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>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 0110</td>
<td>Principles of Economics</td>
<td>1</td>
</tr>
<tr>
<td>or HIST 0150A</td>
<td>History of Capitalism</td>
<td></td>
</tr>
<tr>
<td>ENVS 0490</td>
<td>Environmental Science in a Changing World</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>
<tr>
<td>or EEPS 0240</td>
<td>Earth: Evolution of a Habitable Planet</td>
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</tr>
</tbody>
</table>

Methods - one course

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

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.

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 Specific Requirements

Track 1 - Air, Climate, and Energy

Foundational courses (choose two):
- CHEM 0330  Equilibrium, Rate, and Structure
- EEPS 0220  Earth Processes
- ENGN 0030  Introduction to Engineering
- ENGN 0490  Fundamentals of Environmental Engineering
- PHYS 0030  Basic Physics A
- PHYS 0050  Foundations of Mechanics

Climate (choose one):
- EEPS 0850  Weather and Climate
- EEPS 1430  Principles of Planetary Climate
- ENGN 1931R  The Chemistry of Environmental Pollution
- ENVS 1245  Air Pollution & Chemistry

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

Conservation:
- BIOL 1470  Conservation Biology

Ecology & Conservation Topics: Select One
- BIOL 1155  Hormones and Behavior
- BIOL 1450  Community Ecology
- BIOL 1480  Terrestrial Biogeochemistry and the Functioning of Ecosystems
- BIOL 1515  Conservation in the Genomics Age

Policy: Select One
- ANTH 1601  Reimagining Climate Change
- 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
- ENVS 1755  Globalization and the Environment

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 African Studies
AFRI 0210 Afro Latin Americans and Blackness in the Americas
AFRI 0850 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

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

PHIL 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
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
POLS 1435 Politics of Change

Environmental Studies
### Requirements for the Sc.B. Degree

**AP exam score of 5 in Environmental Science.**

**AP exam score of 4 or 5 in both Microeconomics and Macroeconomics.**

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

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
- **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
- **ECON 1510** Economic Development
- **ENVS 0150** Climate Futures and a Sociology of Just Transitions
- **ENVS 1415** Power, Justice, and Climate Change
- **ENVS 1580** Environmental Stewardship and Resilience in Urban Systems
- **ENVS 1755** Globalization and the Environment
- **SOC 0150** Economic Development and Social Change

**Policy:** Select Two
- **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
- **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
- **ENVS 1105** Introduction to Environmental GIS

**Climate and Thermal Change (choose two):**
- **EEPS 0230** Geochemistry: Earth and Planetary Materials and Processes
- **EEPS 1120** Paleoceanography
- **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
- **ENVS 1245** Air Pollution & Chemistry

**Track 2 - Conservation Science and Policy**

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

**Policy (choose one):**
- **ECON 1340** Economics of Global Warming
- **ENVS 1350** Environmental Economics and Policy
- **ENVS 1415** Power, Justice, and Climate Change
- **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
- **ENVS 1925** Energy Policy and Politics
- **IAPA 1802C** Infrastructure!
- **POLS 1435** Politics of Climate Change
- **POLS 1822I** Geopolitics of Oil and Energy

**Tools:** Select 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
- **ENVS 1105** Introduction to Environmental GIS

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

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

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

**Tools:** Select One
- **EEPS 1320** Introduction to Geographic Information Systems for Environmental Applications

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

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Environmental Studies
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  Global Burden of Disease
PHP 1101  World of Food: Personal to Global Perspectives on Nutrition, Agriculture and Policy
PHP 1700  Current Topics in Environmental Health
PHP 1710  Climate Change and Human Health
PHP 1920  Social Determinants of Health

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 1924  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
POL 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
ECON 1560  Economic Growth
ENVS 1350  Environmental Economics and Policy
IAPA 1700  Economics for Public Policy
Climate: Select One

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<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

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.