Natural Resources Management (NRM)

College of Natural Science and Mathematics
Department of Natural Resources and Environment (https://www.uaf.edu/nne/)
907-474-7188

NRM F101  Natural Resources Conservation and Policy
3 Credits
Offered Fall
History of natural resources conservation and policy in the United States, including the evolution of federal land and water management agencies and policies. Case studies of current natural resource conservation issues, both in the United States and internationally, that examine the interaction of society and the environment and explore solutions.
Prerequisites: Placement in WRTG F111X.
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

NRM F102  Practicum in Natural Resources Management
1-2 Credits
Practical experience in natural resources management. Supervised individual study on a farm, in a greenhouse, managed forest, agency or business, or another approved location.
Prerequisites: Natural Resource Management majors only and permission of instructor.
Lecture + Lab + Other: 1-2 + 0 + 0
Grading System: Pass/Fail Grades
Repeatable for Credit: May be taken 2 times for up to 2 credits

NRM F111X  Introduction to Sustainability Science
3 Credits
Offered Spring
The field of sustainability science provides a useful framework for understanding and responding to complex environmental problems. This course introduces the theory and principles that form the basis of sustainability science, focusing on feedbacks between society and the environment with an emphasis on environmental and related change in Alaska.
Prerequisite: Placement in WRTG F111X.
Attributes: UAF GER Social Sciences Req
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

NRM F112X  Our Changing Climate: Past, Present, Future
3 Credits
Offered Fall and Spring
Examines how the biophysical impacts of climate change define and intersect with social, ecological, economic, political and cultural dimensions of our lives. Provides a foundation in both Indigenous and Western science perspectives of the causes, impacts and feedbacks of a changing climate. Includes theoretical and project-based experience in climate change.
Prerequisites: Placement in WRTG F111X.
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

NRM F161  Wilderness Leadership Education
3 Credits
Offered As Demand Warrants
This course introduces students to many hard and soft skills necessary to be an effective outdoor leader and educator. These foundational skills are developed through classroom learning, readings and hands-on experience in the field. Students will learn to minimize risk and impact while maximizing enjoyment and learning in the field. Field program requires travel through rough un-trailed terrain with heavy packs and average strength and stamina. No use of alcohol, tobacco, illegal drugs or firearms.
Recommended: BIOL F104X, NRM F101 and physical geography.
Special Notes: The field portion of the course includes detailed instruction in and mentored experience with modern backcountry travel techniques.
Lecture + Lab + Other: 0.5 + 0 + 6
Grading System: Letter Grades with option of Plus/Minus

NRM F204  Public Lands Law and Policy
3 Credits
Offered Spring
Background on selected federal lands management legislation and agency policies affecting resources conservation, development and preservation.
Prerequisites: Sophomore class standing.
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

NRM F210  Principles of Sustainable Agriculture
3 Credits
Offered Spring
Basic principles of sustainable agriculture including economic, social, and environmental concepts. Agroecology is introduced as the basis for sustainable soil, plant, and animal agriculture techniques. Sustainable agriculture concepts will be related to current issues such as population growth, resource availability, and developing social structures and preferences.
Prerequisites: NRM F101, BIOL F116X, CHEM F106X or FISH F110.
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

NRM F211  Introduction to Applied Plant Science
3 Credits
Offered Fall
Basic principles and requirements for plant growth and development with special attention to the production and management of field and greenhouse grown crops.
Lecture + Lab + Other: 2 + 3 + 0
Grading System: Letter Grades with option of Plus/Minus

NRM F212  Greenhouse Management
3 Credits
Offered Spring
The greenhouse as a controlled environment for research, education and commercial production of plants; the physical environment; environmental controls and monitors; plant cultivation techniques and crop scheduling useful in plant science and commercial production.
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus
NRM F240  Natural Resources Measurement and Inventory  
3 Credits  
Offered Fall Even-numbered Years  
Techniques and instrumentation used to measure and inventory natural resources, including land, timber, range, wildlife, water and recreation resources.  
Prerequisites: MATH F151X.  
Lecture + Lab + Other: 2 + 3 + 0  
Grading System: Letter Grades with option of Plus/Minus  

