Environmental Studies

Many of the most pressing challenges of the 21st Century are environmental ones. We must find ways to feed a growing human population while maintaining the natural life support system provided by the Earth's ecosystems; to make built environments more efficient as urban areas continue to grow dramatically in size; and to meet the challenges posed by rising sea-level and increasing global temperatures. These challenges are complex, multifaceted, and can best be solved with expertise from multiple, relevant disciplines. To prepare students to meet these challenges, the Institute at Brown for Environment and Society (IBES) offers two undergraduate degrees: an A.B. in Environmental Studies and a Sc.B. in Environmental Science. The two degrees vary primarily in the number of course requirements; the Sc.B. is a more in-depth treatment of a single field. Both degrees provide interdisciplinary exposure to the natural and social sciences, as well as public policy. Both degrees also develop depth in a primary field by requiring students to select one of five tracks of study. Concentrators might also consider pursuing the Engaged Scholars Program, which allows them to connect theory and practice and gain hands-on experience working with community partners.

Through a rigorous set of core courses, track requirements, and a course or project-based capstone experience, our students are primed to make meaningful contributions to environmental scholarship and outreach at local, national, and global scales.

If you have administrative questions regarding theses concentrations or wish to be added to the email directory listing upcoming events, then please contact Jeanne Loewenstein (jeanne_loewenstein@brown.edu), the academic program manager.

Standard program in Environmental Studies and Environmental Science:

The Institute at Brown for Environment and Society administers two concentrations, one offering an A.B. degree in Environmental Studies (requires 14-15 courses) and the other a Sc.B. degree in Environmental Science (requires 19-20 courses). Below are a set of course offerings arranged into four tracks:

1. Air, Climate & Energy
2. Conservation Science & Policy
3. Environment & Inequality
4. Land, Water & Food Security
5. Sustainability in Development

Requirements for the A.B. Degree

<table>
<thead>
<tr>
<th>Core Requirements</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ECON 0110</td>
<td>Principles of Economics ¹</td>
</tr>
<tr>
<td>or HIST 0150A</td>
<td>History of Capitalism</td>
</tr>
<tr>
<td>ENVS 0490</td>
<td>Environmental Science in a Changing World ²</td>
</tr>
<tr>
<td>ENVS 0110</td>
<td>Humans, Nature, and the Environment: Addressing Environmental Change in the 21st Century</td>
</tr>
<tr>
<td>BIOL 0210</td>
<td>Diversity of Life</td>
</tr>
<tr>
<td>or EEPS 0240</td>
<td>Earth: Evolution of a Habitable Planet</td>
</tr>
</tbody>
</table>

Methods - one course

| ENVS 1920         | Methods for Interdisciplinary Environmental Research | 1 |

Electives - three courses

Electives provide increased environmental expertise and further enhance a student’s ability to customize a course of study. Acceptable electives include any ENVS courses, classes with significant environmental content, and prerequisites for classes students take to fulfill requirements within their declared track.

Track Specific Requirements

Capstone - one or two courses

This requirement can be met with a two-semester thesis (ENVS 1970 & ENVS 1971), one-semester research project (ENVS 1970 or ENVS 1971), or an approved capstone course.

Track 1 - Air, Climate, and Energy

<table>
<thead>
<tr>
<th>Foundational courses (choose two):</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 0330 Equilibrium, Rate, and Structure</td>
</tr>
<tr>
<td>EEPS 0220 Earth Processes</td>
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<tr>
<td>ENGN 0030 Introduction to Engineering</td>
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<tr>
<td>ENGN 0490 Fundamentals of Environmental Engineering</td>
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<tr>
<td>PHYS 0030 Basic Physics A</td>
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<tr>
<td>PHYS 0050 Foundations of Mechanics</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Climate (choose one):</th>
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</thead>
<tbody>
<tr>
<td>EEPS 0850 Weather and Climate</td>
</tr>
<tr>
<td>EEPS 1430 Principles of Planetary Climate</td>
</tr>
<tr>
<td>ENGN 1931R The Chemistry of Environmental Pollution</td>
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<tr>
<td>ENVS 1245 Air Pollution &amp; Chemistry</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Policy (choose one):</th>
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</thead>
<tbody>
<tr>
<td>ANTH 1601 Reimagining Climate Change</td>
</tr>
<tr>
<td>ENVS 0710 Powering the Past: Environmental Histories of Energy Use and Social Change</td>
</tr>
<tr>
<td>ENVS 1415 Power, Justice, and Climate Change</td>
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<tr>
<td>ENVS 1615 Making Connections: The Environmental Policy Process</td>
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<tr>
<td>ENVS 1925 Energy Policy and Politics</td>
</tr>
<tr>
<td>POLS 1435 Politics of Climate Change</td>
</tr>
<tr>
<td>POLS 1822I Geopolitics of Oil and Energy</td>
</tr>
</tbody>
</table>

