

2014 SPRING NEWSLETTER:

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ENVIRONMENTAL SCIENCE AND POLICY

Environmental Science and Policy Curriculum:

Environmental Science and Policy Drake University Curriculum Effective Fall, 2014

This will be the required curriculum for students in the Class of 2018 and later. Current students will be able to choose either this curriculum or the old curriculum in order to complete their degree.

Learning Outcomes

- All graduates of the ENSP program will meet the following learning outcomes:
- Students will be able to critically integrate and apply evidence from multiple realms and academic disciplines.
- Students will be able to design and implement original research or analysis. They will be able to assess their results, using them to make informed decisions and recommendations.
- Students will develop an area of specialization within the ENSP program that allows them to realize their professional and personal ambitions

(Curriculum and Fall Courses continues on page 5)

ENVIRONMENTAL SCIENCE AND POLICY

Alumni Profile: **ASHLEY ANNE WICK**



Ashley inspecting a threatened Mormon metalmark butterfly in Grasslands National Park, SK.

Ashley Anne Wick graduated from Drake in 2006, where she was the first-ever Environmental Science and Policy Program Social Chair, was Vice President of the Drake Environmental Action League, coined the nickname DOCTORACEAE, and did research with Professors David Courad-Hauri and Keith Summerville on a study investigating the movement dynamics of prairie butterflies. As of 2013, she is the Biological Research Director at the Kalamazoo Nature Center (KNC), where she is also the founder of the Kalamazoo Climate Change Coalition and Director of the Michigan Butterfly Network. In addition, she works at KNC on the endangered Karner blue

at a military installation, and is

also starting a propagation program with the threatened Mitchell's satyr in collaboration with over a dozen Michigan and Ohio conservation organizations and zoos. Obviously, her current work was heavily inspired and driven by her first research experiences at Drake, and a research experience for undergraduates that she completed at Miami University. During the years between her current work and her days at Drake, Ashley traveled and dipped her toes in several other areas.

"In the years after college I did organizing and fundraising for Greenpeace, I worked as a waitress, I taught English in Korea, saved enough money to move to the Peruvian Amazon where I worked as a Naturalist at an ecolodge, then obtained gainful research employment for a nonprofit, Fauna Forever Tambopata," says Ashley. But it was only after all of these experiences that Ashley returned to school to earn her Master's of Science in Conservation Biology at the University of Alberta, where she studied the threatened population of a metalmark butterflies in Saskatchewan.

"The road I chose to take was sinuous and unpredictable (ask my parents!) but it led me to a place where I applied for a dream job when I was still in grad school and had a job lined up immediately after graduating. It wasn't always easy taking those years

after Drake to travel and experiment with different types of jobs, but it made me absolutely certain that I wanted to be a biologist, a researcher, and work with the public."



Ashley leading a hike to teach the public about monarch migration and tagging.

ENVIRONMENTAL SCIENCE AND POLICY

Capstone Spotlight: EMILY WILKINS

Emily Wilkins, a Senior in the Environmental Science and Policy Program, has been completing her Senior Capstone project working with the Environmental Learning Center (ELC) in Des Moines. Her project entails working with stakeholders at the ELC to determine what their needs and priorities are to improve the center. Following that, the group of four other students working on the capstone worked to determine what would be the most beneficial projects to complete to help the ELC.

The main project the group decided to work on is stream restoration. The hope of this capstone is to earn money from grant writing to dechannelize the stream by adding meanders to it. Not only are these capstone participants working with ELC stakeholders, they are also working with the Southeast Polk school district with this project. Southeast Polk is the main school that uses the ELC; therefore, communication with the district has been key to ensure the teachers and administrators in this district are satisfied with the work and plans to improve the ELC.

Emily and her four other partners are working with this project to not only gain experience in their various fields, but to also contribute to the Des Moines community.



Emily and her peers working on the grant writing portion of their capstone project.

KL: What impact will the improvement of the ELC have on the Des Moines community? What impact will the improvement have on the environment as a whole?

EW: If we get the grant, we could buy materials such as binoculars, tents, and chairs, which would build an infrastructure that would allow for community events. Right now, the ELC is not used by the general community. It will improve the environment because it is bringing things back to their natural state before human intervention, such as removing invasive species from the prairie area and planting native species. It will also help show students the differences between good, bad, and hands-off land management, and the effects of each on the ecosystems.

KL: What has this capstone taught you? What will you take the most away from this?