NRM F277  Introduction to Conservation Biology  
3 Credits  
Offered Spring Even-numbered Years  
Introduction to the basic ecological, genetic, management, legal and historical developments in conservation biology and focused efforts to manage biological diversity resources, with a status review of important habitats and endangered species.  
Prerequisites: BIOL F115X; BIOL F116X.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus  

NRM F290  Field Course of Natural Resource Management Complexity in Alaska  
2 Credits  
Offered Spring  
A 10-day field course examining ecological and societal factors that create challenges to sustainable management of Alaska's natural resources. Topics include agriculture, forestry, fisheries, wildlife management, wildland fire response and management, energy development, recreation and tourism.  
Prerequisite: Permission of instructor.  
Lecture + Lab + Other: 1 + 0 + 3  
Grading System: Letter Grades with option of Plus/Minus  

NRM F300  Internship in Natural Resources Management  
1-3 Credits  
Offered As Demand Warrants  
Supervised pre-professional experience in a business or agency (public or private). Open to students majoring or minoring in natural resources management only. Course may be repeated for credit up to a maximum of 6 credits.  
Prerequisites: NRM F101; junior standing with 3.0 GPA; permission of instructor; an approved internship plan.  
Lecture + Lab + Other: 0 + 0 + 3-10  
Grading System: Letter Grades with option of Plus/Minus  
Repeatable for Credit: May be taken 6 times for up to 6 credits  

NRM F303X  Environmental Ethics and Actions  (h)  
3 Credits  
Offered Spring  
Exploration of the history of modern Western views of the relationship between people and nature, alternative foundations for an environmental ethic (utilitarianism, spiritual activity, rights-based and respect-based ethics) and practices of such ethics in business, profession and general lifestyle today.  
Prerequisites: Junior standing; placement in WRTG F111X.  
Attributes: UAF GER Ethics Req  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus  

NRM F313  Introduction to Plant Pathology  
4 Credits  
Offered As Demand Warrants  
Plant pathology; non-parasitic and parasitic causes of plant diseases; methods of plant infestation and mechanism of plant defenses; epidemiology and disease control.  
Prerequisites: BIOL F115X; BIOL F116X.  
Recommended: BIOL F239.  
Lecture + Lab + Other: 3 + 3 + 0  
Grading System: Letter Grades with option of Plus/Minus  

NRM F338  Introduction to Geographic Information Systems  
3 Credits  
Offered Fall  
Geographic data concepts including mapping systems, data sources, editing data, GIS analysis and computer mapping. Introduction to global positioning systems. GIS applications in natural resources management.  
Prerequisites: Knowledge of PCs or Unix workstations desirable.  
Lecture + Lab + Other: 2 + 3 + 0  
Grading System: Letter Grades with option of Plus/Minus  

NRM F351  Advanced Wilderness Leadership Education  
3 Credits  
Offered Spring  
Natural environment, concentrating on outdoor leadership, environmental ethics, minimum impact camping, forest and Arctic natural history, and adaptable judgment and decision-making. Includes boreal forest and along tundra-ridge hiking, river crossing, glacier ascent, and skills to do these activities safely. Other possible travel mediums include sea kayaks, canoes or rock climbing. No use of alcohol, tobacco, illegal drugs or firearms.  
Prerequisites: NRM F101; NRM F181.  
Special Notes: Three lecture sessions will preview a demanding educational field program of 5-15 days requires travel through rough un-trailed terrain with heavy packs or boats and average strength and stamina.  
Lecture + Lab + Other: 0.5 + 0 + 6  
Grading System: Letter Grades with option of Plus/Minus  

NRM F365  Principles of Outdoor Recreation Management  
3 Credits  
Offered Fall Even-numbered Years  
Theories, practices, economics and problems fundamental to the use of land and related natural resources for recreation. The course focuses on human dimension related issues faced by recreation managers and research to address those issues.  
Prerequisites: NRM F101; STAT F200X; junior standing.  
Lecture + Lab + Other: 3 + 3 + 0  
Grading System: Letter Grades with option of Plus/Minus  

