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 9 departments and three colleges (the Colleges of Agriculture and Natural Resources; Behavioral and Social Sciences; Computer, Mathematical, and Natural Sciences).

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENSP101</td>
<td>Introduction to Environmental Science</td>
<td>3</td>
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<tr>
<td>ENSP102</td>
<td>Introduction to Environmental Policy</td>
<td>3</td>
</tr>
<tr>
<td>ENSP400</td>
<td>Capstone in Environmental Science and Policy</td>
<td>3</td>
</tr>
<tr>
<td>ENSP305</td>
<td>Applied Spatial Analysis in Environmental Science and Policy</td>
<td>3</td>
</tr>
<tr>
<td>ENSP306</td>
<td>Fundamentals of Qualitative Research Methods for Environmental Studies</td>
<td>3</td>
</tr>
<tr>
<td>ENSP330</td>
<td>Introduction to Environmental Law</td>
<td>3</td>
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<tr>
<td>ENSP340</td>
<td>Water: Science, Ethics, and Policy</td>
<td>3</td>
</tr>
<tr>
<td>ENSP342</td>
<td>Environmental Threats to Oceans and Coasts: Towards an Integrated Policy Response</td>
<td>3</td>
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<tr>
<td>ENSP350</td>
<td>Energy Resources: Science and Policy in the 21st Century</td>
<td>3</td>
</tr>
<tr>
<td>ENSP370</td>
<td>Principles of Environmental Justice: Theory and Practice</td>
<td>3</td>
</tr>
</tbody>
</table>

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 Principles of Ecology and Evolution
- BSCI161 Principles of Ecology and Evolution Lab

Group 2 - Chemistry:

- CHEM130 Chemistry I - Fundamentals of General Chemistry
- CHEM131 and General Chemistry I Laboratory

Group 3 - Earth Sciences:

- AOSC200 Weather and Climate
- AOSC201 Weather and Climate Laboratory

Group 4 - Economics:

- AREC240 Introduction to Economics and the Environment
- AREC241 Environment, Economics and Policy
- ECON200 Principles of Microeconomics

Group 5 - Geography:
Environmental Science and Policy Major

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 www.ensp.umd.edu (http://www.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
--- | --- | ---
ANSC101 | Principles of Animal Science | 18-19
& ANSC103 | Principles of Animal Science Laboratory | 1

BSCI170 | Principles of Molecular & Cellular Biology | 1
& BSCI171 | Principles of Molecular & Cellular Biology Laboratory | 1

BSCI222 | Principles of Genetics | 1
or PLSC203 | Plants, Genes and Biotechnology | 1

CHEM131 | Chemistry I - Fundamentals of General Chemistry | 1
& CHEM232 | Organic Chemistry Laboratory I | 1

PLSC112 | Introductory Crop Science | 1
& PLSC113 | Introductory Crop Science Laboratory | 1

GEOG272 | Introduction to Earth Observation Science | 6

GEOG472 | Geographic Visualization and Digital Mapping | 1

GEOG472 | Remote Sensing: Digital Processing and Analysis | 1

GEOG373 | Geographic Information Systems | 1
or ENST415 | Renewable Energy | 1

GEOG473 | Geographic Information Systems and Spatial Analysis | 1

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 | 1
MATH141 | Calculus II | 1
ECON321 | Economic Statistics | 1
or STAT400 | Applied Probability and Statistics I | 1

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 | 1
ECON230 | Applied Economic Statistics | 1
or BMGT230 | Business Statistics | 1
AREC326 | Intermediate Applied Microeconomics | 1
or ECON326 | Intermediate Microeconomic Analysis | 1

Select one of the following courses:

MATH121 | Elementary Calculus II (or Equivalent) | 1
ECON424 | Applied Econometrics | 1
AREC422 | Econometric Analysis in Agricultural and Environmental Economics | 1
AREC380 | Data Science for Environmental and Resource Economics | 1
AREC382 | Computer-Based Analysis in Agricultural and Resource Economics | 1
ENSP305 | Applied Spatial Analysis in Environmental Science and Policy | 1
ENSP306 | Fundamentals of Qualitative Research Methods for Environmental Studies | 1

Restricted Electives inside Economics (Choose 5 courses from an approved list) 1

Restricted Electives outside Economics (choose from one Supporting Area below) 1

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
--- | --- | ---

Internship (3 credits) | Internship | 1

Restricted Electives (choose 5 courses in one Area) 1

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.

