ECOSYSTEM SCIENCE AND POLICY

abess.miami.edu

Dept. Code: ECS

Introduction

The undergraduate program in Ecosystem Science and Policy (ECS) is offered by the Leonard and Jayne Abess Center for Ecosystem Science and Policy. The goal of the program is to educate the next generation of environmental leaders. The ECS program provides students with a broad background in environmental issues from a variety of perspectives, along with in-depth education in an area of specialization.

Educational Objectives

The ECS major offers a series of problem-based learning courses, culminating in a capstone course in the senior year. Courses emphasize integration of science and policy approaches to real-world environmental issues. This preparation gives students both the theoretical background and technical skills to pursue environmental careers in, teaching and research, as well as for careers in government and private industries concerned with the environment.

Advanced Writing and Communication Requirement

To satisfy the Advanced Writing and Communication requirement, students majoring in ECS take three ECS writing intensive courses (ECS 113, 302, 403). They also receive instruction in scientific communication, including how to make charts, graphs, maps, meeting posters, and other representations of data, in ECS 112 and 301. Many ECS courses co-listed with other departments /programs are writing intensive or include instruciton in visual communication.

Degree Programs

The Ecosystem Science and Policy program offers two undergraduate degree major programs: a Bachelor of Science (B.S.) and a Bachelor of Arts (B.A.). The minor consists of 15 credit hours. Majors are required to complete either an environmentally related internship or a research project with the Center for Ecosystem Science and Policy or with other UM faculty.

Only those courses passed with a grade of “C-” or better in the ECS core may be applied to the major or minor. All ECS majors are required to maintain an overall cumulative grade point average of 2.5 or better.

ECS 111. Introduction to the Earth's Ecosystem. 3 Credit Hours.
Earth's ecosystems and the interactions of humans with them. Concepts in ecology, environmental science and policy.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 112. Field Problems in Ecosystem Science and Policy. 2 Credit Hours.
Problem solving in ecology and environmental management. Class projects and case studies providing experience in identifying problems, quantifying scientific issues and considering management options and outcomes. Extensive field experience.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

ECS 113. Introduction to Environmental Policy. 3 Credit Hours.
Theories and case studies from various fields, including anthropology, economics, ethics, geography, political science and psychology, will be used to explore the multiple perspectives that influence group and individual perceptions of environmental issues.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

ECS 114. Social research methods for Ecosystem Science and Policy. 2 Credit Hours.
This course introduces students to critical questions and research approaches to human-dimensions of environmental problems. Class projects and case studies introduce students to a range of data collection techniques including qualitative and quantitative approaches, and challenges students to consider the strengths of different methods and potential questions of ethics and power inherent in social research.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

ECS 195. Studies in Ecosystem Science and Policy. 1-5 Credit Hours.
Courses taken at other institutions but having no direct equivalents here.
Components: LEC.
Grading: GRD.

ECS 196. Studies in Ecosystem Science and Policy. 1-5 Credit Hours.
Courses taken at other institutions but having no direct equivalents here.
Components: LEC.
Grading: GRD.

ECS 197. Studies in Ecosystem Science and Policy. 1-5 Credit Hours.
Courses taken at other institutions but having no direct equivalents here.
Components: LEC.
Grading: GRD.

ECS 198. Studies in Ecosystem Science and Policy. 1-5 Credit Hours.
Courses taken at other institutions but having no direct equivalents here.
Components: LEC.
Grading: GRD.

ECS 199. Studies in Ecosystem Science and Policy. 1-5 Credit Hours.
Courses taken at other institutions but having no direct equivalents here.
Components: LEC.
Grading: GRD.

ECS 201. Seminar Series in Contemporary Environmental Issues I. 1 Credit Hour.
Current environmental topics involving interaction of science and policy.
Components: SEM.
Grading: GRD.
Typically Offered: Fall.