NRM F370  Introduction to Watershed Management  
3 Credits  
Offered Fall Odd-numbered Years  
The hydrologic cycle and the influence of land management techniques on water quantity, quality and timing. Water yield, soil erosion and non-point pollution, snowpack management, and land use alternatives.  
Prerequisites: NRM F101 or NRM F111X.  
Lecture + Lab + Other: 2 + 3 + 0  
Grading System: Letter Grades with option of Plus/Minus
NRM F375  Natural Resource Ecology  
3 Credits  
Offered Spring  
Basic ecology concepts, including physical (wind, temperature, water, etc.), biotic (population and community dynamics), genetic successional and landscape dynamics will be covered. Basic physiological characteristics of trees, succession, vegetation classification, and related concepts. Stand structure, diversity, competition, growth, forest-soil interactions, biomass, nutrient distribution and dynamics, energy relations, ecology of disturbances.  
Prerequisites: NRM F240.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F380  Soils and the Environment  
3 Credits  
Offered Fall  
Soil development and classification; physical and chemical properties; biological activity; water movement and nutrient cycling in natural and manipulated ecosystems.  
Prerequisites: CHEM F105X; WRTG F211X, WRTG F212X, WRTG F213X or WRTG F214X.  
Lecture + Lab + Other: 2 + 3 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F407  Environmental Law  
3 Credits  
Offered Spring Odd-numbered Years  
The role of common law theory in regulatory, statutory and constitutional interpretation in the field of environmental protection, including air and water pollution, toxic/hazardous substances and land-use regulation.  
Prerequisites: Junior or senior class standing.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F430  Resource Management Planning  
3 Credits  
Offered Spring  
Application of planning and conflict resolution principles to natural resources management. Examines plans prepared in response to current Alaska resource disputes, including wolf, brown bear, boreal forest and recreation river plans. Includes public involvement, consensus building, the basic steps in the planning process and resource dispute simulations. Review resource management plans and develop plans for a local resource management issue.  
Prerequisites: Senior standing.  
Stacked with NRM F630.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F435  GIS Analysis  
4 Credits  
Offered Spring  
GIS analysis of natural resources including spatial query, attribute query, vector, grid, image, topographic and network analysis techniques.  
Lecture + Lab + Other: 3 + 3 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F453  Harvesting and Utilization of Forest Products  
3 Credits  
Offered Fall Odd-numbered Years  
Manual and mechanized timber harvesting systems including timber cutting, yarding and transport processes. Technology of processing wood into various products. Introduction to supply and demand of forest products from a world, state and local perspective. Labs include visits to local forest products companies, chainsaw safety and wood identification.  
Prerequisites: NRM F101.  
Lecture + Lab + Other: 2 + 3 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F461  Interpretive Services  
3 Credits  
Offered As Demand Warrants  
Naturalist and other visitor programs in outdoor recreation areas: philosophy, planning and development of interpretive programs; resources, agencies, users, interpretive media and program evaluation.  
Prerequisites: Junior standing.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F466  Environmental Soil Chemistry  
3 Credits  
Offered Spring Odd-numbered Years  
Covers basic principles of soil chemical processes, including soil solution chemistry: precipitation/dissolution and soil colloids; soil solid phase; soil acidity/alkalinity; adsorption and ion exchange; reduction/oxidation reactions; and kinetics of soil chemical processes. Labs include soil chemical analyses, computer simulation models for soil chemistry, and experience writing technical reports.  
Prerequisites: CHEM F105X; CHEM F106X; NRM F380.  
Lecture + Lab + Other: 2 + 3 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F469  Survey Research in Human Dimensions of Natural Resources  
3 Credits  
Offered Spring  
Social science concepts applied to survey-based human dimensions research. Survey research methods including operationalizing research questions into measurable variables, designing survey instruments, assessing reliability and validity, developing a sampling plan, data management, data analysis, and reporting results.  
Prerequisites: NRM F101; STAT F200X.  
Stacked with NRM F669.  
Lecture + Lab + Other: 2 + 3 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F480  Soil Management for Quality and Conservation  
3 Credits  
Offered Fall Odd-numbered Years  
Managing soil in disturbed and natural ecosystems to reduce soil losses and maintain or improve soil quality. Methods for maintaining soil quality, preserving soil against loss from erosion, remediating contaminated soil and reclaiming degraded soils.  
Prerequisites: NRM F380.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus
NRM F484  Senior Thesis in Natural Resources Management  2 Credits  
Problem-solving with emphasis on writing and analysis. Individual project under the guidance of faculty sponsor involving formulation of a question in natural resources management and preparation of a formal, comprehensive written report. Final thesis and presentation.  
Prerequisites: GEOS F483 and permission of instructor.  
Lecture + Lab + Other: 2 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F485  Soil Biology  (n)  3 Credits  
Offered Fall Even-numbered Years  
Major groups of organisms in the soil and their interrelationships; the major biological processes which take place in the soil and their significance to soil productivity, plant growth and environmental quality; and methodology for studying soil organisms and soil biological processes.  
Prerequisites: A course in biology or microbiology and a course in soils.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F489  Alaska Soil Geography Field Trip  1 Credit  
Offered Summer; As Demand Warrants  
Soil geography transect from Pacific(Anchorage) to Arctic(Deadhorse) coast. Hands-on experience describing and sampling soils, with emphasis on how a variety of ecological factors and climate affect soil formation and classification.  
Prerequisites: NRM F380, or a course in soils.  
Stacked with NRM F489.  
Special Notes: Students must provide their own camp gear, be able to walk on uneven or rocky ground and be physically fit for fieldwork.  
Lecture + Lab + Other: 1 + 0 + 0  
Grading System: Pass/Fail Grades

