
On Leave Fall/Spring: Professor R. Bradburd. Class of 1946 Environmental Fellow-in-Residence E. Kolbert.


Mystic Executive Director: T. Van Winkle.

MEMBERS OF THE CENTER FOR ENVIRONMENTAL STUDIES

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Henry W. Art, Professor of Biology and Environmental Studies
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Lois M. Banta, Professor of Biology
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Mary K. Bercaw-Edwards, Associate Professor for Literature of The Sea, Williams-Mystic Maritime Studies Program
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Mea S. Cook, Associate Professor of Geosciences
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Joan Edwards, Professor of Biology
Laura Ephraim, Associate Professor of Political Science
Michael Evans, Assistant Director of The Zilkha Center for Environmental initiatives
Jessica M. Fisher, Assistant Professor of English
Antonia Foias, Professor of Anthropology and Sociology
Jennifer L. French, Professor of Spanish
Sarah S. Gardner, Lecturer in Environmental Studies
Matthew Gibson, Assistant Professor of Economics
Environmental issues call upon citizens, organizations, and governments to grasp complex scientific concepts, address conflicting human values, and make difficult economic, political and ethical choices. A proper understanding of environmental issues is therefore an interdisciplinary exercise. The three curricular options in Environmental Studies—the major in Environmental Studies and the concentrations in Environmental and Maritime Studies—are designed to help majors and concentrators to:

- Effectively address complex environmental issues by integrating perspectives from the natural sciences, the social sciences, and the arts and humanities;
• Understand ecological principles and the nature of living systems;

• Apply scientific methods to collect environmental data and evaluate environmental quality;

• Understand the political and economic factors that inform, enable, and constrain environmental policy;

• Understand the social, cultural, and historical factors that shape environmental thought, history, and behavior;

• Develop significant understanding of one or more of the essential methodological approaches required in addressing environmental challenges;

• Apply their learning in a practical setting.

The program is administered by the Center for Environmental Studies (CES), located in the Class of 1966 Environmental Center. Founded in 1967, CES was one of the first environmental studies programs at a liberal arts college. In addition to the academic program described below, CES is the focus of a varied set of activities in which students lead and participate, often with other members of the Williams community. CES offers extensive resources including databases, funding for student-organizations, and student initiated activities, and generous support for summer research and internships. The Class of 1966 Center, a Living Building and the Program’s home, includes a classroom, living room, study rooms, kitchen, as well as student gardens. The CES manages the Hopkins Memorial Forest, a 2600-acre natural area northwest of campus, in which there are field-study sites and a laboratory, and where passive-recreation opportunities may be found in all seasons. CES also operates the Environmental Analysis Laboratory in Morley Science Center. The Maritime Studies concentration builds on the course offerings of the Williams-Mystic Maritime Studies Program at Mystic Seaport.

The requirements for the environmental studies major and concentration have been revised. The requirements for students from the class of 2020 and subsequent classes are immediately below, followed by the requirements for the students from the class of 2019.

Overview of the Major and Concentrations for Classes of 2020 and Subsequent Classes

The Environmental Studies major is an eleven course major. The major has a “core” of seven courses, with varying amounts of choice for the various “core” course requirements. All majors are required to take four of the seven courses: ENVI 101, ENVI 102, ENVI 411, and the ENVI senior seminar, ENVI 412. ENVI 101, Nature and Society: An Introduction to Environmental Studies, is a broad introduction to the field, emphasizing the humanities and social sciences. ENVI 102, Introduction to Environmental Science, introduces students to the interdisciplinary study of the Earth’s systems through the synthesis of physical, chemical, geological, and biological perspectives. All majors are also required to take, in the senior year (or junior year under special circumstances), ENVI 411, Environmental Planning Workshop: Community-Based Environmental Problem Solving (offered every fall), and ENVI 412, Environmental Studies Senior Seminar (offered every spring). The remaining component of the “core” is comprised of three foundational 200-level courses, one from each of three lists of courses (see below), with each list representing the three main branches of the environmental curriculum (environmental humanities, environmental social science/policy, and environmental science). Students choose, in consultation with their major advisor, the course they will take from each of the three lists.

Building on this seven course foundation, each ENVI major devises an individualized four-course cluster of electives that together comprise a disciplinary or thematic specialization sequence—for example, climate change policy, environmental justice, environmental chemistry, sustainable food and agriculture, sustainable cities, environmental ethics, etc. Students are responsible for designing their own specialization cluster in consultation with a faculty advisor and the CES Advisory Board in the spring semester of their sophomore year. One of these four electives in the cluster must be among those listed by the Program as a research methods course, although students may petition to count another course toward this requirement under special circumstances.

The study of living systems is an integral component of environmental studies, and therefore all students majoring in environmental studies will need to complete at least one course designated by the Program as a “living systems” course (this may be within their specialization cluster or as one of their 200-level foundational courses).

The Environmental Studies concentration is a seven course concentration in which students gain broad exposure to environmental studies while pursuing another major. In addition to the core of ENVI 101, ENVI 102, ENVI 411 and ENVI 412. Students pursuing the concentration will take one elective each from each of three lists of courses, each list (see below) representing a broad category of inquiry: the natural world; humanities, arts, and social sciences; and environmental policy.

