Fall 2009
Course Offerings

Initially developed by Virginia Tech and the USDA Forest Service, the Natural Resources Distance Learning Consortium has expanded to include natural resource programs from 10 accredited (MSACS, NCCU or SACS) universities across the U.S. Consortium members offer:

- Individual courses
- Professional Certificates of Study
- Graduate Professional Degree Programs

Our mission is to deliver courses to web-based students—particularly working adults who would are unable to travel to on-campus locations but are nonetheless committed to professional development.

Academic calendars, admissions deadlines and other important dates vary by university, as do admissions requirements, tuition and fees, and even course delivery methods, so for each of the institutions included in this document we've provided a name and contact information of an individual who can answer your questions and provide the guidance necessary to make your entry into distance learning as smooth as possible.

If you have any questions about the NRDLC or this brochure, please feel free to contact:

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REM221	Ecology	UI
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WILD6400	Ecology of Animal Populations	USU

Economics

AREC250	Introduction to Environmental Economics & Policy	ORState
AREC351	Natural Resource Economics and Policy	ORState
CEDEV430	Principles of Community Economic Development	PSU
CEDEV452	Rural Organization	PSU
CEDEV500	Community & Economic Development and Leadership	PSU
CEDEV509	Population, Land Use and Municipal Finance	PSU
SNR521	Economics of Sustainable Natural Resource Management	ORState

Entomology

ENT311	Introduction to Insect Pest Management	ORState
ENT317	Turfgrass Insect Pest Management	PSU

Fire Management

FOR346	Topics in Wildland Fire	ORState
FOR426	Wildland Fire Management and Ecology	UI
FW436	Wildland Fire Science and Management	ORState

Fisheries

FW251	Principles of Fish and Wildlife Conservation	ORState
FW255	Field Sampling of Fish and Wildlife	ORState
FW320	Introduction of Population Dynamics	ORState
FW321	Fisheries and Wildlife Resource Ecology	ORState
FW323	Management Principles of Pacific Salmon in the Northwest	ORState
FW360	Origins of Fish & Wildlife Mgmt.: Evolution, Genetics & Ecology	ORState
FW520	Ecology and Management of Marine Fisheries	ORState
FW531	Dynamics of Marine Biological Resources	ORState
FW554	Fisheries Biology	ORState
MRM35	Rights-Based Fisheries Management	ORState

Forestry

FO4323	Forest Resource Management	MSState
FO4423	Professional Practice	MSState
FO6323	Forest Resource Management	MSState
FO6423	Professional Practice	MSState
FOR318	Forest Pathology	NCSU
FW350	Urban Forestry	ORState

SNR534	Reduced Impact Timber Harvest	ORState

Genetics

BI311	Genetics	ORState
FW360	Origins of Fish & Wildlife Mgmt.: Evolution, Genetics & Ecology	ORState

Geography

GEO301	Map and Image Interpretation	ORState
OC103	Exploring the Deep: Geography of the World's Oceans	ORState

Geology

GEO102	The Surface of the Earth	ORState
GEO221	Environmental Geology	ORState
GEO308	Global Change and Earth Science	ORState
GEO380	Earthquakes in the Pacific Northwest	ORState
GEO487	Hydrogeology	ORState

GIS

ECE6413	Digital Signal Processing	MSState
FW303	Survey of GIS in Natural Resources	ORState
GEO301	Map and Image Interpretation	ORState
GEO465	Geographic Information Systems and Science	ORState
GEO565	Geographic Information Systems and Science	ORState
GEOG424	GIS Hydrologic Applications of GIS and Remote Sensing	UI
GEOG482	The Nature of Geographic Information	PSU
GEOG483	Problem-Solving with GIS	PSU
GEOG484	GIS Database Development	PSU
GEOG485	GIS Programming and Customization	PSU
GEOG486	Cartography and Visualization	PSU
GEOG487	Environmental Applications of GIS	PSU
GEOG488	Acquiring and Integrating Geospatial Data	PSU
GEOG496	Independent Studies – GIS	PSU
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GR4303	Principles of GIS	MSState
GR4990	Geospatial Technologies	MSState
GR6303	Principles of GIS	MSState
GR6990	Geospatial Technologies	MSState
NR402	GIS Applications in Natural Resources	UI
NR595	GIS Applications in Hydrology	NCSU
PRT462	Introduction to Geographic Information Systems	NCSU
PRT532	Principles of Geographic Information Science	NCSU
PRT533	Application Issues in Geographic Information Systems	NCSU
WATS6920	Geographical Information Systems	USU

GPS

ECE6413	Digital Signal Processing	MSState
GEOG583	Geospatial System Analysis and Design	PSU
GEOG882	Geographic Foundations of Geospatial Intelligence	PSU

GEOG585	Open Web Mapping	PSU
GEOG884	GIS for the Geospatial Intelligence Professional	PSU
GEOG883	Remote Sensing for the Geospatial Intelligence Professional	PSU
GEOG889	Virtual Field Exercise for the Geospatial Intelligence Professional	PSU
GR6990	Geospatial Technologies	MSState

Human Dimensions

ANTH481	Natural Resources and Community Values	ORState
ANTH581	Natural Resources and Community Values	ORState
COMM550	Communication and the Practice of Science	USU
ENVS4000	Human Dimensions of Natural Resource Management	USU
FOR542	Human Dimensions	SFASU
FOR560	American Wilderness Philosophy and Policy	UMT
FW340	Multicultural Perspectives in Natural Resources	ORState
FW350	Endangered Species, Society and Sustainability	ORState
HST481	Environmental History of the United States	ORState
NR5854	Natural Resources Communication Applications	VT
SNR522	Basic Beliefs and Ethics in Natural Resources	ORState
WRP599	Special Topics: Water Governance and Conflict Management	ORState

Interpretation

FOR493	Environmental Interpretation	ORState
FOR567	Oral Interpretive Programs	SFASU
FOR568	Interpretive Writing	SFASU
FOR571	Curriculum-Based Interpretive Programs	SFASU
FOR572	Interpretive Planning	SFASU
FOR573	Interpretive Leadership	SFASU
FOR593	Environmental Interpretation	ORState

Lands Valuation

NR5684	Foundations of Federal Land Management	VT

Law and Policy

AREC250	Introduction to Environmental Economics & Policy	ORState
AREC351	Natural Resource Economics and Policy	ORState
ENVS6900	Special Topics – Introduction to Natural Resource Policy	USU
FW620	Ecological Policy	ORState
NR5344	Natural Resources Law and Policy	VT
PS475	Environmental Politics and Policy	ORState
PS477	International Environmental Politics and Policy	ORState
PS575	Environmental Politics and Policy	ORState
PS577	International Environmental Politics and Policy	ORState

Leadership

CEDEV500	Community & Economic Development and Leadership	PSU

Marine Systems

FW302	Biology and Conservation of Marine Mammals	ORState
FW431	Dynamics of Marine Biological Resources	ORState
FW520	Ecology and Management of Marine Fishes	ORState

FW531	Dynamics of Marine Biological Resources	ORState
OC103	Exploring the Deep: Geography of the World's Oceans	ORState

Meteorology

METEO101	Understanding Weather Forecasting	PSU
METEO241	Fundamentals of Tropical Forecasting	PSU
METEO410	Advanced Topics in Weather Forecasting	PSU

Natural Resource Management

ANTH481	Natural Resources and Community Values	ORState
ANTH581	Natural Resources and Community Values	ORState
AREC351	Natural Resource Economics and Policy	ORState
ENVS6530	Natural Resources Administration	USU
FOR365	Issues in Natural Resources and Conservation	ORState
NR5344	Natural Resources Law and Policy	VT
NRM790	Scientific Writing and Presentations	UT-M
SNR506	Independent Project in Natural Resource Sustainability	ORState
SNR511	Sustainable Natural Resource Development	ORState

Rangeland Management

REM459	Rangeland Ecology	UI
RNG253	Wildland Plant Identification	ORState

Recreation

FOR407	Management of Recreation Resources	UMT
NR5644	Interdisciplinary Recreation Planning	VT
PRT152	Introduction to Parks, Recreation and Tourism	NCSU
PRT200	Leisure Behavior, Health and Wellness	NCSU
PRT500	Theories of Leisure and Recreation	NCSU
PRT595	Special Topic: Sport & Recreation Financial Management	NCSU
FOR562	Managing Recreation Resources in Wilderness Settings	UMT

