

Old Dominion University

List of Selected Courses for Spring 2016

Note: Courses were selected based on a search for Climate, Sea Level, and Conservation.

Table columns:

Depart.	Number	Title	Description	Level
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Contact: Hans-Peter Plag, Mitigation and Adaptation Research Institute, hpplag@odu.edu

BIOL	105N	BIOLOGY MAJORS I	NONSCIENCE	An introductory biology course for nonbiology majors. This course concentrates on major biological concepts concerning molecular biology, cellular biology, cellular reproduction, classical and molecular genetics, energetics, and ecology. This course would be beneficial to students pursuing elementary education degrees due to the discussion of biological topics included in the Virginia Standards of Learning. Cannot be substituted for BIOL 121N and BIOL 122N or BIOL 123N and BIOL 124N.	UG
BIOL	106N	BIOLOGY MAJORS II	NONSCIENCE	An introductory biology course for nonbiology majors. This course concentrates on plants and animals at the organismal level by examining major biological concepts involving diversity, ecology, behavior, and evolution. This course would be beneficial to those students who are pursuing elementary education degrees because it teaches biological topics included in the Virginia Standards of Learning. Cannot be substituted for BIOL 121N and 122N or for BIOL 123N and BIOL 124N.	UG
BIOL	110N	ENVIRONMENTAL SCIENCES	SCI-	An introductory, non-sequential course for nonbiology majors focusing on scientific inquiry and the fundamental biological underpinnings of environmental science. The course concentrates on ecology, evolution, the nature of and threats to biodiversity, and conservation solutions. Cannot be substituted for BIOL 121N or BIOL 123N. BIOL 110N + BIOL 111N satisfy four credits of the University's Nature of Science general education requirement. Pre- or corequisite: BIOL 111N.	UG
BIOL	111N	ENVIRONMENTAL SCIENCES LAB	SCI-	Laboratory activities and scientific experiments that enhance understanding of environmental science through a hands-on approach that cannot be provided in the lecture classroom setting. BIOL 110N + BIOL 111N satisfy four credits of the University's Nature of Science general education requirement. Cannot be substituted for BIOL 122N or BIOL 124N. Pre- or corequisite: BIOL 110N.	UG
BIOL	112N	ENVIRONMENT AND MAN		An introductory, non-sequential course for nonbiology majors focusing on the most serious environmental problems our society is facing today and how these problems can be solved. The course concentrates on the science behind natural resources and resource management, toxicology, environmental policies and ethics, and sustainable living. Cannot be substituted for BIOL 121N or BIOL 123N. BIOL 112N and BIOL 113N satisfy four credits of the University's Nature of Science general education requirement. Pre- or corequisite: BIOL 113N.	UG
BIOL	113N	ENVIRONMENT AND MAN LAB		Laboratory activities and experiments that enhance understanding of the scientific method and environmental sciences through a hands-on approach that cannot be provided in the lecture classroom setting. This course cannot be substituted for BIOL 122N or BIOL 124N. BIOL 112N + BIOL 113N satisfy four credits of the University's Nature of Science general education requirement. Pre- or corequisite: BIOL 112N.	UG

