M 171 or M 172. The factors affecting earth's terrestrial ecosystems are rapidly changing, and understanding their impact on ecosystem services to humanity is becoming increasingly important and yet complex. In this course, students will explore how climate, water and soils interact to shape Earth's biosphere. We will introduce students to a number of fundamental concepts in climate, hydrology, and soil science to gain a comprehensive view of the factors that shape and affect all terrestrial ecosystems. Through a series of lectures and field-based laboratories, students will be introduced to the fundamental principles of climate and hydrology that influence soil development, how they vary across small spatial scales, and how these physical, chemical, and biological processes interact to affect soil development. Ultimately, this class will introduce students to intimate relationship between climate, water, and soils, and how they interact to affect patterns of vegetation we see across the biosphere. Gen Ed Attributes: Natural Science Lab Course (N)
Gen Ed Attributes: Natural Science Course (N)

NRSM 215 - Field Studies in Conservation. 1 Credit.

(R-3) Offered intermittently. Field study focusing on flora and fauna, history of land use and ecological change, contemporary forest management, conservation and community development in western Montana.

NRSM 265 - Elements of Ecological Restora. 3 Credits.

Offered autumn. Prereq., one course in the ecological or biological sciences: B100 105N, BIOB 160N, BIOB 170N, BIOB 172, BIOE 370, BIOE 428, BIOE 447 or BIOE 448; or FORS 330; or NRSM 271N or NRSM 462 or consent of instructor. Overview of the natural and social science elements of ecological restoration, including the ecological foundations of restoration, practices used to restore terrestrial and aquatic habitats, philosophical and ethical challenges involved, and current initiatives in Montana and the United States. Includes Saturday field trips.

NRSM 271N - Conservation Ecology. 3 Credits.

Offered autumn. An overview of ecological concepts and how ecology is applied to further our understanding of ecosystems and conservation. Topics include: ecosystems functions and values, biomes, natural selection and speciation, biodiversity, succession, climate change, fragmentation, protected areas, impacts of exotic species and other human influences on ecosystem functions.

Gen Ed Attributes: Natural Science Course (N)

NRSM 273 - Wilderness/Civ Field Stds. 1-3 Credits.

(R-6) Offered autumn and spring. Field studies in ecology and conservation. Includes natural history, field journaling, ecological monitoring, protected area management, and community conservation. One-day trips as well as extended backcountry trips. Part of the Wilderness and Civilization program.

NRSM 281 - Science of Climate Change. 3 Credits.

This course provides an introduction to Earth's climate system and the scientific evidence of climate change. This course explores how past climate has shaped Earth's ecosystem and how humans are currently altering Earth's climate system, as well as potential future climate scenarios. Through this course students will gain a better understanding of Earth's energy budget, the global carbon cycle, and potential impacts of climate change. This class is open to all undergraduates, both science and non-science majors, and counts toward the Climate Change Studies minor.

NRSM 291 - Special Topics. 1-12 Credits.

(R 12) Offered intermittently. Experimental offerings of visiting professors; new courses or one time offerings of current topics.

NRSM 298 - Internship. 1-6 Credits.

Offered every term. Prereq., consent of department. Extended classroom experience that provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

NRSM 311 - Field Stds ecol/Human Commun. 2-3 Credits.

(R-12) Offered every term. Prereq., consent of instr. Via extended backcountry travel, experiential examination of the structure and function of the ecosystems occurring within the course area. Also investigates the relationship of those ecosystems with the people that manage, live, and work in the area. Offered by the Wild Rockies Field Institute.

NRSM 321 - Field Stds Energy Syst Montana. 2-3 Credits.

Offered Summer. Via an extended bicycle tour of Montana, students examine a variety of energy developments and their environmental, social, and economic implications.

NRSM 344 - Ecosystem Science and Restoration Capstone. 5 Credits.

Offered spring. Prereq., junior or senior standing in Ecological Restoration and successful completion of NRSM 265 and one advanced ecology course: BIOE 370, BIOE 428, BIOE 447, BIOE 448, FORS 330, or NRSM 462.; and completion or concurrent enrollment in NRSM 465. This five-credit, service-learning course is the planning course for the capstone experience for students in the Ecosystem Science and Restoration major (although it is also open to students pursuing other majors). It is designed to get students active in research in ecosystem science and restoration ecology or in the application of ecological principles to restoration practice. The course includes lectures, labs, and hands-on experience working with ecologists and restoration practitioners from local government agencies, NGOs, or other organizations.

NRSM 345 - Watershed Dynamics. 3 Credits.

