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 project-based capstone experience, 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 13-14 courses) and the other a Sc.B. degree in Environmental Science (requires 18-19 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

- ECON 0110 Principles of Economics
- ENVS 0490 Environmental Science in a Changing World
- BIOL 0210 Diversity of Life
- or EEPS 0240 Earth: Evolution of a Habitable Planet

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

The College expects that a capstone will be completed in semesters 7 or 8 - with the intention of providing an opportunity for students to integrate many aspects of their course of study, or area of focus. 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 Understanding Earth and Environmental Processes
- ENGN 0030 Introduction to Engineering
- ENGN 0032 Introduction to Engineering: Design
- 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

Policy (choose one):
- ANTH 1601 Reimagining Climate Change
- ECON 1340 Economics of Global Warming
- ENVS 1350 Environmental Economics and Policy
- ENVS 1415 Power, Justice, and Climate Change
- ENVS 1574 Climate Policy Research: Organizations and Obstruction
- ENVS 1615 Making Connections: The Environmental Policy Process
- ENVS 1805 Ocean Governance and Policy
- ENVS 1925 Energy Policy and Politics
- POLS 1015 Politics and Nature
- POLS 1435 Politics of Climate Change
- POLS 1822I Geopolitics of Oil and Energy
- POLS 2345 Eco-Democracy

Energy Technology and Infrastructure (choose one):
- ENGN 0490 Fundamentals of Environmental Engineering
- ENGN 0720 Thermodynamics
- ENGN 1342 Groundwater Flow and Transport
- 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 0380 The Ecology and Evolution of Infectious Disease
- BIOL 1155 Hormones and Behavior
- BIOL 1450 Community Ecology
Track Intro Course:

- BIOL 1480 Terrestrial Biogeochemistry and the Functioning of Ecosystems
- BIOL 1515 Conservation in the Genomics Age
- CLPS 1195 Life Under Water in the Anthropocene

**Policy:** Select One

- ANTH 1601 Reimagining Climate Change
- ENVS 0715 Political Ecology
- ENVS 1415 Power, Justice, and Climate Change
- ENVS 1555 Local Food Systems and Urban Agriculture
- ENVS 1574 Climate Policy Research: Organizations and Obstruction
- ENVS 1615 Making Connections: The Environmental Policy Process
- ENVS 1805 Ocean Governance and Policy
- ENVS 1916 Animals and Plants in Chinese History
- ENVS 1925 Energy Policy and Politics
- POLS 1015 Politics and Nature
- POLS 1435 Politics of Climate Change
- POLS 2345 Eco-Democracy

**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
- SOC 1100 Introductory Statistics for Social Research

**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
- AFRI 1920 Health Inequality in Historical Perspective
- ANTH 1622 Archaeology of Settler Colonialism
- ANTH 1624 Indians, Colonists, and Africans in New England
- ECON 1370 Race and Inequality in the United States
- ETHN 1000 Introduction to American/Ethnic Studies
- HIST 0150D Refugees: A Twentieth-Century History
- HIST 203 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
- SOC 1490 Power, Knowledge and Justice in Global Social Change

**Environment and Inequality:** Select One

- ENVS 0715 Political Ecology
- ENVS 1247 Clearing the Air: Environmental Studies of Pollution
- ENVS 1552 Science and Power: The Corruption of Environmental Health
- 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 0720 Public Health and the Environment
- PHP 1700 Current Topics in Environmental Health
- SOC 0250 An Environmental Sociology for a Rapidly Warming World

**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 1911 Narrating the Anthropocene
- SOC 1020 Methods of Social Research
- 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 1350 Environmental Economics and Policy
- ENVS 1415 Power, Justice, and Climate Change
- ENVS 1555 Local Food Systems and Urban Agriculture
- ENVS 1574 Climate Policy Research: Organizations and Obstruction
- ENVS 1615 Making Connections: The Environmental Policy Process
- ENVS 1805 Ocean Governance and Policy
- ENVS 1925 Energy Policy and Politics
- POLS 1015 Politics and Nature
- POLS 1435 Politics of Climate Change
- POLS 1822I Geopolitics of Oil and Energy
- POLS 2345 Eco-Democracy

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

**Climate:** Select One

- EEPS 0830 Water in Our World
- EEPS 0850 Weather and Climate
- EEPS 1430 Principles of Planetary Climate
- EEPS 1960X Ocean, Cryosphere, and Sea Level Change
- ENGN 1342 Groundwater Flow and Transport
- ENGN 1931R The Chemistry of Environmental Pollution
- ENVS 1247 Clearing the Air: Environmental Studies of Pollution

**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
- BIOL 1480 Terrestrial Biogeochemistry and the Functioning of Ecosystems
Environmental History: Select One