Restoration

FW445	Ecological Restoration	ORState
FW545	Ecological Restoration	ORState

Soils

AGET720	Advanced Soil and Water Conservation Engineering	UT-M
CSS205	Soils: Sustainable Ecosystems	ORState
CSS395	World Soil Resources	ORState
CSS499	Special Topics: Crop Science and Soil Science	ORState
CSS599	Special Topics: Crop Science and Soil Science	ORState

Statistics

STAT480	Introduction to SAS	PSU
STAT505	Applied Multivariate Statistical Analysis	PSU

Toxicology

ENVS409	Principles of Environmental Toxicology	UI
ENVS509	Principles of Environmental Toxicology	UI

TOX201	Poisons, People and the Environment	NCSU
TOX415	Environmental Toxicology and Chemistry	NCSU
TOX415P	Environmental Toxicology and Chemistry	NCSU

Turfgrass

ENT317	Turfgrass Insect Pest Management	PSU
PPATH412	Turfgrass Disease Management	PSU
TURF230	Turfgrass Pesticides	PSU
TURF235	The Turfgrass	PSU
TURF238	Turf and Ornamental Weed Control	PSU
TURF425	Turfgrass Cultural Systems	PSU
TURF436W	Turfgrass Management Systems	PSU
TURF490	Colloquium	PSU
TURF495	Internship	PSU

Water Resources

AGET720	Advanced Soil and Water Conservation Engineering	UT-M
CSS573	Planning and Decision-Making for Watershed Management	UI
FOR462	Watershed Science and Management	UI
FW531	Dynamics of Marine Biological Resources	ORState
NR595	GIS Applications in Hydrology	NCSU
RNG355	Desert Watershed Management	ORState
WRP599	Special Topics: Water Governance and Conflict Management	ORState

Wetlands

FISH540	Wetlands Restoration	UI
FOR462	Watershed Science and Management	UI
FW479	Wetlands and Riparian Ecology	ORState
FW579	Wetlands and Riparian Ecology	ORState

Wilderness

FOR404	Wilderness in the American Context	UMT
FOR405	Managing in Wilderness Resources	UMT
FOR406	Wilderness Management Planning	UMT
FOR560	American Wilderness Philosophy and Policy	UMT
FOR561	Managing Wilderness Ecosystems	UMT
FOR562	Managing Recreation Resources in Wilderness Settings	UMT
FOR563	Wilderness Planning Theory, Management Frameworks and Application	UMT

Wildlife

FW251	Principles of Fish and Wildlife Conservation	ORState
FW255	Field Sampling of Fish and Wildlife	ORState
FW311	Biology of Birds	ORState
FW320	Introduction of Population Dynamics	ORState
FW321	Fisheries and Wildlife Resource Ecology	ORState
FW350	Endangered Species, Society and Sustainability	ORState
FW360	Origins of Fish & Wildlife Mgmt.: Evolution, Genetics & Ecology	ORState
FW427	Principles of Wildlife Disease	ORState
FW435	Wildlife in Agricultural Ecosystems	ORState
FW535	Wildlife in Agricultural Ecosystems	ORState

WILD4810	Wildlife Damage Management	USU
WILD6400	Ecology of Animal Populations	USU

Wood Products

WPS510	Strategic Business Processes for Forest Products Industry	NCSU
WPS565	Paper Physics	NCSU
WPS591	Wood and Paper Science Graduate Seminar	NCSU
WPS595	Special Topic: Pulp and Paper Technology	NCSU
WPS595R	Special Topic: Paper Characterization	NCSU
WPS595	Special Topic: Wood Products Manufacturing and Business	NCSU
WPS620	Wood and Paper Science Problems	NCSU
WPS625	Advanced Wood and Paper Science Problems	NCSU

MISSISSIPPI STATE UNIVERSITY

Contact: Jodi B. Roberts, Program Coordinator, Division of Academic Outreach & Continuing Education
Tel: (662) 325-0238 Email: jroberts@aoce.msstate.edu

Cost for a typical 3 undergrad credit hour course: $644 + applicable distance fees
Cost for a typical 3 graduate credit hour course: $859 + applicable distance fees

Classes Start/End: August 17 – December 9, 2009

UNDERGRADUATE COURSES

FO4323 Forest Resource Management **3 credits**

Course Description: Application of quantitative decision making techniques to stand-level and forest-wide management problems. Topics include land classification, forest production, optimal rotation analysis, and harvest scheduling.

FO4423 Professional Practice **3 credits**

Course Description: Forest resource data collection and analysis. Development of forest resource alternatives and recommendations for a specific forest property.

GR4303 Principles of GIS **3 credits**

Course Description: Two hours lecture and two hours laboratory. Spatial analysis and topological relationships of geographic data using Geographic Information Systems, with emphasis on GIS theory.

GR4990 Geospatial Technologies **3 credits**

Course Description: Three hours lecture. Geographic Information Systems, Remote Sensing and Global Positioning Systems applied to earth systems and science. Includes field excursions for hands on experience with current technologies.

GRADUATE COURSES

ECE6413 Digital Signaling Processing **3 credits**

Course Description: Three hours lecture. Discrete time signals, Z-Transform, Discrete Fourier Transform, digital filter design including IIR, FIR, and FFT synthesis.

FO6323 Forest Resource Management **3 credits**

Course Description: Application of quantitative decision making techniques to stand-level and forest-wide management problems. Topics include land classification, forest production, optimal rotation analysis, and harvest scheduling.

FO6423 Professional Practice **3 credits**

Course Description: Forest resource data collection and analysis. Development of forest resource alternatives and recommendations for a specific forest property.

GR6303 Principles of GIS **3 credits**

Course Description: Two hours lecture and two hours laboratory. Spatial analysis and topological relationships of geographic data using Geographic Information Systems, with emphasis on GIS theory.

GR6990 Geospatial Technologies **3 credits**

Course Description: Three hours lecture. Geographic Information Systems, Remote Sensing and Global Positioning Systems applied to earth systems and science. Includes field excursions for hands on experience with current technologies.

NORTH CAROLINA STATE UNIVERSITY

Contact: Michael J. Kocurek, College of Natural Resources, Department of Wood & Paper Science
Tel: (919) 515-5812 Email: mike_kocurek@ncsu.edu

Cost for a typical 3 undergrad credit hour course: $429 (resident) or $819 (non-resident)
Cost for a typical 3 graduate credit hour course: $681 (resident) or $1308 (non-resident)

Classes Start/End: August 19 – December 17, 2009

UNDERGRADUATE COURSES

FOR318 Forest Pathology **3 credits**

Course Description: Major diseases of forest trees and deterioration of wood products emphasizing principles of plant pathology; diagnosis; nature, physiology, ecology, and dissemination of disease-causing agents; mechanisms of pathogenesis; epidemiology and environmental influences; principles and practices of control.

PRT152 Introduction to Parks, Recreation and Tourism **3 credits**

Course Description: Introduction to the professional field of recreation by presenting the basic principles, fundamentals and concepts of recreation as related to such factors as recreation history and objectives, sociological and economic aspects of recreation, leadership qualities and facility provision; and settings for organized recreation in modern society.

PRT200 Leisure Behavior, Health and Wellness **3 credits**

Course Description: Leisure as a lifelong resource for human satisfaction and fulfillment; its potential for physical, mental, social and emotional growth and emotional growth and development of the individual. Leisure opportunity areas presented and evaluated.

PRT462 Introduction to Geographic Information Systems **3 credits**

Course Description: Overview of the operations and functions of computerized spatial display and map analysis processes (Geographic Information Systems), production of effective computer-generated maps and spatial displays, concepts for spatial modeling. Extensive independent learning and computer experiences including on-line virtual laboratory sessions.

TOX201 Poisons, People and the Environment **3 credits**

Course Description: Introduction to the fascinating world of chemical poisons including their many and varied effects on people as well as the environment. Learn how and why poisons have played an important role in history, how to critically evaluate the chemical risk information reported in the media, and the underlying principles of "the basic science of poisons."