Coreq. ENST 291, 391 392, NRSM 346. Offered each autumn by Northwest Connections. Via hands on application in rural Montana, students investigate watershed function; introductory stream hydrology and morphology; and fish, amphibian and aquatic furbearer habitat characteristics. The course also explores impacts of road building, timber harvest, and watershed fragmentation on watershed and stream function, fish habitat, and fish populations.

NRSM 346 - Forest and Communities. 3 Credits.

Coreq., ENST 291, 391, 392, NRSM 345. Offered each autumn by Northwest Connections. Via backcountry travel and hands on field application in rural Montana, students will be immersed in the ecology of forested ecosystems in Northwest Montana, including plant succession, fire ecology, soil science and wildlife ecology.

NRSM 352 - Mountain Environment and Development. 3 Credits.

Offered summer only. Coreq., PTRM 353. This course covers the contentious issues surrounding environment and development in the Himalaya using the Garhwal region of India as the example.

NRSM 360 - Rangeland Mgt (equiv 260). 3.000 Credits.

Offered autumn. Prereq., junior standing or consent of instr. An introduction to rangelands and their management, grazing influences, class of animal, grazing capacity, control of livestock distribution, improvements, competition and interrelationships with wildlife. Laboratory exercises to gain on-site experience on topics and concepts presented in lectures.

NRSM 370S - Wildland Conserv Pol/Govrnance. 3 Credits.

Offered autumn and spring. Examination of the historical, philosophical, and legislative background for development and management of our national system of wilderness areas, wild and scenic rivers, trails, and national parks; their place in our social structure. Part of the Wilderness and Civilization program.

Gen Ed Attributes: Social Sciences Course (S)

NRSM 371 - Wilderness Issues Lect Series. 1 Credit.

(R-3) Offered spring. Explores current issues in wilderness preservation, management and research.

NRSM 373 - Wilderness and Civilization. 3 Credits.

(R-6) Offered autumn and spring. Social and cultural perspectives on the wilderness idea and wildland practices. Course topics include history of wilderness and the wilderness movement, various philosophical viewpoints on wilderness, protected area management issues, and how wilderness fits into larger landscapes and societies. Part of the Wilderness and Civilization program.

NRSM 374 - Yellowstone Studies. 1 Credit.

Offered spring. Ecological and sociopolitical perspectives on the greater Yellowstone ecosystem. Topics include winter ecology, biodiversity conservation, national park planning and management, winter recreation, fire, and wildlife. Field course in the Yellowstone area. Part of the Wilderness and Civilization Program.

NRSM 379 - Collab in Nat Res Decisions. 3 Credits.

Offered autumn. Political and social processes affecting natural resource decisions. Examination of cases of multi-party collaboration in forestry, range, and watershed management issues.

NRSM 385 - Watershed Hydrology. 3 Credits.

Offered autumn and spring. Prereq., M 115 or M 121 or M 122 or M 151 or M 162 or M 171 or M 172. An introduction to physical and biological controls over water movement and storage in the environment, and how those controls are affected by land management practices.

NRSM 386 - Watershed Hydrology Lab. 1 Credit.

Offered autumn and spring. Coreq., NRSM 385 or consent of instr. An introduction to basic watershed measurement and analysis techniques. Lab exercises designed around the use of spreadsheets and computer graphics.

NRSM 389E - Ethics Forestry & Conservation. 3.000 Credits.

Offered autumn. Prereq., junior or senior standing. Theoretical and practical ethical issues affecting the management of natural resources in national forests and on other public lands.

Gen Ed Attributes: Ethical & Human Values Course

NRSM 391 - Special Topics. 12.000 Credits.

(R 12) Offered intermittently. Experimental offerings of visiting professors; new courses or one time offerings of current topics.

NRSM 392 - Independent Study. 1-3 Credits.**NRSM 395 - Community-Based Approaches to Wildlife Conservation. 1-6 Credits.**

Offered each summer by Northwest Connections. Via field-based study in western Montana, students learn emerging strategies for reducing human-wildlife conflicts while considering ecological, economical, and societal impacts. Coreq., ENST 395 Wildlife Policy & Rural Communities and Field Ecology of Threatened & Endangered Species in the Northern Rockies. The course emphasizes the multiple perspectives of stakeholders and the importance of striving for collaborative solutions to conflicts over wildlife management and controversial species.

NRSM 398 - Internship. 1-6 Credits.

Offered every term. Prereq., consent of department. Extended classroom experience that provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

NRSM 404 - Wilderness in American Context. 4 Credits.

An expansive treatment of the history of the wilderness preservation movement in the United States. Introduction to the successive influences of philosophy, science, art and politics on society's relationship with wilderness. Discussion of the Wilderness Act of 1964.

