ECOSYSTEM SCIENCE AND POLICY (ECS)

ECS 100. Science, Society And Policy. 3 Credit Hours.
A view of science and discovery through a societal lens. Science has been impacting society since Galileo Galilei proposed his theory that the Earth moved around the Sun. Science continues to have a profound effect on our lives and the planet. It is important to understand what science is, how it works and how it informs existing and future public policy.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

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 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.

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.

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. Requisite: Plan of ECS.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

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: Fall & 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 ways of living that can be sustained for thousands of years, without further damage to earth, ocean and atmosphere. Topics covered include renewable energy, agricultural practices, water issues, green building, low carbon transportation and healthy living/eating. Students advocate for sustainable practices of their choice in writing and in oral/visual presentations. Frequent field trips.
Components: LEC.
Grading: GRD.
Typically Offered: 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: Fall.

ECS 335. Biodiversity in Peru. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

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: Fall & Spring.

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: Offered by Announcement Only.

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: Offered by Announcement Only.

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: Fall, Spring, & Summer.

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: Fall, Spring, & Summer.

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 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 385. Civic Engagement In 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: Fall, Spring, & Summer.

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.

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.

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.

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.

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.

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 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: Fall.
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: Fall.

ECS 485. Political Ecology Of 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: Fall, Spring, & Summer.

ECS 501. Interdisciplinary Environmental Theory. 3 Credit Hours.
Theoretical approaches in environmental and social science fields, including conservation biology, ecology, geography, economics, sociology, anthropology, philosophy, and interdisciplinary approaches. Themes include human ecology, historical ecology, landscape ecology, environmental law and ethics, perception of risk and uncertainty, vulnerability and adaptation, and environmental valuation.
Requisite: Plan of Ecosystem Science and Policy.

Components: DIS.
Grading: GRD.
Typically Offered: Fall.

ECS 503. Interdisciplinary Environmental Methods. 3 Credit Hours.
Environmental methods related to core programmatic themes of Urban Ecology, Global Public Health, Climate and Society, Environment and the Media, Integrated Marine and Terrestrial Management, and Regulatory Regimes. The course focuses on the application of Interdisciplinary approaches and methods for addressing complex environmental problems. Students will learn to design and employ interdisciplinary approaches, using qualitative and quantitative methods and analysis, through lectures, reading assignments, discussion sessions, and assignments.
Requisite: Plan of Ecosystem Science and Policy.

Components: SEM.
Grading: GRD.
Typically Offered: Fall.

ECS 507. Interdisciplinary Environmental Decision Analysis. 3 Credit Hours.
Approaches to studying and interpreting human behavior related to a range of decision making at the level of individual, group, and firm. Multidisciplinary theories and methods informing work in the decision sciences will be covered from fields of psychology, business, economics, political science, and anthropology.
Requisite: Plan of Ecosystem Science and Policy.

Components: LEC.
Grading: GRD.
Typically Offered: Fall.

ECS 572. Special Topics in ECS. 3.00 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, & Summer.

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.

ECS 601. Interdisciplinary Environmental Theory. 3 Credit Hours.
Theoretical approaches in environmental and social science fields, including conservation biology, ecology, geography, economics, sociology, anthropology, philosophy, and interdisciplinary approaches. Themes include human ecology, historical ecology, landscape ecology, environmental law and ethics, perception of risk and uncertainty, vulnerability and adaptation, and environmental valuation.
Requisite: Plan of Ecosystem Science and Policy.

Components: DIS.
Grading: GRD.
Typically Offered: Fall.

ECS 603. Interdisciplinary Environmental Methods. 3 Credit Hours.
Environmental methods related to core programmatic themes of Urban Ecology, Global Public Health, Climate and Society, Environment and the Media, Integrated Marine and Terrestrial Management, and Regulatory Regimes. The course focuses on the application of Interdisciplinary approaches and methods for addressing complex environmental problems. Students will learn to design and employ interdisciplinary approaches, using qualitative and quantitative methods and analysis, through lectures, reading assignments, discussion sessions, and assignments.
Requisite: Plan of Ecosystem Science and Policy.

Components: SEM.
Grading: GRD.
Typically Offered: Fall.
ECS 605. Interdisciplinary Environmental Law & Policy. 3 Credit Hours.
Analysis of science-based environmental decision-making and policy implementation at the federal and state levels in the United States, with comparative international perspectives, and an introduction to international institutions that fashion and carry out environmental policy. Case studies will cover authorization, appropriations and over-sight functions of Congress and state legislatures; the role of the executive, federal and state, in initiating and implementing statutes by regulation and other means; and the role of negotiation, litigation, mediation and consensus-building in resolving disputes and advancing or thwarting environmental policy.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 607. Interdisciplinary Environmental Decision Analysis. 3 Credit Hours.
Approaches to studying and interpreting human behavior related to a range of decision making at the level of individual, group, and firm. Multidisciplinary theories and methods informing work in the decision sciences will be covered from fields of psychology, business, economics, political science, and anthropology.
Requisite: Plan of Ecosystem Science and Policy.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

ECS 608. Interdisciplinary ECS Seminar.. 2 Credit Hours.
Seminar centering on research and case studies illustrating cutting edge human-environment research, and including both qualitative and quantitative methods. Intensive reading and writing related to relevant topics in the field.
Components: SEM.
Grading: GRD.
Typically Offered: Fall.

ECS 672. Special Topics in ECS. 3.00 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, & Summer.

ECS 680. 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: Spring & Summer.

ECS 725. Problems in Environmental Science and Policy. 1-6 Credit Hours.
Content and prerequisites announced when offered. Course may be repeated for credit if content varies.
Requisite: Plan of Ecosystem Science and Policy.
Components: LEC.
Grading: GRD.
Typically Offered: Fall, Spring, & Summer.

ECS 790. Directed Readings. 1-3 Credit Hours.
Individually supervised readings on special topics. Offered by arrangement with the instructor. May be retaken for credit.
Components: THI.
Grading: GRD.
Typically Offered: Fall & Spring.

ECS 820. Master's Research. 9.00 Credit Hours.
Components: THI.
Grading: SUS.
Typically Offered: Fall & Spring.

ECS 830. Pre-Candidacy Research. 1-9 Credit Hours.
Research for ECS Ph.D. students who have not attained candidacy.
Components: THI.
Grading: GRD.
Typically Offered: Fall.

ECS 840. Doctoral Dissertation. 1-6 Credit Hours.
Required for all candidates for the Ph.D. The student will enroll for credit as determined by his/her advisor but not for less than a total of 13 credits total. No more than 12 hours of ECS 730 may be taken in a regular semester, nor more than six in a summer session.
Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.

ECS 850. Research In Residence. 1 Credit Hour.
Used to establish research in residence for the Ph.D., after the student has been enrolled for the permissible cumulative total in appropriate doctoral research. May be regarded as full-time residence as determined by the Dean of the Graduate School.
Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.