ECS 202. Seminar Series in Contemporary Environmental Issues II. 1 Credit Hour.
Current environmental topics involving interaction of science and policy.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

ECS 204. Environmental Statistics. 3 Credit Hours.
An overview of parametric and nonparametric statistics with an emphasis on applications in the analysis of environmental data.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 215. Introduction to Private Urban and Suburban Green Spaces. 1 Credit Hour.
Faculty supervised research & application projects in indoor, urban, and suburban green spaces. Topics of focus include green walls, roof gardening, edible gardening, permaculture, sustainable gardening, composting & vermiculture, gardening for wildlife, and backyard ecology. No previous ecology or gardening experience required.
Components: FLD.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 232. Ecological Principles and Environmental Applications. 3 Credit Hours.
Overview of the science of ecology and its basic principles. Covers aspects of organismal ecology (including population genetics, structure, growth and regulation; adaptations and responses to the physical environment and biological communities); community ecology; and ecosystems (including energy flow, biogeochemical cycles, and biomes). Students will learn to apply ecological principles to understand and solve environmental problems.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 272. Special Topics in Ecosystem Science and Policy. 1-3 Credit Hours.
Content varies by semester and is indicated in parentheses following course number and title in class schedule.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 295. Studies in Ecosystem Science and Policy. 1-5 Credit Hours.
For courses taken at other institutions that have no equivalents here.
Components: LEC.
Grading: GRD.

ECS 296. Studies in Ecosystem Science and Policy. 1-5 Credit Hours.
For courses taken at other institutions that have no equivalents here.
Components: LEC.
Grading: GRD.

ECS 297. Studies in Ecosystem Science and Policy. 1-5 Credit Hours.
For courses taken at other institutions that have no equivalents here.
Components: LEC.
Grading: GRD.

ECS 298. Studies in Ecosystem Science and Policy. 1-5 Credit Hours.
For courses taken at other institutions that have no equivalents here.
Components: LEC.
Grading: GRD.

ECS 299. Studies in Ecosystem Science and Policy. 1-5 Credit Hours.
For courses taken at other institutions that have no equivalents here.
Components: LEC.
Grading: GRD.

ECS 301. Tools for Environmental Decision-Making: The Quantitative Perspective. 3 Credit Hours.
Quantitative decision-making techniques and methodologies.
Prerequisite: ECS 111 and ECS 112 or 114.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 302. Perspectives on Environmental Decision Making. 3 Credit Hours.
Techniques for assessing human impacts on the environment. Covers approaches from law, ethics, anthropology and includes cases involving local, regional and global environmental management issues.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

ECS 309. Microbes and the Environment. 3 Credit Hours.
This course is designed to provide students in geology, biology and environmental science a fundamental understanding of the role microbes play in shaping the Earth and its environments as well as the basic principles and approaches to studying these interactions in both modern and ancient settings. The metabolic diversity displayed by microbial communities makes them an integral component of global elemental cycles. In this regard, microorganisms have shaped our planet over the past 4 billion years and continue to do so in a very prominent way. The goal of this course is to learn about microbial diversity and metabolism, and the ability of microbes to shape and influence the environment.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

ECS 310. Sustainable Living. 3 Credit Hours.
Sustainable Living explores the systems that support life on the planet, how those systems are unsustainable, and the kinds of policies that will allow human development without further damage to earth, ocean, and atmosphere. Topics covered include renewable energy, land-use practices, water issues, green building, transportation, and healthy living/eating. Students advocate for sustainable practices of their choice in writing and in oral/visual presentations
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

ECS 312. Environment Assessment. 3 Credit Hours.
Execution of environmental due diligence in the context of property transactions and land and water pollution in a technical, regulatory, and legal framework, including how client advocacy and regulatory detail influence project design.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

ECS 323. Population, Sustainability, and the Media. 3 Credit Hours.
Explores opposing views of population growth and environmental sustainability through the media and cinema: contrasts "Doomsters" who believe population growth and resource consumption threaten human survival and pro-growth "Boomsters" who believe human ingenuity and technology will continue to allow humankind to prosper.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