BIOL	291	ECOLOGY	An introduction to the basic concepts of ecology for both biology majors and nonmajors. The concepts are introduced with respect to terrestrial and aquatic environments. Prerequisites: BIOL 123N and BIOL 124N must be passed with a grade of C or higher.	UG
BIOL	311	GLOBAL CHANGE BIOLOGY	This course will emphasize the application of evolutionary and ecological principles such as species geographic range shifts, changes in phenology, acclimation, adaptation, and extinction in response to global environmental changes. Prerequisites: BIOL 291 and BIOL 292 must be passed with a grade of	
BIOL	314	DEVELOPMENTAL BIOLOGY	An analysis of development in animals. Lectures will explore experimental approaches to the study of gametogenesis, fertilization, cleavage and morphogenesis. Laboratory emphasizes the morphological features of the developing vertebrate embryo. Prerequisites: BIOL 250 and BIOL 251 must be passed with a grade of C or higher. Pre- or corequisite: CHEM 211.	UG
BIOL	322	ETHNOBOTANY	A survey of plants used for food, fiber, medicine, dyes, perfumes, oils, and waxes. The role of plants in folklore and religion is included. A student research project with a written paper and presentation is required. Prerequisites: BIOL 292 AND BIOL 308 must be passed with a grade of C or higher.	UG
BIOL	331	MARINE BIOLOGY	A survey of the variety, ecology and adaptations of marine organisms. The course is designed to broadly introduce students to life in the oceans and the many special features of marine species that have evolved in the earth's oldest and most extensive ecosystem. Prerequisites: BIOL 291 must be passed with a grade of C (2.0) or higher.	UG
BIOL	334	FIELD ETHNOBOTANY	Identification, ecology, and uses of plants and mushrooms for food, oils, dyes, and cordage, based on collection and preparation of local materials. A field-intensive course with hands-on experience. A class project and presentation are required. Prerequisites: BIOL 123N and BIOL 124N must be passed with a grade of C or higher.	UG
BIOL	335	ECOLOGY LABORATORY	A field and laboratory course that emphasizes techniques employed in ecological investigations. Prerequisites: BIOL 291 must be passed with a grade of C or higher.	UG
BIOL	404	CONSERVATION BIOLOGY	The application of fundamental biological principles to the preservation of biodiversity, including the role of ecological and evolutionary theory to the preservation of biotas on a regional and global basis. Lectures will cover modern approaches to conservation biology, including conservation ethics and management issues. Laboratories will include discussion of case studies, introduction to software applicable to conservation biology, presentations by regional conservation practitioners, and visits to relevant field sites. Prerequisites: BIOL 291 must be passed with a grade of C or higher and junior standing or permission of instructor.	UG

BIOL	405W	BIOLOGY SEMINAR	This course offers a capstone experience in scientific writing, faculty-mentored library research, the review and synthesis of material from the primary technical literature, and oral presentation. Students will develop a deeper understanding of the purposes and types of scientific writing, the structure and interpretation of technical papers, and the oral and written communication skills appropriate to the discipline. (This is a writing intensive course.) Prerequisites: BIOL 291, BIOL 292, BIOL 293, and BIOL 303 and two 300- or 400-level elective courses, a grade of C or better in ENGL 211C or ENGL 221C or ENGL 231C, and CS 120G or CS 121G or CS 126G or HLTH 120G or IT 150G or STEM 251G.	UG
BIOL	415	MARINE ECOLOGY	An introduction to ecological processes in the marine environment with an emphasis on coastal ecosystems. The course covers synthetic topics as well as the ecology of specific marine habitats. Prerequisites: BIOL 291 and BIOL 331 must be passed with a grade of C or higher. Pre- or corequisite: When offered during the fall semester, BIOL 442 is a corequisite.	UG
BIOL	435	MARINE CONSERVATION BIOLOGY	This highly interdisciplinary science of conserving marine biodiversity will be taught through a review of old and new literature. This will include its history, marine ecology related to conservation biology, threats to marine biodiversity, assessment of extinction risk, conservation challenges of marine habitats and regions, and methods for conserving marine biodiversity. Prerequisites: BIOL 331 must be passed with a grade of C or higher.	UG
BIOL	437	ONE HEALTH:PEOPLE, ANIMAL&ENV	A course that examines the interdependence between human health, animal health and environmental health. The One Health approach to the threat of emerging infectious diseases includes understanding the interconnectedness of human and animal pathogens, epidemic zoonoses and corresponding environmental factors, insights into mechanisms of microbial evolution towards pathogenicity, new technologies and approaches towards disease surveillance, and political and bureaucratic strategies. Pre- or corequisite: BIOL 291, BIOL 292, BIOL 293, and BIOL 303; a Microbiology course is recommended.	UG
BIOL	442	MARINE ECOLOGY LAB	A laboratory/field course in which students gain practical experience with research techniques common to coastal marine ecology, and become familiar with the organisms and ecological conditions present in the various marine habitats visited by the class. A field trip of several days is required. Pre- or corequisite: When offered during the fall semester, BIOL 415 is a corequisite.	UG
BIOL	445	COMMUNITY ECOLOGY	The goal of this course is to introduce and evaluate both classical and emerging paradigms in community ecology. This will be achieved by examining those processes (biotic and abiotic) that structure ecological communities and by exposing students to quantitative and theoretical aspects of these paradigms. Prerequisites: BIOL 291 must be passed with a grade of C or higher.	UG