The Maritime Studies concentration is a seven course concentration that builds on course work completed during the Williams-Mystic Maritime Studies Program. In addition to four intermediate-level core courses completed at Williams-Mystic, students pursuing the Maritime Studies concentration will also take the interdisciplinary introductory course GEOS 104 (Oceanography), an elective, and ENVI 412, Environmental Studies Senior Seminar. Students may attend the Williams-Mystic Program in their sophomore, junior or senior year. Students who have completed other study-away programs that emphasize marine studies should consult with the program chair about the possibility of completing the Maritime Studies
Overview of the Major and Concentrations for the Classes of 2019

The **Environmental Studies major** is an eleven course major. The major has a “core” of six courses, with varying amounts of choice for the various “core” course requirements. All majors are required to take two of the courses, ENVI 101 and ENVI 102. ENVI 101, Nature and Society: An Introduction to Environmental Studies, is a broad introduction to the field, emphasizing the humanities and social sciences. ENVI 102, Environmental Science, introduces students to the interdisciplinary study of the Earth’s systems through the synthesis of physical, chemical, geological, and biological perspectives. All majors are also required to take, in the senior year (or junior year under special circumstances), one 400-level Environmental Studies capstone research practicum that involves either collaborative research on a specific environmental problem or client-driven team project on issues of environmental significance in the Berkshire region. Two such courses will be offered in the 2018-19 academic year: ENVI 411, Environmental Planning Workshop: Community-Based Environmental Problem Solving, and ENVI 412, Environmental Studies Senior Seminar. The remaining component of the “core” is comprised of three 200-level courses, one from each of three lists of courses, with each list representing the three main branches of the environmental curriculum (environmental humanities, environmental social science/policy, and environmental science). Students choose, in consultation with their major advisor, the course they will take from each of the three lists.

**Advising**

Majors and concentrators (or first years and sophomores interested in the major or concentrations offered by CES) are encouraged to talk at any time with the Chair or Associate Director of Environmental Studies, or any other members of CES or Maritime Studies for advice. All incoming majors and concentrators will choose a faculty advisor in the spring of their sophomore year.

Advisors for 2018-19: Ralph Bradburd, Henry Art, Sarah Gardner, Nicolas Howe, Pia Kohler, Laura Martin, Mea Cook, Luana Maroja, James Manigault-Bryant.

**Study Away**

Many study away options are available to students in Environmental Studies, including the Williams-Mystic Maritime Studies Program. Furthermore, the Williams-Mystic Program is the foundation of the Maritime Studies concentration. Students considering either a semester or year away who intend to major or concentrate in Environmental Studies should consult the Chair or Associate Director of Environmental Studies and the Dean in charge of study abroad as early as possible to discuss their options. Students may take up to two courses outside of Williams toward their major or concentration, but must have advance approval in writing from the Chair of Environmental Studies.

**Planning for prerequisites on your path through the Environmental Studies major**

While ENVI 101 or ENVI 102 are recommended starting points for the major, and are prerequisites for many other ENVI course offerings, please note that some of the course options for the major may have other courses as prerequisites that may not count toward the programs. For example, ENVI/ECON 213 (Intro to Environmental and Natural Resource Economics) has a prerequisite of ECON 110 (Principles of Microeconomics). We strongly suggest that you do advance planning to avoid being blocked from taking a relevant course. For example, should you want to design a cluster that emphasizes environmental economics, ENVI/ECON 387 (Economics of Climate Change) has a prerequisite of ECON 251 (Price and Allocation Theory), which in turn has a prerequisite of ECON 110. Similarly, should you design a cluster that emphasizes resource conservation, you should be aware that ENVI 312 (Communities and Ecosystems) has a prerequisite of ENVI/Biol 203 (Ecology) or ENVI/Biol 220 (Field Botany and Plant Natural History). Students interested in the program are encouraged to consult with members of the Environmental Studies Program and to contact the Environmental Studies Director or Associate Director.

**Credit for AP, IB, A-levels and other pre-Williams courses**

At this time, students are not allowed to place out of ENVI 101 or ENVI 102. Students who feel that they have a compelling case for placing out of ENVI 101 or 102 must submit a petition to the Chair or Associate Director of Environmental Studies. The petition should include the syllabus, course materials, assignments, etc. for the course(s) that the student wishes to substitute for ENVI 101 or 102.

**Substituting laboratory science courses taken at Williams for ENVI 102**

Students who have taken two or more laboratory science courses at Williams in BIOL, CHEM, or GEOS may in exceptional circumstances be excused from the requirement to take ENVI 102. Requests should be submitted to the Chair or Associate Director of Environmental Studies prior to the spring of the junior year.

**Submitting your Proposed “Course Cluster” and “Plan of Study” to the Major**

Students intending to major in environmental studies must meet with a prospective advisor chosen in consultation with the Environmental Studies Chair to develop their proposed four-course cluster and plan of study through the major. We encourage all students interested in the major to meet with a faculty member in Environmental Studies at least one week prior to spring Pre-registration to discuss their proposed cluster and plan of study. The proposals must be submitted to the program Chair on or before the final day of pre-registration in the spring of the sophomore year. Application materials and instructions are available from Environmental Studies faculty and on the CES website (ces.williams.edu). The proposals will be reviewed by the CES Advisory Board.