Energy Technology and Infrastructure (choose one):

| ENGN 0490 Fundamentals of Environmental Engineering |
| ENGN 0720 Thermodynamics |
| ENGN 1930U Renewable Energy Technologies |
| ENGN 1931P Energy and the Environment |
| ENVS 1400 Sustainable Design in the Built Environment |
| ENVS 1580 Environmental Stewardship and Resilience in Urban Systems |

Track 2 - Conservation Science and Policy

Ecology:

| BIOL 0420 Principles of Ecology |
| BIOL 1470 Conservation Biology |
| BIOL 1480 Terrestrial Biogeochemistry and the Functioning of Ecosystems |
| BIOL 1515 Conservation in the Genomics Age |

Conservation:

| BIOL 1155 Hormones and Behavior |
| BIOL 1450 Community Ecology |
| BIOL 1555 Urban Agriculture: The Importance of Localized Food Systems |
| ENVS 1615 Making Connections: The Environmental Policy Process |
| ENVS 1755 Globalization and the Environment |

1. For students declaring an A.B. in Environmental Studies.
2. Indicates a course that can be used in other concentrations as well.
3. For students declaring a Sc.B. in Environmental Science.
ENVS 1916  Animals and Plants in Chinese History
ENVS 1925  Energy Policy and Politics
POLS 1435  Politics of Climate Change
Statistics: Select One
APMA 0650  Essential Statistics
APMA 1650  Statistical Inference I
BIOL 0495  Statistical Analysis of Biological Data
CLPS 0900  Statistical Methods
ECON 1620  Introduction to Econometrics

Track 3 – Environment and Inequality

Track Intro Course:
ENVS 0705  Equity and the Environment: Movements, Scholarship, Solutions

Race, Class, and Gender Inequality: Select One
AFRI 0090  An Introduction to Africana Studies
AFRI 0210  Afro Latin Americans and Blackness in the Americas
AFRI 0830  How Structural Racism Works
ECON 1370  Race and Inequality in the United States
ETHN 1000  Introduction to American/Ethnic Studies
HIST 0150D  Refugees: A Twentieth-Century History
HIST 0203  Modern Africa: From Empire to Nation-State
HIST 1972J  Racial Capitalism and U.S. Liberal Empire
SOC 0230  Sex, Gender, and Society
SOC 1270  Race, Class, and Ethnicity in the Modern World

Environment and Inequality: Select One
ANTH 0110  Anthropology and Global Social Problems: Environment, Development, and Governance
ENVS 0710  Powering the Past: Environmental Histories of Energy Use and Social Change
ENVS 1910  The Anthropocene: The Past and Present of Environmental Change
HIST 0270A  From Fire Wielders to Empire Builders: Human Impact on the Global Environment before 1492
HIST 0270B  From the Columbian Exchange to Climate Change: Modern Global Environmental History

PHP 1700  Current Topics in Environmental Health

Tools: Select One
ANTH 1940  Ethnographic Research Methods
APMA 1650  Statistical Inference I
ECON 1620  Introduction to Econometrics
ENVS 1105  Introduction to Environmental GIS
EEPS 1320  Introduction to Geographic Information Systems for Environmental Applications
EEPS 1330  Global Environmental Remote Sensing
SOC 1100  Introductory Statistics for Social Research
SOC 1117  Focus Groups for Market and Social Research
SOC 1340  Principles and Methods of Geographic Information Systems
SOC 2610  Spatial Thinking in Social Science

Policy: Select One
ANTH 1601  Reimagining Climate Change
ENVS 0150  Climate Futures and a Sociology of Just Transitions
ENVS 1415  Power, Justice, and Climate Change