EW: I have learned what it would be like to prepare something when there are multiple stakeholders involved, and thus how to appease many parties. I have also strengthened my leadership and organizational skills by working with my team members. Although I've had a lot of previous grant writing experience, I think the other members of my capstone will benefit the most from learning how to write great grants.

KL: Has this been a positive experience? Why or why not?

EW: Yes, it has! I really like my group, and we have been having fun with the project. It's interesting to have a wide array of stakeholders and try to figure out what our group needs to do to have the best project and also appease as many stakeholders as possible. I think it will also be a great experience for my group members to have grant writing experience and learn the ins-and-outs of how that works.

ENVIRONMENTAL SCIENCE AND POLICY

Environmental Science and Policy Fall 2014 Courses:

- **ENSP 35: One Earth.** MWF 11-11:50. Instructor TBD (Courard-Hauri will be on sabbatical) Introduction to environmental science.

- **ENSP 36: One Earth Lab.** T 9-11:50 or T 1-3:50. Instructor: Wirth. This lab is required for ENSP majors, but does not need to be taken concurrently with ENSP 35.

- **ENSP 41: Principles of Geology.** MW 11-12:15; Lab 9-11:50 Th or 9-11:50 F. Instructor: Szramek. Introduction to geology.

- **ENSP 50: Environmental Psychology.** MW 9:30-10:45. Instructor: Renner. The purposes of this course are to survey central issues in the emerging field of ecological psychology, to examine competing conceptions of this field, and to review our growing understanding of the relationship between human beings and the physical environment. Students will study global problems, their environmental effects and mechanisms, and explore possible solutions based on behavioral interventions.
Prerequisite: PSY 001

- **ENSP 55: Tropical Ecology.** TR 11-12:15. Instructor: Summer-ville. This course is primarily aimed at non-majors, and will investigate the biodiversity, human impact, and conservation of tropical rainforests and coral reefs.

- **ENSP 61: Environmental Sociology.** MW 9:30-10:45. Instructor: Haedicke. Environmental sociology examines the relationship between human communities and the natural environment in the modern world. In particular, it focuses on how political, economic, and cultural institutions shape our interactions with the natural environment.

- **ENSP 65: Geographic Information Systems.** T 5-7:50. Instructor: Lang. This course on GIS mapping is required for all ENSP majors. It is taught every fall.

- **ENSP 115: Entomology.** TR 8-9:15; Lab F 12-2:50. Instructor: Summerville. In this course, students will learn about insects and other arthropods, and put together a collection of local specimens. Entomology counts for the field science outcome of the life science track.

- **ENSP 150: National Energy Policy.** TR 11-12:15. Instructor: Kasotia. This course will explore the need for and role of a comprehensive national energy policy as well as factors that have affected and impeded the implementation of such a policy. Students will investigate the roles of various stakeholders in energy policy development, and look at the overall energy situation in the US today.

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ENVIRONMENTAL SCIENCE AND POLICY

- **ENSP 150: Sustainability and the Law.** MT 1:35-2:50. Instructor: Rosenbloom. This is a law class that is being cross-listed with ENSP for the first time, that will explore the diverse and emerging area of sustainability. Students will work with environmental and economic experts and government officials, and draft concrete proposals to change policy and advance issues relevant to sustainability. Past projects have included stormwater management, energy conservation, and access to healthy foods. Students will present their proposals to public officials, including the Des Moines City Council. Speak with your advisor, as this course may substitute for the capstone for ENP seniors. This course is reserved for juniors and seniors.

- **BIO 92: Introduction to Ethnobotany.** TR 9:30-10:45; W 9-10:50 Lab. Instructor: Ross. Ethnobotany is a multidisciplinary field of study that investigates the role of relationships between humans and plant populations in shaping human behavioral and biological adaptations as well as plant community structures. Topics will include uses of plants, how people think about plants and the natural world, the origins of agriculture, ecological relationships between humans and plants, and the relevance of ethnobotany to contemporary global issues.

- **BIO 99: Research and Statistical Methods.** MW 12:30-1:45; F 10-12. Instructor: Rosburg. Introduction to research methods used in the biological sciences including hypothesis formation, research design, ethics in research, scientific integrity, data collection, probability, and confidence intervals, statistical analyses, inference and interpretation, and preparation of research papers. This course is required for the BS degree.

- **BIO 117: Ecology.** 8-8:50 MWF. Instructor: Rosburg. An introduction to the study of the relationships between organisms and their environment. Prerequisite: Introductory Biology course.