TOX415 Environmental Toxicology and Chemistry **4 credits**

Course Description: Provides students with an appreciation and understanding of the principles of environmental toxicology and chemistry including the sources, fate, and effects of chemicals in the environment; emphasis on contemporary problems in human health and the environment.

TOX415P Environmental Toxicology and Chemistry Problem Session **4 credits**

Course Description: Environmental toxicology and chemistry including the sources, fate, and effects of chemicals in the environment. Emphasis on contemporary problems in human health and the environment.

GRADUATE COURSES

NR535 Computer Cartography **3 credits**

Course Description: Principles of cartographic design and how to apply them to produce high-quality Geographic Information System based maps. Successful students will acquire an understanding of map design and experience in applying this with ArcView GIS. Students produce project maps in both print and web media. Offered only through the Internet.

NR595 GIS Applications in Hydrology **3 credits**

Course Description: Individual students or groups of students, under direction of a faculty member, may explore natural resources related topics of special interest not covered by existing courses. Format may consist of readings and independent study, problems, or research not related to thesis. Also used to develop and test new 500-level courses.

PRT500 Theories of Leisure and Recreation **3 credits**

Course Description: Analysis of leisure and recreation and a study of their origin and development as revealed by behavioral patterns. Interpretation of influence and social significance of leisure and recreation concepts on contemporary American culture and their implications on future recreation thought and action.

PRT532 Principles of Geographic Information Science **3 credits**

Course Description: Exploration of theoretical underpinnings of Geographic Information Systems(GIS); focus on spatial concepts, analysis and modeling with computing and programming experiences using a GIS software; required major project, computer homework assignments and independent learning with on-line course modules.

PRT533 Application Issues in Geographic Information Systems **3 credits**

Course Description: Operation and management issues related to GIS use in natural resource organizations. Issues in proposing and implementing GIS through case study analyses and experimental project planning including social and legal impacts, cost and benefit assessments, institutional constraints to implementation, benchmarks, proposal development, education concerns, and planning for technological advances.

PRT595 Special Topic: Sport & Recreation Financial Management **3 credits**

Course Description: Special topics in various aspects of recreation resources developed under direction of a graduate faculty member on a tutorial basis. Subjects offered under this course listing also used to test and develop new courses.

WPS510 Strategic Business Processes for the Forest Products Industry **3 credits**

Course Description: Designed to introduce the technically trained student to organizational, management and leadership processes that drive a successful business. The course highlights the differences between principled leadership and "opinion poll" leadership, the need to balance the conflicting wants of major stakeholders in the business, the importance of a unique strategy, the linkage between strategy and day-to-day implementation of the strategy and the ingredients and requirements for a successful career. Real time illustrations are based on the Forest Products industry.

WPS565 Paper Physics **3 credits**

Course Description: Fibers and bonds, network geometry, sheet structure, formation, thickness and roughness measurements, pore size distributions, distribution of constituents and their determination, effects of sheet composition and structure on optical properties. In-plane properties of paper, cyclic loading, failure and fracture mechanics, Page's equation, structural mechanics of paperboard, dimensional stability, rheology and moisture effects, transport phenomena, absorbency, and swelling.

WPS591 Wood and Paper Science Graduate Seminar **1 credit**

WPS595 Special Topic: Pulp and Paper Technology **1-3 credits**

Course Description: A comprehensive overview of the entire pulping and papermaking processes, including wood & fiber raw materials, pulp mill and paper mill operations, recycling, paper properties, coating, and environmental topics. The learning objectives are to learn how one part of the process affects other parts, and the effect of the processes on pulp and paper product properties and quality.

WPS595R Special Topic: Paper Characterization **1-3 credits**

Course Description: This course focuses on the basics of paper testing with a brief introduction to paper physics. The course is for entry level graduate students with little or no knowledge of the paper industry. The course contains the following topics: introduction to paper grades, overview of papermaking, an introduction to paper structures, testing theory, statistics, paper tests (optical, mechanical, and barrier), use and application of paper testing data.

WPS595 Special Topic: Wood Products Manufacturing and Business **1-3 credits**

Course Description: In this course, we will explore the value chain of wood products – from log to product disposal after its use. The course will cover generic and specific manufacturing and business systems, concepts and tools. The first half will focus on wood products manufacturing, the second on wood products business and industries. These two subjects are interrelated and are therefore covered simultaneously to some degree.

WPS620 Wood and Paper Science Problems **1-3 credits**

Course Description: Assigned or selected problems in the field of wood, paper and pulp science and technology. Credits Arranged

WPS625 Advanced Wood and Paper Science Problems **1-6 credits**

Course Description: Selected problems in the field of wood and paper science.

OREGON STATE UNIVERSITY

Contact: Extended Campus Student Services
Tel: (800) 667-1465 Email: ecampus@oregonstate.edu

Cost for a typical 3 undergrad credit hour course: $624
Cost for a typical 3 graduate credit hour course: $1284

Classes Start/End: September 28 – December 11, 2009

NOTE: Oregon State is on a *quarter*, rather than *semester*, system. As a general rule, a 3 quarter credit course will transfer as a 2 semester credit course, a 4 quarter credit course will transfer as a 3 semester credit course, etc.

UNDERGRADUATE COURSES

ANTH481 Natural Resources and Community Values **3 credits**

Course Description: Investigates relations between human communities and the values of community members. Resource issues integrate concepts from social science, economics, and ecology.

AREC250 Introduction to Environmental Economics and Policy **3 credits**

Course Description: Examines how economic forces and social institutions cause environmental degradation and help build management solutions. Explains key economic concepts for valuing environmental resources and evaluating the trade-offs of alternative management approaches from private markets to regulation. Applies the concepts and theories to topical environmental issues such as water pollution and conserving biodiversity.

AREC351 Natural Resource Economics and Policy **3 credits**

Course Description: Application of principles of economics to identify the causes, consequences, and ways of dealing with natural resource problems, including problems associated with fisheries, forests, water resources, and land. Conceptual topics and policy applications. Emphasis is on developing students' skill in applying an economic way of thinking about natural resource management.

BB450 General Biochemistry **4 credits**

Course Description: Sequence course for students with a limited background in physical chemistry—classes must be taken in sequence. Co-listed as BB550.

BI311 Genetics **4 credits**

Course Description: Fundamentals of Mendelian, quantitative, population, molecular, and developmental genetics.

BI370 Ecology **3 credits**

Course Description: The study of interactions between organisms and their biotic and abiotic environments at the population, community, ecosystem, and biosphere levels of organization.

CSS205 Soils: Sustainable Ecosystems **4 credits**

Course Description: Soil ecosystems as a medium for plant and crop growth, the cycling of nutrients, supply and purification of water, and a habitat for a diverse population of soil organisms. Relationship of human activities to the sustainability of soil ecosystems.

CSS330 World Food Crops **3 credits**

Course Description: Origin, production, utilization, and improvement of the world's major food crops. The role of crop production in global economic and social development; food security and worldwide nutritional requirements.

CSS395 World Soil Resources **3 credits**

Course Description: The properties, global distribution, and agricultural productivity of major world soil groups are described. Potentials for human-accelerated soil degradation are introduced for each soil group, and reasons for conflicting assessments of degradation are discussed.

CSS499 Special Topics: Crop Science and Soil Science **1-16 credits**

Course Description: Technical knowledge and skills development courses offered in a wide array of course formats. Topics vary from term to term and year to year. May be repeated for credit when topics differ.

ENSC479 Environmental Case Studies **3 credits**

Course Description: Improves students' ability to ask questions, gather and synthesize information, and communicate ideas on environmental topics. Instruction and information necessary for the course is entirely web based. (Writing Intensive Course).

ENT311 Introduction to Insect Pest Management **5 credits**

Course Description: Recognition, biology and management of injurious and beneficial insects; insects and human welfare. Concurrent laboratory is designed to illustrate principles of insect pest management in agricultural cropping systems, including medical and veterinary entomology.