Select one:

GEOG272 | Introduction to Earth Observation Science | 1
Environmental Science and Policy Major

**Course** | **Title** | **Credits**
--- | --- | ---
GEOL340 | Geomorphology |  
GEOG340 | Geomorphology |  
Select one:  
GEOL451 | Groundwater |  
GEOL452 | Watershed and Wetland Hydrology |  
ENST417 | Soil Hydrology and Physics |  
Select two:  
ENST301 | Field Soil Morphology I  
& ENST302 | and Field Soil Morphology II  
& ENST303 | 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)** |  
| | | 9

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

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**Environmental Politics and Policy (BSOS)**

**Course** | **Title** | **Credits**
--- | --- | ---
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)** |  
| | | 18

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

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**Culture and Environment (BSOS)**

**Course** | **Title** | **Credits**
--- | --- | ---
ANTH222 | Introduction to Ecological and Evolutionary Anthropology |  
ANTH322 | Method and Theory in Ecological Anthropology |  
ANTH240 | Introduction to Archaeology  
& ANTH340 | and Method and Theory in Archaeology  
or ANTH260 | or ANTH260 Introduction to Sociocultural Anthropology and  
& ANTH360 | 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)** |  
| | | 12

**Restricted Electives outside Anthropology (including 9 credits from the same academic department)** |  
| | | 15

**Applied Field Methods** |  
| | | 3-6

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**Global Environmental Change (BSOS)**

**Course** | **Title** | **Credits**
--- | --- | ---
Lower Level requirements | 18-19 |  
GEOL100 | Physical Geology |  
MATH141 | Calculus II |  
or MATH121 | or MATH121 Elementary Calculus II |  
PHYS161 | General Physics: Mechanics and Particle Dynamics |  
& PHYS174 | and Physics Laboratory Introduction  
or PHYS121 | or PHYS121 Fundamentals of Physics I |  
CHEM231 | Organic Chemistry I  
& CHEM232 | and Organic Chemistry Laboratory I |  
ENST200 | Fundamentals of Soil Science  
or GEOG102 | or GEOG102 Historical Geology |  
**Restricted Electives - Choose at least 6 courses (3 courses in each Area)** |  
| | | 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.
### Land Use (BSOS)

**Course** | **Title** | **Credits**
--- | --- | ---
**Requirements** |  | 3-4
GEOG130 | Development Geography: Environmental & Social Justice | 4
GEOG140 | Natural Disasters: Earthquakes, Floods, and Fires | 4
ENST200 | Fundamentals of Soil Science | 4

**Techniques and Methods** | 6
GEOG272 | Introduction to Earth Observation Science | 6
GEOG373 | Geographic Information Systems | 6

**Application and Synthesis** | 6
ENSP386 | Internship | 6
GEOG431 | Culture and Natural Resource Management | 6

**Restricted Electives (students must choose 8 courses, including at least 3-24 credits from each of the 5 Areas below)** | 1

1. **Area 1** - Social/Cultural Dimensions (choose at least 1 course and 3 credits)
2. **Area 2** - Technical Skills (choose at least 1 course and 3 credits)
3. **Area 3** - Regional Dimensions (choose at least 1 course and 3 credits)
4. **Area 4** - Ecological Dimensions (choose at least 1 course and 3 credits)
5. **Area 5** - International Dimensions (choose at least 1 course and 3 credits)

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### Marine and Coastal Management (BSOS)

**Course** | **Title** | **Credits**
--- | --- | ---
**Upper Level Requirements** | 12
AOSC375 | Introduction to the Blue Ocean | 3
or GEOL375 | Introduction to the Blue Ocean | 3
ENSP342 | Environmental Threats to Oceans and Coasts: Towards an Integrated Policy Response | 3
GEOG441 | The Coastal Ocean | 3
ENST450 | Wetland Ecology | 3

**Technical Requirements** | 6
GEOG272 | Introduction to Earth Observation Science | 3
GEOG373 | Geographic Information Systems | 3

**Synthesis** | 6
ENSP386 | Internship | 6

**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. **Area 1** - Costal Science
2. **Area 2** - Management

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### Society and Environmental Issues (BSOS)

**Course** | **Title** | **Credits**
--- | --- | ---
**Requirements** | 28
SOCY100 | Introduction to Sociology | 3
or SOCY105 | Introduction to Contemporary Social Problems | 3
SOCY202 | Introduction to Research Methods in Sociology | 3
SOCY203 | Sociological Theory | 3
SOCY405 | Scarcity and Modern Society | 3
SOCY441 | Social Stratification and Inequality | 3
Select two:
SOCY415 | Environmental Sociology | 3
SOCY431 | Principles of Organizations | 3
SOCY498 | Selected Topics in Sociology | 3

