

# Institute at Brown for Environment and Society

The Institute at Brown for Environment & Society supports research to understand the interactions between natural, human and social systems. Our teaching programs prepare future leaders to envision and build a just and sustainable world. Our engagement programs take research from the lab to the statehouse, the hospital and the public sphere.

Undergraduate and graduate students can study conservation science and policy, water and food security, environmental health, climate science and meteorology, biogeography and evolution, and more. Research is conducted in laboratories, on supercomputers and at field sites around the world.

For additional information, please visit the Institute's website: <http://www.brown.edu/academics/institute-environment-society/>

## Environmental Studies Concentration Requirements

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 these concentrations or wish to be added to the email directory listing upcoming events, then please contact Jeanne Loewenstein ([jeanne\\_loewenstein@brown.edu](mailto: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 <sup>1</sup>	1
or HIST 0150A	History of Capitalism	

ENVS 0490	Environmental Science in a Changing World <sup>2</sup>	1
ENVS 0110	Humans, Nature, and the Environment: Addressing Environmental Change in the 21st Century	1
BIOL 0210	Diversity of Life	1
or EEPS 0240	Earth: Evolution of a Habitable Planet	
<b>Electives - three courses</b>		<b>3</b>
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.		
<b>Capstone - one or two courses</b>		<b>1-2</b>
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.		
<b>Track Specific Requirements</b>		<b>5</b>
<b>Track 1 - Air, Climate, and Energy</b>		
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
<b>Track 2 - Conservation Science and Policy</b>	
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
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
<b>Track 3 – Environment and Inequality</b>	
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 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
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 Welders 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
<b>Track 4 - Land, Water &amp; Food Security</b>	
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

ENVS 1557	Birding Communities
ENVS 1916	Animals and Plants in Chinese 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 0576A	The Arctic: Global History from the Dog Sled to the Oil Rig
HIST 1360	Amazonia from the Prehuman to the Present
HIST 1820B	Environmental History of East Asia
HIST 1976I	Imperialism and Environmental Change
HIST 1976J	Earth Histories: From Creation to Countdown
PHUM 1904	Power + Water: Material Culture and its Environmental Impact

Policy: Select One

ENVS 0715	Political Ecology
ENVS 1350	Environmental Economics and Policy
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
PHP 1101	World of Food: Personal to Global Perspectives on Nutrition, Agriculture and Policy
POLS 1015	Politics and Nature
POLS 1435	Politics of Climate Change
POLS 2345	Eco-Democracy

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 1911	Narrating the Anthropocene
SOC 1340	Principles and Methods of Geographic Information Systems

**Track 5 - Sustainability in Development**

Environment and Development: Select One

ENVS 0715	Political Ecology
ENVS 1247	Clearing the Air: Environmental Studies of Pollution
ENVS 1415	Power, Justice, and Climate Change

ENVS 1580	Environmental Stewardship and Resilience in Urban Systems
PHUM 1904	Power + Water: Material Culture and its Environmental Impact
SOC 1490	Power, Knowledge and Justice in Global Social Change

Policy: Select Two

ENVS 1350	Environmental Economics and Policy
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 1200	Reimagining Capitalism
POLS 1435	Politics of Climate Change
POLS 1822I	Geopolitics of Oil and Energy
POLS 2345	Eco-Democracy

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

Critical Perspectives: Select One

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

**Total Credits** **13-14**

<sup>1</sup> 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'.

<sup>2</sup> 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** **13-14**

**Additional Track specific requirements for the Sc.B.** **5**

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

Math:	
MATH 0090	Single Variable Calculus, Part I <sup>1</sup>
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
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
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	Paleoceanography
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 <sup>1</sup>
Evolution: Select One	
BIOL 0480	Evolutionary Biology
BIOL 1515	Conservation in the Genomics Age
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 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
SOC 1340	Principles and Methods of Geographic Information Systems
SOC 2610	Spatial Thinking in Social Science

**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
PHP 1650	Race, Racism and Health
PHP 1700	Current Topics in Environmental Health
PHP 1710	Climate Change and Human Health
PHP 1920	Social Determinants of Health
PHP 2365	Public Health Issues in LGBT Populations
<b>FOCUS THREE - Environmental Inequalities in Food, Water, and Energy: Select Three</b>	
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 <sup>1</sup>
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Chemistry: Select One

CHEM 0330	Equilibrium, Rate, and Structure
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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 1110	Descriptive Coastal and Estuarine Oceanography
EEPS 1120	Paleoceanography
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

**Track 5 - Sustainability in Development**

Critical Perspectives: Select One

ECON 1370	Race and Inequality in the United States
ECON 1530	Health, Hunger and the Household in Developing Countries
ENVS 0705	Equity and the Environment: Movements, Scholarship, Solutions

IAPA 1804S	Critical Study of Development
POLS 1200	Reimagining Capitalism
SOC 0150	Economic Development and Social Change
SOC 0250	An Environmental Sociology for a Rapidly Warming World
SOC 1040	World Population Problems
SOC 1490	Power, Knowledge and Justice in Global Social Change

Env. & Development: Select One

ENVS 0715	Political Ecology
ENVS 1247	Clearing the Air: Environmental Studies of Pollution
ENVS 1415	Power, Justice, and Climate Change
ENVS 1580	Environmental Stewardship and Resilience in Urban Systems
PHUM 1904	Power + Water: Material Culture and its Environmental Impact
POBS 1020	Anthropocene with Many Accents: Environmentalizing the Afro-Luso-Brazilian Triangle
SOC 1490	Power, Knowledge and Justice in Global Social Change

Economic Perspectives: Select Two

ECON 1110	Intermediate Microeconomics
ECON 1340	Economics of Global Warming
ECON 1355	Environmental Issues in Development Economics
ECON 1410	Urban 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

EEPS 0830	Water in Our World
EEPS 0850	Weather and Climate
EEPS 1110	Descriptive Coastal and Estuarine Oceanography
EEPS 1370	Environmental Geochemistry
EEPS 1510	Introduction to Atmospheric Dynamics
ENVS 1247	Clearing the Air: Environmental Studies of Pollution

**Total Credits 18-19**

<sup>1</sup> 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.

## Courses

### ENVS 0070C. Transcending Transportation Impacts.

Students will be engaged in interdisciplinary analyses of the life-cycle costs, environmental impacts, technical developments, and policy innovations at the local and regional level. We will discuss technical modifications in vehicles, such as plug-in hybrids, as well as policy and planning on intermodal systems, recycle-a-bike programs, intelligent transportation systems, and other innovations. Enrollment limited to 19 first year students. Instructor permission required.

Fall ENVS0070CS01 17360 TTh 1:00-2:20(06) (K. Teichert)

### ENVS 0070D. The Misuse of Scientific Information in American Life.

Many important political issues hinge on matters of science or technology. But most Americans are ill-equipped to assess these matters. As a result, we are vulnerable to spin when scientific information is distorted, cherry-picked or otherwise misused to advance financial, political or even religious goals. This course examines ways these phenomena skew public discussion of climate change, vaccine safety, the teaching of evolution, cancer screening, GM food and a host of other issues. Enrollment limited to 19 first year students.

