ENVIRONMENTAL STUDIES AND SCIENCES

Department Overview

Environmental challenges are among the most pressing issues facing citizens in the twenty-first century. Few local, national, or international conflicts lack an environmental dimension. Understanding these environmental problems requires an interdisciplinary approach that integrates the natural sciences, social sciences, humanities, and the arts. We cannot adequately understand an issue like water pollution through a single disciplinary perspective; it involves anthropology, biology, business, chemistry, economics, geosciences, government, history, literature, and sociology. The mission of Environmental Studies and Sciences is to help students develop literacy at the intersection of these disciplines.

We emphasize the integration of problem-solving within an interdisciplinary framework. Our students design and carry out empirical research and develop and defend their conclusions through clear written and spoken presentations. Environmental Studies and Sciences students will graduate with rigorous and multifaceted problem-solving skills necessary to frame, describe, analyze, and offer realistic solutions to environmental challenges.

The Environmental Studies and Sciences program includes courses that are interdisciplinary and that address environmental issues from a disciplinary perspective, and offers both a major and a minor degree. We immerse our students in the complexities of environmental issues through both classroom and experiential learning, locally and abroad. Students enrich their academic learning with experiences outside the classroom to foster responsible citizenship and to help our students understand the challenges of creating environmentally sustainable communities.

Director of the Environmental Studies and Sciences Program: Kurt Smemo

Associate Director of the Environmental Studies and Sciences Program: Andrew Schneller

Coordinator, Environmental Studies and Sciences Program: Anne Gallagher Ernst

Associate Professors: Nurcan Atalan-Helicke, Karen Kellogg, Kurt Smemo

Assistant Professors: Andrew Schneller, Kris Covey

Visiting Assistant Professor: Lowery Parker

Senior Lecturer: Anne Gallagher Ernst

Affiliated Faculty

American Studies: Gregory Pfitzer

Anthropology: Kathryn Baustian, Ryan Clasby, Michael Ennis-McMillan, Heather Hurst

Art History: Saleema Waraich

Asian Studies: Ben Bogin

Biology: David Domozych, Corey Freeman-Gallant, Elaine Larsen, Sylvia McDevitt, Joshua Ness, Bernie Possidente, Monica Raveret Richter, Erika Schielke, Patti Steinberger

Chemistry: Kara Cetto Bales, Kim Frederick, Steven Frey, Raymond Giguere, Judith Halstead, Beatrice Kendall, Juan Navea, Maryuri Roca, Ruchira Silva

Economics: Severin Carlson, Monica Das, Sandra Goff, Rodrigo Schneider, Smriti Tiwari

English: Maude Emerson, Michael Marx

Geosciences: Jennifer Cholnoky, Amy Frappier, Kyle Nichols

GIS and Scribner Library: Charlie Bettigole, Jenna Pitera

Health & Human Physiological Sciences: Paul Arciero, Sue D'Isabel

History: Erica Bastress-Dukehart, Eric Morser, Tillman Nechtman

Management and Business: Jennifer Coulombe, Cathy Hill, James Kennelly

Philosophy: William Lewis, Peter Murray

Political Science: Katherine Graney, Feryaz Ocakli, Bob Turner

Religious Studies: Eliza Kent

Sociology: Amon Emeka, Rik Scarce

World Languages and Literatures: Aureli Matheron, Oscar Perez, Shirley Smith

Environmental Sciences B.A.

Students in the environmental science major must successfully complete at least 54 credits in approved courses:

Code	Title	Hours
Foundation Course		
ES 100	Environmental Concerns in Perspective	3
Natural Science Disciplinary Foundation		
BI 108	Organismal Biology	4
CH 125	Principles of Chemistry	4
or CH 126	Principles of Chemistry	
ES 105	Field Studies in Environmental Science	4
or GE 101	Earth Systems Science with Lab	
Interdisciplinary Natural Science Core Courses		
ES 205	Ecosystem Science and Analysis of Forested Landscapes	4
ES 206	Environmental Engineering and the Science of Sustainability	4
ESS Cluster B2 Courses		
Select three additional courses from ESS Cluster B2 [1]		11
ESS Cluster A Courses		
Select two courses from ESS Cluster A: Culture, Society, and the Environment		6
Methods Courses		
BI 235	Biostatistics	4
or MS 204	Statistical Methods	
ID 210	Introduction to GIS	4