BIOL	450	PRINCIPLES OF PLANT ECOLOGY	This course emphasizes the general theoretical concepts in plant ecology with statistical methods. The structure, development, processes, and history of plant communities are studied. Laboratories involve extensive fieldwork. A weekend field trip is required. Prerequisites: BIOL 291 must be passed with a grade of C or higher and senior standing.	UG
BIOL	478	MICROBIAL ECOLOGY	Study of the interactions between microorganisms, particularly bacteria, and their environment. Emphasis is placed on nutrient cycling and the influence of microbes on global mineral dynamics. The effects of physical and chemical factors on the distribution and activity of microbes in their environments and the applications (biotechnology) of these interactions are studied. Prerequisites: BIOL 315 must be passed with a grade of C or higher.	UG
BIOL	488W	HONORS RESEARCH IN BIOLOGY	Independent study and scheduled meetings with faculty advisor. Supervised independent study in an area of individual interest in biology. The work in this course results in the production of a thesis. (This is a writing intensive course.) (qualifies as a CAP experience) Prerequisites: BIOL 487, admission to the Honors Program, senior standing, and a grade of C or better in ENGL 211C or ENGL 221C or ENGL 231C.	UG
BIOL	504	CONSERVATION BIOLOGY	The application of fundamental biological principles to the preservation of biodiversity, including the role of ecological and evolutionary theory to the preservation of biotas on a regional and global basis. Lectures will cover modern approaches to conservation biology, including conservation ethics and management issues. Laboratories will include discussion of case studies, introduction to software applicable to conservation biology, presentations by regional conservation practitioners, and visits to relevant field sites.	GR
BIOL	515	MARINE ECOLOGY	An introduction to ecological processes in the marine environment, with an emphasis on coastal ecosystems. The course covers synthetic topics as well as the ecology of specific marine habitats. Prerequisites: A previous course in marine biology. Pre- or corequisites: When offered during the fall semester, BIOL 542 is a corequisite.	GR
BIOL	535	MARINE CONSERVATION BIOLOGY	This highly interdisciplinary science of conserving marine biodiversity will be taught through a review of old and new literature. This will include its history, marine ecology related to conservation biology, threats to marine biodiversity, assessment of extinction risk, conservation challenges of marine habitats and regions, and methods for conserving marine biodiversity.	GR

BIOL	537	ONE HEALTH:PEOPLE, ANIMAL&ENV	A course that examines the interdependence between human health, animal health and environmental health. The One Health approach to the threat of emerging infectious diseases includes understanding the interconnectedness of human and animal pathogens, epidemic zoonoses and corresponding environmental factors, insights into mechanisms of microbial evolution towards pathogenicity, new technologies and approaches towards disease surveillance, and political and bureaucratic strategies. Pre- or corequisite: A Microbiology course is recommended.	GR
BIOL	542	MARINE ECOLOGY LAB	A laboratory/field course in which students gain practical experience with research techniques common to coastal marine ecology, and become familiar with the organisms and ecological conditions present in the various marine habitats visited by the class. A field trip of several days is required. Pre- or corequisite: When offered during the fall semester, BIOL 515 is a corequisite.	GR
BIOL	545	COMMUNITY ECOLOGY	The goal of this course is to introduce and evaluate both classical and emerging paradigms in community ecology. This will be achieved by examining those processes (biotic and abiotic) that structure ecological communities, and by exposing students to quantitative and theoretical aspects of these paradigms. Prerequisites: Ecology course.	GR
BIOL	550	PRINCIPLES OF PLANT ECOLOGY	Course covers the general theoretical concepts in plant ecology with statistical methods. The structure, development, processes, and history of plant communities are studied. Laboratories involve extensive fieldwork. A weekend field trip is required.	GR
BIOL	578	MICROBIAL ECOLOGY	Study of the interactions between microorganisms, particularly bacteria, and their environment. Emphasis is placed on nutrient cycling and the influence of microbes on global mineral dynamics. The effects of physical and chemical factors on distribution and activity of microbes in their environments and applications of these interactions are studied (biotechnology). Prerequisites: a general microbiology course.	GR
BIOL	579	MICROBIAL ECOLOGY LAB	A laboratory for measurement of microbial numbers and activity in natural environments. Pre- or corequisite: BIOL 578.	GR
BIOL	707	ECOSYSTEM ECOLOGY	Ecological principles at ecosystem level of biological organization. Discussion of energy flow, nutrient cycling, ecosystem stability and ecosystem modeling. Laboratory involves field trips and methods of measuring ecosystem parameters. Prerequisites: a general ecology course.	GR
BIOL	708	ECOLOGICAL SCIENCES SEMINAR	A graduate seminar course in the ecological sciences. The format of the course depends on the faculty running the seminar, but most seminars involve student-led discussions on current research articles.	GR
BIOL	732	GIS IN THE LIFE SCIENCES	This course is designed to introduce students to geographic information systems through examples and applications in the life sciences.	GR