### ENVS 0070E. What Does It Mean To Be Green?

What does it mean to be green? From saving energy to recycling to eating organic food, in recent years the idea of going green has gained increasing attention. But green is not solely a proxy for environmentalism: it encompasses competing, and at times contradictory meanings. This seminar places contemporary green debates in historical and cross-cultural contexts. We'll examine multiple paradigms of greenness in the Global South as well as the Global North. Topics range from imperial visions of tropical landscapes to the green revolution emphasis on agrochemicals, from conservation to climate change. Enrollment limited to 19 first year students.

### ENVS 0070G. Historical Climatology and Global Climate Change.

This course will look at climate trends through the lens of civilizations across the globe. The Maya, Indus and Nile have been cradles to great civilizations, each impacted to a different degree by climate variability. Climate change is now causing history to repeat itself through the displacement of people as climate refugees in places like Honduras, Pakistan and Ethiopia. In this course, we will focus on and analyze instrumental, observational and geologic datasets to assess the role of climate in shaping past civilization and modern society.

### ENVS 0110. Humans, Nature, and the Environment: Addressing Environmental Change in the 21st Century.

This is an engaged scholars course that offers an introduction to contemporary environmental issues. We explore the relationships between human societies and the non-human environment through a survey of topical cases, including: human population growth and consumption, global climate change, toxins, waste streams, water resources, environmental justice and ethics, and agro-food systems. This course also analyzes various solutions—social, political, technical, and economic—put forth by institutions and individuals to address questions of environmental sustainability. Each student must register for a 50-minute weekly engaged scholar lab in addition to lectures. Each lab will partner with a community organization to complete an engaged, environmental project. See class notes for reserved seating registration set up by semester level.

Fall ENVS0110 S01 18346 MWF 10:00-10:50(14) (D. King)

Fall ENVS0110 C01 18347 T 12:00-12:50 'To Be Arranged'

Fall ENVS0110 C02 18348 T 12:00-12:50 'To Be Arranged'

Fall ENVS0110 C03 18349 T 12:00-12:50 'To Be Arranged'

Fall ENVS0110 C04 18350 Th 12:00-12:50 'To Be Arranged'

Fall ENVS0110 C05 18351 Th 12:00-12:50 'To Be Arranged'

Fall ENVS0110 C06 18352 Th 12:00-12:50 'To Be Arranged'

### ENVS 0120. Botanical Roots of Modern Medicine (BIOL 0190E).

Interested students must register for BIOL 0190E.

### ENVS 0121. Plants, Food, and People (BIOL 0190H).

Interested students must register for BIOL 0190H.

### ENVS 0150. Climate Futures and Just Transitions.

The just transition is a foundational concept for labor-environmentalism and it has generated a range of productive debates between labor, feminist, environmental justice, indigenous forces and other actors about the possibilities, genuine dilemmas and trade-offs that confront all attempts to think through the challenge of decarbonization. Following the incorporation of the term "just transition" into the preamble to the Paris Agreement in 2015 at COP 21, it has also taken on a further life of its own in the international climate space as many leading climate NGOs, business elites and international unions articulate their commitment to decarbonization through the language of just transitions. This course seeks to build a reconstructive environmental sociology of the just transition, incorporating debates from political ecology, energy/technology studies, critical art and design studies and the climate social sciences.

Spr ENVS0150 S01 25718 Th 4:00-7:00 (J. Roberts)

### ENVS 0160. Migration and Borders in a Time of Climate Crisis.

This course foregrounds the political implications of migration and border regimes in the context of environmental change, historically, today, and in the future. It examines in what sense environmental and climate factors might be causally related to human movement. We will seek to understand the fears of a future "climate refugee crisis," and how states and security regimes are already preparing for climate displacement. Furthermore, we will ask how migrant justice groups are challenging the closed-border policies of many states in 'the Global North' as well as the global structural inequalities that create the vulnerabilities that drive movement and migration.

### ENVS 0220. Physical Processes in Geology (GEOL 0220).

Interested students must register for GEOL 0220.

### ENVS 0240. Earth: Evolution of a Habitable Planet (GEOL 0240).

Interested students must register for GEOL 0240.

### ENVS 0241. Climate and Climate Change (GEOL 0030).

Interested students must register for GEOL 0030.

### ENVS 0260. Religion Gone Wild: Spirituality and the Environment (RELS 0260).

Interested students must register for RELS 0260.

### ENVS 0300. Environment and Society in Africa (SOC 0300L).

Interested students must register for SOC 0300L.

### ENVS 0410. Environmental Stewardship.

Challenges students to address the economics and logistics of implementing strategies to conserve resources and reduce the negative impacts of the built environment. The goal is to learn the rationale, process and technical aspects of the practice of environmental stewardship. Topics include sustainable design, institutional change, and corporate environmental responsibility. Students collaborate in interdisciplinary teams on applied projects. Permission by instructor by application process prior to enrollment in the class.

### ENVS 0420. Principles of Ecology (BIOL 0420).

Interested students must register for BIOL 0420.

### ENVS 0465. Climate Solutions - A multidisciplinary perspective.

This course will explore solutions to the climate crises through the lens of multiple disciplines. Lectures will cover topics in physical science, economics, political science, persuasive communication, social science, and equity. Online lectures by disciplinary experts from around the country, but developed specifically for this class, will be the basis for the in class discussions and activities led by Brown Faculty.

Fall ENVS0465 S01 17366 W 3:00-5:30(10) (S. Porder)

### ENVS 0490. Environmental Science in a Changing World.

Introduces students to environmental science and the challenges we face in studying human impacts on an ever-changing earth system. We will explore what is known, and not known, about how ecosystems respond to perturbations. This understanding is crucial, because natural systems provide vital services (water and air filtration, climate stabilization, food supply, erosion and flood control) that can not be easily or inexpensively replicated. Special emphasis will be placed on climate, food and water supply, population growth, and energy.

Spr ENVS0490 S01 25719 TTh 10:30-11:50(09) (T. Kartzinel)

**ENVS 0495. Introduction to Environmental Social Science.**

This course introduces students to core areas of theory and research in the environmental social sciences. It also challenges students to think carefully about what we learn and don't learn when we apply different disciplinary lenses to interdisciplinary environmental challenges.

**ENVS 0510. International Environmental Law and Policy.**

Introduces students to principles of international environmental law and examines how international organizations, national governments and non-state actors interact to address human impacts on the global environment. Considers effects of treaties, trade agreements and foreign aid on resolution of trans-boundary environmental problems including climate change, marine governance, biodiversity loss and trade in endangered species and hazardous waste. Students negotiate a mock treaty (NEWORLD) to mitigate some aspect of human impact on global change from the perspective of different state and non-state actors. Introductory coursework that addresses some aspects of environmental studies or environmental science is recommended.