ESS Senior Year Capstone Sequence		
ES 374 & ES 375	ESS Research Capstone: Design and Methods and ESS Research Capstone: Data Collection, Analysis, and Communication	6
Total Hours		**54**

[1] One must be an ES-designated course, at least two must be at the 300 level and the third must at least be 200 level, and two of the three must be lab courses

With permission from the Environmental Studies and Sciences Program, students may transfer up to two major or minor courses per semester from approved study abroad or domestic off-campus programs. Only two courses in total may be at the 300-level. No core requirements may be fulfilled from abroad or off-campus programs. Credits received from other accredited institutions may, with permission of the director, be counted towards ESS requirements.

Writing in the Major Requirement

Both environmental studies and environmental science require writing that synthesizes information from a variety of sources, clearly articulates both science- and value-based arguments, and conveys complicated ideas. Students must learn to write independent pieces and to write effectively in a collaborative setting. In introductory courses for the major, students advance their writing skills through analytical case studies and scientific papers and reports; this focus continues in 200-level courses. The capstone challenges students to describe their complex research findings in narrative and graphical forms and to discuss the relevance of their finding in a manner accessible to community groups. Majors in both Environmental Science and Environmental Studies fulfill the Skidmore writing-in-the-major requirement as they complete their major requirements, learning to write in a variety of disciplines and for a variety of audiences, including the general public.

Environmental Studies B.A.

Students in the environmental studies major must successfully complete at least 41 credits in approved courses.

Code	Title	Hours
Foundation Courses		
ES 100	Environmental Concerns in Perspective	3
ES 105	Field Studies in Environmental Science	4
Social and Cultural Core Courses		
Select three courses of the following:		9
EC 104	Introduction to Microeconomics	
EN 224	Literature and the Environment	
ES 221	Sustainable Development	
ES 223	Environmental Justice	
ES 224	Political Ecology	
ES 225	Human Rights and Development	
PL 231	Environmental Politics and Policy	
HI 266	American Environmental History	
SO 223	Environmental Sociology	
ESS Cluster A Courses		
Select three additional courses from ESS Cluster A: Culture, Society and Environment (at least 6 credits must be at the 300 level)		9
4. ESS Cluster B1 Courses		
Select two courses from ESS Cluster B1: Exploring the Natural World (at least one course with a lab)		7
Methods Course		
Select one of the following:		3
EC 237	Statistical Methods	
ID 210	Introduction to GIS	
MS 104	Introduction to Statistics	
PL 202	Introduction to Political Research	
SO 227	Social Research Methods	
or SO 228	Statistics for the Social Sciences	
ESS Senior Year Capstone Sequence		
ES 374 & ES 375	ESS Research Capstone: Design and Methods and ESS Research Capstone: Data Collection, Analysis, and Communication	6
Total Hours		**41**

With permission from the Environmental Studies and Sciences Program, students may transfer up to two major or minor courses per semester from approved study abroad or domestic off-campus programs. Only two courses in total may be at the 300-level. No core requirements may be fulfilled from abroad or off-campus programs. Credits received from other accredited institutions may, with permission of the director, be counted towards ESS requirements.

Writing in the Major Requirement

Both environmental studies and environmental science require writing that synthesizes information from a variety of sources, clearly articulates both science- and value-based arguments, and conveys complicated ideas. Students must learn to write independent pieces and to write effectively in a collaborative setting. In introductory courses for the major, students advance their writing skills through analytical case studies and scientific papers and reports; this focus continues in 200-level courses. The capstone challenges students to describe their complex research findings in narrative and graphical forms and to discuss the relevance of their finding in a manner accessible to community groups. Majors in both Environmental Science and Environmental Studies fulfill the Skidmore writing-in-the-major requirement as they complete their major requirements, learning to write in a variety of disciplines and for a variety of audiences, including the general public.

Environmental Studies and Sciences Minor

The minor requires students to complete 19 to 24 credit hours.