ENVS 1555  Urban Agriculture: The Importance of Localized Food Systems
ENVS 1574  Engaged Climate Policy in the U.S.: Rhode Island and Washington, DC
ENVS 1615  Making Connections: The Environmental Policy Process
IAPA 1205  International Law
POLS 0220  City Politics
POLS 0400  Introduction to International Politics
POLS 1435  Politics of Climate Change
POLS 1730  Politics of Globalization
URBN 1000  Fieldwork in the Urban Community
URBN 1250  The Political Foundations of the City
URBN 1270  Urban Politics and Urban Public Policy

Track 4 - Land, Water & Food Security

Climate: Select One
EEPS 0850  Weather and Climate
EEPS 1430  Principles of Planetary Climate
ENGN 1931R  The Chemistry of Environmental Pollution
ENVS 1245  Air Pollution & Chemistry

Biology: Select One
BIOL 0160  Plants, Food, and People
BIOL 0210  Diversity of Life
BIOL 0420  Principles of Ecology
BIOL 0430  The Evolution of Plant Diversity
BIOL 0440  Inquiry in Plant Biology: Analysis of Plant Growth, Reproduction and Adaptive Responses
BIOL 0940D  Rhode Island Flora: Understanding and Documenting Local Plant Diversity

Environmental History: Select One
ANTH 0680  Anthropology of Food
ENVS 0710  Powering the Past: Environmental Histories of Energy Use and Social Change
ENVS 1557  Birding Communities
ENVS 1910  The Anthropocene: The Past and Present of Environmental Change
ENVS 1915  Histories of Global Wetlands
ENVS 1916  Animals and Plants in Chinese History
HIST 0150H  Foods and Drugs in History
HIST 0270A  From Fire Wielders to Empire Builders: Human Impact on the Global Environment before 1492

HIST 0270B  From the Columbian Exchange to Climate Change: Modern Global Environmental History

Policy: Select One
ENVS 1350  Environmental Economics and Policy
ENVS 1555  Urban Agriculture: The Importance of Localized Food Systems
ENVS 1574  Engaged Climate Policy in the U.S.: Rhode Island and Washington, DC
ENVS 1615  Making Connections: The Environmental Policy Process
ENVS 1925  Energy Policy and Politics
POLS 1435  Politics of Climate Change
### Requirements for the Sc.B. Degree

**Requires ALL 14-15 course requirements as listed in the A.B. Program**

**Additional Track specific requirements for the Sc.B.**

### Tools: Select One
- APMA 1650 - Statistical Inference I
- EEPS 1320 - Introduction to Geographic Information Systems for Environmental Applications
- EEPS 1330 - Global Environmental Remote Sensing
- ENV 1105 - Introduction to Environmental GIS
- SOC 1340 - Principles and Methods of Geographic Information Systems

### Track 5 - Sustainability in Development

#### Environment and Development: Select Two
- ANTH 0110 - Anthropology and Global Social Problems: Environment, Development, and Governance
- ECON 1530 - Health, Hunger and the Household in Developing Countries
- ENV 0150 - Climate Futures and a Sociology of Just Transitions
- ENV 1415 - Power, Justice, and Climate Change
- ENV 1580 - Environmental Stewardship and Resilience in Urban Systems
- ENV 1755 - Globalization and the Environment
- SOC 0150 - Economic Development and Social Change

#### Policy: Select Two
- ENV 1350 - Environmental Economics and Policy
- ENV 1555 - Urban Agriculture: The Importance of Localized Food Systems
- ENV 1574 - Engaged Climate Policy in the U.S.: Rhode Island and Washington, DC
- ENV 1615 - Making Connections: The Environmental Policy Process
- ENV 1925 - Energy Policy and Politics
- POLS 1435 - Politics of Climate Change
- POLS 1822I - Geopolitics of Oil and Energy

#### Tools: Select One
- ANTH 1940 - Ethnographic Research Methods
- APMA 1650 - Statistical Inference I
- ECON 1620 - Introduction to Econometrics
- EEPS 1320 - Introduction to Geographic Information Systems for Environmental Applications
- EEPS 1330 - Global Environmental Remote Sensing
- ENV 1105 - Introduction to Environmental GIS
- SOC 1100 - Introductory Statistics for Social Research
- SOC 1117 - Focus Groups for Market and Social Research
- SOC 1340 - Principles and Methods of Geographic Information Systems

### Total Credits: 14-15

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1. The ECON 0110 core requirement can be waived for students with an AP exam score of 4 or 5 in both Microeconomics and Macroeconomics.