**Substituting laboratory science courses taken at Williams for ENVI 102**

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Building on this six-course foundation, each ENVI major devises an individualized five-course cluster of electives that together comprise a disciplinary or thematic specialization sequence—for example, climate change policy, environmental justice, environmental chemistry, sustainable food and agriculture, sustainable cities, environmental ethics, etc. Students are responsible for designing their own specialization cluster in consultation with a faculty advisor and the CES Advisory Board in the spring semester of their sophomore year. One of these five electives in the cluster must be among those listed by the Program as a research methods course.

The study of living systems is an integral component of environmental studies, and therefore all students majoring in environmental studies will need to complete at least one course designated by the Program as a “living systems” course (this may be within their specialization cluster or as one of their 200-level foundational courses).

The Environmental Studies concentration is a six course concentration in which students gain broad exposure to environmental studies while pursuing another major. In addition to the core of ENVI 101, ENVI 102, and one of the 400-level ENVI capstone practicum courses, students pursuing the concentration will take one elective each from each of three lists of courses, each list representing a broad category of inquiry: the natural world; humanities, arts, and social sciences; and environmental policy.

The Maritime Studies concentration is a seven course concentration that builds on course work completed during the Williams-Mystic Maritime Studies Program. In addition to four intermediate-level core courses completed at Williams-Mystic, students pursuing the Maritime Studies concentration will also take the interdisciplinary introductory course GEOS 104 (Oceanography), an elective, and one of the 400-level ENVI capstone practicum courses. Students may attend the Williams-Mystic Program in their sophomore, junior or senior year. Students who have completed other study-away programs that emphasize marine studies should consult with the program chair about the possibility of completing the Maritime Studies concentration.


HONORS IN ENVIRONMENTAL STUDIES (MAJOR OR CONCENTRATION)

Candidates for honors in Environmental Studies will complete a thesis in their senior year. A student earns honors by successfully completing a rigorous independent project under the supervision of a member of the CES faculty. The thesis may either be a one-semester plus winter study project, or a full-year project (two semesters plus winter study). Students who are majoring in environmental studies, and who opt to complete a year-long thesis project, have the option of substituting the second semester of their thesis work for the spring semester senior seminar. Honors will be awarded on the basis of the academic merit and originality demonstrated by the student in the completed thesis. Because many theses will require sustained field, laboratory or archival work that is difficult to combine with conventional coursework, students are strongly encouraged to spend the summer before senior year and/or their senior year Winter Study doing advance research.

Funds to support student research are available from endowment funds of the CES, and an open competition is held each spring to allocate summer funding resources. Some other departments also provide limited support for summer thesis research. Students and their faculty sponsors should plan the thesis with the expectation of such research in mind.

Juniors who wish to apply to pursue honors should submit a 5-page proposal to their intended advisor and the Chair of Environmental Studies by the end of the week following spring break. If a student wishes to pursue thesis research advised by a faculty member not affiliated with CES, the student must also identify a co-advisor from within the program. Environmental Studies concentrators may undertake an honors thesis and submit it to both their major department and Environmental Studies; petitions for a joint honors project should be approved by the department chair and the Chair of Environmental Studies by the end of the junior year. Students will be notified by the end of the spring semester whether or not their proposal has been approved.

Students doing a full-year thesis should plan on a presentation in early November to their thesis advisor, second reader, and, if applicable, co-advisor, at which the thesis writer will offer a discussion of the work completed on the thesis to date, and provide an outline of the full thesis and a timetable for completion of the remaining parts of the thesis.

HONORS IN MARITIME STUDIES

Candidates for honors in Maritime Studies will complete a thesis in their senior year. The project will involve original research (archive, museum, field, or laboratory) followed by on-campus analysis and write-up of results. The thesis may either be a one-semester plus winter study project, or a full year (two semesters plus winter study). In either case, data collection during the summer before the senior year may be necessary. In some cases, the thesis project may be a continuation and expansion of the student’s Williams-Mystic research project. Honors will be awarded if the thesis shows a high degree of scholarship, originality, and intellectual insight.

WINTER STUDY AND INDEPENDENT STUDY

In addition to courses fulfilling the environmental studies major and concentration requirements, the following courses are offered:

ENVI 397, 398 Independent Study of Environmental Problems

MAST 397, 398 Independent Study: Maritime Studies
Winter study courses play an important role in the program, offering opportunities to learn about aspects of environmental studies with which students would like to become more familiar. We encourage students to bear in mind their interests in the environment and maritime studies when reviewing each year’s Winter Study offerings.

**THE MAJOR IN ENVIRONMENTAL STUDIES**

The Environmental Studies major is an eleven course major, distributed according to the requirements detailed below. Because the ENVI curriculum was restructured, students in the class of 2019 have different requirements than those for the class of 2020 and subsequent classes. The requirements for the class of 2020 follow immediately below. Those for the class of 2019 are provided below those for the class of 2020.