NRSM 405 - Mgt of Wilderness Resource. 4 Credits.

An ecology-based treatment of wilderness management. Brief overview of fundamental ecological principles followed by an examination of their specific and often unique applications to wilderness ecosystems. Presentation of basic wilderness management principles and guidelines. Discussion of nonconforming wilderness uses.

NRSM 406 - Wilderness Mgt Planning. 3 Credits.

Exploration of basic planning theory, concepts, effective plan writing, and the characteristics of successful planning and implementation. In-depth treatment of the Limits of Acceptable Change planning framework. Comparison and evaluation of the different planning approaches used by the four wilderness managing agencies.

NRSM 408 - Global Cycles and Climate. 3 Credits.

Offered spring even-numbered years. Same as CCS 408. An analysis of the earth's major global biogeochemical cycles with a focus on the ways and extent to which each of them influences and interacts with the global climate system.

NRSM 415 - Environmental Soil Science. 3 Credits.

Offered spring odd-numbered years Prereq., ENSC 245N or NRSM 210N or consent of instr. A detailed analysis of the physical, chemical and biological properties of soils and how they function, with a focus on soil processes and how they affect, and are affected by human activities. Specific topics include element cycling, water quality, the effects of environmental change soil biogeochemistry, plant-soil interactions, and the consequences of large-scale disturbances on soil processes.

NRSM 418 - Ecosystem Climatology. 3 Credits.

Interactions between the biosphere and atmosphere to advanced undergraduate students and graduate students. This course will explore the interactions between Earth's biosphere and atmosphere and how they affect climate over a range of scales. We will focus on the exchange of energy, mass, and important elements between the biosphere and atmosphere and how this exchange can lead to fascinating feedbacks in Earth's climate system. Basic physics and math is not required but it is recommended.

NRSM 422 - Nat Res Policy/Administration. 3 Credits.

Offered autumn and spring. Policy formation in the United States and a survey of the major resource policies interpreted in their historical and political contexts.

NRSM 424 - Community Forestry & Conservtn. 3 Credits.

Offered spring. Co-convened with NRSM 524. In-depth examination of the history, theory and management issues faced in community-driven forestry and conservation in the United States and abroad. Cannot get credit for both NRSM 424 and NRSM 524.

NRSM 425 - Nat Res & Envir Economics. 3 Credits.

Offered alternate spring. Prereq., ENSC 201S or FORS 320; and M 115, M 121, M 122, M 151, M 162, M 171, or 172. Introduction to analytical approaches for economic analysis of management of non-renewable resources, fisheries, forests, threatened and endangered species, and the atmosphere.

NRSM 426 - Climate and Society. 3 Credits.

Offered spring. Co-convened with NRSM 526. This course examines the social and political aspects of climate change, with a focus on international and domestic processes and cases. Cannot get credit for both NRSM 426 and NRSM 526.

NRSM 427 - Advanced Water Policy. 3 Credits.

Offered spring. This course explores the laws, policies, and judicial decisions that have shaped and continue to influence patterns of water allocation and access in the United States. The course offers a general introduction to U.S. water law, specifically highlighting regional and interstate differences in both surface and groundwater appropriation schemes. Important intersections between water policy and other major bodies of U.S. law and policy are investigated, including the U.S.-tribal trust responsibility, the Clean Water Act the Endangered Species Act, and federal hydropower relicensing processes. In addition, special attention is paid to unique aspects of Montana water law and policy as well as current issues of local and regional importance. Level: Undergraduate and Graduate

NRSM 449E - Climate Change Ethics/Policy. 3 Credits.

Offered autumn. Same as CCS 449E. This course focuses on the ethical dimensions of climate change policy. It will cover the following major topics: (1) climate change, personal and collective responsibilities, (2) ethics, climate change and scientific uncertainty, (3) distributive justice and international climate change negotiations, (4) intergenerational justice and climate change policy.

Gen Ed Attributes: Ethical & Human Values Course

NRSM 455 - Riparian Ecology & Management. 3 Credits.

Offered intermittently. Prereqs., successful completion or concurrent enrollment in NRSM 385 and completion of one of the following introductory ecology courses: BIOE 172, BIOE 370, BIOE 428, BIOE 447, BIOE 448, FORS 330, or NRSM 462. Importance of riparian/wetland areas and the complexities associated with their management for short and long term benefits.

NRSM 462 - Rangeland Ecology. 3 Credits.