BIOL	749	BIOGEOGRAPHY	Emphasis on historical biogeography, utilizing both dispersal and vicariance models for explanations of the geographic distribution of organisms. Ecological explanations are also considered. Useful techniques for biogeographic analyses, such as comparison of area cladograms are discussed at length.	GR
BIOL	750	MARINE BENTHIC ECOLOGY	Application of ecological principles at the community level to marine benthic environments. Discussion of community structure, animal-sediment relationships, roles of benthic communities in marine ecosystems. Prerequisites: BIOL 515 or equivalent.	GR
BIOL	832	GIS IN THE LIFE SCIENCES	This course is designed to introduce students to geographic information systems through examples and applications in the life sciences.	GR
CEE	458	SUSTAINABLE DEVELOPMENT	Overview of social, economical, technical environmental aspects of regional, national and international efforts to achieve sustainable development. Discussion of the integration of industrial activity and ecological concerns utilizing principles of zero emissions, pollution prevention and design for the environment. Prerequisite: junior standing or permission of instructor. (WEB Based, On-Line Course)	UG
CEE	558	SUSTAINABLE DEVELOPMENT	Overview of social, economical, technical environmental aspects of regional, national and international efforts to achieve sustainable development. Discussion of the integration of industrial activity and ecological concerns utilizing principles of zero emissions, pollution prevention and design for the environment. Prerequisites: permission of instructor.	GR
CEE	650	POLLUTION PREVENTION	Application of engineering methods to the prevention of pollution. Review of the Pollution Prevention Act and related regulations. Study of source reduction methods analysis for manufacturing, materials, and processing changes. Pollution prevention case studies.	GR
CEE	752	BIOLOG WASTEWATER TREATMENT	The use of microorganisms to treat domestic and industrial waste waters for organics and nutrient removal are studied. Characteristics of individual waste water components and the appropriate treatment processes to remove these components are covered. Prerequisites: CEE 350.	GR
CEE	782	DESIGN OF COASTAL STRUCTURES	Nonlinear wave theories; wave forces on slender piles and seawalls; design of rubblemound structures; design philosophy, initial costs, maintenance costs, optimized design using stochastic methods; design of renourished beaches. Advanced alternative solutions for shore protection. Prerequisites: CEE 482/CEE 582.	GR
CEE	783	TIDAL HYDR IN ESTUARY & COAST	This course introduces fundamental theories of estuarine hydraulics and processes, including classification of estuaries, estuarine hydrodynamics (waves and tides), along-/cross-channel momentum balances, estuarine variability, mixing and stratification in estuaries, wave-current interactions, flushing and fronts in estuaries as well as saltwater intrusion.	GR

