

Interfaces of Global Change Course Requirements:

In addition to 2 credits in Global Change Seminar and 3 credits in the GRAD capstone class (GRAD 5134), students will take at least 5 credits representing these two areas:

- **Science communication** – 2 credits. Communicating Science GRAD 5144 or Outreach in Biology BIOL 6004.
- **Global change science and policy** – 3 credits. Includes courses listed below in conservation biology, sustainability, environmental policy, environmental law, or environmental history.

The course listing below is provided as a resource for fellows in the IGC. It is meant to be a “living and changing document”, and we solicit your help in keeping it updated and relevant. We welcome continuous additions, deletions, and general feedback about these courses from the Virginia Tech community. If you would like to submit a course that you have already taken to fulfill the “global change science and policy” requirement, please submit for approval by the IGC leadership. Please share your feedback and suggestions to Jessica at jcoker@vt.edu.

COURSES RELATED TO ENVIRONMENTAL POLICY, LAW, AND HISTORY

DEPT.	CRS. #	COURSE TITLE	COLLEGE
AAEC	5144	Resource and Environmental Ethics	CALS
AAEC	6524	Environmental Theory and Policy Analysis	CALS
CEE	5804	Engineering Ethics and the Public (<i>Marc Edwards</i>)	COE
FREC	5134	Environmental Conflict Management	CNRE
FREC	5984	Climate Change & The International Policy Framework (<i>Carol Franco</i>)	CNRE
FWC	5414	Endangered Species Management	CNRE
FWC	5814	Stream Habitat Management (<i>Don Orth</i>)	CNRE
FWC	5464G	Advanced Human Dimensions of Fisheries and Wildlife (<i>Vic DiCenzo</i>)	CNRE
GEOG	5984	Climate Change and Societal Impacts	CNRE
GRAD	6984	The Science and Policy of Invasions (Team taught)	GRAD
HIST	5694	American Environmental History (<i>Mark Barrow</i>)	CLAHS
NR	5374	Endangered Species Policy and Management	CNRE
NR	5684	Foundations of Federal Land Management (<i>Katherine Hoover</i>)	CNRE
NR	5614	Advanced Watershed Assessment, Management, and Policy (<i>Schoenholtz, Bosch</i>)	CNRE
NR	5344	Natural Resources Law and Policy (Virtual) (<i>Mark Belleville</i>)	CNRE
PAPA	5614	Introduction to Science and Technology Policy (cross-listed STS/PAPA)	CAUS
PAPA	6664	Advanced Topics in Science and Technology Policy	CAUS

DEPT.	CRS. #	COURSE TITLE	COLLEGE
PAPA	6224	Design, Implementation, and Evaluation of Public Policy and Programs	CAUS
PHS	5014	Environmental Health	VMRCVM
PSCI	6204	Theories of Globalization (cross-listed as GIA/ASPT/PSCI) (<i>Rohan Kalyan; spring</i>)	
STS	5364	Public Ecology (cross-listed STS/GIA/PSCI) (<i>AJ Scerri</i>)	CLAHS
STS	5444	Issues in Bioethics (<i>PR Olsen</i>)	CLAHS
UAP	5134	Advanced Land Use and Environment: Planning and Policy (<i>SC Hankey</i>)	CAUS
UAP	5214	Topics in Natural Resources and Natural Hazards Planning	CAUS
UAP	5264G	Global Change and Local Impacts	CAUS
UAP	5264G	Advanced Environmental Ethics and Policy	CAUS
UAP	5344G	Advanced Law Critical Environmental Areas	CAUS
UAP	5584	Environmental Politics and Policy (cross-listed UAP, GIA, PSCI, STS)	CAUS
UAP	5414	Natural Resources Planning Topics: International Urban Environmental Policy, Planning and Management (<i>KF Wernstedt</i>)	CAUS