Code	Title	Hours
Foundation Courses		
ES 100	Environmental Concerns in Perspective	3
Select one of the following:		4
ES 105	Field Studies in Environmental Science	
ES 205	Ecosystem Science and Analysis of Forested Landscapes	
ES 206	Environmental Engineering and the Science of Sustainability	
ES Cluster A Course		
Select one course, at least three credits, from ES Cluster A: Culture, Society, and the Environment		3-4
ES Cluster A Additional Courses		

Select three additional credits from ES Cluster A	3
Cluster B1 or B2 Course	
Select one course from Cluster B1 or Cluster B2: Exploring the Natural World	1-5
Additional Requirements	
Select one additional course from either Cluster A, Cluster B1, or Cluster B2	1-5
Total Hours	**15-24**

No more than two courses per discipline may be counted for the ESS minor.

With permission from the Environmental Studies and Sciences Program, students may transfer up to two major or minor courses per semester from approved study abroad or domestic off-campus programs. Only two courses in total may be at the 300-level. No core requirements may be fulfilled from abroad or off-campus programs. Credits received from other accredited institutions may, with permission of the director, be counted towards ESS requirements.

Honors

To be eligible for program honors in Environmental Studies and Sciences, a student must

1. attain a major GPA of 3.50 or higher, and
2. complete an exceptional project and performance in the ESS Capstone sequence, (ES 374 ESS Research Capstone: Design and Methods, ES 375 ESS Research Capstone: Data Collection, Analysis, and Communication) as determined by the ESS Capstone instructors and the recommendation of the ESS Faculty.

Note: To be considered for honors, the College requires a GPA of 3.5 or higher for work in the major, and a GPA of 3.0 or higher based on all work taken at Skidmore.

Course Listing

Environmental Science and Studies Courses

ES 100 - Environmental Concerns in Perspective
Credits: 3
An interdisciplinary, multiple-perspective approach to the study of environmental concerns. In this course, students study the interaction of human beings and their social, political, and economic institutions with the natural environment. Issues such as air pollution, water pollution, and land management are discussed from the perspectives of both the natural sciences and the social sciences. Local, regional, national, international, and historical perspectives on these issues are also discussed.

ES 105 - Field Studies in Environmental Science
Credits: 4
An interdisciplinary scientific approach to the study of human-dominated landscapes and environmental issues. The primary context for the course is water movement through watersheds and landscapes and how human development can influence the resources and ecosystem services that natural systems provide, with an overall goal of understanding the structure, function, and management of ecosystems. We examine and study several regional watersheds, streams, and lakes, including Loughberry Lake, the primary drinking water supply for Saratoga Springs. Water supply and budgets, water chemical characteristics, and the natural and built structure of the surrounding landscapes will be analyzed from an ecological and biogeochemical perspective. The course involves laboratory and field work, emphasizes the scientific methodologies and communication, and exposes students to common techniques and methods used in environmental science.
Prerequisites: *QR1 or MA 100 or placement at the FQR level or placement at the AQR level.*
Note(s): Three hours of lecture, three hours of lab per week. Fulfills Natural Sciences requirement; fulfills Fundamental QR and Scientific Inquiry requirements.

ES 205 - Ecosystem Science and Analysis of Forested Landscapes
Credits: 4
A critical and quantitative study of the ecology and management of forested watersheds at the local and global scale. Students will examine historical and contemporary issues in environmental science through the lens of forest structure, function, and disturbance. Field labs and field trips will address the ecology and history of regional forest and aquatic ecosystems, watersheds, and landscapes, including those of the North Woods and the Adirondacks. One weekend field trip is required.
Prerequisites: *ES 100 and ES 105 or BI 108 and placement at the AQR level or completion of an FQR course or QR1; also, the student must have completed or be currently enrolled in CH 125; or consent of the instructor.*
Note(s): Three hours of lecture, three hours of lab per week. Fulfills Applied QR requirement.

ES 206 - Environmental Engineering and the Science of Sustainability
Credits: 4
An application of ecological and ecosystem-based concepts and principles to the design of regenerative solutions for water-, waste-, soil-, and energy-related environmental problems. Using natural science methods as a foundation, students will critically evaluate and construct systems for a range of applications, including waste water treatment, brownfield restoration, composting, anaerobic digestion, and biofabrication. The overall goals of the course are to appreciate the complexity of environmental problems and potential solutions and to understand how discoveries in the primary scientific literature can be applied to design more efficient and sustainable closed-loop systems.
Prerequisites: *ES 100 and BI 108 and placement at the AQR level or completion of an FQR course or QR1.*
Note(s): Three hours of lecture, three hours of lab per week. Fulfills Applied QR requirement.