ECS 324. You & Your Microbiome. 3 Credit Hours.
Recent advances in immunology, genetic manipulation and the microbiome; consequences on emerging notions of personalized health and medications; the creation of tailored therapies against cancer; implications for cost of healthcare and politics of medicine.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 325. Hazards and Disasters: The Nature-Society Interface. 3 Credit Hours.
Borrows from themes in Geography, Urban Planning, Anthropology and Policy Studies to explore how human-environmental interactions determine the distribution, causes and consequences of natural hazards and disasters.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 332. Ecology and Land Use in the Galapagos. 3 Credit Hours.
Fundamental principles of ecology manifested on Isla Isabela will be employed to evaluate land usages including subsistence and production agriculture, animal husbandry, fuel wood and timber, and conservation with ecotourism. Habitats, flora, and fauna from the vicinity of Puerto Villamil to the rim of Volcán Sierra Negra; analysis of agricultural practices and problems of the mist zone on this volcano's southeastern flank.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 335. Biodiversity in Peru. 3 Credit Hours.
The focus is on developing skills to analyze and value the components of biodiversity, identifying its potentials and the tools to make sustainable use and conservation possible.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 337. Latin America and the Environment. 3 Credit Hours.
Theoretical dimensions of current environmental challenges in Latin America and examines their ecological, social, economic, and political dimensions.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 342. Decision-Making and the Environment. 3 Credit Hours.
Provides a comprehensive overview of the art and science of decision modeling in natural resources policy management. Students learn to understand and develop basic decision models, interpret the results and communicate them to non-analytical decision makers.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

ECS 345. Economics of Natural Resources and the Environment. 3 Credit Hours.
A comprehensive overview of the economics of national, international, and global environmental problems. A unifying theme throughout is sustainable development defined as "maximizing the net benefits of economic development while maintaining the services and quality of natural resources over time". We will use economic reasoning to examine causes and consequences of environmental and resource problems, and measures for dealing with them.
Prerequisite: ECO 211.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

ECS 352. Environmental Ethics. 3 Credit Hours.
Theoretical and practical issues in the field of environmental ethics.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 357. Global Food: A Hands-On Approach. 3 Credit Hours.
Application of principles of permaculture via designing and creating a small "global farm" on campus to grow perennial food crops which are unique to the South Florida environment. We learn by doing, cultivating plants that hold the solution to world hunger problems.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

ECS 360. Readings in Ecosystem Science and Policy. 1-3 Credit Hours.
Supervised readings on special topics. Offered by special arrangement with a faculty member. May be repeated for credit.
Components: DIS.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 361. Readings in Ecosystem Science and Policy. 1-3 Credit Hours.
Supervised readings on special topics. Offered by special arrangement with a faculty member. May be repeated for credit.
Components: DIS.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 362. Readings in Ecosystem Science and Policy. 1-3 Credit Hours.
Supervised readings on special topics. Offered by special arrangement with a faculty member. May be repeated for credit.
Components: DIS.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 363. Readings in Ecosystem Science and Policy. 1-3 Credit Hours.
Supervised readings on special topics. Offered by special arrangement with a faculty member. May be repeated for credit.
Components: DIS.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 371. Readings in Ecosystem Science and Policy. 1-2 Credit Hours.
Supervised readings on special topics. Offered by special arrangement with a faculty member. May be repeated for credit.
Components: DIS.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 372. Special Topics in Ecosystem Science and Policy. 3 Credit Hours.
Content varies by semester and is indicated in parentheses following course number and title in class schedule.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 373. Topics in Ecosystem Science. 3 Credit Hours.
Content varies by semester and is indicated in parentheses following course number and title in class schedule.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 374. Topics in Environmental Policy. 3 Credit Hours.
Content varies by semester and is indicated in parentheses following course number and title in class schedule.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 375. Topics in Environment and the Humanities. 3 Credit Hours.
Content varies by semester and is indicated in parentheses following course number and title in class schedule.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 376. Topics in Environmental Communication. 3 Credit Hours.
Content varies by semester and is indicated in parentheses following course number and title in class schedule.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 377. Topics in Environmental Economics and Development. 3 Credit Hours.
Content varies by semester and is indicated in parentheses following course number and title in class schedule.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 379. Special Topics in Ecosystem Science and Policy. 1 Credit Hour.
Content varies by semester and is indicated in parentheses following course number and title in class schedule.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 380. Field Studies in Ecosystem Science and Policy. 1-4 Credit Hours.
Field course to various U.S. and international regions, focusing on current and historic interactions of humans with the local environment. Includes water, land, and mineral resources as well as impacts on local ecosystems. Emphasis on current management efforts and potential impacts of climate change.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 381. Field Studies in Ecosystem Science and Policy. 1-4 Credit Hours.
Field course to various U.S. and international regions, focusing on current and historic interactions of humans with the local environment. Includes water, land, and mineral resources as well as impacts on local ecosystems. Emphasis on current management efforts and potential impacts of climate change.
Components: FLD.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 385. Civic Engagement in the Galapagos. 3 Credit Hours.
This course is part of the UGalapagos semester held in the Galapagos and is open only to students who have been accepted by the Department of Biology. This field course offers you a rare chance to examine human interactions in a highly politicized landscape of conservation. You will learn historical development and contemporary issues of Latin America from an interdisciplinary perspective, through the cultural, political and social lens of the Galapagos
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 391. Studies in Ecosystem Science and Policy. 1-4 Credit Hours.
(Not offered: transfer credit only) Courses taken at other institutions but having no direct equivalents here.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 392. Studies in Ecosystem Science and Policy. 1-4 Credit Hours.
(Not offered: transfer credit only) Courses taken at other institutions but having no direct equivalents here.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 393. Studies in Ecosystem Science and Policy. 1-4 Credit Hours.
(Not offered: transfer credit only) Courses taken at other institutions but having no direct equivalents here.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 394. Studies in Ecosystem Science and Policy. 1-4 Credit Hours.
(Not offered: transfer credit only) Courses taken at other institutions but having no direct equivalents here.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 395. Studies in Ecosystem Science and Policy. 1-4 Credit Hours.
(Not offered: transfer credit only) Courses taken at other institutions but having no direct equivalents here.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 401. Internship. 3 Credit Hours.
Students selecting the internship will be required to spend a minimum of 120 contact hours working in an outside firm or agency whose mission is to address environmental issues where science and policy intersect.
Components: THI.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