CEE	882	DESIGN OF COASTAL STRUCTURES	Lecture 3 hours; 3 credits. Nonlinear wave theories; wave forces on slender piles and seawalls; design of rubble-mound structures; design philosophy, initial costs, maintenance costs, optimized design using stochastic methods; design of renourished beaches. Advanced alternative solutions for shore protection.	GR
CEE	883	TIDAL HYDR IN ESTUARY & COAST	This course introduces fundamental theories of estuarine hydraulics and processes, including classification of estuaries, estuarine hydrodynamics (waves and tides), along-/cross-channel momentum balances, estuarine variability, mixing and stratification in estuaries, wave-current interactions, flushing and fronts in estuaries as well as saltwater intrusion.	GR
CHEM	449	ENVIRONMENTAL CHEMISTRY	An overview of the natural chemical systems operating in Earth's atmosphere, hydrosphere (natural waters), and terrestrial environment, and the effects that human activities may have on them. Specific topics to be discussed include: origin and evolution of Earth and life, chemistry of the atmosphere (including the ozone layer and greenhouse effect), organic and inorganic components of soil and water, the hydrologic cycle, chemical weathering, chemical speciation and complexation, and microbial processes in soil and water. Prerequisites: CHEM 123N or CHEM 137N, CHEM 213 and CHEM 321 with a grade of C or higher or permission of the instructor.	UG
CHP	360	INTRO TO GLOBAL HEALTH	This course introduces students to health-care delivery systems of nonWestern countries, specifically developing countries. The various factors that influence health-care planning and delivery of health services are addressed. Prerequisite: CHP 200.	UG
CHP	415W	CRIT ISSUES IN COMM HLTH ADMIN	Identification and analyses of critical issues currently facing public/community health and the American health care system. This is a writing intensive course. Prerequisites: ENGL 110C and ENGL 211C or ENGL 221C or ENGL 231C with a grade of C or better.	UG
COMM	500	INTERCULTURAL COMMUNICATION	This course is designed to introduce students to the study of communication in cultural contexts, the purpose of which is to prepare students to live and work within an increasingly multicultural world. This is accomplished by first defining and critically analyzing concepts of culture. Throughout the semester, the course will investigate theories of culture and communication that address the development of cultural identity, intercultural communication competence, the role of verbal and nonverbal communication across cultures, the cultural composition of the U.S., and finally ethical communication and challenges in a globalized era. (This is a writing intensive course.)	GR

ECON	445W	URBAN ECONOMICS	An analysis of the economic factors which give rise to the formation of urban centers and which contribute to the following problems: urban poverty, housing conditions, traffic congestion, and the fiscal crisis faced by modern cities. (This is a writing intensive course.) Prerequisites: A grade of C or better in ENGL 211C or ENGL 221C or ENGL 231C, ECON 202S (or ECON 200S and permission of the instructor), and a declared major at the University or permission of the Dean's Office.	UG
ECON	447W	NATURL RESOURCE & ENV-IRON ECON	Topics discussed include conservation and scarcity, market failure, fishery management, benefit-cost analysis, water resource development, environmental quality, recreation, energy, and marine resources. (This is a writing intensive course.) Prerequisites: A grade of C or better in ENGL 211C or ENGL 221C or ENGL 231C; ECON 202S (or ECON 200S and permission of the instructor), and a declared major at the University or permission of the Dean's Office.	UG
ECON	450	INTERNATIONAL ECONOMICS	An analysis of the principles of trade theory and policy with an overall exposition of the principles of international finance. The main objective of the course is to provide knowledge of analytical tools used by economists in analyzing contemporary international economic problems. Prerequisites: ECON 201S and ECON 202S, along with a declared major at the University or permission of the Dean's Office.	UG
ECON	535	HEALTH ECON-GLOBAL PERSPECTIVE	This course introduces the student to the economics of health care and the application of health economics to health care problems, the issues surrounding those problems, and the potential solutions to those problems. The course will emphasize institutional features of the health care industry, the market for health care, the political economy of health care, and government involvement in the delivery of health care. Further, the course will survey the delivery of health care in other countries and provide a global perspective on selected health care issues such as AIDS, water and air quality, and the aging of the population.	GR
ECON	545	URBAN ECONOMICS	An analysis of the economic factors which give rise to the formation of urban centers and which contribute to the following problems: urban poverty, housing conditions, traffic congestion, and the fiscal crisis faced by modern cities.	GR
ECON	547	NATURL RESOURCE & ENV-IRON ECON	Topics discussed include conservation and scarcity, market failure, fishery management, benefit-cost analysis, water resource development, environmental quality, recreation, energy, and marine resources.	GR