**ENVS 0520. Wild Literature in the Urban Landscape.**

Combines deep study of ecological poetry, fiction, essays and other writing with service to schools in the community through exploration of local ecological challenges through both creative and more discursive expressions. The field-work or community component to this course will involve students in conducting workshops that combine literature and ecology in order to better elucidate and understand local issues related to, for one example, eco-industrial histories associated with Gorham Silver in Providence and the current state of Maspaug Pond on the Reservoir Triangle, where a public high school, Alvarez, now sits on contaminated soil. Enrollment limited to 22 undergraduates. S/NC.

**ENVS 0580. Foundations of Physical Hydrology (GEOL 0580).**

Interested students must register for GEOL 0580.

**ENVS 0700A. New England Environmental History.**

Explores the environmental history of New England from the arrival of people circa 10,000 years ago to the present day. Topics include Native American and colonial environmental interactions and 20th century environmental transformations. From abandoned textile mills to Northern forests, understanding the history of a place can help us plan for its future.

**ENVS 0700C. Extinction: A Global History.**

In the past five centuries, about 800 species of animals and plants have gone extinct, the majority of them in the last one hundred years. Recent estimates suggest that 41 percent of described amphibians, 26 percent of mammals, and 13 percent of birds currently face the threat of extinction. We will examine the current global extinction crisis as a biological, historical, cultural, economic, and political phenomenon. This course adopts an interdisciplinary approach by examining the issue of extinctions from the perspectives of the humanities and environmental sciences.

**ENVS 0700D. Food for Thought: Food and Agriculture in the History of the Americas.**

This course is an introduction to the history of food and agriculture in the Americas. We will examine key topics such as the domestication of plants and animals several thousand years ago, food production + consumption in pre-Columbian societies, the impact of European colonialism + colonial systems of food production across the Americas farming in the 19th century, the industrialization of agriculture in the 19th and early 20th centuries in the US and Latin America, the Green Revolution, organic agriculture and alternatives to industrial agriculture in the Americas in the past few decades, and the future of food + agriculture.

**ENVS 0705. Equity and the Environment: Movements, Scholarship, Solutions.**

The environmental justice movement emerged in the U.S. South from the observation that African-Americans were more exposed to toxics than whites. It spurred decades of academic and activist efforts to understand and address the relationship between inequality and environment. The issue has expanded around the world, and beyond unequal exposures to "bads", to unequal access to "goods," along lines of equity by race, class, gender, ethnicity, indigenous identity, and position in the global economy. Issues of assigning responsibility and applying theories of justice with legal instruments have made environmental justice policy difficult. This course seeks to serve first-years and sophomores.

**ENVS 0710. Powering the Past: Environmental Histories of Energy Use and Social Change.**

From wood, water, and muscles, to coal, oil, and nuclear power, humans have a long history of reshaping their environments to access energy. The nature of these energy sources also influences the form and distribution of political and economic power. Using environmental history methods, this course examines the ties between energy, power, environmental change, and inequality, from before the agricultural revolution to the present. Readings and lectures link the United States and Europe to the rest of the globe, with particular emphasis on the nineteenth and twentieth centuries. Each class combines lecture and discussion. No prerequisites.

**ENVS 0715. Political Ecology.**

Political ecology asks how power mediates human-environment relationships. How do we, as society, understand "the environment," environmental problems, our role in them, and potential solutions? How have human-environment interactions reproduced inequity related to class, race, gender, and worldview; how does inequity, in turn, relate to environmental realities? Whose environmental "truth" counts, whose doesn't, and why? Are better futures possible (and who defines "better futures")? In this course, we will consider these questions and more. We will examine how knowledge production and socio-economic structures and processes relate to environmental change across economic, political, social, and ecological contexts. The first part of the course will introduce political ecology's roots and major arguments. We will use this foundation to analyze real-world cases and consider the opportunities, or "openings," for different environmental futures.

**ENVS 0717. Ocean Resilience: Ecology, Management, and Politics.**

In this course, we will examine ocean management for resilience and conservation: policy design, implementation, and effects on ecosystems and people. The use of tools such as marine protected areas and marine spatial planning has exploded in recent decades, and global interest in alternative energy, food security, and marine biodiversity conservation has heightened the use, and critique of these key tools in ocean conservation and resilience. Co-taught by an interdisciplinary team (a coastal ecologist and an oceans governance scholar), this course will explore questions such as: What management tools are available? What do they do (and not do) and how? How are they created and managed in particular contexts? Who gets to decide and why?

Fall ENVS0717 S01 18674 MWF 1:00-1:50(08) (L. Acton)

**ENVS 0720. Ecological Imperialism.**

Empires have played important roles in transforming the earth's environments for over two millennia, conquering land and transforming its ecosystems and societies to make them more profitable. This course will examine how empires have reorganized the landscapes of conquered regions from the ancient empires of Rome and China to the informal American empire, focusing in particular on Asia, Africa and Latin America.

**ENVS 0900. Quantitative Methods in Psychology (CLPS 0900).**

Interested students must register for CLPS 0900.

**ENVS 0930A. Appropriate Technology (ENGN 0930A).**

Interested students must register for ENGN 0930A.

**ENVS 1000. Fieldwork in the Urban Community (URBN 1000).**

Interested students must register for URBN 1000.

**ENVS 1070. The Burden of Disease in Developing Countries (PHP 1070).**

Interested students must register for PHP 1070.



**ENVS 1105. Introduction to Environmental GIS.**

This course introduces the tools, techniques, and fundamentals of Geographic Information Systems (GIS) using the ArcGIS software package. GIS has broad applications in environmental, natural, and social sciences. Examples include disaster management, transportation planning, and environmental quality assessment. By the end of this course, students will understand the processes of spatial data analysis, geographic databases, visualization and cartography, and uncertainty quantification. Students will produce an independent final research project in Story Maps and present their results in a highly-visual flash talk. Tuesday 4:00-6:30 PM seminar will be held online. However, students will have the option to attend lab group meetings either virtually or in person. Course override required. Contact the instructor (samiah\_moustafa@brown.edu) with year, concentration, and statement of interest.

**ENVS 1110. Estuarine Oceanography (GEOL 1110).**

Interested students must register for GEOL 1110.

**ENVS 1180. Feminist Thoughts for a Heated Climate (POLS 1180).**

Interested students must register for POLS 1180.

**ENVS 1225. Arctic Climate and Policy: Winter Session in Bodø.**

The Arctic is a region where rapid climate and social changes will have important and far-reaching consequences. Current issues include access to mineral and hydrocarbon resources, possibilities for new maritime routes, cross-border cooperation, governance and self-determination, sustainability of fisheries, opportunities for Arctic tourism, and support of indigenous communities. Students will travel to Bodø, Norway, to participate in this class together with undergraduates from Babson College and Nord University Business School. Students will work together across disciplines and cultures to learn how to apply knowledge to map relevant policy issues more creatively, effectively, and responsibly.

**ENVS 1230. Forest History of Colonial New England: Combining Evidence from Documents and Pollen.**

Bringing metal tools and animals with them from Europe, settlers set out to transform the Northeastern American landscape shortly after founding Plymouth Colony in 1620. Historical accounts describe an abundance of tree cover, which, environmental historians argue, provided the frame and fuel for American nationhood. But what do we really know about the pre-colonial canopy of the Northeast and its transformation under colonialism? To find out, we have to go back into the woods and understand how forests age. Using ecology and pollen records, we can learn about Abenaki and early settlers' interactions with the treed landscape.

