ENVIRONMENTAL SCIENCE AND POLICY MAJOR

Program Director: Mark Carroll, Ph.D.

Environmental Science and Policy is a broadly multi-disciplinary, undergraduate major, drawing courses and faculty from nine departments, three colleges (the Colleges of Agriculture and Natural Resources; Behavioral and Social Sciences; Computer, Mathematical, and Natural Sciences), and one School (the School of Public Health).

New ENSP students begin in the College of Agriculture and Natural Resources, where they will be guided through a structured, exploratory advising process. ENSP students are expected to declare a concentration by the end of their third semester in the program and, once they declare their concentration, will move administratively to the college and department sponsoring the concentration. There, they are advised by a faculty member in their discipline.

The ENSP faculty and staff aspire to provide a strong identity for the students enrolled in this major, and we encourage students to take advantage of the rich resources available at a Research I public university. Experiential learning through research, internships, and study abroad is strongly encouraged.

Admission to the Major

Incoming students who wish to enter ENSP may do so by selecting ENSP-Undeclared on their application for admission. On-campus students may declare ENSP during a meeting with the Assistant Director. Please review the ENSP website at http://ensp.umd.edu to learn about the program and its requirements prior to your first advising meeting.

Program Objectives

The curriculum of Environmental Science and Policy comprises an introductory core of lower-level courses in environmental science, environmental policy, biology, chemistry, earth sciences, geography, economics, calculus, and statistics. This is followed by in-depth and focused training in one of eleven areas of concentration in biological resources, earth systems, or the human dimensions of the field; and two upper-level courses in applied science and policy. The educational philosophy of the program is to train students broadly using a multi-disciplinary approach at the introductory level so that they are exposed to the myriad ways there are to learn about environmental systems and to address human-environment issues. This introductory approach precedes the concentration in which the students are prepared for post-graduate study or work in a discipline-based field. The combination of the lower-level core courses and upper-level depth in a concentration prepares graduates to work and study independently or as members of teams in which they will be asked to be experts in one area, while understanding and using effectively other natural and social science knowledge and investigative approaches.

Program Learning Outcomes

1. Utilize and integrate knowledge and understanding of natural and social sciences.
2. Depth and knowledge in an area of concentration.
3. Readiness for full-time employment and grad school.

REQUIREMENTS

Course	Title	Credits
ENSP Core [1]		**18-19**
ENSP101	Introduction to Environmental Science	
ENSP102	Introduction to Environmental Policy	
ENSP400	Capstone in Environmental Science and Policy ((senior standing))	
Applied Science and Policy (select one) [2, 3]		
ENSP305	Applied Spatial Analysis in Environmental Science and Policy	
ENSP306	Fundamentals of Qualitative Research Methods for Environmental Studies	
ENSP330	Introduction to Environmental Law	
ENSP340	Water: Science, Ethics, and Policy	
ENSP342	Environmental Threats to Oceans and Coasts: Towards an Integrated Policy Response	
ENSP350	Energy Resources: Science and Policy in the 21st Century	
ENSP370	Principles of Environmental Justice: Theory and Practice	
Calculus (select one):		
MATH120	Elementary Calculus I	
MATH136	Calculus for Life Sciences	
MATH140	Calculus I	
Statistics (select one):		
BIOM301	Introduction to Biometrics	
SOCY201	Introductory Statistics for Sociology	
PSYC200	Statistical Methods in Psychology	
GEOG306	Introduction to Quantitative Methods for the Geographical Environmental Sciences	
ECON321	Economic Statistics	
Select at least one course each from four of the five groups:		12-14
Group 1- Biology:		
BSCI160 & BSCI180	Principles of Ecology and Evolution and Principles Biology Laboratory (BSCI161 may count for BSCI180)	
Group 2 - Chemistry:		
CHEM131 & CHEM132	Chemistry I - Fundamentals of General Chemistry and General Chemistry I Laboratory	
Group 3 - Earth Sciences:		
AOSC200 & AOSC201	Weather and Climate and Weather and Climate Laboratory	
ENST200	Fundamentals of Soil Science	
GEOG201 & GEOG211	Geography of Environmental Systems and Geography of Environmental Systems Laboratory	
GEOL100 & GEOL110	Physical Geology and Physical Geology Laboratory	
GEOL120 & GEOL110	Environmental Geology and Physical Geology Laboratory	
Group 4 - Economics:		
AREC240	Introduction to Economics and the Environment	
AREC241	Environment, Economics and Policy	
ECON200	Principles of Microeconomics	

Group 5 - Geography:		
GEOG130	Development Geography: Environmental & Social Justice	
GEOG140	Natural Disasters: Earthquakes, Floods, and Fires	
GEOG170	Mapping our Digital World	
GEOG202	Introduction to Human Geography	
Total Credits		**30-33**

[1] Requirements may vary slightly depending on concentration; please refer to complete list of requirements on http://ensp.umd.edu.
[2] To be taken in the junior or senior year
[3] Students shall not double-count the Applied Science and Policy requirement with another requirement for their concentration.