COURSES RELATED TO CONSERVATION BIOLOGY AND SUSTAINABILITY			
BIOL	6064	Special Topics in Freshwater Biology (Freshwaters in the Anthropocene)	COS
BIOL	6004	Advanced Conservation Biology	COS
CSES	5744G	Advanced Managed Ecosystem Services and Sustainability	CALS
FREC	5464	Social Science Research Methods in Natural Resources (<i>Marc Stern</i>)	CNRE
FREC	5984	Linking Humans and the Environment (<i>Mike Sorice</i>)	CNRE
FREC	5014	Constructing Sustainability (cross-listed as FOR,NR, FWC)	CNRE
FWC	5114	Fisheries and Wildlife Conservation Genetics	CNRE
FWC	5814	Stream Habitat Management (<i>Don Orth</i>)	CNRE
FWC	5984	Systems Ecology and Conservation	CNRE
GEOG	5984	Climate Change and Societal Impacts	CNRE
GEOG	5984	Environmental Conservation	CNRE
NR	5734	Conservation Ecology	CNRE
NR	5984	Biodiversity Conservation and Environmental Sustainability	CNRE
NR	5044	Environmental Conservation and the American Landscape	CNRE
NR	5114	Global Issues in Natural Resources (<i>HE Eves</i>)	CNRE
NR	5834	Ecological Economics	CNRE

COURSE DESCRIPTIONS

1. SCIENCE COMMUNICATION

GRAD 5144 Communicating Science

Practice-based pedagogy techniques for effective communication about scientific, technical, and health research. Application of communication techniques across public and professional audiences and a variety of oral and written communication contexts.

When: Fall and spring | Credit Hour(s): 2 | Level: Graduate

BIOL 6004 Outreach in Biology

Outreach is an increasingly important component of academia, yet graduate students often receive little to no training in how to successfully design and complete an outreach activity. This course will cover the importance of communicating science to the broader public, successful techniques for effective communication of complex scientific principles, and pedagogical techniques that improve the success and impact of outreach activities. We will discuss national and statewide science education standards and how to design activities that meet these standards and are therefore easy to incorporate into K-12 curricula. The culmination of the course will be the design and execution of an outreach activity based upon each student's area of expertise.

Instructor: Dana Hawley | When: Alternating years/varied - next offered Spring 2019

Credit Hour(s): 2 | Level: Graduate

2. GLOBAL CHANGE SCIENCE AND POLICY

Courses related to Environmental Policy, Law, History:

AAEC 5144 Resource and Environmental Economics

Economic theory and methods are applied to analysis of the uses of natural resources, environmental problems, and public investment planning. The contribution of economic analysis to public policy formulation is stressed.

When: Spring | Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

Prerequisite(s): ECON 3104 (UG) OR ECON 3104 OR AAEC 3004 (UG) OR AAEC 3004

AAEC 6524 Environmental Theory and Policy Analysis

Advanced coverage of the theory of environmental economics and policy. Topics covered in the course include: theory of externalities and public goods, theory behind policy instruments, issues with non-point source and transboundary pollution, and the role of the political economy for environmental problems.

Credit Hour(s): 4 | Lecture Hour(s): 3 | Level: Graduate | Prerequisite(s): ECON 5006

CEE 5804 - Engineering Ethics and the Public

Moral obligations of engineers and scientists toward the publics they serve; responsible conduct of research; responsible conduct of practice; the responsibilities and risks of witnessing wrongdoing; the value of non-expert knowledge claims and the importance of listening to public stakeholders. Graduate standing required.