**For students in the class of 2020 and subsequent classes:**

**Introductory required courses (2 courses):**

- ENVI 101 Nature and Society: An Introduction to Environmental Studies
- ENVI 102 Introduction to Environmental Science

**200-level foundational courses required for all ENVI majors (3 courses, 1 from each category):**

**Culture/Humanities**

- ENVI 217 Landscape, Place, and Power (formerly Environmental Humanities: Theory and Practice)
- or ENVI 244 Environmental Ethics
- or ENVI 250 Environmental Justice
- or ENVI 259 New England Environmental History

**Social Science/Policy**

- ENVI/ECON 213 Introduction to Environmental and Natural Resource Economics (ECON 110 prerequisite)
- or ENVI 270 Environmental Problems: Social Causes, Consequences and Policy Solutions
- or ENVI/PSCI 283 Dirty Politics: Regulating Hazardous Chemicals and Wastes
- or ENVI 307/PSCI 317 Environmental Law

**Environmental Science (with lab)**

- ENVI 203 Ecology
- or ENVI 205 Geomorphology
- or ENVI 215 Climate Changes

**Specialization (4-course) Cluster (including a “methods course” and in some cases one “living systems” course)**

In the spring of the sophomore year, at the same time that the major declaration is due, each student planning to major in Environmental Studies is required to submit a detailed proposal for a specialization cluster comprised of four elective courses built around a disciplinary or thematic focus. The proposed specialization must include one course identified as a “methods” course, that is, a course providing substantial training in a relevant method of inquiry (see list below for indicative list of courses that might fulfill that designation).

To help students get a better idea of what the “cluster” entails, we have provided examples of specialization clusters on the CES website, including on the following themes (not intended to be an exhaustive list): climate change policy, environmental economics, environmental justice, environmental literature, environmental chemistry, environmental biology, environmental geosciences, environmental planning and design, urban environmental studies, water and energy, sustainable food and agriculture, environmental justice.

The student’s specialization sequence will be developed under guidance of an adviser from the CES faculty, and formally approved by the CES Advisory Board, and will be examined in the broader context of the student’s proposed route through the major (including their choice of 200-level foundational courses). One of the courses in the student’s proposed route through the major must be from a designated list of “living systems” courses (below).

Courses taken abroad may be included in the specialization with the approval of the Chair or Associate Director. Additional courses from the
200-level group requirements (culture/humanities; social science/policy; and environmental science) or from among the research practicum courses may also be included in the specialization.

One “methods course” requirement:
- ENVI 214/GEOS 214 Geographic Information Systems
- or STAT 201 Statistics and Data Analysis
- or STAT 202 Introduction to Statistical Modeling
- or ANSO 205 Ways of Knowing
- or POEC 253 Empirical Methods in Political Economy
- or ECON 255 Econometrics
- or STAT 346 Regression and Forecasting
- or CHEM 364/ENVI 364 Instrumental Methods of Analysis
- or MATH 410/BIOL 214 Mathematical Ecology

This is not intended to be an exhaustive list. Students are expected to make the case for how their designated methods course complements their proposed specialization.

One “living systems course” requirement:
- BIOL 203/ENVI 203 Ecology
- BIOL 134/ENVI 134 The Tropics: Biology and Social Issues
- BIOL 220/ENVI 220 Field Botany and Plant Natural History
- BIOL 231/MAST 311 Marine Ecology
- GEOS 210/MAST 211 Oceanic Processes
- BIOL 302/ENVI 312 Communities and Ecosystems

The Environmental Studies program will consider requests from students to substitute another course that focuses on living systems for one of the courses listed above. These requests should be submitted to the Chair or to Sarah Gardner, Associate Director.

Senior Seminar Requirement:
In the senior year—or, under special circumstances during the junior year—students will take two 400-level seminars, ENVI 411 and ENVI 412, that together serve as a capstone experience for the major and concentrations. These courses are interdisciplinary, issue-based and project-driven. Offered every fall semester, the practicum Environmental Planning Workshop engages students in team-based work on community projects in the Berkshires involving urban and rural land use planning and sustainable design. Offered in the spring semester, the Senior Research Seminar engages students in research on a policy-related environmental problem.

Required Courses (2 courses)
- ENVI 411 Practicum: Environmental Planning Workshop: Community Based Environmental Problem Solving
- ENVI 412 Practicum: Senior Research Seminar

CONCENTRATION IN ENVIRONMENTAL STUDIES
The Environmental Studies concentration provides students with an opportunity to explore how humans interact with the environment, including physical, biological, philosophical, and social elements. The concentration is designed so that students will understand the complexity of issues and perspectives that inhere in environmental problems and will appreciate that most environmental issues lack distinct disciplinary boundaries. The goal of the concentration is to educate students to be well-informed, environmentally literate citizens who have the capacity to become active participants in the local and global community. To this end, the concentration is designed to develop the capability to think in interdisciplinary ways and to use synthetic approaches to solve problems while incorporating the knowledge and experiences gained from majoring in other departments at the College. The concentration in Environmental Studies consists of seven courses: four core courses and one elective course from each of the three categories below: The Natural World; Humanities, Arts and Social Sciences; and Environmental Policy.

