NATURAL RESOURCES (NR)

Course numbers with the # symbol included (e.g. #400) have not been taught in the last 3 years.

NR 803 - Watershed Water Quality Management
Credits: 4
Principles of land use as they relate to water quality and quantity. Lectures focus on biogeochemical cycles and the watershed approach to land and water resource management. Labs and field trips focus on methods of water sampling and analysis. One year of chemistry is recommended. Lab/field trips.
Equivalent(s): WARM 803
Grade Mode: Letter Grading
Special Fee: Yes

NR 806 - Soil Ecology
Credits: 4
Examines the ecological relationships between soil microorganisms and their biotic and abiotic environment, with emphasis on the role of soil microorganisms in biogeochemical cycling. Specific objectives are to examine the biodiversity present in soil systems, factors controlling microbial community composition and diversity, and linkages between soil microbial communities, soil physical properties, and soil organic matter and nutrient cycling dynamics. Lab.
Equivalent(s): SOIL 806
Grade Mode: Letter Grading
Special Fee: Yes

NR 807 - Environmental Modeling
Credits: 4
Environmental Modeling introduces students to a range of key mathematical and computer modeling concepts and the ways they can be used to address important scientific questions. The course is divided into four topical sections: Population and Community Ecology, Hydrology, Biogeochemistry, and Ecosystems. In each section, modeling concepts and skills are presented together with environmental information to emphasize the linkage between quantitative methods and relevant scientific results.
Equivalent(s): EOS 807
Grade Mode: Letter Grading

NR 820 - International Environmental Politics and Policies for the 21st Century
Credits: 4
Students examine policies for managing human activities to sustain the health of regional ecosystems and planetary life-support systems. Selected problems of the international commons (oceans, marine resources, atmosphere, migratory species); global and regional carrying capacity (population, resource consumption), internationally shared ecosystems (trans-boundary watersheds, water-bodies, tropical forests); and the relevant international institutions and politics for policy formation, conflict resolution, and implementation. Using a policy-analytic framework, students develop case studies to assess international policies and institutional arrangements to achieve the objectives of Agenda 21--Earth Summit Strategy to Save the Planet.
Equivalent(s): EC 820
Grade Mode: Letter Grading

NR 824 - Resolving Environmental Conflicts
Credits: 4
Theories and practices of environmental dispute settlement. Roles of public, non-governmental and governmental organizations. Effectiveness of public participation initiatives in influencing public policy decisions and/or resolving environmental conflicts. Alternative approaches to consensus (policy dialogues, joint problem solving; strategic planning; negotiation, mediation) as well as litigation. Specific cases are critiqued and evaluated; conflict resolution skills are developed. Students observe and/or participate in ongoing local decision processes. Lab.
Equivalent(s): EC 824
Grade Mode: Letter Grading
Special Fee: Yes

NR 829 - Silviculture
Credits: 4
The science and art of establishing, growing, and tending forests to meet multiple objectives. Basics of forest stand dynamics applied to the problems of timber management, wildlife habitat, water quality, and carbon sequestration.
Grade Mode: Letter Grading
Special Fee: Yes

NR 830 - Terrestrial Ecosystems
Credits: 4
Processes controlling the energy, water, and nutrient dynamics of terrestrial ecosystems; concepts of study at the ecosystem level, controls on primary production, transpiration, decomposition, herbivory; links to Earth-system science, acid deposition, agriculture.
Equivalent(s): EOS 830
Grade Mode: Letter Grading

NR #834 - Tropical Ecology
Credits: 4
This course introduces students to the ecology of different tropical ecosystems, and involves students in analyzing and interpreting ecological field data and remotely sensed data. An important emphasis is to understand patterns and processes across scales - from individual plants to ecosystems and landscapes. The also addresses important global issues in the tropics, including climate change, land use change, diverse ecosystem services, and sustainable resource management.
Equivalent(s): FOR 834
Grade Mode: Letter Grading

NR 840 - Inventory and Monitoring of Ecological Communities
Credits: 4
Provides an introduction to the major concepts associated with monitoring change in ecological communities. Students develop an appreciation for such issues as: identification of appropriate baselines for comparison; use of indicator species; the tools used to inventory common, rare, and secretive species; how trend data are analyzed; and the implications of failing to detect an indicator species. Restricted to senior wildlife majors others by permission. Lab.
Grade Mode: Letter Grading
Special Fee: Yes

NR 843 - Addressing Arctic Challenges I
Credits: 4
Students will gain knowledge on the effect of climate change on Arctic environmental, social, and built systems, and apply transdisciplinary approaches to addressing arctic challenges. This course employs inquiry-based, peer-to-peer, and self-driven approaches. Students will tackle a research project, including in-depth data analysis in R, with the aim of contributing new knowledge in the form of a proposal, peer-reviewed publication, policy brief, outreach product, or other.
Grade Mode: Letter Grading