ES 207 - Regenerative Environmental Systems
Credits: 4
An application of basic ecological concepts, theoretical principles, and advanced analytical techniques to regenerative systems design and assessment. Using an interdisciplinary solutions-oriented framework, we will explore the benefits and challenges of regenerative systems in both developing and developed nations for urban, terrestrial, and marine ecosystem management. Students will build their understanding during discussions, problem sets, and labs evaluating solutions to our most pressing environmental challenges.
Prerequisites: *ES 100 and BI 108.*

ES 221 - Sustainable Development
Credits: 3
An examination of the concepts and practice of sustainable development as a process for resolving the tensions between economic development and the necessity to protect and preserve the global environment for future generations. Students will explore both domestic issues facing countries as they struggle to address their economic, social and environmental problems, and how their relationship with the rest of the international community influences their decisions. Students will explore the interplay among the pillars of sustainable development on both a local and global scale through the use of case studies (e.g., international fisheries).
Prerequisites: *ES 100.*

ES 222 - Energy Systems and Sustainable Solutions
Credits: 3
An exploration of the fundamental physics of energy, the evolving designs and efficiencies of conventional and renewable energy production, and the comprehensive environmental impacts of various energy sources and systems. Students will analyze case studies in electricity generation, heating and cooling, and transportation, which will increase their understanding of the complexity of the factors that shape reasonable, more sustainable solutions to our growing energy demands.
Prerequisites: *ES 100 and placement at the AQR level or completion of an FQR course or QR1.*
Note(s): Fulfills Applied QR requirement.

ES 223 - Environmental Justice
Credits: 3
An exploration of local, national, and international case studies that highlight the origin of environmental racism. Environmental justice examines the disproportionate impact that marginalized populations bear from environmental hazards, vulnerability, and inequalities in enforcement of regulations. Students will dissect the research and policy challenges to incorporate environmental justice into environmental law, collaborative problem solving, and advocacy/mobilization tactics used to alleviate health, ecological, economic, and equity issues facing communities.
Prerequisites: *ES 100 and SSP 100.*
Note(s): Fulfills the Bridge Experience requirement.

ES 224 - Political Ecology
Credits: 4
Political Ecology is the study of the relationships between the political, social, and economic factors and environmental issues. This course introduces students to the array of broad political and socio-economic forces that shape the human relationships with the environment through various questions: Who has power over the environment? How is nature constructed and destructed? How do existing policies and stakeholder interactions affect the use of environment by society? How do resource conflicts arise and become resolved? How is environmental knowledge used and abused? These forces are multiple and interact in complex ways over a set of interlocking scales from local to global. We will address these issues by covering several case studies, both from the United States and the world. It is a civic engagement, service learning class.
Prerequisites: *ES 100 and SSP 100.*
Note(s): Fulfills Bridge Experience requirement.

ES 225 - Human Rights and Development
Credits: 3
An exploration of rights-based development approach with a focus on Sustainable Development Goals. Students use conceptual approaches and knowledge from diverse disciplines including history, economics, gender studies and environmental studies to analyze human development between the North and the South, and within countries; mutual benefits of political and economic rights-embedded development; and alternatives. Students work on case studies with local and/ or global focus, including poverty reduction strategies, maternal health, women immigrants, hunger and genetically engineered food, and climate justice.
Prerequisites: *SSP 100 and ES 100 or permission of the instructor.*
Note(s): Fulfills Bridge Experience requirement.