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ENVS 1557</td>
<td>Birding Communities</td>
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<tr>
<td>ENVS 1916</td>
<td>Animals and Plants in Chinese History</td>
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<tr>
<td>HIST 0270A</td>
<td>From Fire Wielders to Empire Builders: Human Impact on the Global Environment before 1492</td>
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<tr>
<td>HIST 0270B</td>
<td>From the Columbian Exchange to Climate Change: Modern Global Environmental History</td>
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<tr>
<td>HIST 0576A</td>
<td>The Arctic: Global History from the Dog Sled to the Oil Rig</td>
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<tr>
<td>HIST 1360</td>
<td>Amazonia from the Prehuman to the Present</td>
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<tr>
<td>HIST 1820B</td>
<td>Environmental History of East Asia</td>
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<tr>
<td>HIST 1976I</td>
<td>Imperialism and Environmental Change</td>
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<tr>
<td>HIST 1976J</td>
<td>Earth Histories: From Creation to Countdown</td>
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<tr>
<td>PHUM 1904</td>
<td>Power + Water: Material Culture and its Environmental Impact</td>
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Policy: Select One

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<td>ENVS 0715</td>
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<td>Environmental Economics and Policy</td>
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<td>ENVS 1555</td>
<td>Local Food Systems and Urban Agriculture</td>
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<tr>
<td>ENVS 1574</td>
<td>Climate Policy Research: Organizations and Obstruction</td>
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<td>POLS 1200</td>
<td>Reimagining Capitalism</td>
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<td>POLS 2345</td>
<td>Eco-Democracy</td>
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Tools: Select One

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<tr>
<td>APMA 1650</td>
<td>Statistical Inference I</td>
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<tr>
<td>EEPS 1320</td>
<td>Introduction to Geographic Information Systems for Environmental Applications</td>
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<tr>
<td>EEPS 1330</td>
<td>Global Environmental Remote Sensing</td>
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<tr>
<td>ENVS 1911</td>
<td>Narrating the Anthropocene</td>
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<td>SOC 1020</td>
<td>Methods of Social Research</td>
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<td>SOC 1100</td>
<td>Introductory Statistics for Social Research</td>
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<td>SOC 1117</td>
<td>Focus Groups for Market and Social Research</td>
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<td>SOC 1340</td>
<td>Principles and Methods of Geographic Information Systems</td>
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Critical Perspectives: Select One

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<tr>
<td>ECON 1370</td>
<td>Race and Inequality in the United States</td>
</tr>
<tr>
<td>ECON 1530</td>
<td>Health, Hunger and the Household in Developing Countries</td>
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<tr>
<td>ENVS 0705</td>
<td>Equity and the Environment: Movements, Scholarship, Solutions</td>
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<tr>
<td>IAPA 1804S</td>
<td>Critical Study of Development</td>
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<tr>
<td>POLS 1200</td>
<td>Reimagining Capitalism</td>
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<tr>
<td>SOC 0150</td>
<td>Economic Development and Social Change</td>
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<tr>
<td>SOC 0250</td>
<td>An Environmental Sociology for a Rapidly Warming World</td>
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<tr>
<td>SOC 1040</td>
<td>World Population Problems</td>
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<tr>
<td>SOC 1490</td>
<td>Power, Knowledge and Justice in Global Social Change</td>
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</tbody>
</table>

Total Credits: 13-14

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, or minimum score of 6 in ‘IB HL Economics’.

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 13-14 course requirements as listed in the A.B. Program

Additional Track specific requirements for the Sc.B. 5

Track 1 - Air, Climate, and Energy

Math:

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>MATH 0090</td>
<td>Single Variable Calculus, Part I 1</td>
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Policy (choose one):

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<tr>
<td>ANTH 1601</td>
<td>Reimagining Climate Change</td>
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<tr>
<td>ECON 1340</td>
<td>Economics of Global Warming</td>
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<tr>
<td>ENVS 1350</td>
<td>Environmental Economics and Policy</td>
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<tr>
<td>ENVS 1415</td>
<td>Power, Justice, and Climate Change</td>
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<td>Climate Policy Research: Organizations and Obstruction</td>
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<td>ENVS 1615</td>
<td>Making Connections: The Environmental Policy Process</td>
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</table>

Environmental Studies 3
ENVS 1805 Ocean Governance and Policy
ENVS 1925 Energy Policy and Politics
POLS 1015 Politics and Nature
POLS 1435 Politics of Climate Change
POLS 1822I Geopolitics of Oil and Energy
POLS 2345 Eco-Democracy

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 1911 Narrating the Anthropocene
SOC 1100 Introductory Statistics for Social Research