**ENVS 1245. Air Pollution & Chemistry.**

Air pollution is a major concern across the globe, impacting human health, ecosystems, and climate. This course will provide students with an understanding of the chemical and physical processes that determine the composition of the atmosphere, with an emphasis on the dispersion of pollutants responsible for urban smog, acid rain, climate change, and the ozone hole. Topics to be covered also include health and environmental impacts of air pollutants, potential technological solutions, air pollution monitoring, and international policy regulations. Prerequisites: CHEM 0330, CHEM 0050, ENGN 0720 or similar.

**ENVS 1247. Clearing the Air: Environmental Studies of Pollution.**

Whether air, water or land borne, pollution is a multivalent "wicked problem" that has profound implications for the climate, ecological and economic systems, and human health and well-being. Emphasizing engaged scholarship based in Providence, we will explore pollution's historical origins, review current pollution measurements and reduction/mitigation efforts, and discuss alternative approaches that better address pollution's historical legacies and resulting social and environmental inequalities. Coursework will revolve around a Providence-based air monitoring project, augmented by readings, guest lectures, and discussion. Assessment will involve participation in discussion, 2-3 response papers and a final project linked to an engaged, field-study.

**ENVS 1260. Indigenous People and Nature: Birds (ANTH 1260).**

Interested students must register for ANTH 1260.

**ENVS 1270. From Magic Mushrooms to Big Pharma: Anthropology of Drugs (ANTH 1880).**

Interested students must register for ANTH 1880.

**ENVS 1330. Global Environmental Remote Sensing (GEOL 1330).**

Interested students must register for GEOL 1330.

**ENVS 1331. Weather and Climate (GEOL 1350).**

Interested students must register for GEOL 1350.

**ENVS 1350. Environmental Economics and Policy.**

This course considers environmental issues through an economic lens. It is loosely arranged around four questions: why are markets so powerful? Why do markets frequently fail to deliver environmental goods? Can markets be harnessed to deliver environmental goods? If so, why don't we do that?

Fall	ENVS1350	S01	17662	MWF	2:00-2:50(01)	(A. Poterack)
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**ENVS 1355. Environmental Issues in Development Economics (ECON 1355).**

Interested students must register for ECON 1355.

**ENVS 1356. Health, Hunger and the Household in Developing Countries (ECON 1530).**

Interested students must register for ECON 1530.

**ENVS 1370. Environmental Geochemistry (GEOL 1370).**

Interested students must register for GEOL 1370.

**ENVS 1400. Sustainable Design in the Built Environment.**

Course develops students' analytical abilities to apply fundamental concepts of environmental issues, building systems analysis, and architectural and engineering design. Students learn how to reduce the negative environmental impacts, and maximize positive social and economic impacts, of the built environment. Students cultivate applied skills in sustainable design; including fundamental energy calculations, heat flow analysis, schematic design analysis, and building operating impacts assessment. Course emphasis is on building energy flows. Students conduct group and independent research projects, providing the opportunity to study broader impacts of the built environment and propose solutions. Class meetings combine lectures, student presentations, and group workshops. To join the waitlist if there are no available seats, please enter an override request reason and briefly summarize your learning objectives in Courses@Brown. Your concentration and semester information is automatically entered.

Fall	ENVS1400	S01	17361	TTh	9:00-10:20(05)	(K. Teichert)
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**ENVS 1410. Environmental Law and Policy.**

Introduces students to environmental law in the United States. Uses legal decisions and policy frameworks to consider the roles of non-/governmental actors in formation and implementation of environmental policy. Students will become familiar with major federal environmental laws and regulatory databases and see how legal precedent, differing understandings of risk and alternative regulatory and market-enlisting strategies have shaped solutions to environmental problems. Provides opportunity to apply legal skills to local environmental legislation or legal problem. Intermediate coursework in Environmental Studies, Political Science, Community Health, Urban Studies or other environmentally-related coursework is recommended. First year students need instructor permission.

**ENVS 1415. Power, Justice, and Climate Change.**

Climate change creates injustices in who caused the problem, who is suffering worst and first, and who is taking action. Power differences between nations and social groups drives unequal disaster risks and "compounded vulnerabilities" for poor peoples and nations, and has led to gridlock in United Nations negotiations. The course reviews social and political dimensions of climate change, including local and national adaptation and mitigation efforts, media dynamics, collective and individual denial, negotiations, the rise of climate social movements, and countermovements. Enrollment limited to 40.



**ENVS 1421. Podcasting For the Common Good: Storytelling with Science.**

How can we use podcasts to spread compelling information about the future of our planet? In this hands-on, interactive course, we bring new perspective to environmental topics by integrating scientific research with audio story telling techniques. Students will learn how to find answers to environmental questions, use recording equipment, conduct interviews, write scripts, and make a finished product. Students will produce several audio projects for the course including an episode for Possibly- a podcast produced through a partnership between IBES and The Public's Radio. Students who want to enroll should write a one page (max) statement about how skills related to explaining environmental and health issues will help them in their educational trajectory. Statements can be emailed to Megan\_Hall@Brown.edu.

Spr ENVS1421 S01 25720 W 3:00-5:30(10) (M. Hall)

**ENVS 1440. Conservation Biology (BIOL 1470).**

Interested students must register for BIOL 1470.

**ENVS 1450. Ecosystem Analysis.**

Develops ability to measure and characterize important biological and physical parameters of terrestrial ecosystems. Weekly field trips to explore measurement techniques and develop testable questions and/or hypotheses about different forested ecosystems. Qualitative and quantitative writing exercises explore how to describe the patterns and processes associated with the ecosystems visited. One Saturday field trip to central Massachusetts and one weekend field trip to New Hampshire are required. A background in environmental issues, as evidenced by taking BIOL 0420, is strongly recommended.

**ENVS 1455. Marine Conservation Science and Policy.**

Students will develop an interdisciplinary understanding of ocean ecosystems and how humans are connected to them socially, economically, and ecologically. Integration of the scientific and human dimensions of marine conservation will be achieved through analysis of the current status, trends, and threats to ocean ecosystems, and the range of solutions to mediate these threats. This course is designed for advanced juniors, seniors and graduate students; participating students are expected to have background in at least one related field (e.g., biology, geosciences, sociology, economics, or political science) beyond the intermediate level. Suggested prerequisites include ENVS 0490, BIOL 0420 or 1470.

**ENVS 1460. Microbial Diversity and the Environment.**

This is a lecture and discussion based course that focuses on the role of microbes in biological, geological, and environmental processes. This includes: introductory concepts, origins of life, bacterial evolution, role in climate change, metabolic diversity of biogeochemical cycles, microbial communities and interactions, habitat specific examples, and applications in the environment and human health. Recommended background courses: BIOL 0200, CHEM 0330 and an intermediate science course (e.g., BIOL 0280, GEOL 0240, or ENVS 0490).