ECON	650	INTERNATIONAL ECONOMICS	ECO-	An analysis of international trade theory, commercial policy, foreign exchange markets, open economy macroeconomics, and balance of payments. The course provides the theoretical basis to understand contemporary international economic issues. (Credit may not be applied toward the M.A. in economics.)	GR
EET	370T	ENERGY AND THE ENVIRONMENT	ENVI-	A study of existing and new energy production methods, energy as a purchased/traded commodity, physics of energy, positive and negative implications for the environment, economics of energy alternatives, and resulting human/social impacts. Prerequisite: PHYS 101N or PHYS 111N or PHYS 226N or PHYS 231N.	UG
GEOG	405	SEM IN INTERNATL RESOURCE MGMT	RE-	Discussion of the ecological and management principles underlying international resource management and the goal of attaining a sustainable, ecologically balanced world. Prerequisites: GEOG 100S or GEOG 101S; GEOG 305 recommended.	UG
GEOG	420	MARINE GEOGRAPHY		An analysis of human-sea relationships with particular emphasis on resource management and political organization from global, regional, and national perspectives. Prerequisites: Junior standing and six credits in human behavior, or permission of the instructor.	UG
GEOG	422W	COASTAL GEOGRAPHY		An examination of the physical and human geography of the coastal zone. Considers problems of managing coastal resources with an emphasis on North America. Lectures focus on coastal patterns, processes, and problems at the global, national, and local scales. Students investigate a section of the local coastline and write a report on the physical and human geography on the basis of field study, library, and internet research. (This is a writing intensive course.) Prerequisites: GEOG 100S or 101S, a grade of C or better in ENGL 211C or ENGL 221C or ENGL 231C, or permission of the instructor.	UG
GEOG	451	EUROPE		A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in Europe. Prerequisites: Junior standing and GEOG 100S or GEOG 101S, or permission of the instructor.	UG
GEOG	452	AFRICA		A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in Africa. Prerequisites: Junior standing and GEOG 100S or GEOG 101S, or permission of the instructor.	UG
GEOG	453	ASIA		A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in Asia excluding the Middle East and the former USSR. Prerequisites: Junior standing and GEOG 100S or GEOG 101S, or permission of the instructor.	UG
GEOG	454W	LATIN AMERICA		A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in Latin America. (This is a writing intensive course.) Prerequisites: Junior standing, GEOG 100S or GEOG 101S, a grade of C or better in ENGL 211C or ENGL 221C or ENGL 231C, or permission of the instructor.	UG

GEOG	455	THE MIDDLE EAST	A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in the Middle East. Prerequisites: Junior standing and GEOG 100S or GEOG 101S, or permission of the instructor.	UG
ENVH	461	HAZARDOUS WASTE MANAGEMENT	Description of the hazardous waste problem, the fundamentals of the chemistry involved with hazardous waste transport, methods of identification, assessment, control, and disposal of toxic and hazardous waste are discussed. In addition the relevant legal statutes, risk assessment emergency response and case studies are presented. Introduction to the toxicological effects of exposure to hazardous waste is discussed. Prerequisites: junior standing.	UG
ENVH	465	HAZARDOUS MATERIALS MANAGEMENT	The management of hazardous materials includes a wide array of interlocking regulations addressing use, manufacturing, exposure, storage, shipping and disposal. A life cycle review of hazardous materials highlighting best practices and legislation is presented. Useful in preparation for CHMM examination. Prerequisites: junior standing.	UG
ENVH	495	TOPICS IN ENVIRONMENTAL HEALTH	Advanced study of selected topics. Prerequisites: junior standing.	UG
ENVH	561	HAZARDOUS WASTE MANAGEMENT	Description of the hazardous waste problem, the fundamentals of the chemistry involved with hazardous waste transport, methods of identification, assessment, control, and disposal of toxic and hazardous waste are discussed. In addition the relevant legal statutes, risk assessment emergency response and case studies are presented. Introduction to the toxicological effects of exposure to hazardous waste is discussed.	GR
ENVH	565	HAZARDOUS MATERIALS MANAGEMENT	The management of hazardous materials includes a wide array of interlocking regulations addressing use, manufacturing, exposure, storage, shipping and disposal. A life cycle review of hazardous materials highlighting best practices and legislation is presented. Useful in preparation for CHMM examination.	GR
IS	710	GLOBAL ENVIRONMENTAL POLICY	Lecture 3 hours; 3 credits. This seminar examines the institutions and political actors involved in global environmental policy making with emphasis on the role of the United States. In doing so, it addresses the scientific and political debate concerning the causes, consequences, and proposed solutions of selected worldwide ecological problems, including global climate change, stratospheric ozone depletion, acid rain, and loss of biodiversity among others.	GR
IS	810	GLOBAL ENVIRONMENTAL POLICY	Lecture 3 hours; 3 credits. This seminar examines the institutions and political actors involved in global environmental policy making with emphasis on the role of the United States. In doing so, it addresses the scientific and political debate concerning the causes, consequences, and proposed solutions of selected worldwide ecological problems, including global climate change, stratospheric ozone depletion, acid rain, and loss of biodiversity among others.	GR