FOR350 Urban Forestry **3 credits**

Course Description: Introduction to principles and practices of planting and managing trees as a system of urban environment; understanding the economic, environmental, social aspects of urban forests, and an overview of contemporary land use issues and societal perspectives between people and plants.

FOR364 Issues in Natural Resources and Conservation **3 credits**

Course Description: Background of major current issues in natural resources conservation with emphasis on forests, soils, and water and potential sustainable carrying capacity. Focus on evaluating facts and opinions related to issues. Basics of terrestrial and aquatic ecology, recent and current issues of soil, water, and forest use and management.

FOR436 Wildland Fire Science and Management **4 credits**

Course Description: Principles and applications of fire as a natural resource management tool; the role of fire in conservation management, restoration, and preservation of ecosystems. Covers basic techniques and current research used to describe fire behavior and spread, fuels and fuel manipulation, and fire effects on the biota. Focus will be on fire as a natural process in ecosystem dynamics. Lec/lab. This course may be subject to Enforced Prerequisites that restrict registration into the course.

FOR493 Environmental Interpretation **4 credits**

Course Description: Interpretation of natural and cultural features in parks, museums, and similar settings. Emphasis on learning and applying effective communication techniques in the development of brochures, exhibits, talks, museums, and visitor centers. This course may be subject to Enforced Prerequisites that restrict registration into the course.

FW251 Principles of Fish and Wildlife Conservation **3 credits**

Course Description: History of conservation and natural resource use; ecological principles, and social and economic limitations of conservation; principles and practices of wildlife and fisheries management; role of research in management.

FW255 Field Sampling of Fish and Wildlife **3 credits**

Course Description: Introduction to sampling populations and communities of vertebrate animals emphasizing sampling design, collection and management of data, and communication of results.

FW302 Biology and Conservation of Marine Mammals **4 credits**

Course Description: An examination of the biology of whales, pinnipeds, and other marine mammals, include general adaptations to a marine existence; systematics and biogeography; reproduction; diving physiology; communication and echolocation; feeding and migratory behavior; and marine mammal/human interactions, including conservation issues.

FW303 Survey of GIS in Natural Resources **3 credits**

Course Description: Concepts underlying geographic information systems, global positioning system, and remote sensing; application to management and research, data quality issues, and case studies. Not a lab/skills class.

FW311 Biology of Birds **3 credits**

Course Description: Survey of the adaptations of birds to a diverse array of habitats. Topics include origins, anatomy, reproductive strategies, migration, flight, behavior, physiology, nutrition, and conservation.

FW320 Introduction to Population Dynamics **4 credits**

Course Description: Principles and concepts of population dynamics related to fish and wildlife populations; methods of estimating abundance, mortality, sustainable harvest levels and extinction risk; hands-on introduction to models for population analysis.

FW321 Fisheries and Wildlife Resource Ecology **3 credits**

Course Description: Perspectives in community and ecosystem ecology, including ecosystem classification, and their use in management of fisheries and wildlife resource systems.

FW323 Management Principles of Pacific Salmon in the Northwest **3 credits**

Course Description: A 28-session video course exploring the nature of the salmon problem in the Northwest. Experts from diverse disciplines describe principles of salmon biology, habitat ecology and management, socioeconomics of direct and indirect users, and government policies.

FW325 Global Crisis in Resource Ecology **3 credits**

Course Description: Historical and contemporary implications of the impacts of burgeoning human populations on rates and patterns of global ecological change. Changes in ecosystem processes and crises of species extinction in the context of cultural and political institutions. This course may be subject to Enforced Prerequisites that restrict registration into the course.

FW340 Multicultural Perspectives in Natural Resources **3 credits**

Course Description: Explores multicultural influences on development of natural resources in the American West. Effects of diverse social values on changes in the physical landscape and biodiversity.

FW346 Topics in Wildland Fire **3 credits**

Course Description: An interdisciplinary survey of concepts relating to fire science, ecology, management, and policy. Includes case studies of several representative ecosystems, ranging from west- and eastside forests of the Pacific Northwest to shrub steppe ecosystems of the Intermountain West and chapparal ecosystems of southern California. Distance and campus-based delivery using videos, Web site, and discussion.

FW350 Endangered Species, Society and Sustainability **3 credits**

Course Description: Provides a general background to endangered species biology, and the social and economic implications of the legislation enacted to conserve endangered species (Endangered Species Act, CITES Treaty).

FW360 Origins of Fish and Wildlife Management.: Evolution, Genetics and Ecology **3 credits**

Course Description: Examines genetics and human interactions with fisheries and wildlife from an ecological and evolutionary perspective. Basic principles of environmental interactions, and how humans interact with other species and their environments in the disciplines commonly recognized as fisheries, wildlife and conservation sciences.

FW421 Aquatic Biological Invasions **4 credits**

Course Description: An overview of the background, theory, evolution, ecology, politics and conservation of invasions by introduced species in aquatic environments.

FW427 Principles of Wildlife Disease **4 credits**

Course Description: Ecological aspects of important diseases affecting North American wildlife will be discussed. Demonstrations will mainly cover migratory birds, carnivores and ruminants. Lec/lab. Ecampus sections do not use lab demonstrations.

FW431 Dynamics of Marine Biological Resources **4 credits**

Course Description: Strategies of marine fishery management. A synthesis of the principles of population dynamics for single- and multi-species systems from the viewpoint of a marine resource manager. Offered alternate years. Taught at Hatfield Marine Science Center.

FW435 Wildlife in Agricultural Ecosystems **3 credits**

Course Description: Examines the relationships between agricultural production and fish and wildlife populations and communities. Explores the impacts of agricultural practices on fish and wildlife. Field trips required; transportation fee charged. OSU Ecampus students are not required to attend field trips.

FW445 Ecological Restoration **4 credits**

Course Description: Fundamentals of restoring and reclaiming disturbed landscapes and ecosystems. Topics to be covered include types and assessment of site conditions; determining restoration goals and feasibility; hydrologic, biotic, and soil functions and their importance in restoration; and measures of successful restoration. This course may be subject to Enforced Prerequisites that restrict registration into the course.

FW479 Wetlands and Riparian Ecology **3 credits**

Course Description: Ecology of riparian freshwater and estuarine wetlands of the Pacific Northwest. Effects of land use on ecosystem structure, function, biodiversity, and restoration will be explored.

GEO102 The Surface of the Earth **4 credits**

Course Description: Processes that shape the earth's surface. Weathering mass movement, ice dynamics, biogeography, climate, surface and ground water flow. Use of maps and imagery.

GEO221 Environmental Geology **4 credits**

Course Description: Introductory geology emphasizing geologic hazards (volcanoes, earthquakes, landslides, flooding), geologic resources (water, soil, air, mineral, energy), and associated environmental problems and mitigation strategies.

GEO300 Environmental Conservation and Sustainability **3 credits**

Course Description: Geography of human relationships to earth's systems with an emphasis on individual impacts and collective efforts to achieve environmental sustainability.

GEO301 Map and Image Interpretation **4 credits**

Course Description: Reading, analysis, and interpretation of maps/remote sensing images used by geoscientists. Use of topographic, geologic, nautical and other geoscience maps; basic air photo interpretation.

GEO308 Global Change and Earth Science **3 credits**

Course Description: Study of global change over different time scales during the history of the earth, with emphasis on evolution of its atmosphere, plate tectonics, paleoclimates, and mass extinctions.

GEO380 Earthquakes in the Pacific Northwest **3 credits**

Course Description: Earthquake hazards in the Northwest; responses to reducing earthquake risk at state, local, and personal levels.

GEO465 Geographic Information Systems and Science **4 credits**

Course Description: Introduction to modern spatial data processing, development, and functions of geographic information systems (GIS); theory, concepts and applications of geographic information science.

GEO487 Hydrogeology **4 credits**

Course Description: Movement of water through porous media. Darcy's Law and groundwater flow equation. Development of groundwater resources. Computer models.

HST481 Environmental History of the United States **3 credits**

Course Description: A study of human interaction with the environment and the transformation of the landscape and ecology of North America from the Indian period to the present, with special attention to the progressive alterations induced by the modernizing world of agriculture, industry, urbanism, and their relation to the market system in the United States. Not offered every year.