Instructor: Marc Edwards | When: Fall | Credit Hour(s): 3 | Lecture Hour(s): 3

FREC 5134 - Environmental Conflict Management

Seminar-styled course will develop and explore theories and practical approaches to understanding and managing modern environmental conflicts, with an emphasis on the processes and structures unique to the United States. Causes, controls, and potential remedies for managing the intense conflicts routinely associated with natural resource management and environmental regulation. Graduate standing required.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

FREC 5984 - Climate Change & The International Policy Framework

Instructor: Carol Franco | Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

FWC 5414 - Endangered Species Management

History, philosophy, and practice of endangered species management with emphasis on management in the United States. Biology of extinction, rationale for preservation, endangered species legislation, status surveys, management goals, habitat protection, recovery plans.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate | Prerequisite(s): FIW 4414 OR FIW 4614 OR BIOL 4404

FWC 5814 - Stream Habitat Management

Application of stream ecology, fish biology, hydrology, and hydraulics to the protection, restoration, and enhancement of stream habitats and fauna. Major emphasis on stream habitat evaluation, regulated stream flow, biotic, integrity, and watershed management.

Instructor: Don Orth | Credit Hour(s): 3 | Level: Graduate | Prerequisite(s): BIOL 4004

FWC 5464G - Advanced Human Dimensions of Fisheries and Wildlife

Values, attitudes and opinions of people towards fish and wildlife. Social, economic, legal and political aspects of fisheries and wildlife management. Roles of professionals and the public in fish and wildlife policy processes. Contemporary fish and wildlife policy issues. Graduate Standing required.

Instructor: Vic DiCenzo | When: Fall | Credit Hour(s): 3 | Lecture Hour(s): 3

GEOG 4984/5984 – Climate Change and Societal Impacts

This class will focus on the multidimensional climate change impacts and adaptation options, and more importantly on their causes and consequences, interactions, complexity, uncertainty, and possible outcomes for different societies. It will explore dynamic trends of climate change-induced population movement, conflicts, socioeconomic shifts, geopolitics, and equity issues, as well as their impact on vulnerability, resilience, and adaptive capacity of different societies using contemporary digital tools and methodologies.

Instructor: Anamaria Bukvic | When: Fall | Credit Hour(s): 3 | Lecture Hour(s): 3

Level: Graduate

GRAD 6984- The Science and Policy of Invasions

Invasive species are one of the five elements of global change that shape ecosystem structure and function worldwide. This course will take a “deep dive” approach to identify and advance one fundamental unknown related to biological invasions. This approach will involve researching previous knowledge, current status, and perhaps proposed solutions during the semester. Possible topics include sociological, economic, ecological, process-based, or policy aspects of invasions. The idea is to set the foundation and then investigate the identified issue with the whole class participating in the effort. The course will consist of weekly meetings that are a mix of baseline materials, lectures from subject matter experts, methods of literature review and meta-analyses, with the majority being student-led discussions based on research findings. We will also discuss and reinforce professional development topics related to guidelines for successful multi-author collaborations and publications. The result of this work will be the basis for a high-impact review or opinion article that can be further developed the following semester by those willing and interested to pursue it to that end.

Instructors: Team Taught- Barney, Brown, Haak, Hotchkiss, Salom;

When: Fall | Credit Hours(s): 3 | Level: Graduate

HIST 5694 – American Environmental History

Examination of the important ways Americans have shaped and been shaped by the natural environment from the time of European contact with the New World to the present. Emphasis on the evolution of environmental concern in the nineteenth and twentieth centuries.

Instructor: Mark Barrow | When: Fall | Credit Hour(s): 3 | Lecture Hour(s): 3

Level: Graduate

NR 5374 - Endangered Species Policy and Management

Holistic assessment of endangered species policy and management in the United States, focusing on the Endangered Species Act of 1973 as amended. Topics covered will include legislative history, policy design principles, and various technical issues, especially species prioritization and agency implantation. This course will also address the socioeconomic context of endangerment, including the politics of species conservation, ESA and democracy, ESA in the courts, and ecological economics of species conservation. Graduate standing required.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

NR 5684 - Foundations of Federal Land Management

Provides the framework for public land laws and policies development. Reviews the origins and status of significant laws and policies affecting federal land management, including the evolution to present and impacts. Emphasis is placed on legal concepts, critical analysis, and problem solving. Includes student interactions with land management agencies and with professional organizations. Graduate standing required.

