# 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

#### Core Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 0110 or HIST 0150A</td>
<td>Principles of Economics ¹</td>
<td>1</td>
</tr>
<tr>
<td>ENVS 0490</td>
<td>Environmental Science in a Changing World ²</td>
<td>1</td>
</tr>
<tr>
<td>ENVS 0110</td>
<td>Humans, Nature, and the Environment: Addressing Environmental Change in the 21st Century</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 0210</td>
<td>Diversity of Life</td>
<td>1</td>
</tr>
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</table>

#### Methods - one course

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ENVS 1920</td>
<td>Methods for Interdisciplinary Environmental Research</td>
</tr>
</tbody>
</table>

#### Electives - three courses

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

#### Capstone - one or two courses (1-2)

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 Specific Requirements

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

**Foundational courses (choose two):**

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

**Climate (choose one):**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>EEPS 0850</td>
<td>Weather and Climate</td>
</tr>
<tr>
<td>EEPS 1430</td>
<td>Principles of Planetary Climate</td>
</tr>
<tr>
<td>ENVS 1245</td>
<td>Air Pollution &amp; Chemistry</td>
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</tbody>
</table>

**Policy (choose one):**

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

**Energy Technology and Infrastructure (choose one):**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ENGN 0490</td>
<td>Fundamentals of Environmental Engineering</td>
</tr>
<tr>
<td>ENGN 0720</td>
<td>Thermodynamics</td>
</tr>
<tr>
<td>ENGN 1930U</td>
<td>Renewable Energy Technologies</td>
</tr>
<tr>
<td>ENGN 1931P</td>
<td>Energy and the Environment</td>
</tr>
<tr>
<td>ENVS 1400</td>
<td>Sustainable Design in the Built Environment</td>
</tr>
<tr>
<td>ENVS 1580</td>
<td>Environmental Stewardship and Resilience in Urban Systems</td>
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</tbody>
</table>

#### Track 2 - Conservation Science and Policy

**Ecology:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 0420</td>
<td>Principles of Ecology</td>
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</table>

**Conservation:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>BIOL 1470</td>
<td>Conservation Biology</td>
</tr>
</tbody>
</table>

**Ecology & Conservation Topics: Select One**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 1450</td>
<td>Community Ecology</td>
</tr>
<tr>
<td>BIOL 1480</td>
<td>Terrestrial Biogeochemistry and the Functioning of Ecosystems</td>
</tr>
<tr>
<td>BIOL 1515</td>
<td>Conservation in the Genomics Age</td>
</tr>
</tbody>
</table>

**Policy: Select One**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVS 1415</td>
<td>Power, Justice, and Climate Change</td>
</tr>
<tr>
<td>ENVS 1555</td>
<td>Urban Agriculture: The Importance of Localized Food Systems</td>
</tr>
<tr>
<td>ENVS 1574</td>
<td>Engaged Climate Policy in the U.S.: Rhode Island and Washington, DC</td>
</tr>
<tr>
<td>ENVS 1615</td>
<td>Making Connections: The Environmental Policy Process</td>
</tr>
<tr>
<td>ENVS 1755</td>
<td>Globalization and the Environment</td>
</tr>
<tr>
<td>ENVS 1916</td>
<td>Animals and Plants in Chinese History</td>
</tr>
<tr>
<td>ENVS 1925</td>
<td>Energy Policy and Politics</td>
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</tbody>
</table>

**Statistics: Select One**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>APMA 0650</td>
<td>Essential Statistics</td>
</tr>
<tr>
<td>APMA 1650</td>
<td>Statistical Inference I</td>
</tr>
<tr>
<td>BIOL 0495</td>
<td>Statistical Analysis of Biological Data</td>
</tr>
</tbody>
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¹ Other courses with significant environmental content may be substituted for core requirements.

² Choose a track, or consult academic program manager.
Environmental Studies

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
- 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
- EDUC 1100 Introduction to Qualitative Research Methods
- 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
- 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

Track 4 - Land, Water & Food Security

Climate: Select One
- EEPS 0850 Weather and Climate
- EEPS 1430 Principles of Planetary Climate
- 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

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
- HIST 1820B Environmental History of East Asia
- HIST 1976C Animal, Vegetable, Mineral: Environmental Histories of Non-Human Actors
- HIST 1976I Imperialism and Environmental Change

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

Tools: Select One
- APMA 1650 Statistical Inference I
- EEPS 1320 Introduction to Geographic Information Systems for Environmental Applications
- EEPS 1330 Global Environmental Remote Sensing
- ENVS 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
**Requirements for the Sc.B. Degree**

**Tools (choose one):**
- Math:
  - APMA 0340: Methods of Applied Mathematics I, II

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

**Policy:** Select One
- ENVS 1350: Environmental Economics and Policy
- ENVS 1574: Engaged Climate Policy in the U.S.: Rhode Island and Washington, DC
- ENVS 1615: Making Connections: The Environmental Policy Process
- ENVS 1755: Globalization and the Environment

**Analysis Tools:** Select One
- ENVS 0490: Infrastructure!
- BIOL 0460: Insect Biology
- BIOL 0430: Invertebrate Zoology
- BIOL 0440: Evolutionary Biology

**Total Credits: 14-15**

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 ENVS 0490 can be waived for students with an AP exam score of 5 in Environmental Science.

**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.**

**Track 2 - Conservation Science and Policy**

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

**Evolution:** Select One
- BIOL 0480: Evolutionary Biology
- BIOL 0410: Invertebrate Zoology

**Organismal Diversity:** Select One
- 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

**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**

**Track 3 - Environment and Inequality**

**Tools (choose one):**
- APMA 0650: Essential Statistics
- 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

**Climate and Thermal Change (choose two):**
- EEPS 0230: Geochemistry: Earth and Planetary Materials and Processes
- EEPS 1120: Paleoclimatology
- EEPS 1370: Environmental Geochemistry
- EEPS 1510: Introduction to Atmospheric Dynamics
- ENGN 0720: Thermodynamics
- ENGN 1720: Design of Thermal Engines
- ENGN 1930M: Industrial Design
- ENVS 1245: Air Pollution & Chemistry

**ENVS 1390:** Global Environmental Remote Sensing

**ENVS 1105:** Engaged Climate Policy in the U.S.: Rhode Island and Washington, DC

**ENGS 1320:** Introduction to Geographic Information Systems for Environmental Applications

**ENVS 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

**Track 3 - Environment and Inequality**

**Tools (choose one):**
- ANTH 1940: Ethnographic Research Methods
- ECON 1620: Introduction to Econometrics
- EDUC 1100: Introduction to Qualitative Research Methods
- 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

**Race, Class and Gender Inequality:** Select One
- ECON 1370: Race and Inequality in the United States
Energy: Select Three

FOCUS THREE - Environmental Inequality in Food, Water, and Energy: Select Three

AMST 1906P Food in American Society and Culture
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
IAPA 1805C Caribbean and Pacific Small States: On the Margins of Development

PHP 1500 Global Health Nutrition

Track 4 - Land, Water & Food Security
Math: Select One
MATH 0090 Introductory Calculus, Part I ¹
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 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
Critical Perspectives on Development: Select One
ANTH 0110 Anthropology and Global Social Problems: Environment, Development, and Governance
IAPA 0010 Sophomore Seminar in Development Studies
IAPA 1802C Infrastructure!
POLS 1200 Reimagining Capitalism
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
ECON 1560 Economic Growth
Climate: Select One
EEPS 0850 Weather and Climate
ENVS 1245 Air Pollution & Chemistry

Total Credits 19-20

¹ 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

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.