GRADING POLICY: Students who entered the Environmental Science and Policy Program (ENSP) in Spring 2002, and thereafter, are required to earn grades of "C-" or higher in all courses taken within the ENSP core, in all required courses, and restricted electives of the selected area of concentration.

Areas of Concentration

Students choose an area of concentration and move administratively to the College and academic department sponsoring the concentration where they receive faculty advising and advanced training and background. See requirements for each Area of Concentration below.

Environment and Agriculture (AGNR)

Course	Title	Credits
Requirements		
Fundamentals and Background		18-19
ANSC101 & ANSC103	Principles of Animal Science and Principles of Animal Science Laboratory	
BSCI170	Principles of Molecular & Cellular Biology	
BSCI180	Principles Biology Laboratory	
or BSCI171	Principles of Molecular & Cellular Biology Laboratory	
BSCI222	Principles of Genetics	
or PLSC203	Plants, Genes and Biotechnology	
CHEM131 & CHEM232	Chemistry I - Fundamentals of General Chemistry and Organic Chemistry Laboratory I	
PLSC112 & PLSC113	Introductory Crop Science and Introductory Crop Science Laboratory	
Cartography, Remote Sensing, and GIS (6 credits)		6
GEOG272	Introduction to Earth Observation Science	
GEOG475	Geographic Visualization and Digital Mapping	
GEOG472	Remote Sensing: Digital Processing and Analysis	
GEOG373	Geographic Information Systems	
or ENST415	Renewable Energy	
GEOG473	Geographic Information Systems and Spatial Analysis	
Internship (3 credits)		
ENSP386	Internship	
Restricted Electives (choose 5 courses in one Area) [1]		**15-19**
Area 1 - Crop production and plant protection		
Area 2 - Human dimensions		
Total Credits		**39-44**

[1] See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved electives.

Environmental Economics (AGNR)

Course	Title	Credits
Economics Foundation - Choose Track 1 or Track 2		**13-14**
Track 1: Preparation for PhD programs in Economics and quantitative careers that produce economic analysis		
ECON201	Principles of Macroeconomics	
MATH141	Calculus II	
ECON321	Economic Statistics	
or STAT400	Applied Probability and Statistics I	
ECON326	Intermediate Microeconomic Analysis	
Track 2: Preparation for Master's programs in Public Policy, Law, and careers that involve decision-making informed by economic analysis		
ECON201	Principles of Macroeconomics	
ECON230	Applied Economic Statistics	
or BMGT230	Business Statistics	
AREC326	Intermediate Applied Microeconomics	
or ECON326	Intermediate Microeconomic Analysis	
Select one of the following courses:		
MATH121	Elementary Calculus II (or Equivalent)	
ECON424	Applied Econometrics	
AREC422	Econometric Analysis in Agricultural and Environmental Economics	
AREC380	Data Science for Environmental and Resource Economics	
AREC382		
ENSP305	Applied Spatial Analysis in Environmental Science and Policy	
ENSP306	Fundamentals of Qualitative Research Methods for Environmental Studies	
Restricted Electives inside Economics (Choose 5 courses from an approved list) [1]		**15**
Restricted Electives outside Economics (choose from one Supporting Area below) [1]		**12**
Area 1- Social science (at least 9 credits must be 300- or 400-level)		
Area 2 - Earth Science		
Area 3 - Life Science (at least 9 credits must be 300- or 400-level)		
Area 4 - Preparation for Graduate Work in Environmental Economics		
Total Credits		**40-41**

[1] See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved electives.

Soil, Water, and Land Resources (AGNR)

Course	Title	Credits
Requirements		**18-22**
Select one:		
GEOG272	Introduction to Earth Observation Science	

Select one:	
GEOL340	Geomorphology
GEOG340	Geomorphology
Select one:	
GEOL451	Groundwater
GEOL452	Watershed and Wetland Hydrology
ENST417	Soil Hydrology and Physics
Select two:	
ENST301 & ENST302 & ENST303	Field Soil Morphology I and Field Soil Morphology II and Field Soil Morphology III
ENST415	Renewable Energy
ENST423	Soil-Water Pollution
Select two:	
ENST411	Principles of Soil Fertility
ENST414	Soil Morphology, Genesis and Classification
ENST417	Soil Hydrology and Physics
ENST421	Soil Chemistry
ENST422	Soil Microbial Ecology
Restricted Electives (at least 3 courses) [1]	**9**

[1] See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved electives.