Instructor: Katherine Hoover, Virtual lecture | When: Fall | Credit Hour(s): 3

Lecture Hour(s): 3 | Level: Graduate | Instruction Type(s): Lecture, Online Lecture

NR 5344 - Natural Resources Law and Policy

In-depth examination of natural resource management laws and policies. Operation of laws, historical, and philosophical underpinnings. Emphasis on laws specific to wildlife, public lands, international policies, and scientific aspects of natural resource policy. All sources of law,

including treaties, statutes, regulations, Executive Orders, and case law will be utilized, with a strong emphasis on U.S. federal law. Graduate standing required.

Instructor: Mark Belleville; Virtual Lecture | When: Fall | Credit Hour(s): 3

Lecture Hour(s): 3 | Level: Graduate | Instruction Type(s): Lecture, Online Lecture

NR 5614G - Advanced Watershed Assessment, Management, and Policy

Multidisciplinary perspectives of assessment, management, and policy issues for protecting and improving watersheds ecosystems. Topics include: monitoring and modeling approaches for assessment, risk-based watershed assessment, geographic information systems for watershed analysis, decision support systems and computerized decision tools for watershed management, policy alternatives for watershed protection, urban watersheds, and current issues in watershed management. Pre: Graduate standing.

Instructors: Schoenholtz/Bosch | Credit Hour(s): 2 | Lecture Hour(s): 2 | Level: Graduate

Instruction Type(s): Lecture

PAPA 5614 / STS 5614 - Introduction to Science and Technology Policy

Strategies for science and technology policy; science education; scientific and technical information for societal uses; government and public policy; resource allocation; economy and global exchanges of science and technology; approaches to policy evaluation.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate | Instruction Type(s): Lecture

PAPA 6664 - Advanced Topics in Science and Technology Policy

Variable topics in science and technology policy. Includes advanced study of science, technology, and economy; science, technology, and power; strategies for research and development policy --public and private sector; transfer of technology; technological forecasting; government regulation and responses; science policy assumptions and challenges, specialist knowledge and expertise; state and academic knowledge production; issues of race, class, gender, and national identity in policy work. May be repeated with a different topic for a maximum of 6 credits. Credit Hour(s): 3

PAPA 6224 - Design, Implementation, and Evaluation of Public Policy and Programs

The general purpose of this course is to develop an understanding of the process by which policy is formulated, analyzed, implemented, and evaluated. The focus will be on such actions as undertaken by policy analysts in and out of government. The methodological issues and techniques used to accommodate the major social, economic, political, and behavioral aspects of policy analysis in an organizational context will be discussed.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

PHS 5014: Environmental Health

Exploration of major environmental health concepts and issues, *environmental policies and regulations*. Topics include world population and pressures on the environment, healthy environment; environmental determinants of public health, including biological, physical and chemical factors; disease vectors and their control; air and water quality; waste management; the built environment, work environments and recreational area; food protection and safety; occupational health; tools for environmental evaluation, planning and safety.

Instructor: Marmagas | Credit Hour(s): 3

PSCI 6204: Theories of Globalization

Examination of past and present eras of globalization through various theoretical perspectives. Addresses colonialism and emergence of western models for development of poor countries. Controversies about impacts of current globalization on the nation-state, cultures, ecosystems, and racial/ethnic/gender inequalities. Explores present trends, such as globalization of agriculture and food systems, industrial production, migration, human rights, and anti-globalization resistance. Pre-requisite may be substituted for any equivalent 5000 level international course.