ECS 402. Thesis. 3 Credit Hours.
Individual, original research of independent study supervised by a UM faculty member and concluded by formal thesis preparation, public oral defense and submission of the thesis.
Components: THI.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

ECS 403. Interdisciplinary Approaches. 3 Credit Hours.
Students with diverse disciplinary backgrounds will design an interdisciplinary study focused on an environmental problem with a major science component and significant societal implications. Students will apply quantitative methods, formulate usable policy, and communicate their results.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 405. Applied Research in Ecosystem Science and Policy. 1-3 Credit Hours.
Faculty-mentored applied research in environmental topics. Projects in natural ecosystems, sustainable design and business, and communication of environmental issues.
Components: THI.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

ECS 415. Research in Private Urban and Suburban Green Spaces. 1 Credit Hour.
Faculty supervised research & application projects in indoor, urban, and suburban green spaces. Topics of focus include green walls, roof gardening, edible gardening, permaculture, sustainable gardening, composting & vermiculture, gardening for wildlife, and backyard ecology.
Requisite: ECS Major or ECS Minor or Prerequisite: ECS 215.
Components: FLD.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 432. Ecology in the Galapagos. 3 Credit Hours.
Organisms in relation to their environment, with a focus on interactive hands-on learning experiences that connect empirical nature with abstract thinking. Lectures, discussion and field work will help students begin to understand ecosystem ecology, plant dispersal and colonization, organisms' responses to spatial and temporal variability in their environments, plant/animal interactions. Origins and effects of invasive species and actions of bio-control agents.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 433. Conservation in Practice. 3 Credit Hours.
Intersection between economic development, science and conservation in one of the world's most pristine and fragile ecosystems. Exploration of how tourism offers an alternative to unsustainable fisheries that once drove the local economy, yet has created a new set of pressures on the people and the environment. Mitigation efforts, science, and international conservation mesh with an understanding of local politics, customs, and cultures.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 485. Political Ecology of the Galapagos. 3 Credit Hours.
This course is part of the UGalapagos semester held in the Galapagos and is open only to students who have been accepted by the Department of Biology. Throughout the term, you will engage in civic activities identified in consultation with the people, government and public health facilities of the small, rural village of Villamil, the sole habitation on Isla Isabella. A major aim is to nurture the mutual respect and understanding across the cultural divide that is necessary to make a difference in the civic life of a community.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 515. Private Green Space Management. 3 Credit Hours.
Students plan and manage ongoing and proposed green space projects. Student managers work with supervising faculty; also organize and educate student volunteers and students concurrently enrolled in ECS 215 and 415.
Prerequisite: ECS 415.
Components: FLD.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 572. Special Topics in ECS. 0-3 Credit Hours.
Content varies by semester and is indicated in parentheses following course number and title in class schedule.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

ECS 580. Field Studies. 1-4 Credit Hours.
This course will provide participants with the opportunity for intensive field research geared toward an interdisciplinary understanding of environmental issues and conservation concerns.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.