**ENVS 1490. SES-Independent Study/Science Writing.**

The culmination of the Semester in Environmental Sciences at the Marine Biological Laboratory is an independent research project that builds on the topics covered in the aquatic and terrestrial ecosystem analysis core courses. In addition students participate in a seminar designed to help improve their ability to tell a lay reader about science. Enrollment is limited to students in this program. Instructor permission required.

Fall ENVS1490 S01 11578 Arranged 'To Be Arranged'

**ENVS 1491. SES-Terrestrial Ecosystem Analysis.**

Team-taught course examining: the structure of terrestrial ecosystems fundamental biogeochemical processes, physiological ecology, impacts of environmental change on the landscape; the application of basic principles of ecosystem ecology to investigating contemporary environmental problems. Part of the Semester in Environmental Science at the Marine Biological Laboratory; enrollment is limited to students in this program. Instructor permission required.

Fall ENVS1491 S01 11579 Arranged 'To Be Arranged'

**ENVS 1492. SES-Aquatic Ecosystem Analysis.**

Team-taught course examining the structure of freshwater, estuarine and marine ecosystems; impacts of environmental change on the landscape at local regional and global scales; the application of basic principles of ecosystem ecology to investigating contemporary environmental problems such as coastal eutrophication, fisheries exploitation. Part of the Semester in Environmental Science at the Marine Biological Laboratory; enrollment is limited to students in this program. Instructor permission required.

Fall ENVS1492 S01 11580 Arranged 'To Be Arranged'

**ENVS 1493. SES-Environmental Science Elective.**

Two environmental science electives are offered each fall semester as part of the Semester in Environmental Science at the Marine Biological Laboratory, including: aquatic chemistry, mathematical modeling of ecological systems and microbial ecology. Enrollment is limited to students in this program. Instructor permission required.

Fall ENVS1493 S01 11581 Arranged 'To Be Arranged'

**ENVS 1500. Environmental Justice and Climate Change in Rhode Island TRI-Lab Engaged Research.**

The TRI- Lab (Teaching, Research, Impact) on Climate Change and Environmental Justice in Rhode Island will be taught by a team including two experts from the RI state Department of Health. It will investigate ways to reduce the climate change-related public health risks to vulnerable individuals in three targeted neighborhoods in Providence, and increase the capacities of these neighborhoods to respond to climate change threats. Content topics to be covered include: projected climate change impacts in RI; public health risk assessment; risk outreach and communications strategies; state and federal policies, design and evaluation of adaptive responses; community-based research methods.

**ENVS 1510. Environmental Theory and Philosophy.**

Each student develops his or her own concept of "socially better." The task is to understand conceptions of "socially better" belonging to various authors and others in the class, to put one's own concept in context with the readings and class discussion, and explain why that concept is sensible and should be taken seriously by others. Prerequisite: ENVS 1350 or permission of the instructor.

**ENVS 1530. From Locke to Deep Ecology: Property Rights and Environmental Policy.**

Examines the evolution of property law and tenure in land, water, the atmosphere and natural resources, and the consequences of these property rights regimes for environmental protection. Readings drawn from the scientific, legal, public policy and popular literature are used to consider the development of American attitudes about the relationship between people and nature; the relationship between public and private rights in the land, sea, freshwater, atmosphere and wildlife; and the use of innovative property rights regimes in environmental policy. Intermediate coursework in Environmental Studies, Urban Studies, American Civilizations or other environmentally-related coursework is recommended.

**ENVS 1535. Environmental (In)justice and Island Societies: Towards Equitable, Sustainable Solutions.**

The island nations of the world are among the most vulnerable to the economic and social strains of globalization, and the impacts of climate change. This course will take a case-based approach to deconstructing and proposing equitable and sustainable solutions for various environmental justice challenges faced by islands across the Caribbean, Atlantic and Indian Oceans, and Pacific. Cases will include: (a) Puerto Rico and self-determination in the post-Hurricane Maria period; (b) military occupation in the South China Sea; (c) ocean grabbing, territoriality and small-scale fishers in Kiribati; (d) nuclear testing in the Marshall Islands; and (e) climate-induced relocation in Fiji.

**ENVS 1540. Technology and Material Culture in America: The Urban Built Environment (AMST 1520).**

Interested students must register for AMST 1520.

**ENVS 1545. The Theory and Practice of Sustainable Investing.**

21st century businesses and investors face a broadening and deepening array of Environmental, Social, and Governance (ESG) risks and opportunities. Climate change, water scarcity, community conflicts, resource depletion, supply chain breakdowns, worker well-being and economic inequality pose present material challenges that make sustainability an imperative for successful corporations and investors. We will examine current ESG strategy, trends, future scenarios, players, and frameworks and integrate that theory with practical investment performance analysis, metrics, and study of screens, asset classes, and diversification.

Fall ENVS1545 S01 17363 TTh 6:40-8:00PM(02) 'To Be Arranged'

**ENVS 1547. Finance and the Environment.**

This course inspects the power and the pitfalls of finance/capitalism, seeking to provide students with a rudimentary understanding of finance and the flow of capital as well as a deeper understanding of how the global financial system can be adjusted to solve social and environmental problems. The class begins with an overview of the global financial system, including instruments like stocks, bonds, currencies, mutual funds, banks, pension funds, and insurance companies. This financial architecture will then be used to examine what impact investing is and how it can be used to address social and environmental issues. To encourage discussion and participation, to ensure that students are eager to learn about the issues, and to try to accommodate a wealth of ideas, backgrounds and perspectives, the class will be by application only.

**ENVS 1552. Science and Power: The Corruption of Environmental Health.**

The topics we focus on include: the use of human research subjects, the corporate use and corruption of science, health and development, and climate change's impact on environmental health. What are the most effective ways to improve environmental health on the local, national, and/or global level? Developing a plan(s) to achieve improvements in environmental health is the main purpose of the course. Various reading, videos, and guest faculty will address this question, but the answer is not known. If the answer was known these problems (and this course) would not exist. Students will be expected to develop creative approaches to various solution(s) eg. Tiktok, TV show, plan for community organizing, legislation etc.

Fall ENVS1552 S01 17604 Th 4:00-6:30(04) (D. Egilman)

**ENVS 1554. Farm Planet: Hunger, Development, and the Future of Food and Agriculture.**

Hunger amidst plenty is an enduringly wicked problem. Modern agriculture has become incredibly productive, fueling the global grain trade, the meatification of human diets, and the exponential expansion of food and non-food products. Still, the number of people who are hungry, food insecure, and/or malnourished is stable or increasing in various parts of the world. As global population rises, calls to further increase and intensify agricultural production ring out across the globe. Through (agro-)ecological, feminist, and justice lenses, we will explore the political economy of food insecurity and agriculture, the political ecology of agricultural development, and critical humanist approaches to the past, present, and future of farming. We will connect with human geographers, sociologists, anthropologists, historians, Indigenous scholars, Black Studies scholars, feminists, and people working outside of academia.