ES 227 - Plastic Planet: The Promise and Perils of Polymers
Credits: 3
An examination of the variety of modern plastics, their basic chemical and physical properties, and the scale of society's dependence on them. From this foundation, we will analyze impacts to public health and ecosystem functioning, along with policies that regulate plastics and the bioplastics that might provide more sustainable alternatives. Plastics are present in every facet of our lives, and their contributions to advances in medicine, transportation, construction, and electronics have provided huge societal benefits. Those benefits come at a cost, however; plastics derive from limited fossil fuels, leach toxic chemicals, litter our landscapes, and imperil marine life. How have plastics come to dominate our lives, and what are the human health and ecosystem effects of this domination?
Prerequisites: *ES 100.*

ES 241 - Adirondack Wilderness Experience
Credits: 4
The Adirondack Park is the birthplace of the American concept of wilderness and land conservation. It is the second oldest park in the U.S. and the largest publicly protected area in the contiguous United States, larger than Yellowstone, Everglades, Glacier, and Grand Canyon parks combined. Today, it is on the cutting edge of how to turn the abstract principles of environmental sustainability into a set of feasible political, economic, and ecological principles. This class will examine the natural setting of the park, the environmental impact of humans on the park, the evolution of popular views of the wilderness, the attempts to balance development and preservation, the prospects of bio-regional level governance, and the major challenges to ecological, social, and economic success in the Adirondack Park. The emphasis of the course is on experiential learning and will involve various hikes and/or canoe trips into the wilderness itself.
Note(s): Summer only.

ES 252 - Topics in Environmental Studies
Credits: 1-4
An interdisciplinary examination at the intermediate level of a subject area in environmental studies not available in existing course offerings. Specific topics vary by instructor, discipline, program, and semester.
Prerequisites: *Permission of instructor.*
Note(s): The course, in a different subject area, may be repeated for credit.

ES 271 - Independent Study in Environmental Studies and Science
Credits: 1-4
An opportunity for qualified students to pursue intermediate level independent study or research n environmental studies under the supervision of an appropriate faculty member. The written study proposal must be approved by the Environmental Studies Program before registration for the course. The student must produce a major research paper approved by the faculty sponsor and the ES Program.
Prerequisites: *ES 100.*
Note(s): Only 3 credits in total from ES 271, ES 299, ES 371, or ES 399 may count toward the major or minor.

ES 281 - Disease and the Environment
Credits: 3
An introduction to the study of the relationship between disease and the environment. We will study the epidemic of cholera in industrial Britain, the evidence linking smoking to lung disease, the relationship between exposure to lead and developmental problems in children, and other important cases in the history of epidemiology that yielded a link to environmental causes. We will continue using a "case study" approach to examine current issues in environmental disease. Students will be encouraged to learn problem-solving and technical skills as they work together to prepare their own group case.
Prerequisites: *QR2.*

ES 299 - Professional Internship in Environmental Studies and Science
Credits: 1-4
An internship opportunity for students whose curricular foundations and curricular experience have prepared them for professional work related to the major field. With faculty sponsorship and Environmental Studies Program approval, students may extend their educational experience in environmentally related interdisciplinary areas such as environmental consulting, environmental advocacy, environmental law, and environmental outreach.
Note(s): Only three credits in total from ES 271, ES 299, ES 371, or ES 399 may count toward the major or minor. Must be taken S/U. Not for liberal arts credit.

ES 301 - Urban Ecology
Credits: 4

ES 302 - Environment and Development in the Middle East
Credits: 4
An interdisciplinary study of the natural and human environment in the Middle East, addressing major development and environmental topics, including impacts of oil and other natural resource use; modernization and large dam projects; population growth and access to water, energy and food; and climate change and other transboundary environmental issues. Students will explore the complex characteristics of Middle East environmental issues at both the regional and global scales through the examination of case studies from the region.
Prerequisites: *one gateway course (ES 100, IA 101, PL 101, PL 103, SO 101 or AN 101) and one 200-level course (any 200-level ES course, PL 239, PL 241, PL 231, or SO 223).*
Note(s): Fulfills non-Western Cultures and Social Sciences requirements; Global Cultural Perspectives requirement.

ES 303 - The Politics of Food, Agriculture, and Social Justice
Credits: 4
An examination of the global agro-food system and the politics of food consumption. Students will study the environmental problems and social inequalities that arise from the dominant forms of production and distribution of food and explore alternative strategies that promote social justice and environmental sustainability.
Prerequisites: *One gateway course from ES 100, IA 101, PL 101, PL 103, SO 101, AN 101, or HP 242 and one 200-level ES course or PL 231 or SO 223 or AN 231 and SSP 100.*
Note(s): Fulfills Social Sciences requirement; fulfills Bridge Experience requirement.