MAE	413	ENERGY CONSERVATION		Introduction of relevant kinetic theory, solid state, and thermodynamic principles; operation and analysis of thermoelectric, photovoltaic, thermionic, magnetohydrodynamic devices, fuel cell, isotopic, and solar power generators. Course seeks to define engineering limits of converter efficiency and other performance criteria. Prerequisite: MAE 312.	UG
OEAS	108N	UNDERSTAND GLOBAL CLIMATE CHNG		Lecture, 3 hours; Lab, 2 hours. 4 credits. What is the science behind global climate change? How reliable are forecasts of future global warming? This course examines these questions to evaluate the likelihood and potential severity of anthropogenic climate change in the coming centuries. It includes an overview of the physics of the greenhouse effect, an overview of the global carbon cycle and its role as a global thermostat; an examination of predictions and reliability of model forecasts of future climate change; and examination of local impacts of global climate change (e.g., sea level rise in the Tidewater area).	UG
OEAS	210	ENVIRONMENTAL SCIENCE	EARTH	Lecture 3 hours; laboratory 2 hours; 4 credits. Dynamic processes of the land, ocean, and atmosphere and how they affect people. Topics include plate tectonics; rocks and minerals; soil and water; weather and climate; tides and currents; limits to natural resources. OEAS 210 is a required course for the IDS program in Early Childhood Education. Does not satisfy OEAS major degree requirements.	UG
OEAS	302	ENVIRONMENTAL GEOLOGY	GEOL-	Lecture 3 hours; 3 credits. Prerequisites: junior standing and an 8-hour sequence in a General Education science course. Geologic resources and processes that limit human activities and pose significant hazards. Does not satisfy OEAS major degree requirements.	UG
OEAS	306	OCEANOGRAPHY		General survey of physical, geological, chemical and biological oceanography. The application of skills from mathematics, geology, physics, biology and chemistry for the solution of oceanographic problems. Prerequisites: MATH 211, BIOL 121N and BIOL 122N, CHEM 121N-CHEM 122N, OEAS 111N, and PHYS 111N or PHYS 231N.	UG
OEAS	313	MINERALOGY		The concepts of mineralogy are developed on the basics of geometrical, crystallographic, chemical bonding, crystal structures, and physical and optical properties. Mineral associations and genesis will be emphasized. Laboratory exercises include mineral identification by physical and optical properties, X-ray diffraction, and crystal form. Prerequisites: CHEM 121N-CHEM 122N.	UG
OEAS	402	FIELD EXPERIENCE IN OCEAN/EARTH SCI	IN	Lecture 2 hours; field experience 2 hours; 3 credits. Prerequisite: background in K-12 Education. Field and laboratory experiences in oceanography including hands-on experience using equipment and methods suitable for middle and secondary education professionals. Course will provide understanding of oceanic processes using simple field and laboratory experiments. Not available for credit for OEAS majors and minors.	UG