Fall ENVS1554 S01 18663 MWF 11:00-11:50(16) (M. Schneider)

**ENVS 1555. Local Food Systems and Urban Agriculture.**

This is an engaged scholar course. Urban agriculture has a critical function in a small but increasing movement toward more localized and sustainable food systems. This course focuses on research and readings from multiple disciplines addressing urban agriculture and local food systems' role in shaping food policies, labor practices, sustainable agricultural practices, and human health (to name a few). More importantly, students will work with community partners to actively engage in a local food system project. Enrollment limited to 40.

**ENVS 1556. Environmentalism and the Politics of Nature (ANTH 1556).**

Interested students must register for ANTH 1556.

**ENVS 1557. Birding Communities.**

This seminar explores and builds communities around a charismatic and conspicuous class of animals: birds. The irony is that birds are marvelously diverse and abundant, but birding is associated with a narrow and privileged sector of society. Birding provides an excellent case to explore the politics of inclusion and exclusion around race, economic status, gender, dis/ability, citizenship, sexuality in relations with nature. While studying these politics of access and authority worldwide and historically, we create our own community of knowledge and practice by going birding with adults or schoolchildren. Participants in this seminar will learn from interdisciplinary scholarship, school children, and not least, the birds. History matters. Be woke. Think globally. Bird locally.

**ENVS 1570. Guts of the City: Perspectives on Urban Infrastructure and Environmental Planning (URBN 1570).**

Interested students must register for URBN 1570.

**ENVS 1574. Climate Policy Research: Organizations and Obstruction.**

Over three decades, sufficient and equitable policies addressing the crisis of climate change have been elusive, and US leadership is crucial for an adequate global response. After several weeks of readings and lectures on climate policy, the course shifts to team-based research to produce strategic, policy-relevant briefings and scholarly outputs, some with partner organizations. Students will travel to D.C. for five days in October to attend meetings with experts and staff from government agencies, industry organizations, think tanks, journalists and environmental NGOs, and to hold briefings on our joint research.

Fall ENVS1574 S01 17364 M 3:00-5:30(03) (J. Roberts)

**ENVS 1575. Engaged Climate Policy at the UN Climate Change Talks.**

Twelve undergraduate students will study a group of core readings, conduct independent and group projects, and attend the United Nations Framework Convention on Climate Change's (UNFCCC) 23rd Conference of the Parties (COP23) and related climate change events in Bonn, Germany in November 2017. Students will critically analyze contemporary political events; develop and addresses pertinent research questions; engage with and interview experts in the field; craft policy-relevant and empirically grounded publications; and develop experience in using social media. Team-based research may be shared at the climate negotiations in Bonn. Contact J. Timmons Roberts for an application - j\_timmmons\_roberts@brown.edu.

**ENVS 1580. Environmental Stewardship and Resilience in Urban Systems.**

This course investigates current environmental impacts and risks related to urban infrastructure systems. Students analyze efforts to minimize negative environmental, health and economic impacts of the built environment. The course explores urban initiatives to increase sustainability and resiliency of infrastructure systems in anticipation of increased risks related to climate change. The goal is to learn the rationale, process and technical aspects of the practice of environmental stewardship and resilience planning in an urban context. Students will develop competence in technical analysis, policy analysis, and program implementation through case studies and systems analyses. To join the waitlist if there are no available seats, please enter an override request reason and briefly summarize your learning objectives in courses@brown. Your concentration and semester information is automatically entered.

Spr ENVS1580 S01 25926 TTh 10:30-11:50(09) (K. Teichert)

**ENVS 1605. Glaciers and Climate Change.**

What is the fate of glaciers in a warming world? Where, how much, and how rapidly will glaciers melt? This course investigates how Earth's glaciers are responding to climate change. This class will provide a comprehensive overview of changes to Earth's glaciers, ice caps, and ice sheets, synthesize the latest scientific information, find gaps in our current knowledge, and identify what questions should be explored in future research. And, students will work with glacier-based observations and interpret trends using remote sensing, GIS, and/or other visualization techniques. Topics will also include impacts to sea level rise, ocean circulation, and water resources.

**ENVS 1615. Making Connections: The Environmental Policy Process.**

The diminishing quality of Earth's systems and resources carries profound implications for the fulfillment of human rights and aspirations. But even as Western knowledge systems understand better the intrinsic interdependencies between humans and the non-human, policy gridlock persists. Indeed, scientific findings are regularly contested on political grounds. The purpose of this course is to learn how to apply diverse knowledges from Indigenous to Modern to map the relevant policy in problems at the intersection of human rights and environmental integrity, and to develop approaches to address them in ways that are creative, effective, responsible and just. Students are admitted in the following order: capstone fulfillment, core requirements, EEPS or ENVS concentrator, and others, in the order received in each category.

Fall ENVS1615 S01 18356 TTh 2:30-3:50(12) (A. Lynch)

**ENVS 1650. Statistical Inference I (APMA 1650).**

Interested students must register for APMA 1650.

**ENVS 1660. Instrumental Analysis with Environmental Applications (GEOL 1660).**

Interested students must register for GEOL 1660.

**ENVS 1700B. Watershed Policy + Management: Governance Beyond Borders.**

Changes in land use at parcel and landscape scales have altered water cycles, water quality and water-dependent ecosystems. Governance Beyond Borders examines the management of water, land use and aquatic life in coastal watersheds. We will consider the accomplishments of the top-down, expert-driven federal laws of the 1960s and 1970s. However we will focus on integrated, trans-boundary approaches to governance of land, water, pollutants and aquatic life and become immersed in thinking like a watershed. ENVS1410 is desirable but not required. Other relevant courses could include BIOL1470, ENVS1350, ENVS1530, ENVS1615. Enrollment is limited to 18 students. Instructor's approval is required.

**ENVS 1710. Environmental Health and Policy.**

Provides an overview of environmental health methods and their application to policy and regulation. Students will learn the basic tools of environmental health sciences, including toxicology, epidemiology, and risk assessment, as well as the scientific basis for regulation. Traditional environmental health concerns will be discussed, as well as emerging discourses on environmental health issues, including urban pollution and its concomitant health concerns, climate change, issues of health disparities and environmental injustice, and the interrelationship between humanitarian crises and environmental degradation. Open to both undergraduate and graduate students of all fields, space permitting. Prerequisite: ENVS 0110 or instructor permission.

**ENVS 1711. Current Topics in Environmental Health (PHP 1700).**

Interested students must register for PHP 1700.

**ENVS 1720. Environmental Justice: The Science and Political Economy of Environmental Health and Social Justice.**

Provides an overview of environmental justice history, theory and definitions. Students will review quantitative, qualitative, and theoretical approaches for understanding the origins and persistence of environmental discrimination. Examines the regulatory, institutional, structural, political, and economic forces that underlie patterns of race and class-based discrimination and their implications for environmental health among diverse communities. Case examples of environmental justice organizing will inform students of positive efforts by people of color in protecting their communities. Not open to first year students. Prerequisite: ENVS 0110.

**ENVS 1725. Political Economy of the Environment in Latin America (INTL 1450).**

Interested students must register for INTL 1450.