Required Courses (4 courses)
Distribution Courses (3 courses, 1 from each group)

In order to earn the concentration a student must take one course from each of the following three groups. Courses may be counted both toward the concentration in Environmental Studies and toward a disciplinary major. (It is not possible to major in Environmental Studies while also concentrating in Environmental Studies).

Students may check with the Chair or Associate Director of Environmental Studies to see if other courses not listed here might count as electives, such arrangements must be approved in writing.

The Natural World

BIOL 134/ENVI 134 The Tropics: Biology and Social Issues
BIOL 203/ENVI 203 Ecology
BIOL 220/ENVI 220 Field Botany and Plant Natural History
BIOL 302/ENVI 312 Communities and Ecosystems
BIOL 422/ENVI 422 Ecology of Sustainable Agriculture
BIOL 424/ENVI 424 Conservation Biology
CHEM 341/ENVI 341 Toxicology and Cancer
CHEM 364/ENVI 364 Instrumental Methods of Analysis
ENVI 240T Conservation and Climate Change
GEOS 101/ENVI 105 The Co-Evolution of Earth and Life
GEOS 102 An Unfinished Planet
GEOS 103/ENVI 103 Global Warming and the Reshaping of Landscapes
GEOS 104/ENVI 104/MAST 104 Oceanography
GEOS 201/ENVI 205 Geomorphology
GEOS 205/ENVI 207 Earth Resources
GEOS 206/ENVI 206 Renewable Energy and the Sustainable Campus
GEOS 214/ENVI 214 Remote Sensing and Geographic Information Systems
GEOS 215/ENVI 215 Climate Changes
GEOS 226/ENVI 226/MAST 226 The Oceans and Climate
GEOS 254/ENVI 254 Gulf of California Tectonics and Coastal Ecosystems
GEOS 314/MAST 314/ENVI 314 Sediment Records of Climate Change
GEOS 324/ENVI 324 Corals and Sea Level
GEOS 405/ENVI 405 Geochemistry: Understanding Earth’s Environment
MAST 211/GEOS 210 Oceanographic Processes
MAST 311/BIOL 231 Marine Ecology
MATH 410/BIOL 214 Mathematical Ecology
PHYS 108/ENVI 108 Energy Science and Technology

Humanities, Arts, and Social Sciences
The Maritime Studies concentration provides students with an opportunity to explore how humans interact with the environment, including the maritime environment. Understanding the oceans and our interactions with them is of increasing importance in this era of climate change, sea-level rise, fisheries crises, and the internationalization of the high seas. We encourage students to investigate our WaterWorld from the perspectives of the humanities, social sciences, and physical sciences. Maritime Studies is an interdisciplinary, cross-divisional program that includes the literature, history, policy issues, and science of the ocean. Candidates for the concentration in Maritime Studies must complete a minimum of seven courses: the interdisciplinary introductory course (GEOS 104 Oceanography), four intermediate core courses (at Williams-Mystic), an elective, and the senior seminar.

Students who have completed other study-away programs that emphasize maritime studies should consult with the CES chair about the possibility of completing the Maritime Studies concentration.

**Required Courses (7 courses)**

**Introductory Course**

- MAST/ENVI/GEOS 104 Oceanography

Note: Students who take MAST 211/GEOS 210 (Oceanographic Processes) at Williams-Mystic can substitute an extra elective in lieu of GEOS 104
Capstone Course

One Practicum course:

ENVI/MAST 412 Practicum: Environmental Science and Policy

Core Courses (taken as part of Williams-Mystic program at Mystic Seaport):

MAST/ENGL 231 Literature of the Sea

MAST 311/Biol 231 Marine Ecology OR MAST 211/GEOS 210 Oceanographic Processes

MAST/ENVI 351/ PSCI 319 Marine Policy

MAST/HIST 352 America and the Sea, 1600-Present

Elective Courses

Elective courses are listed based on either a clear maritime statement in the course description or broad practical/theoretical applicability to maritime studies. Concentrators will take a minimum of one course from the list below. If concentrators find other courses in the catalog that they believe meet the requirements for a MAST elective, they may bring them to the attention of the Chair or Associate Director.

Maritime History

HIST 127 The Expansion of Europe

HIST/AFR 248 The Caribbean: From Slavery to Independence

HIST/JAPN/ASST 321 History of U.S.-Japan Relations

HIST/ASST/INST 391 When India was the World: Trade, Travel and History in the Indian Ocean

Maritime Literature

CLAS 101/COMP 107 The Trojan War

Marine Policy

ECON/ENVI 213 Introduction to Environmental and Natural Resources Economics

ECON/ENVI 386/ ECON 518 Environmental and Natural Resource Policy

ENVI 307/PSCI 317 Environmental Law

PSCI 223 International Law

PSCI 229 Global Political Economy

PSCI 347 Law of the Sea

ENVI/PSCI 328 Global Environmental Politics

Marine Science

BIOL 414 Life at Extremes: Molecular Mechanisms

GEOS 212 / BIOL 211 Paleobiology

GEOS/ENVI 215 Climate Changes

GEOS/ENVI/MAST 226 The Oceans and Climate

GEOS 302 Sedimentology

GEOS/ENVI/MAST 314 Sediment Records of Climate Change

MAST 25 (W) Material Culture and Craft of 19th Century Coastal New England
Crosslistings: ENVI26 / MAST25