2. The core requirement of ENV 0490 can be waived for students with an AP exam score of 5 in Environmental Science.

### Track 1 - Air, Climate, and Energy

#### Math:
- MATH 0090 - Introductory Calculus, Part I

#### Policy (choose one):
- ECON 1340 - Economics of Global Warming
- ENV 1350 - Environmental Economics and Policy
- ENV 1415 - Power, Justice, and Climate Change
- ENV 1574 - Engaged Climate Policy in the U.S.: Rhode Island and Washington, DC
- ENV 1615 - Making Connections: The Environmental Policy Process
- ENV 1755 - Globalization and the Environment
- ENV 1925 - Energy Policy and Politics
- IAPA 1802C - Infrastructure!
- POLS 1435 - Politics of Climate Change
- POLS 1822I - Geopolitics of Oil and Energy

#### Tools (choose one):
- APMA 0340 - Methods of Applied Mathematics II
- APMA 0650 - Essential Statistics
- APMA 1650 - Statistical Inference I
- ECON 1620 - Introduction to Econometrics
- EEPS 1320 - Introduction to Geographic Information Systems for Environmental Applications
- EEPS 1330 - Global Environmental Remote Sensing
- ENV 1105 - Introduction to Environmental GIS

#### Climate and Thermal Change (choose two):
- EEPS 0230 - Geochemistry: Earth and Planetary Materials and Processes
- EEPS 1120 - Palaeoceanography
- EEPS 1370 - Environmental Geochemistry
- EEPS 1510 - Introduction to Atmospheric Dynamics
- ENGN 0720 - Thermodynamics
- EEPS 1520 - Ocean Circulation and Climate
- ENGN 0720 - Thermodynamics
- ENGN 1710 - Heat and Mass Transfer
- ENGN 1930M - Industrial Design
- ENGN 1931R - The Chemistry of Environmental Pollution
- ENV 1245 - Air Pollution & Chemistry

### Track 2 - Conservation Science and Policy

#### Math: Select One
- MATH 0090 - Introductory Calculus, Part I

#### Evolution: Select One
- BIOL 0480 - Evolutionary Biology

#### Organismal Diversity: Select One
- BIOL 0410 - Invertebrate Zoology
- BIOL 0430 - The Evolution of Plant Diversity (BIOL 0460 - Insect Biology)
- BIOL 0440 - Inquiry in Plant Biology: Analysis of Plant Growth, Reproduction and Adaptive Responses
- BIOL 0940D - Rhode Island Flora: Understanding and Documenting Local Plant Diversity
- BIOL 1880 - Comparative Biology of the Vertebrates

#### Env. Econ: Select One
- ECON 1340 - Economics of Global Warming
- ENV 1350 - Environmental Economics and Policy
- ENV 1355 - Environmental Issues in Development Economics

#### Tools: Select One
### Track 3 – Environment and Inequality

**Tools: Select One**
- ANTH 1940 Ethnographic Research Methods
- ECON 1620 Introduction to Econometrics
- EEPS 1320 Introduction to Geographic Information Systems
- EEPS 1330 Global Environmental Remote Sensing
- ENVS 1105 Introduction to Environmental GIS
- SOC 1100 Introductory Statistics for Social Research
- SOC 1117 Focus Groups for Market and Social Research
- SOC 1340 Principles and Methods of Geographic Information Systems
- SOC 2610 Spatial Thinking in Social Science

**Race, Class and Gender Inequality: Select One**
- ECON 1370 Race and Inequality in the United States
- ETHN 1200I History and Resistance in Representations of Native Peoples
- SOC 1270 Race, Class, and Ethnicity in the Modern World

**SELECT A FOCUS AREA** (pick three courses from only one focus area)

**FOCUS ONE - Environmental Inequality in Globalization and Development: Select Three**
- ANTH 0110 Anthropology and Global Social Problems: Environment, Development, and Governance
- ECON 1355 Environmental Issues in Development Economics
- ECON 1510 Economic Development
- ECON 1530 Health, Hunger and the Household in Developing Countries
- ENVS 1415 Power, Justice, and Climate Change
- ENVS 1916 Animals and Plants in Chinese History
- HIST 0150D Refugees: A Twentieth-Century History
- PHP 1070 The Burden of Disease in Developing Countries
- POLS 1440 Security, Governance and Development in Africa
- POLS 1730 Politics of Globalization
- SOC 0150 Economic Development and Social Change