Wildlife Ecology and Management (AGNR)

Course	Title	Credits
Requirements		**29**
BSCI170	Principles of Molecular & Cellular Biology	
BSCI180	Principles Biology Laboratory	
or BSCI171	Principles of Molecular & Cellular Biology Laboratory	
ENST214	Introduction to Natural Resources Management	
BSCI222	Principles of Genetics	
CHEM231 & CHEM232	Organic Chemistry I and Organic Chemistry Laboratory I	
ENST460	Principles of Wildlife Management	
BSCI361	Principles of Ecology	
PHYS121	Fundamentals of Physics I (Require)	
ENSP305	Applied Spatial Analysis in Environmental Science and Policy	
Internship/Research		**3-6**
ENSP386	Internship	
or ENSP499	Honors Thesis Research	
Restricted Electives - Choose at least 6 courses (3 courses in each Area) [1]		**18**
Area 1 - Ecological and Taxonomic Dimensions		
Area 2 - Management		
Total Credits		**50-53**

[1] See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved electives.

Culture and Environment (BSOS)

Course	Title	Credits
Requirements		**13**
ANTH222	Introduction to Ecological and Evolutionary Anthropology	
ANTH322	Method and Theory in Ecological Anthropology	
ANTH240 & ANTH340	Introduction to Archaeology and Method and Theory in Archaeology	
or ANTH260 & ANTH360	Introduction to Sociocultural Anthropology and Linguistics and Method and Theory in Sociocultural Anthropology	
Restricted Electives in Anthropology (choose at least 4 courses; at least 6 credits must be 300- or 400-level) [1]		**12**
Restricted Electives outside Anthropology (including 9 credits from the same academic department) [1]		**15**
Applied Field Methods [1]		**3-6**

[1] See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved courses in this category.

Environmental Politics and Policy (BSOS)

Course	Title	Credits
Requirements		**24**
ECON201	Principles of Macroeconomics	
GVPT170	American Government	
GVPT200	International Political Relations	
GVPT280	The Study of Comparative Politics	
GVPT306	Global Environmental Politics	
GVPT417	Seminar in Advanced Topics in Environmental Policy Analysis	
ENSP330	Introduction to Environmental Law	
GVPT course of choice. Must be 200/300/400-level with advisor approval		
Restricted Electives (6 courses) [1]		**18**

[1] See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved electives.

Global Environmental Change (BSOS)

Course	Title	Credits
Requirements		
Lower Level requirements		18-19
GEOL100	Physical Geology	
MATH141	Calculus II	
or MATH121	Elementary Calculus II	
PHYS161 & PHYS174	General Physics: Mechanics and Particle Dynamics and Physics Laboratory Introduction	
or PHYS121	Fundamentals of Physics I	
CHEM231 & CHEM232	Organic Chemistry I and Organic Chemistry Laboratory I	
ENST200	Fundamentals of Soil Science	
or GEOL102	Historical Geology	

Upper Level requirements		18-19
BSCI361	Principles of Ecology	
or GEOG342		
GEOG331	Introduction to Human Dimensions of Global Change	
GEOG301	Advanced Geographical Environmental Systems	
or GEOG345		
GVPT306	Global Environmental Politics	
or ENSP340	Water: Science, Ethics, and Policy	
or ENSP342	Environmental Threats to Oceans and Coasts: Towards an Integrated Policy Response	
or ENSP350	Energy Resources: Science and Policy in the 21st Century	
GEOG442	Biogeography and Environmental Change	
or AOSC400	Physical Meteorology	
or GEOL437	Global Climate Change: Past and Present	
ENSP386	Internship	
Techniques & Methods [1]		**9**
Restricted Electives - Select 6 credits from one Area and 3 credits from the other [1]		**9**
Area 1 - Physical and Biological Components		
Area 2 - Human Dimensions		

[1] See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved courses in this category.

Land Use (BSOS)

Course	Title	Credits
Requirements		
Lower-level focus: Choose one		3-4
GEOG130	Development Geography: Environmental & Social Justice	
GEOG140	Natural Disasters: Earthquakes, Floods, and Fires	
ENST200	Fundamentals of Soil Science	
Techniques and Methods		6
GEOG272	Introduction to Earth Observation Science	
GEOG373	Geographic Information Systems	
Application and Synthesis		**6**
ENSP386	Internship	
GEOG431	Culture and Natural Resource Management	
Restricted Electives (students must choose 8 courses, including at least 3 credits from each of the 5 Areas below) [1]		**22-24**
Area 1 - Social/Cultural Dimensions (choose at least 1 course and 3 credits)		
Area 2 - Technical Skills (choose at least 1 course and 3 credits)		
Area 3 - Regional Dimensions (choose at least 1 course and 3 credits)		
Area 4 - Ecological Dimensions (choose at least 1 course and 3 credits)		
Area 5 - International Dimensions (choose at least 1 course and 3 credits)		

[1] See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved electives.