Offered spring. NRSM 210N; and BIOO 105N or BIOB 170N or BIOE 172N or BIOB 160N or FORS 240; and FORS 201 or STAT 216 or SOCI 202 or WILD 240 or PSYX 222. We will discuss the ecological principles and processes that drive the structure and function of rangeland ecosystems. We will focus on the intersections of plant, animal, ecosystem, and landscape ecology. We will weave in discussions of management to understand how rangeland dynamics contribute and respond to differing management paradigms.

NRSM 465 - Foundations of Restoration Ecology. 3 Credits.

Offered spring. Prereq., graduate or junior or senior standing and NRSM 265 and one 300-400 level ecology courses: BIOE 370, BIOE 428, BIOE 447, BIOE 448, FORS 330, or NRSM 462; or consent of instructor. This course covers the primary ecological theories that inform the practice of ecological restoration. Topics include the dynamic nature of ecological systems, community assembly, biodiversity and ecosystem functioning, food web dynamics, ecological engineering, macroecology, and statistical issues and study design.

NRSM 475 - Environment & Development. 3 Credits.

Offered spring. Co-convened with NRSM 575. Examines key social forces that influence how individuals, groups and nation-states understand and live within their bio-physical environments, especially policies and processes relating to development, corporate capitalism, globalization, culture, class and other forms of power and social relations. Pays close attention to ways both indigenous and introduced resource use and management practices (including conservation) variably impact people of different races, classes, genders, cultures and livelihood practices. Cannot get credit for both NRSM 475 and NRSM 575.

NRSM 491 - Special Topics. 1-9 Credits.

(R 9) Offered intermittently. Experimental offerings of visiting professors; new courses or one time offerings of current topics.

NRSM 492 - Independent Study. 1-3 Credits.**NRSM 494 - Ecosystem Science and Restoration Seminar. 1 Credit.**

Offered spring. Prereq., senior standing and successful completion or concurrent enrollment in NRSM 495; and consent of instr. This seminar provides a forum for students to share the results of practicum projects conducted in NRSM 495. Each student will lead at least one seminar during the semester.

NRSM 495 - Ecosystem Science and Restoration Practicum. 1-6 Credits.

(R-6) Offered every semester. Prereq., senior standing in Ecosystem Science and Restoration and successful completion of NRSM 344, a faculty-approved practicum proposal; and consent of instructor. The goal of this service-learning practicum is for students to gain real-world experience in research, monitoring, or project implementation. Students will implement a project under the supervision of faculty and mentors from local management agencies, organizations or other sponsors.

NRSM 498 - Internship. 1-6 Credits.

Offered every term. Prereq., consent of instr. Extended classroom experience which provides practical application of classroom learning during placements off-campus. Prior approval must be obtained from faculty advisor and Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

NRSM 499 - Senior Thesis. 1-3 Credits.

(R-3) Offered autumn and spring. Prereq., senior standing and consent of instr. Preparation of a major paper based on study or research in a field selected according to the needs and objectives of the student.

NRSM 500 - Conserv Social Sci Methods. 3 Credits.

Offered autumn. Prereq., a course in statistics or consent of instr. The nature of scientific research, planning research projects, organization and presentation of research results. Level: Graduate

NRSM 513 - Nat Res Conflict Resolution. 3 Credits.

Offered autumn. Same as ENST 513 and LAW 613. Examines the basic framework for preventing and resolving natural resource and environmental conflicts in America. Reviews the history of alternative approaches, emphasizes the theory and practice of collaboration, and considers future trends. This highly interactive course uses lectures, guest speakers, case studies, and simulations. Level: Graduate

NRSM 515 - Enviro Negotiation Mediation. 3 Credits.

Same as COMM 515 and ENST 515. This course prepares students to effectively engage in multiparty negotiation on natural resource and environmental issues. It is grounded in theory and provides an opportunity to develop practical skills in both negotiation and facilitation/mediation. Guest speakers, case studies, and simulations allow students to develop, test, and refine best practices. The course is face-paced, highly interactive, and serves as the second of three required courses in the Natural Resources Conflict Resolution Program. Level: Graduate

NRSM 524 - Community Forestry & Conservtn. 3 Credits.

Offered spring. Co-convened with NRSM 424. In-depth examination of agroforestry, community forestry, and opportunities and constraints to the use of trees in rural development and protected areas management. Level: Graduate

NRSM 526 - Climate and Society. 3 Credits.

Offered spring. Co-convened with NRSM 426. This course applies relevant social and political theory to the problem of climate change and examines the social science of climate change. Cannot get credit for both NRSM 426 and NRSM 526. Level: Graduate

NRSM 532 - Forest Ecosystem Analysis. 3 Credits.

Offered spring. Graduate standing only. Logical strategies for transforming ecosystem complexity into simplified simulation models with emphasis on space/time scaling and environmental policy relevance. Level: Graduate

NRSM 560 - Am Wilderness Phil & Policy. 4 Credits.