**ENVS 1755. Globalization and the Environment.**

What are the effects of globalization on the environment? Can globalization be greened? Corporations, civil society, international organizations and states are in a race to globalize their rules, sometimes working together, and others times in bitter conflict. This course seeks to understand this set of issues through a mix of examining concrete social/environmental problems and studying theories of globalization and social change. While addressing global issues and the impacts of wealthy nations, this course focuses most on the developing countries, where the impacts of these global issues appear to be worst, and where resources are fewest to address them. Enrollment limited to 20 juniors and seniors.

**ENVS 1790. North American Environmental History (HIST 1790).**

Interested students must register for HIST 1790.

**ENVS 1791. From Nature's Dangers to Nature Endangered: A History of American Environmental Thought (HIST 1977T).**

Interested students must register for HIST 1977T.

**ENVS 1805. Ocean Governance and Policy.**

This course offers a deep dive into ocean and coastal governance and policy. As residents of the Ocean State, how well do we understand how society interacts with ocean spaces and resources, from local to national and global scales? We will investigate how marine policy planning and implementation processes interact with particular political, social, and economic contexts through case study examples, local practitioner guest speakers, and in-class debates. Using a variety of marine policy sectors (e.g., fisheries, energy, and biodiversity management), we will critically evaluate management tools (e.g., market mechanisms, regulations, area-based management, and community-based management). We will unsettle "established" policy assumptions, asking: Who governs oceans? How does power relate to ocean policy creation and outcomes? What are the roles of science, knowledge, institutions, history, and context in how ocean governance plays out on the ground (or in the waves!)?

**ENVS 1820. Environmental Health and Disease (BIOL 1820).**

Interested students must register for BIOL 1820.

**ENVS 1823. Climate Media, Discourse, and Power.**

How does the American public think about and talk about climate change, and how are these discussions shaped by the interventions of powerful interest groups and political elites? In this course, we will consider how individuals' understandings of climate change are deeply shaped by relations of power, from corporate strategies to delay meaningful action on climate change, to the norms and operations of media institutions, to dominant environmentalist discourses that fail to engage larger socioeconomic structures. While we will primarily discuss how public understanding has historically been constrained by the operation of power, we consider throughout possibilities for crafting climate narratives that resist these limitations to pursue transformative change. This course will focus primarily on climate politics in the United States, but we will also consider other national contexts and impacts on communities across the globe.

Fall ENVS1823 S01 18561 TTh 10:30-11:50(13) (R. Wetts)

**ENVS 1824. Environmental Political Thought (POLS 1824L).**

Interested students must register for POLS 1824L.

**ENVS 1890. Native American Environmental Health Movements (ETHN 1890J).**

Interested students must register for ETHN 1890J.

**ENVS 1900. Introduction to Geographic Information Systems for Environmental Applications (GEOL 1320).**

Interested students must register for GEOL 1320.



**ENVS 1905. Thinking with the Elements: Environmental Theories and Praxis.**

Structured around critical “elements” in the contemporary relationship between people and the environments they inhabit—from water and carbon to forests and phosphorus—this course offers a tour through debates and conversations about environmental politics, knowledge production, and action. Through readings in decolonial, Black and Indigenous theory; fiction; films; and visits from scholars and practitioners, the goal of the class is to offer students fresh methods for understanding the origins of environmental inequalities based on racial, gendered and other forms of hierarchical thinking; how communities have and are living otherwise; and ways to imagine the kinds of social and ecological worlds we hope to build. Individual and group writing and other creative work are integral to this senior capstone course.

Fall ENVS1905 S01 18646 M 3:00-5:30(03) (B. Demuth)

**ENVS 1910. The Anthropocene: The Past and Present of Environmental Change.**

Scholars in many disciplines have begun using the term the Anthropocene to signal a geological epoch defined by human activity. This seminar examines the Anthropocene idea from the perspective of environmental history. What activities might have changed the planet – the use of fire thousands of years ago, or agriculture, or fossil fuels? Is the Anthropocene another term for climate change, or does it include pollution and extinction? Is it a useful concept? Drawing on anthropology and the sciences as well as history, we will use the Anthropocene to think through environmental change and the human relationship with the non-human world.

**ENVS 1911. Narrating the Anthropocene.**

Narratives are key to how we understand our world—making nonfiction storytelling a critical part of comprehending and acting in a time of environmental crises. Through regular writing practice and discussions of readings and other media—including podcasts and film—this class will examine models for how nonfiction narratives can foster a better understanding of past and present environmental change, imagine an environmentally just future, explain technical information for a broad audience, and support an informed, politically active citizenry. Visits from authors and creators will supplement class discussion, as assignments build toward each student completing an environmentally-focused creative narrative project.

Fall ENVS1911 S01 17362 Th 4:00-6:30(04) (B. Demuth)

**ENVS 1913. China's Environment: Power, Pollution and Hope.**

This course focuses on key environmental issues transforming Chinese landscapes and society. It introduces students to China's geography and identifies contemporary environmental problems (including air, water and soil pollution, biodiversity loss, etc.) as well as their proposed solutions. Considering China's recent history of rapid economic growth and stark socio-economic inequalities, a central objective of the course is to develop tools to effectively locate environmental issues within a broader political, social and economic context — a skill transposable to other geographical and environmental contexts. We will draw on scholarship from geography, anthropology, political science, and environmental science.

**ENVS 1914. Colonization and Environmental Change in Chinese History.**

This course explores how the wide diversity of cultures and ecosystems that existed across the East Asian mainland 3,000 years ago came to be replaced with the language, culture and agricultural practices of North and Central China. It aims to teach students to think comparatively about processes of colonialism, especially the environmental aspects of the gradual colonization of non-Chinese ethnic groups in what is now South China.

**ENVS 1915. Histories of Global Wetlands.**

Wetlands are increasingly recognized as dynamic ecosystems, but for much of human history were valued only after being drained to make farmland. This course explores how humans have used, transformed and destroyed wetlands around the world over the past two millennia. In some cases people have entirely rebuilt hydrological systems with dikes, sluices and dams, creating landscapes that require constant management and investment to remain livable. Studying the environmental history of wetlands can help with conservation, managing cities built upon them, and recognizing how coastal peoples can adapt to rising sea levels.

**ENVS 1916. Animals and Plants in Chinese History.**

Plants and animals are the basis of human civilization, providing us with shelter, clothing, medicine and, especially, food. While historians have traditionally put humans at the center of history, this course shifts the focus to species that have shaped Chinese society from prehistoric farming to global agribusiness. We will study wild animals, farmed fish, silk worms, crops like rice and soybeans, livestock like pigs and cattle, fruit like oranges and peaches, drugs like tea and opium, and building materials like wood and bamboo. We will examine the roles these species have played from Chinese villages to Brown's campus, which is home to dozens of Chinese ornamental plants and was built in part from the profits of the tea and silk trades. Studying the histories of specific species will help students appreciate the central roles that plants and animals have played in Chinese civilization, and still play in our daily lives.