Primary Crosslisting

The goal in this course is to provide an opportunity for students to develop an intimate understanding of 19th century Mystic through lived experience. To appreciate a culture or a community so different from what we live and experience today, you must also understand the ways in which its residents shaped their world, specifically, the crafts they plied. There are few opportunities in life when this understanding can be delivered through lived experience. This will be one of them. Taking advantage of the extraordinary resources of Williams-Mystic, the coastal and ocean studies campus of Williams College located at the Mystic Seaport in Mystic, CT, this winter-study course, taught at Williams-Mystic, aims to: 1) provide rich hands-on participatory experiences that authentically mirror 19th century maritime craft and culture; and 2) offers learners a rare opportunity to delve deeply into the mindset of 19th century maritime culture by creating an authentic artifact that reflects understanding of the values and mores of this time period. There will be a number of instructors; including instructors employed by the Mystic Seaport in who specialize in chanteys, shipsmithing, ship Carving, scrimshaw, canvasworks, and boatbuilding.

Class Format: Williams-Mystic

Requirements/Evaluation: performance-based evaluation using exemplars, experts and authentic audience; final paper or project

Prerequisites: none

Enrollment Limit: 12

Enrollment Preferences: by application

Materials/Lab Fee: $1,500

Attributes: EXPE Experiential Education Courses; TRVL Winter Study Travel Course

Winter 2019

TVL Section: 01 Cancelled

MAST 31 (W) Sen Thesis: Maritime Studies

Maritime Studies senior thesis.

Class Format: independent study

Winter 2019

HON Section: 01

MAST 99 (W) Independent Study: Maritime Studies

Open to upperclass students. Students interested in doing an independent project (99) during Winter Study must make prior arrangements with a faculty sponsor. The student and professor then complete the independent study proposal form available online. The deadline is typically in late September. Proposals are reviewed by the pertinent department and the Winter Study Committee. Students will be notified if their proposal is approved prior to the Winter Study registration period.

Class Format: independent study

Winter 2019

IND Section: 01

MAST 104 (S) Oceanography

Crosslistings: MAST104 / ENVI104 / GEOS104

Secondary Crosslisting

The oceans cover about 72% of Earth's surface, yet we know the surface of Venus better than our own ocean floors. Why is that? This integrated introduction to the oceans covers formation and history of the ocean basins; the composition and origin of seawater; currents, tides, and waves; ocean-atmosphere interactions; oceans and climate; deep-marine environments; coastal processes; productivity in the oceans; and human impacts. Coastal oceanography will be investigated on an all-day field trip, hosted by the Williams-Mystic program in Connecticut.
**MAST 211 (F) Oceanographic Processes**

Crosslistings: GEOS210 / MAST211

*Primary Crosslisting*

This course examines ocean and coastal environmental science issues including carbon dioxide and the ocean’s role in climate, El Niño and other ocean-atmosphere oscillations that influence our weather, coastal erosion and other hazards, coastal pollution, and fisheries. The focus is on controlling processes with regional comparisons. Blue water oceanography is conducted in the Atlantic and comparative coastal oceanography includes trips to southern New England shores, and the West and Gulf coasts of the US as part of the Williams-Mystic program.

**Class Format:** lecture/laboratory, including coastal and near-shore field trips, 11 days offshore, and a laboratory or field research project

**Requirements/Evaluation:** two tests, a research project, and a presentation

**Extra Info:** offered only at Mystic Seaport

**Distributions:** (D3)

**Attributes:** ENVI Natural World Electives; EXPE Experiential Education Courses

Not offered current academic year

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**Fall 2018**

**LEC Section: 01** TBA Lisa A. Gilbert

**Spring 2019**

**LEC Section: 01** TBA Lisa A. Gilbert

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**MAST 231 (F) Literature of the Sea (WI)**

Crosslistings: MAST231 / ENGL231

*Primary Crosslisting*

Taking advantage of our maritime museum, coastal setting, and three field seminars, we study canonical and lesser-known novelists, short-story writers, dramatists, and poets who set their works in the watery world, often in the exact places where we travel as a class. We read, for example—depending on fall or spring semester—Ernest Hemingway when sailing on the Straits of Florida, John Steinbeck when exploring Cannery Row on Monterey Bay, and Mark Twain on a steamboat on the Mississippi. We read Kate Chopin on the sands of the Gulf of Mexico, Rudyard Kipling out on Georges Bank, and Herman Melville's masterpiece *Moby-Dick* aboard Mystic Seaport’s historic whaleship, the *Charles W. Morgan*, a vessel nearly identical to the vessel he climbed aboard at age twenty-one. In the classroom we examine these works through a mixture of lecture, small-group discussion, and writing. To further appreciation and analysis, this interdisciplinary course uses students’ emerging knowledge of maritime history and marine science.