History of the American Wilderness idea and associated policies, including the Wilderness Act and implementing regulations. Current management challenges also covered. Level: Graduate

NRSM 561 - Manag Wilderness Ecosystems. 4 Credits.

Ecosystem science and policies and management practices related to managing specific resources, such as air, wildlife, and water, within wilderness. Management of non-conforming uses is also covered. Level: Graduate

NRSM 563 - Wilderness Planning. 4 Credits.

Planning theory and effective plan development, including principles and practices of public involvement. Includes examination of primary planning frameworks. Level: Graduate

NRSM 570 - Political Ecology. 3 Credits.

Graduate seminar on key theories, issues and literature in the subfield of Political Ecology, an interdisciplinary environmental social science approach which integrates how political, economic, cultural and ecological processes interact and shape society nature relations. Case examples are drawn from both the North and South. Level: Graduate

NRSM 571 - Int'l Conserv & Develop. 3 Credits.

Offered spring. Prereq., graduate standing. Critical review of selected international natural resource development, conservation and management approaches and experiences. Level: Graduate

NRSM 574 - Perspectives in Human Dimensions. 3 Credits.

Consent of instructor. This course will provide graduate students with an understanding of multiple perspectives in human dimensions of natural resources. The course is intended to be broad in nature in order to provide students with a comprehensive understanding of the topics. Students will read and discuss foundational pieces by Orr and Leopold (among others) and explore newer readings on current research. The course will cover social psychological and sociological perspectives and discuss key issues such as scale, multidisciplinary research, sustainability and social diversity in natural resources. Students will be challenged to approach natural resources issues from multiple perspectives, not just the perspective they are most familiar with. Students will be able to communicate effectively among social scientists and be able to integrate diverse perspectives. Level: Graduate

NRSM 575 - Environment & Development. 3 Credits.

Offered spring. Co-convened with NRSM 475. Examines key social forces that influence how individuals, groups and nation-states understand and live within their bio-physical environments, especially policies and processes relating to development, corporate capitalism, globalization, culture, class and other forms of power and social relations. Pays close attention to ways both indigenous and introduced resource use and management practices (including conservation) variably impact people of different races, classes, genders, cultures and livelihood practices. Level: Graduate

NRSM 579 - Collaborative Conservation. 3 Credits.

(R-4) Offered every semester. Same as ENST 579 and LAW 679. Prerequisite, ENST 513 or consent of instructor. Designed as the capstone experience of the Natural Resources Conflict Resolution Program. Provides practical experience in multi-party collaboration and conflict resolution. Students may design their own project in consultation with the director of the NRCR Program, or participate in a project organized and convened by faculty. Projects may be conducted year-round. Level: Graduate

NRSM 594 - Seminar. 1-4 Credits.

(R-12). Offered intermittently. Prereq. graduate standing. Presentations by student, faculty, and associates on issues and topics in their field. Level: Graduate

NRSM 595 - Special Topics. 1-12 Credits.

(R-12) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one time offerings of current topics. Level: Graduate

NRSM 596 - Independent Study. 1-12 Credits.

(R-12) Offered every term. Prereq., consent of instr. Individual study or research problems. Level: Graduate

NRSM 597 - Graduate Research. 1-15 Credits.

(R-15) Offered every term. Independent graduate research in forest management, wood science, soils, wildlife management, silviculture, recreation and other topic areas. Level: Graduate

NRSM 598 - Internship. 1-2 Credits.

(R-12) Offered every term. Practical application of academic learning in an off-campus placement. Prior approval must be obtained from faculty supervisor. Level: Graduate

NRSM 599 - Professional Paper. 1-15 Credits.

(R-15) Offered every term. Professional paper preparation. Level: Graduate

NRSM 622 - Advanced Problems in Env Policy. 3 Credits.

Offered spring even-numbered years. Examines environmental policy problems and contemporary issues in environmental policy, law, and administration. Policy tools, concepts and research resources introduced. Numerous problems, themes, and issues in environmental policy analyzed. Readings-based seminar; students lead most reviews and discussions. Level: Graduate

NRSM 695 - Special Topics. 1-12 Credits.

(R-12) Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Level: Graduate

NRSM 697 - Graduate Research. 1-15 Credits.

(R-15) Offered every term. Independent graduate research in forest management, wood science, soils, wildlife management, silviculture, recreation and other topic areas. Level: Graduate

NRSM 699 - Thesis. 1-15 Credits.

(R-15) Offered every term. Thesis/dissertation preparation. Level: Graduate