Instructor: R. Kalyan | When: Spring | Credit Hours(s): 3

STS 5364 (PSCI 5364) (GIA 5364) - Public Ecology

Examines policy developments and practices that move beyond the conceptual divisions and policy operations begun during the 1970s, which largely divided the more natural science-based environmental sciences from social science-based environmental based studies. Mixes the insights of life science, physical science, social science, applied humanities, and public policy into a cohesive conceptual and operational approach to environmental protection in the 21st century. Graduate standing.

Instructor: AJ Scerri | Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

STS 5444 - Issues in Bioethics

Identification and analysis of ethical issues arising in basic and applied biological, medical, environmental, ecological, and energy studies.

Instructor: PR Olsen | Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

UAP 5134G - Advanced Land Use & Environmental: Planning & Policy

Environmental factors involved in land use planning and development, including topography, soils, geologic hazards, flooding, and sotrm water management, ecological features and visual quality. Techniques for conducting environmental land inventories and land use suitability analyses. Policies and programs to protect environmental quality in land use planning. Pre-requisite: Graduate Standing required.

Instructor: SC Hankey | Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

Instruction Type(s): Lecture, Online Lecture

UAP 5214 - Topics in Natural Resources and Natural Hazards Planning

Concepts, theory, and practice of resilience-based, climate- change integrated natural resources management and hazards planning. Effects of land, water, soil, and ecosystem management on quality of life for present and future generations. Natural resources and natural hazards planning process and tools for local communities and policies at state and federal levels. May be repeated for a maximum of 9 credit hours. Pre: Graduate standing.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

UAP 5264 - Global Change and Local Impacts; (also GEOG 5264)

All jurisdictions, national, regional, or local, function in an interconnected global market. Understanding the structure and interactions within that global market and the impacts therein is the focus of UAP 5264. Thematic topics include a review of welfare state functions, privatization, decentralization, and nonprofit organizations and their relation to global market

dynamics. Upon completion of the courses, students will have an understanding of how global forces influence local areas and how local leaders have developed strategies to cope with their position in an increasingly global market.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

UAP 5264G - Advanced Environmental Ethics and Policy

Issues in applied environmental ethics. Contributions of multi-cultural religious and spiritual traditions to contemporary perspectives on the human-nature relationship. Examination of selected issues in environmental ethics from utilitarian economic, deep ecology, and ecofeminist perspectives. Graduate standing required.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Instruction Type(s): Lecture, Online

UAP 5344G - Advanced Law Critical Environmental Areas

Examines the legal principles and policy debates involved in the regulation and protection of critical environmental resources. Variable topics including wetlands law and policy, endangered species habitat, open space, forestland and farmland protection, coastal zone management, and floodplain regulation and policy. Pre-requisite: Graduate Standing Required.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

UAP 5584 (GIA 5584) (PSCI 5584) - Environmental Politics and Policy

Course provides a broad introduction to the key ideas, actors and institutions related to environmental politics and policy in the United States, with some coverage of global issues. It is intended to provide students with basic interdisciplinary knowledge and an intellectual framework for understanding and thinking critically about environmental politics and policy.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate | Instruction Type(s): Lecture

UAP 5414 - Natural Resources Planning Topics *(Fall 2014: International Urban Environmental Policy, Planning, and Mgmt. in Developing and Transitioning Countries)*

The natural resource planning process as implemented by federal public lands and water resources agencies in the U.S. Public participation, environmental impact assessment, and resource evaluation methods used in planning and decision-making. Applications to resources planning in developing countries. May be repeated with different topics for a maximum of 9 credits. Graduate standing required.

Instructor: KF Wernstedt | Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

Instruction Type(s): Lecture, Online Lecture

Courses related to Conservation Biology and Sustainability:

BIOL 6004 - Topics in Ecology and Systematics: Advanced Conservation Biology (taught even years)

Reading and discussion in a specific area of ecology and systematics. Topic will vary, and course may be taken for credit more than once. Background in ecology or systematics required. I,II

Credit Hour(s): 1 TO 19 | Lecture Hour(s): 1 TO 19 | Level: Graduate

Instruction Type(s): Lecture

BIOL 6064 - Topics in Freshwater Ecology (Freshwaters in the Anthropocene)

The study of how altered climate, eutrophication, invasive species, unsustainable withdrawal, and other anthropogenic activities are altering freshwater quantity and quality globally. An emphasis on lakes and streams, using simulation models, global budgets, and high-frequency data to track ecosystem responses and resilience. National water policies and regulations will be compared among countries, as well as their future water scenarios.