- **BIO 117: Ecology.** 8-8:50 MWF. Instructor: Rosburg. An introduction to the study of the relationships between organisms and their environment. Prerequisite: Introductory Biology course.

- **BIO 118L: Ecology Lab.** 2-4:50 W. Instructor: Rosburg. This lab is optional for all except those on the life science track.

- **POLS 155: American Public Policy.** MW 2-3:15. Instructor: Mosser. Critical examination of contemporary public-policy issues in the United States with emphasis on the dynamics of issue development, political culture, basic institutions, processes, and contemporary problems. This course is required for ENP majors, and is not taught on a fixed schedule, so ENP majors should try to fit it in to their schedules if possible.

- **SCSS 145: Food and Society.** MW 9:30-10:45. Instructor: Hae-dicke. The aim of this course is to unearth and analyze the social context of food production, distribution and consumption. Students will examine social identities represented and reproduced in food consumption, food regulation and food-based activism, and cultural differences in the preparation and eating of food, among other topics. Prerequisite: One SCSS or SCSA course.

(J-Term opportunities on Page 7)

ENVIRONMENTAL **SCIENCE** AND **POLICY**

Environmental Science and Policy J-term 2014 Courses:

- **ENSP 27: Environmental Hazards.** Instructor: Szramek. This course will address the basic science of volcanic, earthquake, flood, drought, weather and pollution hazards and provide an introduction to environmental hazards.

- **ENSP 50: Zoo Biology.** Instructor: Renner. This course will provide a hands-on overview of the field of zoo biology, with emphases on the role of zoos in conservation, species survival plans, captive management of small populations of exotic animals (especially including endangered species), and the use of behavioral research and environmental enrichment methods in captive animal welfare. The course will have a significant component of experiential learning, including participation in ongoing zoo-initiated studies and student-initiated behavioral research projects in a zoo setting.

- **ENSP 115: Field Mammology.** Instructor: Summerville. The goal of this course is to introduce students to the biology of the class Mammalia. Upon completion of this J-Term experience, students will be prepared for advanced graduate study in Mammalogy or for careers as mammalian ecologists.

- **ENSP 150: Sustainability and Justice on the Gulf Coast.** Instructor: Haedicke. Students in this course will examine questions of environmental sustainability and social justice in New Orleans and the surrounding area through field site visits, service learning activities, critical readings, & guided discussion and reflection. The course includes a week-long service learning component in which students will partner with local organizations that are seeking to address social inequities and environmental vulnerabilities in the area. Although the exact nature of service learning activities will be determined by comparing students' skills & interests with the needs of community partners, they may include wetlands restoration, home construction, community gardening, and neighborhood revitalization.

- **BIO 112L: Avian Winter Ecology.** Instructor: Eaton. In this J-term course, you will gain extensive experience working with birds in a field setting. You will learn and practice a fundamental tool used by ornithologists and wildlife biologists for studying birds: mist-netting and banding of individuals. In addition, you will learn identification of Iowa's winter bird species, working with museum study skins as well as captured live individuals, and you will design and conduct behavioral experiments on birds, exploring their winter physiology and ecological roles. Class time will be outdoors as much as possible. You will become expert at handling and releasing live birds, and the skills developed in this course will well prepare you for advanced field studies and graduate work in Ornithology.



A photo from the Zoo Biology J-Term Course.

ENVIRONMENTAL SCIENCE AND POLICY

Environmental Science and Policy Curriculum:

In addition, there are major specific outcomes:

| Life Science | Geological Science | Policy |
|--|---|--|
| <p>Students will develop a range of field and laboratory skills necessary to be proficient in collecting environmental data.</p> <p>Students will develop fluency with primary ecological literature and will be able to analyze and critique ecological research.</p> <p>Students will demonstrate expertise in the natural history and conservation biology of taxa of their choosing.</p> <p>Students will be capable of applying principles of biology, earth science, and policy to the management of biodiversity.</p> | <p>Students will develop the field and laboratory skills necessary to quantify biogeochemical processes and detect environmental contamination.</p> <p>Students will develop fluency with the primary earth science literature and will be able to analyze and critique earth science research.</p> <p>Students will be fluent in the basic mechanisms that govern chemical reactions.</p> <p>Students will be capable of applying principles of geology, chemistry, biology, and public policy to the management of water and/or soil quality.</p> | <p>Students develop fluency in subdisciplines that impinge upon policy formulation and implementation.</p> <p>Students will be able to analyze the relationships between policy, social structure, and individual behavior.</p> <p>Students will be capable of using the appropriate methodology to collect data and make inferences about risk and both the costs and benefits of environmental policies.</p> <p>Students will develop appropriate techniques for communicating among various constituencies that have a stake in environmental policy.</p> |