OEAS	404	ENVIRON PHYSIOL- MARINE ANIMALS	Lecture 3 hours; 3 credits. Prerequisite: junior standing; upper level biology courses. Functional morphology and physiological aspects of growth and ecological energetics of marine animals. Basic concepts and habitat comparisons.	UG
OEAS	412	GLOBAL ENVIRONMENTAL CHANGE	Lecture 3 hours; 3 credits. Prerequisites: OEAS 306 and 310. An examination of the development of the earth as a habitable planet, from its origin to human impacts on global biogeochemical cycles on land, and in the oceans and atmosphere.	UG
OEAS	444	COMMUNICATING OCEAN SCIENCE	This course provides Earth Science Education students with instruction on presenting scientific information to informal audiences (K through adult). The course provides techniques and practical experience in designing informal lessons. For Earth Science Education track students, OEAS 444 and OEAS 445 can replace OEAS 441/OEAS 442W. It is available as an elective for all other students. Prerequisites: OEAS 306 or OEAS 310.	UG
OEAS	445	COMMUNICATING OCEAS SCIENCE II	This course provides Earth Science Education students with instruction on presenting scientific information to informal audiences (K through adult). Students will develop more in-depth presentations and extended practice presenting their materials on the Virginia Aquarium floor. For Earth Science Education track students, OEAS 444 and OEAS 445 can replace OEAS 441/OEAS 442W. It is available as an elective for all other students. Prerequisite: OEAS 444.	UG
OEAS	448	POPULATION ECOLOGY	Lecture 3 hours; 3 credits. Prerequisite: MATH 211. This course uses conceptual and mathematical models to understand how populations grow and persist in space and time. Both plants and animals are discussed.	UG
OEAS	502	FIELD EXPER IN OCEAN/EARTH SCI	Lecture 2 hours; field experience 2 hours; 3 credits. Prerequisite: background in K-12 Education. Field and laboratory experiences in oceanography including hands-on experience using equipment and methods suitable for middle and secondary education professionals. Course will provide understanding of oceanic processes using simple field and laboratory experiments. Not available for credit for OEAS majors and minors.	GR
OEAS	504	ENVIRON PHYSIOL- MARINE ANIMALS	Lecture 3 hours; 3 credits. Functional morphology and physiological aspects of growth and ecological energetics of marine animals. Basic concepts and habitat comparisons.	GR
OEAS	512	GLOBAL ENVIRONMENTAL CHANGE	Lecture 3 hours; 3 credits. An examination of the development of the earth as a habitable planet, from its origin to human impacts on global biogeochemical cycles on land, and in the oceans and atmosphere.	GR
OEAS	622	WETLAND HYDROLOGY	Lecture 2 hours; laboratory 3 hours; 3 credits. Hydrologic criteria used to delineate wetlands. Techniques used to calculate components of water budgets for non-tidal wetlands. Many lab exercises will require extensive field work in wetlands.	GR

OEAS	644	ENVIR PHYSIOLOGY MA- RINE ANIMAL	Lecture 3 hours; 3 credits. Prerequisite: OEAS 640 or equivalent. Physiological and biochemical adaptations of marine animals in stable and changing environments. Topics include foraging, respiration growth and reproductive strategies in diverse marine habitats.	GR
OEAS	690	TOPICS MARINE ENVIRON POLICY	Lecture 3 hours; 3 credits. This course will give students a working understanding of how science policy decisions are made by governments and how science and technology impact public policy. This course seeks to integrate current policy/legislative initiatives with the underlying scientific issues in order to raise the students appreciation for and understanding of the various influences that affect the decision-making process. In particular, the course will look at how science influences policy and assess the state of the science relative to the issues at stake.	GR
PADM	632	ENVIRONMENTAL PLAN- NING	Lecture 3 hours; 3 credits. Environmental analysis and the planning process; administrative agency structure, policy development, regulation and enforcement, content and use of the environmental impact statement.	GR
PHYS	104N	MODERN ASTRONOMY	Emphasizes the study of stars, star systems, cosmology and relativity. Emphasis on how we acquire knowledge of celestial objects to develop models of our universe.	UG
POLS	401	GLOBAL ENVIRONMENTAL POLICY	This course analyzes the causes, severity, potential consequences, and proposed solutions regarding global ecological issues with special attention to the scientific debate and the political and policy process. It examines environmental policies of national governments, regional/international organizations, and global conferences. Prerequisites: Six credits in political science.	UG
PRTS	406	OUTDOOR LEADERSHIP IN ENV EDUC	This course is designed to examine the history, development, and trends in outdoor leadership and environmental education, including the development of curriculum concepts that foster an environmentally literate citizenry. Leadership and teaching techniques for successful utilization of the out-of-doors as a classroom will be explored. Prerequisites: junior standing or permission of the instructor.	UG
PRTS	495	TOPICS	This course provides an opportunity for in-depth study of selected topics in the variety of areas comprising parks, recreation and tourism studies. Prerequisites: junior standing.	UG
PRTS	595	TOPICS	This course provides an opportunity for in-depth study of selected topics in the variety of areas comprising parks, recreation and tourism studies.	GR
SOC	427	VIOLENCE AGAINST WOMEN	A critical analysis of violence against women as an institution of social control. Examines violence in the context of social and political inequality and feminist critique. Issues explored include pornography, prostitution, sexual harassment, incest, battering and rape. Prerequisites: SOC 201S or CRJS 215S or permission of the instructor.	UG