ES 305 - Environmental Education
Credits: 4
An exploration of environmental education in the U.S., as well as the various pedagogical tools, programs, and resources that are available for the global dissemination of environmental education. Students will examine innovations and philosophies behind experiential and authentic environmental education; sustainability education; research on environmental education (pro-environmental knowledge, attitudes, and behaviors); environmental service learning; adventure education; garden-based learning, and place-based learning. Students will design a curriculum and multi-unit lesson plan that they will teach to children and/or adults in partnership with a community stakeholder. This 4-credit service-learning course requires students to work for 30 hours in community schools, nonprofit organizations, and nature centers delivering environmental education lessons. Off-campus travel to service sites is a requirement.
Prerequisites: *ES 100 or permission of instructor.*
Note(s): Fulfills Social Sciences requirement.

ES 306 - U.S. Public Lands and Oceans: Policy, Law, Management, and Current Events
Credits: 3
An investigation of the policies, laws, and philosophies governing the management of U.S. public lands and oceans. State and federal agencies manage, and at times mismanage, public lands and oceans for their diverse recreational, economic, and environmental values. Students will examine the science and cultural forces that influence the management of tribal, state, and federally owned public resources. We will interview active stakeholders in the public lands and oceans policy arena, which include a diversity of activists, agencies, tribes, non-governmental organizations, researchers, and industries.
Prerequisites: *One gateway course (ES 100, IA 101, PL 101, SO 101, PL 231) or permission of instructor.*
Note(s): Fulfills Social Sciences requirement.

ES 307 - Global Environmental Governance
Credits: 3
An examination of the role of governments, scientific bodies, and non-governmental organizations in global environmental decision-making, and their use of science, law, economics, and ethics as political tools to create powerful representations of environmental problems or decisions over others. Students will investigate who produces global environmental knowledge about the world, and what that knowledge means in terms of intervention global environmental decisions. They will also explore the relationship between scientific/institutionalized and local knowledge productions, global politics, knowledge as a form of power, and power and the politics of intervention.
Prerequisites: *ES 100 and one other 200 level IA or ES class or permission of the instructor.*

ES 308 - Soil and Watershed Science for a Crowded Planet
Credits: 4
An introduction to the ecology, geography, and management of the soil resource, with a focus on sustainable watersheds and the resource demands of an ever-expanding human population. Soil properties and processes are the foundation of ecosystem functioning and provide many of the ecosystem goods and services upon which all life on earth depends, including regulation of hydrologic cycles, climate, and global water and food security. Most regional to global-scale environmental challenges are related to soil. Students will acquire an understanding of soil properties in relation to watershed-scale processes and dynamics, sustainable management of the soil resource, and the consequences of policy decisions related to soil and water. Specific topics include nutrient availability in time and space, organic matter turnover, and the role of soil in the climate, water, and food systems. Field- and laboratory-based activities will focus on forest, agricultural, and urban watersheds of the upstate NY region.
Prerequisites: *ES 205 or BI 241.*

ES 309 - Wicked Environmental Problems: Managing Global Climate
Credits: 4
An in-depth exploration of global climate change, impacts, and management. Students will explore the science of our dynamic climate system and study the ways environmental managers can tackle this complex challenge in the real world. Lectures, field tours, and quantitative laboratory exercises investigate the science of global climate in a local context. Students will critically evaluate management strategies and explore solutions for climate change adaptation and mitigation.
Prerequisites: *ES 205 or ES 206 or ES 207, or ES 100 and any 200-level natural science lab course.*

ES 352 - Advanced Topics in Environmental Studies and Sciences
Credits: 1-4
An interdisciplinary examination at the advanced level of a subject area in environmental studies not available in existing course offerings. Specific topics vary by instructor, discipline, program, and semester.
Prerequisites: *Permission of the director.*
Note(s): The course, in a different subject area, may be repeated for credit.

ES 367 - ES Junior Seminar
Credits: 1

ES 371 - Independent Study in Environmental Studies and Science
Credits: 1-4
An opportunity for qualified students to pursue independent study or research in environmental studies under the supervision of an appropriate faculty member. The written study proposal must be approved by the Environmental Studies Program before registration for the course. The student must produce a major research paper approved by the faculty sponsor and the ES Program.
Note(s): Only 3 credits in total from ES 271, ES 299, ES 371, or ES 399 may count toward the major or minor.