Instructor: Cayelan Carey | Credit Hour(s): 2 | Lecture Hour(s): 2 | Level: Graduate

CSES 5744G - Advanced Managed Ecosystem Services & Sustainability

Interactions of climate, soils, and organisms within intensively managed ecosystems used to produce food, energy, water, recreation, and other essential ecosystem services. Models of ecosystem development, role of disturbance, application of ecological theory and concepts to agricultural, grassland, and urban/turf ecosystems. Regional and global significance in sustainable food systems, and global ecosystem assessment. Pre-requisite: Graduate Standing and knowledge of basic soil science required.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

FOR 5464 - Social Science Research Methods in Natural Resources

Social science research design and methods for students studying natural resource management. Addresses the unique and interdisciplinary nature of social science research related to complex natural resource problems. Guides students through the development of research questions into detailed research proposals that address human dimensions of natural resource management. Students' own research topics will provide examples for in-class discussion of research design. Graduate standing required.

Instructor: Marc Stern | When: Fall | Credit Hour(s): 3 | Lecture Hour(s): 3

FOR 5984: Linking Humans and the Environment to Improve Sustainability Science

In this course, we explore various established and emerging approaches that seek to link social and ecological systems, which require a highly interdisciplinary approach. This course will review trends regarding the epistemology and history of conservation and sustainability science and analyze specific proposals to link and understand the human-nature interaction. As an outcome of this course, students will have a strong conceptual and practical understanding of integrated socio-ecological research.

Instructor: Mike Sorice | When: Fall; main campus | Credit Hour(s): 3 | Lecture Hour(s): 3
Level: Graduate

FOR 5014 - Constructing Sustainability

Synthesize ecological, economic, and social dimensions of sustainable and resilient systems. Examine history, theory, current status, and future prospects of sustainability and resiliency as organizing principles for natural resource management professions. Situate science, policy, professional and civic institutions in sustainability efforts. Analysis sustainable and resilient bio-cultural systems. Pre-requisite: Graduate Standing required.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

FWC 5114 - Fisheries and Wildlife Conservation Genetics

Population genetics of terrestrial and aquatic animals as applied to fisheries and wildlife management, endangered species management, and ecosystem protection. Discussion of genetic variability and analytic techniques, population genetic processes, and practical applications.

Instructor: Hallerman | Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate

FWC 5984 – Systems Ecology and Conservation

Systems Ecology and Conservation adopts an integrative approach to understanding problems of sustainable management and conservation of natural environments. The course is founded on the idea that effective environmental conservation can only be achieved through consideration and management of broader, multifaceted factors related to natural ecosystems and human societies. It seeks to help students conceptualize and articulate their own problems of study within an interdisciplinary framework. The course introduces students to approaches to understanding biological conservation problems as integrated systems by reviewing the literature on Systems Ecology and Social-Ecological Systems. Attention is paid to the diversity of social-ecological settings across the globe and the role of rural communities in environmental conservation. Classes are based on discussions of readings led jointly by the students and instructor.

Instructor: L.Castello | When: Spring | Credit Hours: 3 | Lecture Hours: 3 | Level: Graduate

GEOG 4984/5984 – Climate Change and Societal Impacts

This class will focus on the multidimensional climate change impacts and adaptation options, and more importantly on their causes and consequences, interactions, complexity, uncertainty, and possible outcomes for different societies. It will explore dynamic trends of climate change-induced population movement, conflicts, socioeconomic shifts, geopolitics, and equity issues, as well as their impact on vulnerability, resilience, and adaptive capacity of different societies using contemporary digital tools and methodologies.