**FOCUS TWO - Environmental Health and Inequality: Select Three**
- AFRI 1920 Health Inequality in Historical Perspective
- ANTH 1310 International Health: Anthropological Perspectives
- BIOL 1820 Environmental Health and Disease
- HIST 1960Q Medicine and Public Health in Africa
- PHP 0320 Introduction to Public Health
- PHP 1070 The Burden of Disease in Developing Countries
- PHP 1101 World of Food: Personal to Global Perspectives on Nutrition, Agriculture and Policy

**FOCUS THREE - Environmental Inequalities in Food, Water, and Energy: Select Three**
- ENVS 0710 Powering the Past: Environmental Histories of Energy Use and Social Change
- ENVS 1415 Power, Justice, and Climate Change
- ENVS 1555 Urban Agriculture: The Importance of Localized Food Systems
- ENVS 1580 Environmental Stewardship and Resilience in Urban Systems
- ENVS 1915 Histories of Global Wetlands
- ENVS 1925 Energy Policy and Politics
- ETHN 1750B Treaty Rights and Food Fights: Eating Local in Indian Country

### Track 4 - Land, Water & Food Security

**Math: Select One**
- MATH 0090 Introductory Calculus, Part I

**Chemistry: Select One**
- CHEM 0330 Equilibrium, Rate, and Structure

**Earth/Life Systems: Select Three**
- BIOL 1470 Conservation Biology
- BIOL 1480 Terrestrial Biogeochemistry and the Functioning of Ecosystems
- EEPS 0240 Earth: Evolution of a Habitable Planet
- EEPS 0830 Water In Our World
- EEPS 1120 Paleoceanography
- EEPS 1130 Ocean Biogeochemical Cycles
- EEPS 1310 Global Water Cycle
- EEPS 1370 Environmental Geochemistry
- EEPS 1510 Introduction to Atmospheric Dynamics
- ENGN 1340 Water Supply and Treatment Systems - Technology and Sustainability

### Track 5 - Sustainability in Development

**Sociology and Politics: Select One**
- ENVS 0150 Climate Futures and a Sociology of Just Transitions
- ENVS 1755 Globalization and the Environment
- POLS 0400 Introduction to International Politics
- SOC 0150 Economic Development and Social Change

**Critical Perspectives on Development: Select One**
- ANTH 0110 Anthropology and Global Social Problems: Environment, Development, and Governance
- ECON 1370 Race and Inequality in the United States
- IAPA 1802C Infrastructure!
- POLS 1200 Reimagining Capitalism
- SOC 0150 Economic Development and Social Change
- SOC 1620 Globalization and Social Conflict

**Economic Perspectives: Select Two**
- ECON 1110 Intermediate Microeconomics
- ECON 1340 Economics of Global Warming
- ECON 1355 Environmental Issues in Development Economics
- ECON 1510 Economic Development
- ECON 1530 Health, Hunger and the Household in Developing Countries
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 1560</td>
<td>Economic Growth</td>
</tr>
<tr>
<td>ENVS 1350</td>
<td>Environmental Economics and Policy</td>
</tr>
<tr>
<td>IAPA 1700</td>
<td>Economics for Public Policy</td>
</tr>
<tr>
<td></td>
<td>Climate: Select One</td>
</tr>
<tr>
<td>EEPS 0850</td>
<td>Weather and Climate</td>
</tr>
<tr>
<td>ENVS 1245</td>
<td>Air Pollution &amp; Chemistry</td>
</tr>
</tbody>
</table>

Total Credits: 19-20

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The track requirement of MATH 0090 can be waived for students with an AP exam of 4 or 5 on Calc AB; or students with an AP exam score of 4 or 5 on Calc BC in place of Math 0090 & 0100.

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**Honors**

Students interested in graduating with honors in their concentration must complete a thesis determined to be of the highest quality and must have excelled in their coursework required for the concentration, which is defined here as receiving a grade of "A" in the majority of courses taken to fulfill the concentration. You can learn more by visiting the honors page (https://www.brown.edu/academics/institute-environment-society/education/undergraduate/honors/) on the IBES website.
Font Notice

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Helvetica was used instead of Arial.

The editor may contact Leepfrog for a draft with the correct fonts in place.