ES 374 - ESS Research Capstone: Design and Methods
Credits: 2
The first half of the ESS Capstone sequence. Student teams will select a community-based, natural or social sciences environmental problem and learn how to launch a formal research project. Preparation includes drafting a research plan (purpose or hypothesis, literature review, and methods) and developing data collection and analysis plans. Teams will present their research proposals to the class and begin collecting data for their projects.
Prerequisites: *Senior standing and declared Environmental Studies or Environmental Science major and permission of the instructor.*
Note(s): Fulfills Senior Experience Coda requirement.

ES 375 - ESS Research Capstone: Data Collection, Analysis, and Communication
Credits: 4
A research capstone in Environmental Studies and Sciences. Student teams implement their research plans developed in ES 374 and learn data analysis techniques, and develop skills in manuscript writing, professional presentation, and communication of environmental issues. The research experience culminates in a formal public presentation to faculty, students, and community stakeholders. A portion of the course is also dedicated to professional development, including resume design, interview skills, internship, employment, and graduate opportunities.
Prerequisites: *ES 374.*
Note(s): Fulfills Senior Experience Coda requirement.

ES 399 - Professional Internship in Environmental Studies and Science
Credits: 1-4
Interdisciplinary professional experience at an advanced level for juniors or seniors with substantial academic experience in environmental studies. With faculty sponsorship and Environmental Studies Program approval, students may extend their educational experience in environmentally related interdisciplinary areas such as environmental consulting, environmental advocacy, environmental law, and environmental outreach. The intern must produce a research paper related to the area of the internship, on a topic approved by the faculty sponsor and on-site supervisor.
Note(s): Only 3 credits in total from ES 271, ES 299, ES 371, or ES 399 may count toward the major or minor. Must be taken S/U. Not for liberal arts credit.

Cluster A: Culture, Society, and the Environment

Courses in Cluster A examine the social and cultural dimensions of environmental issues. Drawing upon disciplinary and interdisciplinary foundations in the social sciences, humanities, and arts, these courses provide the student with an understanding of how changes in the environment affect social organization and cultural development. Courses in this cluster also examine how society and culture affect the environment and influence human response to environmental issues. Cluster A courses emphasize social and cultural perspectives (i.e., social sciences, humanities, and arts), although concepts in the natural sciences may be introduced as background material. Cluster A courses apply to the Environmental Studies major, the Environmental Science major, and the ESS minor.

Code	Title	Hours
AH 208	Art and the Environment in Ancient Mesoamerica and South America	3
AM 252	The Hudson River	4
AM 263	The Machine in the Garden	3
AN 205	Mesoamerican Archaeology	3
AN 207	North American Archaeology	3
AN 222	You Are What You Eat: Food and Culture	4
AN 252	Non-Western Themes in Anthropology (when topic is Mesoamerican Archeology II)	3
AN 306	Evolution of the Human Diet	4
AS 221	The Himalayas: Interdisciplinary Perspectives on the "Roof of the World"	3
EC 104	Introduction to Microeconomics	4
EC 286	Economics of Development	3
EC 243	Environmental and Resource Economics	3
EN 224	Literature and the Environment	3
ES 221	Sustainable Development	3
ES 223	Environmental Justice	3
ES 224	Political Ecology	4
ES 302	Environment and Development in the Middle East	4
ES 303	The Politics of Food, Agriculture, and Social Justice	4
ES 305	Environmental Education	4
ES 306	U.S. Public Lands and Oceans: Policy, Law, Management, and Current Events	3
ES 307	Global Environmental Governance	3
ES 352C	(when topic is Urban Planning)	3
HP 131	Introduction to Public Health	3
HP 361	(when topic is Contemporary Issues in Public Health)	3
GW 210	Ecofeminism, Women, and the Environment	3
HI 116H	Sea Changes: A History of the World's Oceans	4
HI 264	History of the American West	3
HI 266	American Environmental History	3
HI 267	American Indian History	3
HI 280	Science and Nature in the Renaissance	3
HI 312		3
MB 351	Special Topics in Business and Management (when the topic is Business and the Natural Environment)	3
PH 225	Environmental Philosophy	3
PL 231	Environmental Politics and Policy	4
PL 338		4
PL 339	International Political Economy and the Environment	4
PL 365	Topics In Comparative Politics (Food Politics)	4
RE 225	Religion and Ecology	3
SO 223	Environmental Sociology	3
SO 331	Women in Global Economy	3
SO 326	Social Theories of the Environment	3
SO 351A-D	(when the topic is Population Explosion in Sociological Perspective)	3
TH 340	Climate Justice and Theater Action	3
WLL 263A-D	(when topic is Green Italy: Gardens, Food, and Material Culture)	1-4
WLS 325	Advanced Studies: Environmental Perspectives	3
WLS 331	Tales of the Wondrous Lands: The Hispanic Transatlantic World	3