Marine and Coastal Management (BSOS)

Course	Title	Credits
Upper Level Requirements		**12**
AOSC375	Introduction to the Blue Ocean	
or GEOL375	Introduction to the Blue Ocean	
ENSP342	Environmental Threats to Oceans and Coasts: Towards an Integrated Policy Response	
GEOG441	The Coastal Ocean	
ENST450	Wetland Ecology	
Technical Requirements		**6**
GEOG272	Introduction to Earth Observation Science	
GEOG373	Geographic Information Systems	
Synthesis		**6**
ENSP386	Internship	
Restricted Electives--Choose 5 courses. At least 2 courses must be from Area 1, and at least 1 course must be from Area 2: [1]		**15**
Area 1 - Costal Science		
Area 2 - Management		

[1] See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved electives.

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Biodiversity and Conservation Biology (CMNS)

Course	Title	Credits
Requirements		**32-33**
BSCI170	Principles of Molecular & Cellular Biology	
BSCI180	Principles Biology Laboratory	
or BSCI171	Principles of Molecular & Cellular Biology Laboratory	
BSCI207	Principles of Biology III - Organismal Biology	
BSCI222	Principles of Genetics	
BSCI361	Principles of Ecology	
BSCI363	The Biology of Conservation and Extinction	
BSCI370	Principles of Evolution	
CHEM231 & CHEM232	Organic Chemistry I and Organic Chemistry Laboratory I	
CHEM241 & CHEM242	Organic Chemistry II and Organic Chemistry Laboratory II	
MATH141	Calculus II	
or MATH121	Elementary Calculus II	
or MATH135	Discrete Mathematics for Life Sciences	
Restricted Electives (Choose 5 courses from an approved list) [1]		**15**

[1] See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved electives.

Environmental Geosciences and Restoration (CMNS)

Course	Title	Credits
Basic Sciences		**12**
CHEM231 & CHEM232	Organic Chemistry I and Organic Chemistry Laboratory I	
MATH141	Calculus II	
PHYS161 & PHYS174	General Physics: Mechanics and Particle Dynamics and Physics Laboratory Introduction	
or PHYS141	Principles of Physics	
Upper Level Requirements		**17**
BSCI361	Principles of Ecology	
GEOL340	Geomorphology	
GEOL451	Groundwater	
or GEOL452	Watershed and Wetland Hydrology	
GEOL453	Ecosystem Restoration	
ENSP386	Internship	
Areas of Depth (at least 5 classes from an approved list, inlcuding a minimum of 6 credits from each of two Areas, or a minimum of 9 credits in one Area) [1]		**15**
Area 1. Techniques and Application		
Area 2. Environmental Restoration		
Area 3. Surficial Geology		
Area 4. Deep-Earth Geology		

[1] See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved electives.

Environmental Justice (SPHL)

Course	Title	Credits
Requirements		
AAAS101	Public Policy and the Black Community	3
EPIB301	Epidemiology for Public Health Practice	3
ENSP330	Introduction to Environmental Law	3
ENSP386	Internship	3
or MIEH309	Environmental Health Research	
ENSP370	Principles of Environmental Justice: Theory and Practice	3
GBHL200	Introduction to Global Health	3
GEOG373	Geographic Information Systems	3
or ENSP305	Applied Spatial Analysis in Environmental Science and Policy	
MIEH300	A Public Health Perspective: Introduction to Environmental Health	3
MIEH330	Environmental Justice, Racism, and Environmental Health Disparities: How where you live can kill you	3
MIEH331	The Built Environment, Sustainability, and Public Health: The Good, the Bad, and the Ugly	3
SPHL100	Foundations of Public Health	3
URSP250	The Sustainable City: Exploring Opportunities and Challenges	3
Restricted Electives [1]		**12**
Total Credits		**48**

[1] See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved electives.

GRADUATION PLANS

Click here (https://agnr.umd.edu/academics/advising/four-year-plans/) for roadmaps for graduation plans in the College of Agricultural and Natural Resources.

Additional information on developing a graduation plan can be found on the following pages:

- http://4yearplans.umd.edu
- the Student Academic Success-Degree Completion Policy (https://academiccatalog.umd.edu/undergraduate/registration-academic-requirements-regulations/academic-advising/#success) section of this catalog