NRM F601  Research Methods in Natural Resources Management  2 Credits  
Offered Fall  
Introduction for graduate students to the research methods employed in the various fields of resource management, including agriculture, forestry, ecology and social sciences. Designed to acquaint students with the relationship between theory and research, the nature of scientific inquiry, approaches to research, the sequence of steps involved in scientific investigation and the presentation of research results.  
Prerequisites: Graduate standing.  
Lecture + Lab + Other: 2 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F613  Resilience Internship  2 Credits  
Offered As Demand Warrants  
Students of the Resilience and Adaptation Program participate in internships to broaden their interdisciplinary training, develop new research tools and build expertise outside their home disciplines. Internships are for eight to ten weeks of full time commitment and take place during the student's first summer in the program. In summer students meet to discuss their internship experiences and make public presentations.  
Prerequisites: ANTH F687, BIOL F687, CON F687 or NRM F687; ANTH F688, BIOL F688, ECON F688 or NRM F688.  
Cross-listed with ANTH F687; BIOL F613; ECON F613.  
Lecture + Lab + Other: 2 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F616  Ecological Background for Resilience and Adaptation  1 Credit  
Offered Fall  
Provides the ecological background that is necessary for understanding the role of ecology in complex systems involving interactions among biological, economic, and social processes. Designed for incoming students of the Resilience and Adaptation Program (RAP), who have not received training in ecology.  
Prerequisites: Graduate standing.  
Cross-listed with BIOL F616.  
Lecture + Lab + Other: 1 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F630  Resource Management Planning  3 Credits  
Offered Spring  
Application of planning and conflict resolution principles to natural resources management. Examines plans prepared in response to current Alaska resource disputes, including wolf, brown bear, boreal forest and recreation river plans. Includes public involvement, consensus building, the basic steps in the planning process and resource dispute simulations. Review resource management plans and develop plans for a local resource management issue.  
Prerequisites: Graduate standing.  
Stacked with NRM F430.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F637  Evolution of Conservation Concepts and Policy  3 Credits  
Offered As Demand Warrants  
Resource policy issues development and implementation including forestry, mining, fisheries, oil, wildlife and other topics as demand warrants. Focus on policy issues involved in management of Alaska's resources.  
Prerequisites: Graduate standing.  
Cross-listed with ECON F637.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F638  GIS Programming  3 Credits  
Offered Spring Odd-numbered Years  
GIS programming for ArcView, Arc/Info and ArcGIS. Programming techniques for customizing GIS, efficient batch processing, and development of custom tools for GIS display and analysis.  
Prerequisites: NRM F338.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus

NRM F641  Natural Resource Applications of Remote Sensing  3 Credits  
Offered Spring Even-numbered Years  
Application of remote sensing for inventory and analysis of natural resources. Topics include aerial photography applications and digital remote sensing, including image display, rectification, classification and accuracy assessment.  
Prerequisites: NRM F338.  
Lecture + Lab + Other: 3 + 0 + 0  
Grading System: Letter Grades with option of Plus/Minus  
Repeatable for Credit: May be taken 6 times for up to 6 credits
NRM F647  Sustainability in the Changing North
3 Credits
Offered Fall
Explores the basic principles of sustainability of environmental and social systems. Principles are applied across a range of scales from local communities to the globe, with an emphasis on examples in Alaska and the Arctic. Specific attention to the theory and practice of boundary spanning and knowledge coproduction.
Prerequisites: Graduate standing.
Cross-listed with ANTH F647; BIOL F647; ECON F647.
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

NRM F649  Integrated Assessment and Adaptive Management
3 Credits
Offered As Demand Warrants
An interdisciplinary exploration of the theoretical and practical considerations of integrated assessment and adaptive management. Students survey concepts important in understanding societal and professional-level decision-making. Students work as individuals and as a team to undertake case studies with relevance to integrated assessment and adaptive management.
Prerequisites: Graduate student standing in a natural science, social science or interdisciplinary program at UA or another university.
Recommended: ANTH F647, BIOL F647, ECON F647, NRM F647; ANTH F657, BIOL F657, ECON F657, NRM F657.
Cross-listed with ANTH F649; BIOL F649; ECON F649.
Special Notes: In case of enrollment limit, priority will be given to graduate students in the Resilience and Adaptation Program in order for them to be able to meet their core requirements.
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

NRM F656  Sustainable Livelihoods and Community Well-being
3 Credits
Offered Fall
Review principles governing the sustainability of systems, cultural practices and behaviors that enhance or degrade sustainable livelihoods and community wellbeing. Emphasis is on historical context of sustainability, nature and magnitude of the social, economic and ecological dimensions of contemporary change, and "best practices" for communities to respond effectively to change.
Prerequisites: Graduate standing.
Cross-listed with CCS F656.
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

NRM F672  Nutrient Cycling
3 Credits
Offered Spring Odd-numbered Years
Examination of physical, chemical and biological processes controlling nutrient element recycling, availability and retention in natural and managed ecosystems.
Prerequisites: CHEM F106X; NRM F375 or BIOL F371; NRM F380.
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus
NRM F685  Soil Microbiology and Biochemistry
3 Credits
Offered As Demand Warrants
Current topics in soil microbiology and biochemistry. Based on readings from
the primary literature and discussions in class. Each student will be expected
to lead at least one discussion, write a research proposal and present the
proposal to class.
Prerequisites: At least one course in soil science; one course in
microbiology.
Lecture + Lab + Other: 3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus

NRM F689  Alaska Soil Geography Field Trip
1 Credit
Offered Summer As Demand Warrants
Soil geography transect from Pacific (Anchorage) to Arctic (Deadhorse)
coast. Hands-on experience describing and sampling soils, with emphasis
on how a variety of ecological factors and climate affect soil formation and
classification.
Prerequisites: NRM F380, or a course in soils.
Stacked with NRM F489.
Special Notes: Students must provide their own camp gear, be able to walk
on uneven or rocky ground and be physically fit for fieldwork.
Lecture + Lab + Other: 1 + 0 + 0
Grading System: Pass/Fail Grades

NRM F692  Graduate Seminar
1-3 Credits
Topics in natural resources management and geography explored through
readings, student presentations, group discussions and guest speakers.
Prerequisites: Graduate standing.
Lecture + Lab + Other: 1-3 + 0 + 0
Grading System: Letter Grades with option of Plus/Minus
Repeatable for Credit: May be taken 3 times for up to 3 credits

NRM F698  Non-thesis Research/Project
1-9 Credits
Lecture + Lab + Other: 0 + 0 + 0
Grading System: Pass/Fail Grades
Repeatable for Credit: May be taken unlimited times for up to 99 credits

NRM F699  Thesis
1-12 Credits
Lecture + Lab + Other: 0 + 0 + 0
Grading System: Pass/Fail Grades
Repeatable for Credit: May be taken unlimited times for up to 120 credits

NRM F699A  Thesis
1-12 Credits
Lecture + Lab + Other: 1-12 + 0 + 0
Grading System: Pass/Fail Grades
Repeatable for Credit: May be taken unlimited times for up to 99 credits