Cluster B1 and B2: Exploring the Natural World

Courses in these clusters examine the physical and biological aspects of environmental issues and, to a significant extent, examine how these aspects influence and are influenced by people. These courses offer students a scientific foundation in environmental issues by drawing on disciplinary and interdisciplinary courses in biology, chemistry, geology, mathematics, physics, and/or other disciplines. Cluster B courses emphasize the natural sciences, although social and cultural dimensions may be introduced as background material. Cluster B1 courses apply to the Environmental Studies major only, whereas Cluster B2 courses can be used for both the Environmental Studies major and the Environmental Science major. Both B1 and B2 courses can count towards the ESS minor.

Cluster B1

Code	Title	Hours
BI 115H	Ecology of Food	4
BI 136	Ecology of the Adirondacks	4
BI 140	Marine Biology	4
BI 165	Microbes and Society	4
ES 222	Energy Systems and Sustainable Solutions	3
ES 227	Plastic Planet: The Promise and Perils of Polymers	3
ES 252	Topics in Environmental Studies	1-4
HP 242	Principles of Nutrition for Health and Performance	3
GE 101	Earth Systems Science with Lab	4
GE 112	Oceanography: Introduction to the Marine Environment	4
GE 205	Introduction to Energy Resources	3
GE 207	Environmental Geology	4
GE 208	Origin and Distribution of Natural Resources	4
GE 211	Climatology	4
GE 306	Oceans and Global Change	4

HP 242	Principles of Nutrition for Health and Performance	3
ID 351	Advanced Topics in Interdisciplinary Study	3

Cluster B2

Code	Title	Hours
BI 224	Evolution	4
BI 239	Parasitology, Epidemiology, and Public Health	4
BI 241	Ecology	4
BI 307	Ornithology	4
BI 316	Animal Behavior	4
BI 325	Tropical Ecology	3
BI 327	Conservation Ecology	3
BI 338	Plant Biotechnology	4
BI 339	Plant-Animal Interactions	4
BI 351	Topics in Biology (when topic is Ecology of North America)	3
CH 221	Organic Chemistry I	5
CH 222	Organic Chemistry II	5
CH 232	Analytical Methods in Chemistry	5
CH 351	Special Topics in Chemistry (when topic is Atmosphere Chemistry)	5
CH 353	Topics in Environmental Chemistry	3
ES 205	Ecosystem Science and Analysis of Forested Landscapes	4
ES 206	Environmental Engineering and the Science of Sustainability	4
ES 222	Energy Systems and Sustainable Solutions	3
ES 252	Topics in Environmental Studies	1-4
ES 308	Soil and Watershed Science for a Crowded Planet	4
HP 242	Principles of Nutrition for Health and Performance	3
GE 208	Origin and Distribution of Natural Resources	4
GE 211	Climatology	4
GE 235	Data Analysis, Modeling, and Scientific Programming: Earth and Environmental Sciences	4
GE 301	Hydrogeologic Systems	4
GE 302	Reading the Sedimentary Record: Sedimentology and Stratigraphy	4
GE 304	Geomorphology	4
GE 305	Remote Sensing of the Earth and Environment	4
GE 306	Oceans and Global Change	4
GE 309	Field Techniques	4
GE 311	Paleoclimatology	3
GE 320	Global Biogeochemical Cycles	4
ID 351	Advanced Topics in Interdisciplinary Study (Spatial Analysis & Modeling)	4

Methods

Code	Title	Hours
BI 235	Biostatistics	4
EC 237	Statistical Methods	4
ID 210	Introduction to GIS	4
SO 226		4