OC103 Exploring the Deep: Geography of the World's Oceans **4 credits**

Course Description: Introduces non-science students to the oceans, including marine geology and chemistry, ocean currents, coastal and biological processes.

PS475 Environmental Politics and Policy **4 credits**

Course Description: Environmental and natural resource issues and policies in national and regional context, emphasizing public attitudes, elections, Congress, public policy, and relevant national and state agencies.

PS477 International Environmental Politics and Policy **4 credits**

Course Description: Analysis of international environmental theory and politics, the development of international environmental regimes, agreements and treaties, and the process of globalization and the quality of the environment.

RNG253 Wildland Plant Identification **4 credits**

Course Description: 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.

RNG355 Desert Watershed Management **3 credits**

Course Description: Principles and methods in managing rangeland for optimum production and regulation of water yields, as well as maintaining soil stability and on-site productivity. Effects of grazing herbivores and their potential as land use, manipulative tools. Concepts of arid land hydrology, with emphasis on the resultant effects on runoff quantity and quality.

GRADUATE COURSES

ANTH581 Natural Resources and Community Values **3 credits**

Course Description: Investigates relations between human communities and the values of community members. Resource issues integrate concepts from social science, economics, and ecology. This course may be subject to Enforced Prerequisites that restrict registration into the course.

BB550 General Biochemistry **4 credits**

Course Description: Sequence course for students with a limited background in physical chemistry—classes must be taken in sequence. Co-listed as BB450.

COMM550 Communication and the Practice of Science **3 credits**

Course Description: Good communication skills are needed to effectively interact with colleagues across disciplines, market project results, or implement policy based on scientific findings. This course develops a broad range of skills encompassing verbal, written, and visual media styles of communication. Topics include: working in teams and collaborative decision-making; interpersonal and organization communication; writing and making presentations to diverse audiences; negotiation and consensus building; and persuasion and influence in communication.

CSS540 Weed Management **4 credits**

Principles of weed control by cultural, biological, and chemical means; weed identification; introduction to herbicides and factors influencing their use.

CSS599 Special Topics: Crop Science and Soil Science **1-16 credits**

Course Description: Technical knowledge and skills development courses offered in a wide array of course formats. Topics vary from term to term and year to year. May be repeated for credit when topics differ. This course may be subject to Enforced Prerequisites that restrict registration into the course.

FOR593 Environmental Interpretation **4 credits**

Course Description: Interpretation of natural and cultural features in parks, museums, and similar settings. Emphasis on learning and applying effective communication techniques in the development of brochures, exhibits, talks, museums, and visitor centers.

FW520 Ecology and Management of Marine Fisheries **3 credits**

Course Description: A lecture and lab course that covers the ecology of marine fishes and important ecological principles that guide conservation and management. Life history, behavior, habitat, community dynamics and ecosystem processes are emphasized, along with alternative management strategies.

FW521 Aquatic Biological Invasions **4 credits**

Course Description: An overview of the background, theory, evolution, ecology, politics and conservation of invasions by introduced species in aquatic environments.

FW531 Dynamics of Marine Biological Resources **4 credits**

Course Description: Strategies of marine fishery management. A synthesis of the principles of population dynamics for single- and multi-species systems from the viewpoint of a marine resource manager. Offered alternate years. Taught at Hatfield Marine Science Center.

FW535 Wildlife in Agricultural Ecosystems **3 credits**

Course Description: Examines the relationships between agricultural production and fish and wildlife populations and communities. Explores the impacts of agricultural practices on fish and wildlife. Field trips required; transportation fee charged. OSU Ecampus students are not required to attend field trips. (Writing Intensive Course)

FW545 Ecological Restoration **3 credits**

Course Description: Fundamentals of restoring and reclaiming disturbed landscapes and ecosystems. Topics to be covered include types and assessment of site conditions; determining restoration goals and feasibility; hydrologic, biotic, and soil functions and their importance in restoration; and measures of successful restoration. This course may be subject to Enforced Prerequisites that restrict registration into the course.

FW554 Fisheries Biology **5 credits**

Course Description**:** Principles and methods used in studying the biology of fishes; ecological requirements of freshwater and anadromous fishes; principles and practices in sport fishery management. This course may be subject to Enforced Prerequisites that restrict registration into the course.

FW579 Wetlands and Riparian Ecology **3 credits**

Course Description: Ecology of riparian freshwater and estuarine wetlands of the Pacific Northwest. Effects of land use on ecosystem structure, function, biodiversity, and restoration will be explored.

FW620 Ecological Policy **3 credits**

Course Description: Policy issues associated with ecosystems management, risk assessment, biological diversity, ecosystems health, sustainability, invasive species, bioregionalism, globalization and transnational factors, and rights, ethics, and morals.

GEO565 Geographic Information Systems and Science **4 credits**

Course Description: Introduction to modern spatial data processing, development, and functions of geographic information systems (GIS); theory, concepts and applications of geographic information science.

MRM535 Rights-Based Fisheries Management **3 credits**

Course Description: Clear, appropriate and enforceable fishing entitlements and responsibilities are a cornerstone of sustainable fisheries management. Rights-based management tools such as dedicated access privileges, community quotas, co-management and cost recovery will be explored as ways of promoting individual and collective responsibility for sustainable fisheries management. High seas fisheries will also be addressed. This course may be subject to Enforced Prerequisites that restrict registration into the course.

PS575 Environmental Politics and Policy **4 credits**

Course Description: Environmental and natural resource issues and policies in national and regional context, emphasizing public attitudes, elections, Congress, public policy, and relevant national and state agencies.

PS577 International Environmental Politics and Policy **4 credits**

Course Description: Analysis of international environmental theory and politics, the development of international environmental regimes, agreements and treaties, and the process of globalization and the quality of the environment.

PSM565 Accounting and Finance for Scientists **3 credits**

Course Description: Students begin to develop their business management intellect by learning about managerial accounting, including cash flow statements, break-even analysis, and investment risks. These skills provide individuals with basic tools required for effective project management and understanding the business end of science. With this knowledge, they will become versatile employees in both the public and private work sectors.

SNR506 Independent Project in Natural Resource Sustainability **2 credits**

Course Description: Students identify, pose, frame, and analyze the various components of an important natural resource sustainability problem with their country, region, or organization and, at the end of term, present a workplan for its resolution. Oral and written reports are expected.

SNR511 Sustainable Natural Resource Development **1 credits**

Course Description: Using readings, class discussions, and field trips, we introduce the SNR program sessions and pedagogical methods, familiarize students with basic working definitions of sustainability, and build capacity to work as group on a common project.

SNR521 Economics of Sustainable Natural Resource Management **3 credits**

Course Description: Focus on the sources of market failure, the means of correcting market failure, and the real-world examples of making progress toward sustainable resource use by means of market mechanisms

SNR522 Basic Beliefs and Ethics in Natural Resources **3 credits**

Course Description: Examines the basic philosophies and ethical systems in American forestry, including Pinchot's agricultural approach and Leopold's biotic forestry, and compares them to contemporary public attitudes and considers their implications for sustainability.

SNR534 Reduced Impact Timber Harvest **2 credits**

Course Description: Explores planning, implementation, monitoring, and evaluation of reduced impact timber harvesting.

WRP599 Special Topics: Water Governance and Conflict Management **1-16 credits**

Course Description: This course may be subject to Enforced Prerequisites that restrict registration into the course.

PENN STATE WORLD CAMPUS

Contact: Adult Learner Enrollment Services
Tel : (800) 252-3592 (within the U.S.) Email: **psuwd@psu.edu**
Tel : (814) 863-3283 (international)

Cost: Tuition Table

Classes Begin: August 24 – December 11, 2009

UNDERGRADUATE COURSES

CEDEV430 Principles of Community Economic Development **3 credits**

Course Description: Concepts, strategies, and techniques of local economic analysis, planning, and development; case studies and decision-making exercises.

CEDEV452 Rural Organization **3 credits**

Course Description: Social organization and change in rural communities; use of sociological principles in analysis of rural problems and rural development

ENT317 Turfgrass Insect Pest Management **3 credits**

Course Description: Introduction to entomology and management of insect pests of cool- and warm-season turfgrass.