Instructor: Anamaria Bukvic | When: Fall | Credit Hour(s): 3 | Lecture Hour(s): 3
Level: Graduate

GEOG 4984/5984- Environmental Conservation

Conservation of the environment is arguably the most pressing concern that humans now face. All sectors of our economies and all aspects of our lives are engaged in a grand struggle with the environment and yet the conservation movement is still quite narrowly defined. In this course we will critically examine a broadly construed environmental conservation by working towards 3 course goals: identifying the dominant links between nature, science, and society; understanding how these links began, how they change, and how they are represented relative to the conservation movement; and evaluating to what extent the dynamics of these links reflect the spirit of conserving the environment.

Instructor: Tim Baird | Credit Hours 3 | Lecture Hours: 3 | Level: Graduate

NR 5724 - Conservation Ecology

Explores the interdisciplinary knowledge, theories, and research related to natural resource management and conservation. Emphasis will be on the synthesis and integration of

knowledge, skills and abilities required to develop innovative approaches to sustain resource development as conservation issues become more complex. Graduate standing required.

Instructor: Megan Draheim | When: Fall | Credit Hour(s): 3 | Lecture Hour(s): 3
Level: Graduate | Instruction Type(s): Lecture, Online Lecture

NR 5984/FWC 5984 - Special Study- Biodiversity Conservation and Environmental Sustainability

Interfacing Ecological and Social Sciences, we will examine the history, theories, current status, and future prospects, given ongoing global changes, of biodiversity conservation as a societal enterprise. The course will emphasize the study, practice, and scientific and socioeconomic contexts of conservation, especially as it relates to emerging goals for sustainability. It will synthesize ecological, socioeconomic, and cultural perspectives as it explores cross-institutional and cross-disciplinary approaches to conservation. Students will be encouraged to consider how they might engage science, policy, and other professionals in achieving conservation goals.

Instructor: Paul Angermeier | Credit Hour(s): 3 (1 day/wk) | Lecture Hour(s): 3
Level: Graduate | Instruction Type(s): Lab, Lecture, Online Lecture

NR 5044 - Environmental Conservation and the American Landscape

Comprehensive examination of American attitudes toward the environment and the history of efforts to protect it, from early European settlers to conservationists of today. History of the U.S. Forest Service and the National Park Service, as well as other federal and private land and resource conservation entities. Concept of wilderness, particularly within national parks and forests. Definitions of the American environment in the context of national development and our evolving strategies of environmental conservation. Primarily taught at National Capital Region. Graduate standing required.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Level: Graduate
Instruction Type(s): Lecture, Online Lecture

NR 5114 - Global Issues in Natural Resources

Study of the global economic and environmental consequences of the use of renewable natural resources. Emphasis on the world's forest, fisheries, and wildlife resources and on sustainable management. Seeks to enhance knowledge and understanding of the world's natural resources and the management of related industries from a global perspective.

Instructor: Heather Eves (Virtual lecture online) | When: Fall | Credit Hour(s): 3
Lecture Hour(s): 3 | Level: Graduate | Instruction Type(s): Lecture, Online Lecture

NR 5834 - Ecological Economics

Fusion of ecology and economics to assess the sustainability of economic policies. The economic system as an evolutionary function of the physical and biological environment. Effects of human economies on the environment and natural resources. Economic growth theory and policy in relation to sustainability of human society and management of natural resources. Distribution of wealth and allocation of resources. Primarily taught at National Capital Region. Graduate standing required.

Credit Hour(s): 3 | Lecture Hour(s): 3 | Instruction Type(s): Lecture, Online Lecture
Prerequisite(s): (BIOL 2804 (UG) OR BIOL 2804), (FOR 3424 (UG) OR FOR 3424)