Climate and Thermal Change (choose two):
BIOL 1480 Terrestrial Biogeochemistry and the Functioning of Ecosystems
EEPS 0230 Geochemistry: Earth and Planetary Materials and Processes
EEPS 1110 Descriptive Coastal and Estuarine Oceanography
EEPS 1120 Paleoclimatology
EEPS 1370 Environmental Geochemistry
EEPS 1510 Introduction to Atmospheric Dynamics
EEPS 1520 Ocean Circulation and Climate
EEPS 1960X Ocean, Cryosphere, and Sea Level Change
ENGN 0720 Thermodynamics
ENGN 1710 Principles of Heat Transfer
ENGN 1930M Industrial Design
ENGN 1931R The Chemistry of Environmental Pollution
ENVS 1247 Clearing the Air: Environmental Studies of Pollution

Track 2 - Conservation Science and Policy
Math: Select One
MATH 0090 Single Variable Calculus, Part I

Evolution: Select One
BIOL 0480 Evolutionary Biology
BIOL 1515 Conservation in the Genomics Age

Organismic 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 0450 Evolutionary Behavioral Ecology
BIOL 0940D Rhode Island Flora: Understanding and Documenting Local Plant Diversity

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

Tools: Select One
EEPS 1320 Introduction to Geographic Information Systems for Environmental Applications
EEPS 1330 Global Environmental Remote Sensing
ENVS 1911 Narrating the Anthropocene

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 for Environmental Applications
EEPS 1330 Global Environmental Remote Sensing
ENVS 1911 Narrating the Anthropocene
SOC 1020 Methods of Social Research
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
PHP 2365 Public Health Issues in LGBT Populations
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
ECON 1355 Environmental Issues in Development Economics
ECON 1530 Health, Hunger and the Household in Developing Countries
ENVS 0715 Political Ecology
ENVS 1415 Power, Justice, and Climate Change
ENVS 1916 Animals and Plants in Chinese History
HIST 0150D Refugees: A Twentieth-Century History
HIST 1360 Amazonia from the Prehuman to the Present
IAPA 1701K Geography of Uneven Development
IAPA 1801K From Growth to the Green Transition
PHP 1070 Global Burden of Disease
POLS 1440 Security, Governance and Development in Africa
POLS 1822I Geopolitics of Oil and Energy
SOC 0150 Economic Development and Social Change

FOCUS TWO - Environmental Health and Inequality: Select Three
AFRI 1920 Health Inequality in Historical Perspective
ANTH 1310 Global Health: Anthropological Perspectives
BIOL 1820 Environmental Health and Disease
ENVS 1552 Science and Power: The Corruption of Environmental Health
PHP 0320 Introduction to Public Health
PHP 0330 Public Health Policy
PHP 0720 Public Health and the Environment
PHP 1070 Global Burden of Disease
PHP 1101 World of Food: Personal to Global Perspectives on Nutrition, Agriculture and Policy
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>PHP 1650</td>
<td>Race, Racism and Health</td>
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<td>PHP 1700</td>
<td>Current Topics in Environmental Health</td>
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<td>PHP 1710</td>
<td>Climate Change and Human Health</td>
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<td>PHP 1920</td>
<td>Social Determinants of Health</td>
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<td>PHP 2365</td>
<td>Public Health Issues in LGBT Populations</td>
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<td>EEPS 0830</td>
<td>Water in Our World</td>
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<td>ENVS 1580</td>
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<tr>
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<td>Ocean Governance and Policy</td>
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<td>ENVS 1915</td>
<td>Histories of Global Wetlands</td>
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<td>ENVS 1925</td>
<td>Energy Policy and Politics</td>
</tr>
<tr>
<td>PHUM 1904</td>
<td>Power + Water: Material Culture and its Environmental Impact</td>
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</tbody>
</table>

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

- EEPS 0830 Water in Our World
- ENVS 1415 Power, Justice, and Climate Change
- ENVS 1555 Local Food Systems and Urban Agriculture
- ENVS 1580 Environmental Stewardship and Resilience in Urban Systems
- ENVS 1805 Ocean Governance and Policy
- ENVS 1915 Histories of Global Wetlands
- ENVS 1925 Energy Policy and Politics
- PHUM 1904 Power + Water: Material Culture and its Environmental Impact

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

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

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

**EarthLife 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 1110 Descriptive Coastal and Estuarine Oceanography
- EEPS 1120 Paleocenography
- EEPS 1130 Ocean Biogeochemical Cycles
- EEPS 1150 Limnology: The Study of Lakes
- EEPS 1310 Global Water Cycle
- EEPS 1370 Environmental Geochemistry
- EEPS 1510 Introduction to Atmospheric Dynamics
- EEPS 1960X Ocean, Cryosphere, and Sea Level Change
- ENGN 1340 Water Supply and Treatment Systems - Technology and Sustainability

**Total Credits** 18-19

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.