GEOG482 The Nature of Geographic Information **2 credits**

Course Description: Orientation to the properties of geographic data and the practice of distance learning.

GEOG483 Problem-Solving with GIS **3 credits**

Course Description: How geographic information systems facilitate data analysis and communication to address common geographic problems

GEOG484 GIS Database Development **3 credits**

Course Description: Database design, creation, maintenance, and data integration using desktop GIS software.

GEOG485 GIS Programming and Customization **3 credits**

Course Description: Customizing GIS software to extend its built-in functionality and automate repetitive tasks.

GEOG486 Cartography and Visualization **3 credits**

Course Description: Theory and practice of cartographic design emphasizing effective visual thinking and visual communication with geographic information systems.

GEOG487 Environmental Applications of GIS **3 credits**

Course Description: Simulated internship experience in which students play the role of GIS analysts in an environmental consultancy.

GEOG488 Acquiring and Integrating Geospatial Data **3 credits**

Course Description: Advanced technical, legal, and ethical and institutional problems related to data acquisition for geospatial information systems.

GEOG496 Independent Studies - GIS **2 credits**

Course Description: This course is for students who have successfully completed the ESRI Virtual Campus course, Understanding Geographic Data, and who wish to substitute that course for GEOG 482. The introductory course helps students learn skills required to participate effectively in an online class, including creating and publishing online portfolios of class projects on the World Wide Web. Projects enable the students to demonstrate mastery of both online learning skills and basic concepts of geographic information science.

METEO101 Understanding Weather Forecasting **3 credits**

Course Description: Fundamental principles of synoptic and physical meteorology, satellite and radar imagery, and data analysis in the setting of mid-latitude weather forecasting.

METEO241 Fundamentals of Tropical Forecasting **3 credits**

Course Description: Applying atmospheric principles to the tropics, with an emphasis on the development, structure prediction, and destructive impact of hurricanes.

METEO410 Advanced Topics in Weather Forecasting **3 credits**

Course Description: Exploring highly specialized topics and techniques in weather forecasting that span from mesoscale to planetary spatial scales and short-term to long-range time scales.

PPATH412 Turfgrass Disease Management **3 credits**

Course Description: Introduction to biology of turfgrass pathogens and management of cool- and warm-season turfgrass disease.

STAT480 Introduction to SAS **1 credits**

Course Description: Introduction to SAS with emphasis on reading, manipulating, and summarizing data.

TURF230 Turfgrass Pesticides **1 credit**

Course Description: Course covers chemical toxicity, formulations, environmental fate, labels, MSDS, calibration, IPM, safety, handling, storage, and Pennsylvania certification and regulations.

TURF235 The Turfgrass **3 credits**

Course Description: Characterization of the primary plant species used for sports, lawn and utility turf; includes turfgrass morphology, environmental adaptation, and cultural requirements.

TURF238 Turf and Ornamental Weed Control **3 credits**

Course Description: Students will be introduced to the development of integrated weed management strategies utilizing a variety of cultural and chemical methods.

TURF 425 Turfgrass Cultural Systems **3 credits**

Course Description: A study of turfgrass maintenance practices and how their interrelationships can be utilized to develop management systems.

TURF 436W Turfgrass Management Systems **3 credits**

Course Description: Case Study and discussion considering integrated management of selected turfgrass sites; emphasis on problem analysis, principle application, and decision making.

TURF 490 Colloquium **1 credit**

Course Description: Oral presentations developed by students in consultation with the course instructor

TURF 495 Internship **3 credits**

Course Description: Supervised off-campus, non-group instruction including field experiences, practica, or internships. Written and oral critique of activity required.

GRADUATE COURSES

CEDEV500 Community & Economic Development and Leadership **3 credits**

Course Description: Understanding principles and strategies of community and economic development in relation to general system theory, community decision making, and leadership strategies and roles in groups and community settings.

CEDEV509 Population, Land Use, and Municipal Finance **3 credits**

Course Description: Study of interaction of population characteristics, land use, municipal funds, and taxation in a locality, and how they impact the operation and management of government jurisdictions.

GEOG583 Geospatial System Analysis and Design **3 credits**

Course Description: Systematic approach to requirements acquisition, specification, design and implementation of geospatial information systems.

GEOG585 Open Web Mapping **3 credits**

Course Description: Design, development, and implementation of web mapping applications using OGC standards and open source software.

GEOG597K GIS for Analysis of Health **3 credits**

Course Description: The role of geographic information systems in understanding disease, including relevant spatial analysis and cartographic visualization techniques.

GEOG882 Geographic Foundations of Geospatial Intelligence **3 credits**

Course Description: Orientation to the geographic foundations of geospatial intelligence and its applications in national security, international relief work, and disaster management.

GEOG883 Remote Sensing for the Geospatial Intelligence Professional **3 credits**

Course Description: Understanding remote sensing systems' operation, data products, and processing techniques to address typical problem scenarios faced by the geospatial intelligence professional.

GEOG884 Geographic Information Systems for the Geospatial Intelligence Professional **3 credits**

Course Description: How geographic intelligence systems facilitate data analysis and communication to address common geographic problems faced by the geospatial intelligence professional.

GEOG889 Virtual Field Exercise for the Geospatial Intelligence Professional **2 credits**

Course Description: Comprehensive examination in geospatial data analysis and communication to address common geographic problems faced by the geospatial intelligence professional.

STAT505 Applied Multivariate Statistical Analysis **3 credits**

Course Description: Analysis of multivariate data; T-squared tests; partial correlation; discrimination; MANOVA; cluster analysis; regression; growth curves; factor analysis; principal components; canonical correlations.

STEPHEN F. AUSTIN STATE UNIVERSITY

Contact: Mary Ramos, Administrative Assistant, Arthur Temple College of Forestry & Agriculture
Tel: (936) 468-1365 Email: **mramos@sfasu.edu**

Cost for a typical 3 graduate credit hour course: $1172

Classes Begin: August 31 – December 18, 2009

GRADUATE COURSES

FOR542 Human Dimensions **3 credits**

Course Description: This course examines the role of resource managers in making wise decisions concerning natural resources, incorporating not only biological sciences but sound information concerning human thought and action regarding natural systems. This course provides the opportunity to explore and build foundations of understanding current human-natural resource relationships and the development of theoretical understanding of the importance of viewing humans as part of the natural resource decision-making process.

FOR567 Oral Interpretive Programs **3 credits**

Course Description: Three semester hours. Web course. Application of interpretive philosophy and techniques to oral interpretive programs. Includes the philosophy, techniques, curriculum, training and certification process of the NPS Interpretive Development Program (IDP).

FOR568 Interpretive Writing **3 credits**

Course Description: Three semester hours. Web course. Provides an overview and experience in understanding, analyzing and producing interpretive written products. Introduces students to advanced writing techniques related to graduate and professional performance.

FOR571 Curriculum-Based Interpretive Programs **3 credits**

Course Description: Explores the body of knowledge and skills necessary to understand, develop and present an effective curriculum-based program.

FOR572 Interpretive Planning **3 credits**

Course Description: Three semester hours. Web course. Examines significant aspects of interpretive planning including leadership, plan development and participation on a planning team. Fall only.

FOR573 Interpretive Leadership **3 credits**

Course Description: Overview of interpretive leadership skills, principles and techniques including program administration, public outreach, staff training, and coaching.

UNIVERSITY OF IDAHO

Contact: Debi Zenner, College of Natural Resources
Tel: (208) 885-5529 Email: **debiz@uidaho.edu**

Cost for a typical 3 undergrad credit hour course: $858 + $105 Web Fee
Cost for a typical 3 graduate credit hour course: $951 + $105 Web Fee

Classes Begin: August 25 – December 18, 2009

UNDERGRADUATE COURSES

ENVS409 Principles of Environmental Toxicology **3 credits**

Course Description: Fundamental toxicological concepts including dose-response relationships, absorption of toxicants, distribution and storage of toxicants, biotransformation and elimination of toxicants, target organ toxicity and teratogenesis, mutagenesis, and carcinogenesis; chemodynamics of environmental contaminants including transport, fate and receptors, chemicals of environmental interest and how they are tested and regulated; risk assessment fundamentals. Co-listed as ENVS409, FST 409/509. Max Enrollment: 40 students

FOR426 Wildland Fire Management and Ecology **3 credits**

Course Description: Integrated fire-related biological, ecological, physical, and economic information for land managers; autecology and synecology of plant and animal species in wildlands; natural role of fire; fire as a management tool; application to current issues. Maximum enrollment: 45students

GEOG424 GIS Hydrologic Applications of GIS and Remote Sensing **3 credits**

Course Description: Concepts of area-based hydrologic modeling and assessment and the various types of spatially distributed information commonly used in these activities, such as topographic data, vegetation cover, soils and meteorologic data. Hands-on experience in manipulating these types of data sets for hydrologic applications. Maximum enrollment: 30.