NR 844 - Biogeochemistry
Credits: 4
Examines the influence of biological and physical processes on elemental cycling and geochemical transformations from the molecular to the global scale, involving microorganisms, higher plants and animals and whole ecosystems; factors that regulate element cycles including soils, climate, disturbance and human activities; interactions among the biosphere, hydrosphere, lithosphere, and atmosphere; transformations of C, N, S, and trace elements.
Equivalent(s): EOS 813, EOS 844
Grade Mode: Letter Grading

NR 845 - Forest Management
Credits: 4
Forest land ownership; management objectives; forest inventory regulation and policy; forest administration; professional responsibilities and opportunities. Restricted to Natural Resources majors. Lab.
Equivalent(s): FOR 845
Grade Mode: Letter Grading
Special Fee: Yes

NR 849 - Forest Inventory and Modeling
Credits: 4
Applied sampling and statistical techniques for assessing current forest conditions and predicting future growth, yield, and structure. Topics include plot and point sampling, ecological inventory, and evaluation of site quality and stand density.
Grade Mode: Letter Grading
Special Fee: Yes

NR 851 - Aquatic Ecosystems
Credits: 4
Energy flow and nutrient cycling in streams, rivers and lakes, with an emphasis on understanding the control of primary productivity, decomposition and community structure by both hydrologic and biotic drivers. Role of aquatic ecosystems in carbon and nitrogen budgets at watershed, regional, and global scales. Impacts of environmental changes such as global climate change and suburbanization on aquatic ecosystems. Lab.
Grade Mode: Letter Grading

NR 857 - Remote Sensing of the Environment
Credits: 4
Practical and conceptual presentation of the use of remote sensing and other geospatial technologies for mapping and monitoring the environment. This course begins with the use of aerial photographs (photogrammetry, and photo interpretation) and includes measures of photo scale and area, parallax and stereo viewing, object heights, flight planning, photo geometry, the electromagnetic spectrum, camera systems and vegetation/land cover mapping. The course concludes with an introduction to other geospatial technologies including digital image analysis, global positioning (GPS), and geographic information systems (GIS). Conceptual lectures are augmented with practical homework assignments and hands-on lab exercises. Lab.
Grade Mode: Letter Grading
Special Fee: Yes

NR 859 - Digital Image Processing for Natural Resources
Credits: 4
Introduction to digital remote sensing, including multispectral scanners (Landsat and SPOT) radar, and thermal imagery. Hands-on image processing including filtering, image display, ratios, classification, registration, and accuracy assessment. GIS as it applies to image processing. Discussion of practical applications. Use of ERDAS image-processing software. Knowledge of PCs required.
Prerequisite(s): NR 857 with a minimum grade of B-.
Grade Mode: Letter Grading

NR 860 - Geographic Information Systems in Natural Resources
Credits: 4
This course in geographic information systems (GIS), covers advanced theory, concepts, and applications of GIS for natural resource and related disciplines. Discussion of database structures, data sources, spatial data manipulation/analysis/modeling, data quality and assessment. Students conduct a project of their design exploring aspects of GIS most useful to them. Lecture emphasizes concepts and applications through a text and selected peer-reviewed articles. Lab uses the latest version of ArcGIS software and provides hands-on experience.
Prerequisite(s): NR 658 with a minimum grade of D-.
Grade Mode: Letter Grading

NR 861 - Environmental Soil Chemistry
Credits: 4
Chemical transformations in soils are the basis for soil fertility and plant productivity in natural and managed ecosystems, and also influence key ecosystem processes including soil organic matter turnover and soil-atmosphere exchange of trace gases. This class will explore soil chemistry processes and transformations related to soil nutrient cycling, plant nutrient acquisition, and other critical environmental services.
Grade Mode: Letter Grading

NR 882 - Forest Health
Credits: 4
Forests cover over 30% of the land surface of the Earth and are incredibly important ecologically, economically, and to the health of the planet. While forests show great capacity to withstand disturbance, these ecosystems are increasingly threatened worldwide by climate change, native and introduced insects and disease, poor management practices, land clearing, drought, fire, and pollution. This course offers an overview of the dominant threats to forests, their causes and consequences, and options for monitoring, management, and mitigation.
Grade Mode: Letter Grading
Special Fee: Yes

NR 887 - Advanced Topics in Sustainable Energy
Credits: 4
This course will engage students in advanced topics in sustainable energy. Course reviews basic structure of our energy system, energy markets and economics, and the environmental, economic and technological of our energy landscape. Focus will be on electricity and building use with introductions to the transportation system. Students will gain the knowledge to evaluate innovations in technology, policy and financing necessary to implement sustainable energy goals from conservation and efficiency to renewables and energy storage.
Grade Mode: Letter Grading
Special Fee: Yes

NR 899 - Master's Thesis
Credits: 1-10
Master's Thesis. Usually 6 credits, but up to 10 credits when the problem warrants.
Repeat Rule: May be repeated for a maximum of 10 credits.
Grade Mode: Graduate Credit/Fail grading

NR 900 - Teaching Assistantship Practicum
Credits: 0
This course covers best practices, norms, and expectations in performing the duties of a teaching assistant. Strategies for effective grading, communication with students and instructors, and institutional policies are explored and reinforced.
Grade Mode: Graduate Credit/Fail grading