**Class Format:** small group tutorials with weekly lectures, including coastal and near-shore field trips and ten days at sea

**Requirements/Evaluation:** regular papers, class participation, journal-writing, and a final paper

**Extra Info:** offered only at Mystic Seaport

**Extra Info 2:** may not be taken on a pass/fail basis; not available for the fifth course option

**Distributions:** (D1) (WI)

**Attributes:** AMST Arts in Context Electives; ENVI Humanities, Arts + Social Science Electives;
MAST 311 (F) Marine Ecology
Crosslistings: BIOL231 / MAST311

Primary Crosslisting
Using the principles of evolutionary biology and experimental ecology, this course examines the processes that control the diversity, abundance and distribution of marine organisms. Major marine communities, including estuaries, the rocky shore, sandy beaches, salt marshes, coral reefs, and the deep sea are discussed in detail.

Class Format: lecture/laboratory, including coastal and near-shore field trips, 10 days offshore, and a laboratory or field research project

Requirements/Evaluation: two tests, a research project, and a presentation

Extra Info: offered only at Mystic Seaport

Prerequisites: BIOL 101 or GEOS/MAST 104, or permission of instructor

Distributions: (D3)

Attributes: ENVI Natural World Electives; EVST Living Systems Courses; EXPE Experiential Education Courses

MAST 324 (S) Corals and Sea Level
Crosslistings: GEOS324 / MAST324 / ENVI324

Secondary Crosslisting
In coastal communities, increasing flood damage from storm surges and chronic inundation by seawater are already happening as a result of sea level rise. How do we know what contributes to the observed change in sea level in the last century? What does the geological record teach us about what controls the natural variation in sea level on short and long timescales? How can we use this information to separate anthropogenic effects from natural change in modern systems? And how does this inform us on what to expect through the 21st century and beyond? In this course, we will examine how sea level is reconstructed using geological archives and how coral-based sea level data led to breakthroughs in our understanding of the long-term evolution of the ocean and climate, the controls in the timing of ice age cycles, the singularity of modern climate change, and how high the future seas will rise. During Spring Break, the class will travel to Barbados, a renowned locality for Quaternary sea level reconstruction, to observe modern and ancient reefs, and collect samples that will be the basis of individual or group projects in the second half of the semester. Participation in the Spring Break trip is not required for successful completion of the course, but course enrollment is necessary to attend the trip.

Class Format: lecture/laboratory

Requirements/Evaluation: short papers, labs, participation in discussion, and a research project

Extra Info: may not be taken on a pass/fail basis; not available for the fifth course option

Prerequisites: GEOS 104 or GEOS 210 or GEOS 215 or MAST 311 or permission of instructor

Enrollment Limit: 10

Enrollment Preferences: Geoscience majors, students who commit to the Spring Break trip

Expected Class Size: 10

Distributions: (D3)

Attributes: ENVI Natural World Electives; EXPE Experiential Education Courses
MAST 351 (F) Marine Policy

Crosslistings: ENVI351 / PSCI319 / MAST351

Primary Crosslisting
This seminar utilizes the interdisciplinary background of the other Williams-Mystic courses to examine national and international contemporary issues in our relationship with our ocean and marine environment. This seminar takes a topical approach to the study of ocean and coastal law and policy, examining climate change, fisheries, coastal zone management, admiralty law, marine biodiversity, ocean and coastal pollution, and ocean governance.

Class Format: lecture, discussions, guest lectures by active professionals, and includes coastal and near-shore field trips, and 10 days offshore

Requirements/Evaluation: an independent research paper, a presentation, and a final exam

Extra Info: offered only at Mystic Seaport

Department Notes: satisfies the Environmental Policy requirement for the Environmental studies concentration

Distributions: (D2)

Attributes: ENVI Environmental Policy; EXPE Experiential Education Courses; POEC International Political Economy Courses

Fall 2018
LEC Section: 01  TBA  Catherine Robinson Hall

Spring 2019
LEC Section: 01  TBA  Catherine Robinson Hall

MAST 352 (F) Americans and the Maritime Environment (WI)

Crosslistings: HIST352 / MAST352

Primary Crosslisting
This course examines the impact of the maritime environment (both salt water and fresh) on human affairs from the age of European expansion to the opening decades of the 21st century. Taught using the collections of Mystic Seaport Museum and on several distant field seminars, Americans and the Maritime Environment examines en situ such things as race, gender, revolution, and humankind's changing relationship with the world's oceans. Readings in primary sources and secondary works on the social, economic, and technological implications of maritime activities culminate in an original research paper.

Class Format: lecture/discussion, including coastal and near-shore field trips, 10 days offshore, and an independent, primary source research project

Requirements/Evaluation: two papers, and short presentation, and final exam. Student papers will be a 5-page minimum and a 15-page minimum essay; the 15-page paper will be critiqued in three steps, as a proposal, a draft, and a final paper, with attention to reasoning and style

Extra Info: offered only at Mystic Seaport

Prerequisites: BIOL 101 or GEOS/MAST 104, or permission of instructor

Distributions: (D2) (WI)

Attributes: AMST Space and Place Electives; ENVI Humanities, Arts + Social Science Electives; EXPE Experiential Education Courses; HIST Group F Electives - U.S. + Canada; HIST Group P Electives - Premodern;

Fall 2018
LEC Section: 01  TBA  Alicia C. Maggard

Spring 2019
LEC Section: 01  TBA  Alicia C. Maggard

MAST 397 (F) Independent Study: Maritime Studies
Maritime Studies independent study.