NR402 GIS Applications in Natural Resources **1 credit**

Course Description: Application of GIS principles to natural resources problems. Topics include GIS/GPS integration, habitat inventory, site suitability studies, risk assessment, sources of spatial

data, map accuracy, etc. ArcView software and extensions will be used in hands on exercises. Max students: 99.

REM221 Ecology **3 credits**

Course Description: Principles of ecology. Major topics covered in the course include the physical environment, how organisms interact with each other and their environment, evolutional processes, population dynamics, communities, energy flow and ecosystems, conservation biology and human influences on ecosystems. Seats: maximum 65 students.

REM410 Principles of Vegetation Measurement and Assessment **1 credit**

Course Description: Designed to establish a solid understanding of vegetation structure and composition is necessary to understand how activities on rangelands and forested lands will affect wildlife habitat, livestock forage, fire behavior, watershed characteristics, and many other wildland values.

REM459 Rangeland Ecology **2 credits**

Course Description: Application of ecological principles in rangeland management; stressing response and behavior of range ecosystems to various kinds and intensity of disturbance and management practice. Maximum enrollment: 35 students.

GRADUATE COURSES

CSS573 Planning and Decision-Making for Watershed Management **3 credits**

Course Description: Focus on ecological and human factors in process-oriented approaches to watershed analysis and planning for effective decision-making; emphasis on practical applications of current tools and approaches, e.g., GIS, MAU Theory, collaborative management. Course Information: Maximum enrollment: 30 students.

ENVS509 Principles of Environmental Toxicology **3 credits**

Course Description: Fundamental toxicological concepts including dose-response relationships, absorption of toxicants, distribution and storage of toxicants, biotransformation and elimination of toxicants, target organ toxicity and teratogenesis, mutagenesis, and carcinogenesis; chemodynamics of environmental contaminants including transport, fate and receptors, chemicals of environmental interest and how they are tested and regulated; risk assessment fundamentals. Co-listed as ENVS409, FST 409/509. Max Enrollment : 40 students

FISH540 Wetlands Restoration **3 credits**

Course Description: This course contains modules covering wetland science, restoration ecology, freshwater restoration, coastal restoration, and monitoring/maintenance. The emphasis is on the science of wetland ecosystems and the applied ecology/practice of restoration, with additional consideration of cultural and socio-political contexts. Extensive readings, an assignment, and a study guide are required for each module. Students apply their learning in and contribute relevant professional experience to weekly online discussions. Students are also be responsible for obtaining documentation of at least one wetland restoration site in their region and conducting a site visit in order to evaluate the success of the restoration project. A final exam (re-design of a failed restoration project) is administered online, with partial credit earned through discussion with an interdisciplinary team of classmates and partial credit earned through individual analysis and synthesis. Restoration Ecology is recommended. Seats: maximum 25 students.

REM560 Plant Ecophysiology **3 credits**

Course Description: Functional responses and adaptations of individual plant species to their environment, emphasizing morphological and physiological mechanisms that influence plant establishment, the physical environment, below- and above-ground productivity, and plant interactions such as competition, herbivory, and allelopathy.

UNIVERSITY OF MONTANA

Contact: Lisa Gerloff, College of Forestry and Conservation
Tel: (406) 243-5346 Email: lisa.gerloff@cfc.umt.edu

Cost for a typical 3 undergrad credit hour course: $750 - $900
Cost for a typical 3 graduate credit hour course: $810 - $970

Open Enrollment

UNDERGRADUATE COURSES

FOR404 Wilderness in the American Context **4 credits**

Course Description: This course provides a broad perspective of what wilderness is and how the idea developed, and exposes the student to some of the differing values, ethics, and expectations of wilderness held by society. It offers an account of the origins of the wilderness idea, tracing the beginnings of the conservation movement from the Greek philosophers to today. In this course you will examine the early history of wilderness preservation that ultimately led to federal protection in the Wilderness Act and subsequent legislation, including how each agency applies these laws. Legislation since 1964 and how each agency applies these laws are also discussed. FOR404 is an excellent course for managers and students interested in obtaining a firm academic foundation in wilderness philosophy and ethics. Co-listed as RECM404.

FOR405 Managing in Wilderness Resources **4 credits**

Course Description: Studies ecosystem characteristics and basic principles of wilderness management. Separate chapters discuss management of specific wilderness resources such as fire, wildlife, cultural and historical sites, etc.; managing non-conforming uses such as grazing, mining, and motorized vehicles and equipment and mechanical transport. Discusses the use of primitive means to achieve management objectives, use of the minimum tool, and no-trace camping methods. Co-listed as RECM405.

FOR406 Wilderness Management Planning **3 credits**

Course Description: explores basic planning theory, planning concepts, and effective plan writing. The course provides a thorough treatment of the elements that characterize effective planning on public lands. A substantial part of this discussion is the role of public participation in planning. It also discusses differences in planning among the four federal land management agencies, with a comparison of the philosophy and application of each. Moving from planning to application, the course then gives an example of the Limits of acceptable Change planning framework, currently one of the most widely used planning processes in wilderness. This provides a model for identifying the elements necessary to produce a workable plan, one that is ultimately capable of being implemented.

The role of indicators and standards of quality in wilderness is likewise discussed, as is the importance of executing a monitoring program. Co-listed as RECM406.

FOR407 Management of Recreation Resources **3 credits**

Course Description: Explores and discusses how to manage for quality visitor experiences including examples of common problems and solutions. Managing to minimize recreational impacts is covered in detail in a separate chapter. Other chapters include wilderness education and information techniques, as well as law enforcement and emergency response. Managing Recreation Resources deals with the people aspect of wilderness by focusing on managing wilderness for visitor use and enjoyment, and by representing ways to solve problems associated with visitors' expectations and their impacts. Co-listed as RECM407.

GRADUATE COURSES

FOR560 American Wilderness Philosophy and Policy **4 credits**

Course Description: RECM/FOR 560 lays the groundwork for all other courses in the Program. This course provides a broad perspective of what wilderness is and how the idea developed, and exposes the student to some of the differing values, ethics, and expectations of wilderness held by society. It offers an account of the origins of the wilderness idea, tracing the beginnings of the conservation movement from the Greek philosophers to today. In this course you will examine the early history of wilderness preservation that ultimately led to federal protection in the Wilderness Act and subsequent legislation, including how each agency applies these laws. Legislation since 1964 and how each agency applies these laws are also discussed. 595A is an excellent course for managers and students interested in obtaining a firm academic foundation in wilderness philosophy and ethics. Co-listed as RECM560.

FOR561 Managing Wilderness Ecosystems **4 credits**

Course Description: Study ecosystem characteristics and basic principles of wilderness management. Separate chapters discuss management of specific wilderness resources such as fire, wildlife, cultural and historical sites, etc.; managing non-conforming uses such as grazing, mining, and motorized vehicles and equipment and mechanical transport. Discusses the use of primitive means to achieve management objectives, use of the minimum tool, and no-trace camping methods. Co-listed as RECM561.

FOR562 Managing Recreation Resources in Wilderness Settings **3 credits**

Course Description: Explores and discusses how to manage for quality visitor experiences including examples of common problems and solutions. Managing to minimize recreational impacts is covered in detail in a separate chapter. Other chapters include wilderness education and information techniques, as well as law enforcement and emergency response. Managing Recreation Resources in Wilderness Settings deals with the people aspect of wilderness by focusing on managing wilderness for visitor use and enjoyment, and by representing ways to solve problems associated with visitors' expectations and their impacts. Co-listed as RECM562.