NR 903 - Approach to Research
Credits: 2
Provides incoming graduate students with an overview of the scientific method, peer review, and various research approaches and methods. Ethics, institutional and individual responsibilities, and effective communication are also addressed in a seminar and discussion format.
Grade Mode: Graduate Credit/Fail grading

NR 905 - Grant Writing
Credits: 2
The ability to secure financial support for research and outreach activities is becoming increasingly important. This course is intended for graduate and post-graduate level students who need to write proposals for their graduate work or to gain external funding from government agencies. Students will gain in-depth understanding of the proposal writing process through class discussions, insights shared by UNH faculty, and by writing a research proposal following the entire process.
Equivalent(s): SOIL 905, WARM 905
Grade Mode: Graduate Credit/Fail grading

NR #907 - Genomes to Phenomes Seminar
Credits: 1
This seminar-style class examines linkages between genotype, phenotype and fitness in natural populations through readings of the primary literature. Topics covered include organismal adaptation, evolutionary ecology, adaptive capacity, resilience to climate change, environmental genomics, microbiome evolution, and environmental DNA monitoring. Students will gain an appreciation for the role of genomics ecological, evolution, and conservation science.
Repeat Rule: May be repeated for a maximum of 2 credits.
Grade Mode: Graduate Credit/Fail grading

NR #908 - Landscape Genetics
Credits: 3
This course provides interdisciplinary training and overview of landscape genetics -- the application of genetic and genomic tools to the study of organismal connectivity, dispersal and gene flow across the landscape. The course caters to graduate students in both basic and applied ecology and ecological genetics/genomics. Through a combination of online lectures distributed across multiple participating institutions and in-class seminar-style format, students learn from international experts and discuss papers with local peers.
Grade Mode: Letter Grading

NR 909 - Analysis of Ecological Communities and Complex Data
Credits: 4
This course introduces you to a suite of tools appropriate for analyzing and interpreting multivariate data arising from agroecological (and other ecological) research. In this course we cover a variety of multivariate analyses, including clustering, ordination (principle components analysis, nonmetric multidimensional scaling, correspondence analysis), group comparisons (multi-response permutation procedures, PerMANOVA, indicator species analysis, discriminant analysis, mantel test), and other hypothesis-driven techniques, including structural equation modeling.
Grade Mode: Letter Grading

NR 913 - Hierarchical Modeling in Ecology
Credits: 4
This course uses modern Bayesian statistical modeling approaches to analyze ecological data, with an emphasis on applied hierarchical models. These models will be used to examine ecological systems and related topics including: population and community dynamics, experimental design, spatial patterns, species abundance and diversity, community organization, metapopulations, and landscape processes. To be successful in the course students should have taken a course in statistics and have working knowledge of the R programming language.
Grade Mode: Letter Grading

NR 947 - Ecosystem Science: Theory, Practice, and Management Applications for Sustainability
Credits: 4
This course is designed for graduate students to explore in detail the fundamental principles and practical application of ecosystem science. Emphasis will be placed on understanding historical context as well as the most recent peer-reviewed literature. Writing assignments will emphasize local, regional, and international applications of ecosystem science to address environmental sustainability.
Grade Mode: Letter Grading

NR 965 - Community Ecology
Credits: 4
This course investigates how community properties -- species richness, and abundance distribution -- are influenced by evolutionary history, landscape phenomena such as dispersal and migration, and local factors such as the physical environment, disturbance, competition, predation, and positive interactions. Mechanistic models of community dynamics, including succession, are discussed. The influence of species diversity on ecosystem function is discussed, and all aspects of the course are related to conservation science.
Equivalent(s): NR 865
Grade Mode: Letter Grading

NR 977 - Just Maps: Cartographies of Environmental Justice
Credits: 4
Maps are ubiquitous. We carry them in our pockets, hang them on walls. We use maps to orient ourselves and rely on them to make meaning of social-environmental information. But whose space and time to maps employ? How do maps construct knowledge and to what social and political ends? What power dynamics do maps reflect and how do they become powerful themselves? This course explores such questions with focus on environmental in/justice. Completion of a GIS/Mapping course required prior to taking this course.
Grade Mode: Letter Grading

NR 993 - Natural and Environmental Resources Seminar
Credits: 2
Presentation and discussion of recent research, literature, and policy problems in the natural and social sciences influencing resource use.
Grade Mode: Graduate Credit/Fail grading

NR 995 - Investigations
Credits: 1-4
Investigations in Natural Resources may include topics in environmental conservation, forestry, soil science, water resources, and wildlife management.
Grade Mode: Letter Grading

NR 996 - Natural Resource Education
Credits: 2
Responsibilities include set-up, teaching, and grading of one lab section per week or equivalent lecture experience. Meets the teaching requirement for M.S. degree students.
Grade Mode: Graduate Credit/Fail grading

NR 998 - Directed Research
Credits: 1-4
Student designs and conducts original research that culminates in a paper of publishable quality. Alternative to NR 899 for those choosing non-thesis degree option. IA (continuous grading).
Repeat Rule: May be repeated for a maximum of 4 credits.
Grade Mode: Graduate Credit/Fail grading