Class Format: independent study

Fall 2018
IND Section: 01    TBA     Henry W. Art

MAST 398 (S) Independent Study: Maritime Studies
Maritime Studies independent study.
Class Format: independent study

Spring 2019
IND Section: 01    TBA     Henry W. Art

MAST 402 (S) Senior Seminar: Perspectives on Environmental Studies  (WI)
Crosslistings: ENVI412 / MAST402

Secondary Crosslisting
The Environmental Studies and Maritime Studies programs provide students with an opportunity to explore the myriad ways that humans interact with
diverse environments at scales ranging from local to global. The capstone course for Environmental Studies and Maritime Studies, this seminar brings
together students who have specialized in the humanities, social studies and/or the sciences to exchange ideas across these disciplines. Over the
course of the seminar, students will develop a sustained independent research project on a topic of their choice.

Class Format: seminar
Requirements/Evaluation: evaluation is based on active participation, discussion leading, several smaller assignments and capstone project
Extra Info: may not be taken on a pass/fail basis; not available for the fifth course option
Prerequisites: ENVI 302 or MAST 351 Maritime Policy or permission of instructor
Enrollment Limit: 20
Enrollment Preferences: limited to senior Environmental Studies majors and concentrators and Maritime Studies concentrators
Expected Class Size: 20
Department Notes: required course for students wishing to complete the Maritime Studies concentration
Distributions:  (WI)
Distribution Notes: does not meet Division 1, 2, or 3 requirements Each student in this course will complete a semester-long research project
resulting in a final report of 20-25 pages. The project will proceed in phases, with significant pieces of writing due at regular intervals throughout the
semester, and with multiple opportunities for revision and peer review. There will also be several short reading response papers during the first half of
the semester.
Attributes: EVST Senior Practicum; SCST Elective Courses;

Spring 2019
SEM Section: 01    W 1:10 pm - 3:50 pm     Nicolas C. Howe

MAST 404 (S) Coastal Processes and Geomorphology  (QFR)
Crosslistings: ENVI404 / MAST404 / GEOS404

Secondary Crosslisting
Can people live safely along the coast? Recent events like SuperStorm Sandy and the Tohoku Tsunami have shown us how the ocean can rise up
suddenly and wreak havoc on our lives and coastal infrastructure. Only educated geoscientists can evaluate the risks and define informed strategies to
prevent future coastal catastrophes. Currently almost half the global population lives within 100 km of the coast, with a large percent of those living in
densely populated cities (e.g., New York, New Orleans, Los Angeles, Shanghai, Hong Kong, Cape Town, Sydney, Mumbai). Despite the growing risks
and challenges associated with climate change and rising sea levels, the coastal population continues to grow rapidly. To help ensure these growing populations can live safely along the coast requires a detailed understanding of the processes that shape the coastal zone. These processes act across a variety of scales, from deep-time geologic processes that dictate coastal shape and structure, to decadal-scale processes that determine shoreline position and evolution, to weekly and daily processes such as storms and tides. This course will provide an in-depth look at the forces—wind, waves, storms, and people—that shape the coastal zone, as well as the geologic formations—sandy beaches, rocky cliffs, barrier islands, deltas, and coral reefs—that are acted upon and resist these forces. Coastal dynamics are strongly affected by human interventions, such as seawalls, dredged channels, and sand dune removal, as well as by sea level rise and changes in storm frequency and magnitude associated with climate change. Finally, the course will provide students with a perspective on how the U.S. seeks to manage its coastal zone, focusing on sea level rise and coastal development. This class will include a quantitative lab that will use MATLAB software to model and evaluate various coastal processes. Students will gain a basic understanding of MATLAB functionality, and will be asked to independently apply what they have learned to various data sets provided by the instructor.

Class Format: lecture two times a week with a lab one time per week

Requirements/Evaluation: lab reports, tests, and an independent research project

Prerequisites: GEOS 104 or permission of instructor

Enrollment Limit: none

Expected Class Size: 10

Distributions: (D3) (QFR)

Attributes: ENVI Natural World Electives;

Spring 2019

LEC Section: 01  MWF 8:30 am - 9:45 am  Alex A. Apotsos

MAST 493 (F) Senior Thesis: Maritime Studies

Maritime Studies senior thesis.

Class Format: independent study

Extra Info: may not be taken on a pass/fail basis; not available for the fifth course option

Fall 2018

HON Section: 01  TBA  Henry W. Art

MAST 494 (S) Senior Thesis: Maritime Studies

Maritime Studies senior thesis.

Class Format: independent study

Extra Info: may not be taken on a pass/fail basis; not available for the fifth course option

Spring 2019

HON Section: 01  TBA  Henry W. Art