FOR563 Wilderness Planning Theory, Management Frameworks and Application **3 credits**

Course Description: explores basic planning theory, planning concepts, and effective plan writing. The course provides a thorough treatment of the elements that characterize effective planning on public lands. A substantial part of this discussion is the role of public participation in planning. It also discusses differences in planning among the four federal land management agencies, with a comparison of the philosophy and application of each. Moving from planning to application, the

course then gives an example of the Limits of acceptable Change planning framework, currently one of the most widely used planning processes in wilderness. This provides a model for identifying the elements necessary to produce a workable plan, one that is ultimately capable of being implemented. The role of indicators and standards of quality in wilderness is likewise discussed, as is the importance of executing a monitoring program. Co-listed as RECM563.

UNIVERSITY OF TENNESSEE AT MARTIN

Contact: Timothy N Burcham, College of Agriculture and Applied Sciences
Tel: (731) 881-7211 Email: **tburcham@utm.edu**

Cost for a typical 3 graduate credit hour course: $1173 (resident) or $1275 (non-resident)

Classes Begin: August 31 – December 18, 2009

GRADUATE COURSES

AGET720 Advanced Soil and Water Conservation Engineering **3 credits**

Course Description: Engineering principles for hydrologic analysis and design for small catchments including: hydrologic frequency analysis, rainfall runoff estimation, open channel hydraulics, hydraulics of control structures, sediment properties and transport, erosion and sediment yield, sediment control structures, groundwater, monitoring of hydrologic systems, and hydrologic modeling. Students are required to complete a written term report on a current topic associated with soil and water engineering.

NRM 790 Scientific Writing and Presentations **3 credits**

Course Description: A course designed to give graduate students the skills necessary to write a thesis, and to prepare other professional materials for presentation or publication. Topics covered in this course include: searching the scientific literature; scientific writing style; writing graduate level papers, proposals, projects, and thesis components; preparing scientific presentations; presentation of data; using visual aids; and using word processing, spreadsheet, and presentation software. (Same as AGRI 790)

Utah State University

Contact: Judy Kurtzman, College of Natural Resources
Tel: (435) 797-0922 Email: **judy.kurtzman@usu.edu**

Cost for a typical 3 undergrad credit hour course: $633
Cost for a typical 3 graduate credit hour course: $1072

Classes Begin: August 24 – December 11

[Continued on next page]

UNDERGRADUATE COURSES

ENVS4000 Human Dimensions of Natural Resource Management **3 credits**

Course Description: Focuses on balancing science and social values in ecosystem management and decision-making. Topics include environmental justice, communication and behavior change strategies, landscape perception and attitudes, resource dependent communities, public involvement, and conflict management.

WILD4810 Wildlife Damage Management **2 credits**

Course Description: This course is particularly suited for people interested in expanding their awareness of the political, social, economic, technical, and biological issues involved in wildlife damage management, especially as it reflects on both positive and negative human-wildlife interactions.

GRADUATE COURSES

ENVS6530 Natural Resources Administration **2 credits**

Course Description: Organizational structures and processes common in natural resources administration on federal and state levels, and how they impact career development and land management. Please note: This course requires you to attend, in person, one full-day meeting in the Utah.

ENVS6900 Special Topics – Introduction to Natural Resource Policy **3 credits**

Course Description: This course will begin with a background on the differences between laws, regulations and policies, and the history of environmental and cultural laws and policies. It will then focus on 16 federal natural and cultural resource laws, regulations and policies that land managers must be familiar with to effectively manage public lands. These laws and policies were chosen because they are the ones most frequently encountered by resource managers and specialists. The course will consist of audio lectures with PowerPoint slides, assigned readings, a weekly discussion topic that students are required to participate in, and two short-answer essay exams on the course material, a mid-term and a final exam.

WATS6920 Geographical Information Systems **4 credits**

Course Description: Examines structure and operation of Geographic Information Systems (GIS). Explores design, theory, and implementation of GIS software, digitizing, fundamentals of vector and raster GIS processing, geo-referencing, map accuracy, and site location. To receive graduate-level credit, students must complete a more rigorous final project directed toward their thesis or dissertation.

WILD6900 Special Topics: Ecological Foundation of Natural Resource Management **3 credits**

Course Description: This course explores how key ecological principles are used in the management of wildlife and fish species. Students investigate ecological concepts at the individual, population, community, and ecosystem scales and examine the relationship of those concept to the conservation and management of wild animals and their habitats.

VIRGINIA TECH

Contact: Helen He, Natural Resources Program
Tel: (703) 538-3763 Email: **nrstaff@nvc.vt.edu**

Cost for a typical 3 graduate credit hour course: $1685 (resident) $3037* (non-resident)
[*non-resident fees waived for federal employees]

Classes Begin: August 24 – December 16

GRADUATE COURSES

NR 5344 Natural Resources Law and Policy **3 credits**

Course Description: Natural resource management has a governing framework of laws and policies. Knowing and understanding these myriad laws - which can be overlapping and even contradictory - and the historical and philosophical underpinnings of these laws - is essential to the natural resource manager and conservation professionals. This course will look at specific laws, with an emphasis on wildlife, fisheries, and forests, and public lands, but more importantly, it will give students the tools needed to find and understand the laws relevant to particular resources. The emphasis will be on U.S. federal law, but will also touch on international, state, and local law. In addition, the course will include an overview of the legislative and regulatory processes that have an enormous impact on the implementation of resource management and conservation programs.

NR5424 Urban Wildlife **3 credits**

Course Description: Eight of every ten of Americans live in cities or towns of 50,000 people or more, and 50% of the world's human population now live in urban areas. What has been the impact of this transition on wildlife populations? While it's a common assumption that cities are inhospitable to non-human animal life, we have ample evidence today to indicate that not only do some wildlife species survive in urban areas, they can thrive. One positive consequence of this is that people can directly enjoy and appreciate wildlife close to home, and feel a closer connection to the natural world by doing so. A negative consequence is that conflicts between people and wildlife are on the rise. Urbanization has created new challenges for wildlife management professionals, and most have little or no special training in this area. This course will be organized into five learning units: urban landscapes, urban ecosystems, urban habitats and hazards, sociopolitical issues, and special management considerations. This is a writing-intensive course.

NR 5634 Urban Ecology **3 credits**

Course Description: Our planet is increasingly urban. Approximately 50% of the world's people now live in urban areas. In many regions of the world, the rate of urbanization is declining; however, individual cities, metropolitan regions, and urban areas continue to grow (in number, extent and population). In this context, urban ecology is an important approach to environmental science and sustainable development. Key questions: What is an urban ecosystem? Are cities sustainable environments? What are civic stakeholders, local communities, and global society doing to ensure that urban and urbanizing landscapes are healthy and desirable places for today's world?

NR 5644 Interdisciplinary Recreation Planning **3 credits**

This course focuses on outdoor recreation planning processes as a component of overall land planning activities. Students will develop the role of the outdoor recreation planner, both, as a team leader and as a team member, in comprehensive land management planning, applicable at the county, the state or the federal level. Recreation is but one land use demand upon the available land

resources. It continues, however, to evolve to equal or greater status than other land use demands in many communities, states and on the public's federal lands. Tools are provided for the learner to synthesize, in a personal portfolio, their intellectual and academic growth and development in interdisciplinary planning.

NR 5684 Foundations of Federal Land Management **3 credits**

Course Description: This course addresses the acquisition, disposal, reservation, and management of the public domain as administered by the Bureau of Land Management, National Park Service and the USDA Forest Service. Policies, trends, and management needs are examined. Intra– and inter- agency integration of land management programs.

NR 5854 Natural Resources Communications Applications **3 credits**

Course Description: This course presents an in-depth analysis of current communications strategies and theories used to address natural resource issues, how to evaluate these strategies, and the elements necessary for a successful communications program. Students will apply communications theories and models to a variety of natural resource issues. Teaching methods include classroom interactions, guest speakers, analysis of case studies, lectures, on-line discussions, team projects, videos, and constructive feedback from the instructor and class members.