**ENVS 1917. Ice, Coral, Dust and Pollen: Multidisciplinary Approaches to Climate History.**

Scholars in the humanities increasingly recognize that human societies are ecosystems enmeshed in global biogeochemical cycles, and this brings their research into communication with the natural sciences. This course focuses on one area in which these two domains of knowledge meet, namely climate history, a field that forces historians to employ biological and geological materials as sources. The difficulties faced in working between these fields often reflect different methodologies, research questions and writing styles between the humanities and the sciences, something this course will explore by juxtaposing work from the sciences, history, and other branches of the humanities.

Spr ENVS1917 S01 25717 W 3:00-5:30(10) (B. Lander)

**ENVS 1920. Methods for Interdisciplinary Environmental Research.**

This course provides an introduction to a wide range of research approaches in the social and environmental sciences. We will cover the epistemological and theoretical foundations of various research approaches and discuss implications of these foundations for what research questions are answerable and what evidence one can bring to bear to answer such questions. By the end of the semester, students will be able to write a clear and answerable research question, and know what methods are appropriate to use to answer such a question. Enrollment limited to ENVS Juniors.

**ENVS 1925. Energy Policy and Politics.**

From coal power to solar power, energy drives economies and increases quality of life world-wide. However, this same energy use can, and often does, lead to severe environmental destruction/pollution and global warming. This course serves as an introduction to energy policy in the United States and also explores global attempts to solve energy problems. This course examines different types of energy sources and uses, different ideological paths driving energy policy, the environmental impacts of energy use, current global and domestic attempts to solve energy problems, and the role of renewable and alternative forms of energy in future energy policy.



**ENVS 1926. Wasted: Rethinking Chemical Environments.**

This senior seminar investigates chemical and other forms of industrially produced waste and its impacts on environment and society. We will take an interdisciplinary approach, drawing on scholarship from anthropology, geography, history, sociology, science studies, and discard studies. We will follow chemicals around the world, from their inception in Western laboratories to their disposal in landfills and waste pits of the global South. Along the way, we will consider how corporations engineer chemicals' manufacture, governments regulate their use, sciences measure their human and ecological effects, and communities contend with the lived realities of chemical exposure and toxic suffering.

Fall ENVS1926 S01 18235 W 3:00-5:30(10) (S. Frickel)

**ENVS 1927. Nature, Society and Culture.**

This senior seminar provides a selective overview of major approaches, debates, and interdisciplinary cross-currents shaping environmental sociology. It's designed to provide a substantive background to undergraduates interested in pursuing a specialization in environmental sociology or related fields. The general goal is to deepen collective understanding of the dynamic interrelationships shaping human societies and the natural environment. We will pursue this goal by considering how sociologists and others have conceptualized society-environment relations and by critically assessing the various approaches developed to examine those relations, their causes, and outcomes.

**ENVS 1928. Race and the Politics of Nature: Intersecting Histories and Political Ecologies.**

This senior seminar examines the ongoing perpetuation of race and racism as fundamentally related to concepts of "nature" and "the natural." We examine scientific and pseudoscientific concepts about population, biology, and resource scarcity, western environmentalism's origins and history, and relations with projects of incarceration, border violence, triage, environmental determinism, dehumanization, and the maintenance of essentialist understandings of 'race.' This course centralizes a critical race studies lens towards the history of environmental injustices, while also querying in what way nature, ecology, or environmentalism might be liberatory projects for racial justice.

**ENVS 1929. The Fate of the Coast: Land Use and Public Policy in an Era of Rising Seas.**

For the last few decades, there has been a land-rush on the ocean coasts of the United States. Unfortunately, this swamps the coast at a time when sea levels are on the rise. In some places the rise is natural, in some places the rise is exacerbated by human activities and everywhere it is fueled by climate change. This course will examine the causes of sea level rise, the effects it produces on land, the steps people have taken to deal with these effects and their consequences, and possible remedies. Enrollment limited to 20. Preference given to juniors and seniors.

**ENVS 1930. Land Use and Built Environment: An entrepreneurial view (ENGN 1930S).**

Interested students must register for ENGN 1930S.

**ENVS 1931. Renewable Energy Technologies (ENGN 1930U).**

Interested students must register for ENGN 1930U.

**ENVS 1931E. Writing the Environment.**

Few issues are more important than restoring and preserving our environment, but also few are more complex and politicized. Researchers must know how to convey the substance and importance of their work, not just in the language of scholarly journals, but also in ways that engage a lay audience while maintaining scientific accuracy. This seminar focuses on writing about subjects including new findings, the people who make them, scientific disputes, calls to action and policy debates. Participants will produce news and feature articles, profiles, op-ed pieces, essays, policy papers, web pages and the like. Enrollment limit 15.

**ENVS 1965. Engaged Environmental Scholarship and Communication.**

This upper level seminar will enable to students to place their research in the context of environmentally relevant policy and practice. Development of an environmentally-focused thesis or independent research project is a prerequisite. Students will hone practical professional skills, e.g. how to communicate scientific findings to the media and policy audiences; oral presentation skills, and tips on professional interactions. Required of all Brown Environmental Fellows (<http://blogs.brown.edu/bef/>), and open to others engaged in environmentally relevant projects from the natural and social sciences and humanities. Enrollment is limited to 15 seniors and graduate students, by application only (available Fall 2011). Instructor permission required. Contact Heather\_Leslie@brown.edu for more information.

**ENVS 1970. Independent Study.**

First semester of individual analysis of environmental issues, required for all environmental studies concentrators. Section numbers vary by instructor. Please check Banner for the correct section number and CRN to use when registering for this course. Instructor override required prior to registration.

**ENVS 1971. Independent Study.**

Second semester of individual analysis of environmental issues, required for all environmental studies concentrators. Section numbers vary by instructor. Please check Banner for the correct section number and CRN to use when registering for this course. Instructor override required prior to registration.

**ENVS 2010. Special Topics in Environmental Studies.**

A mandatory seminar for graduate students in environmental studies. This course develops group problem-solving skills by addressing a current local, national or global environmental issue. We will work on problem definition, identifying options for addressing the problems, and crafting potential solutions. In all stages we work closely with non-profit groups, government agencies, or firms, who have the capacity to implement solutions. Students learn basic research design and begin the process of developing a research question and possible methods for conducting their Master's thesis research.

**ENVS 2110B. Radical American Romanticism: Democratic, Environmental, + Religious Traditions in America (RELS 2110B).**

Interested students must register for RELS 2110B.

**ENVS 2420. The Structure of Cities (ECON 2420).**

Interested students must register for ECON 2420.

**ENVS 2450. Exchange Scholar Program.****ENVS 2980. Reading and Research.**

First semester of thesis research during which a thesis proposal is prepared. Section numbers vary by instructor. Please check Banner for the correct section number and CRN to use when registering for this course. Instructor override required prior to registration.

**ENVS 2981. Reading and Research.**

Second semester of thesis research. Section numbers vary by instructor. Please check Banner for the correct section number and CRN to use when registering for this course. Instructor override required prior to registration.

**ENVS 2990. Thesis Preparation.**

For graduate students who have met the tuition requirement and are paying the registration fee to continue active enrollment while preparing a thesis.