Select one:
SOCY230 | Sociological Social Psychology | 3
SOCY410 | Social Demography | 3
SOCY411 | Demographic Techniques | 3
SOCY412 | Family Demography | 3
SOCY399 | Independent Study in Sociology | 3
ENSP386 | Internship | 3

Select one (GVPT):
GVPT200 | International Political Relations | 3
GVPT273 | Introduction to Environmental Politics | 3
GVPT306 | Global Environmental Politics | 3
GVPT417 | Seminar in Advanced Topics in Environmental Policy Analysis | 3

**Restricted Electives (at least 9 credits must be at 300- or 400-level):**

1. See ENSP website (https://ensp.umd.edu/students/degree-requirements/) for list of approved electives.
Environmental Science and Policy Major

**Biodiversity and Conservation Biology (CMNS)**

<table>
<thead>
<tr>
<th>Course Requirements</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Principles of Molecular &amp; Cellular Biology</td>
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<tr>
<td></td>
<td>and Principles of Molecular &amp; Cellular Biology Laboratory</td>
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<tr>
<td>BSCI170</td>
<td>Principles of Biology III - Organismal Biology</td>
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<tr>
<td>BSCI222</td>
<td>Principles of Genetics</td>
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<tr>
<td>BSCI361</td>
<td>Principles of Ecology</td>
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<tr>
<td>BSCI363</td>
<td>The Biology of Conservation and Extinction</td>
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<tr>
<td>BSCI370</td>
<td>Principles of Evolution</td>
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<tr>
<td>CHEM231</td>
<td>Organic Chemistry I</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM232</td>
<td>and Organic Chemistry Laboratory I</td>
<td></td>
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<tr>
<td>CHEM241</td>
<td>Organic Chemistry II</td>
<td></td>
</tr>
<tr>
<td>&amp; CHEM242</td>
<td>and Organic Chemistry Laboratory II</td>
<td></td>
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<tr>
<td>MATH141</td>
<td>Calculus II</td>
<td></td>
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<tr>
<td></td>
<td>or MATH121 Elementary Calculus II</td>
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<tr>
<td></td>
<td>or MATH135 Discrete Mathematics for Life Sciences</td>
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**Restricted Electives (Choose 5 courses from an approved list)**

<table>
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<tr>
<th>Course Requirements</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
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<td>15</td>
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</table>

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

**Environmental Geosciences and Restoration (CMNS)**

<table>
<thead>
<tr>
<th>Course Requirements</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Organic Chemistry I</td>
<td>12</td>
</tr>
<tr>
<td>&amp; CHEM232</td>
<td>and Organic Chemistry Laboratory I</td>
<td></td>
</tr>
<tr>
<td>MATH141</td>
<td>Calculus II</td>
<td></td>
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<tr>
<td>PHYS161</td>
<td>General Physics: Mechanics and Particle Dynamics</td>
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<tr>
<td>&amp; PHYS174</td>
<td>and Physics Laboratory Introduction</td>
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<td></td>
<td>or PHYS141 Principles of Physics</td>
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**Upper Level Requirements**

<table>
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<tr>
<th>Course Requirements</th>
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<tr>
<td>BSCI361</td>
<td>Principles of Ecology</td>
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<tr>
<td>GEOL340</td>
<td>Geomorphology</td>
<td></td>
</tr>
<tr>
<td>GEOL451</td>
<td>Groundwater</td>
<td></td>
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<tr>
<td>or GEOL452</td>
<td>Watershed and Wetland Hydrology</td>
<td></td>
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<tr>
<td>GEOL453</td>
<td>Ecosystem Restoration</td>
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<tr>
<td>ENSP386</td>
<td>Internship</td>
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**Areas of Depth (at least 5 classes from an approved list, including a minimum of 6 credits from each of two Areas, or a minimum of 9 credits in one Area)**

<table>
<thead>
<tr>
<th>Area</th>
<th>Title</th>
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<tbody>
<tr>
<td>1</td>
<td>Techniques and Application</td>
</tr>
<tr>
<td>2</td>
<td>Environmental Restoration</td>
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</tbody>
</table>

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

**FOUR-YEAR PLAN**

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

Additional information on developing a four-year academic 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