ENVIRONMENTAL SCIENCE AND POLICY

→ Environmental Science and Policy New Curriculum:

ENSP 37: Environmental Case Analysis

ENSP 37 will be a new course, focused on the development of critical thinking and problem solving skills among our majors. The course will be team-taught, and built around three case studies: one focused on life science, one on earth science, and one on policy, but with each requiring some level of analysis from other areas. Groups will spend five weeks on each case study, developing solutions to a complex problem with competing stakeholder needs. The case studies will be designed to require collaborative (rather than parallel) effort, and students will receive feedback on their ability to draw upon interdisciplinary ideas and work with the requisite level of complexity.

Program faculty will adjust the curriculum in both the ENS and ENP majors in light of needs identified during Program Review.

Core Curriculum:

The core curriculum will be unified across all ENSP majors. It will combine an introductory overview of the field (ENSP 35/36), a physical science component (ENSP 41), a new sociology requirement (ENSP 61, which specifically addresses concerns brought up by the external reviewer), and two skills development courses (ENSP 37 and 65):

ENSP 35/36: One Earth: Global Environmental Science plus lab (4)

ENSP 37: Environmental Case Analysis (3)

ENSP 41: Principles of Geology (4)

ENSP 61: Environmental Sociology (3)

ENSP 65: Introduction to GIS (3)

(17 credits)

ENVIRONMENTAL SCIENCE AND POLICY

Environmental Science; Biological Conservation Track (62 credits)

Core Curriculum:

ENSP 35/36: One Earth: Global Environmental Science plus lab (4)
ENSP 37: Environmental Case Analysis (3)
ENSP 41: Principles of Geology (4)
ENSP 61: Environmental Sociology (3)
ENSP 65: Introduction to GIS (3)

Life Science Base:

BIO 12 & 13: General/Pre-Professional Biology (8)
CHEM 1 & 3: General Chemistry with lab (4)
BIO 117 & 118: Ecology (5)
BIO 120 & 120L or 167 & 167L: Advanced ecology (4).

Data Analysis:

BIO 99 or Stat 60: Statistics (3)
ENSP 154 or 168: Modeling (3)
ENSP 165: Advanced GIS (3)

Field Electives (6 credits, advisor approved):

A field elective is any course in the earth or life sciences that incorporates a significant field component. This could be a laboratory with a large fraction of field activities, or it could be a course where field work is fully integrated into the course itself.

Curriculum Continued:

Science-Policy Integration (6 credits from):

ENSP 135: Global Change
ENSP 125: Conservation Biology
ENSP 150: Water Resources

or advisor approved elective where there is significant consideration of scientific content as well as how the science relates to important discussions in the policy realm.

Capstone (3)

ENVIRONMENTAL SCIENCE AND POLICY

Environmental Hydrology, and Geology Track (62 credits)

Core Curriculum:

ENSP 35/36: One Earth: Global Environmental Science plus lab (4)

ENSP 37: Environmental Case Analysis (3)

ENSP 41: Principles of Geology (4)

ENSP 61: Environmental Sociology (3)

ENSP 65: Introduction to GIS (3)

Physical Science Base

MATH 050: Calculus I (3)

BIO 99 or STAT 60: Statistics (3)

PHYS 1: Introductory Physics (4)

CHEM 1-4: General Chemistry with Lab (8)

Quantitative/Chemical Science; 6 credits from

MATH 70 or higher

CHEM 81 or higher

Area of Specialization; 12 credits from

ENSP 27 Environmental Hazards

ENSP 105 Environmental Geology

ENSP 150 Landscape Evolution

ENSP 150 Global Biogeochemical Cycles

ENSP 165 Advanced GIS

ENSP 168 Dynamic Modeling

Or advisor-approved specialization course

Curriculum Continued:

Science-Policy Integration (6 credits from):

ENSP 135: Global Change

ENSP 125: Conservation Biology

ENSP 150: Water Resources

or advisor approved elective where there is significant consideration of scientific content as well as how the science relates to important discussions in the policy realm.

Capstone (3)

ENVIRONMENTAL SCIENCE AND POLICY

Environmental Policy Track (62 credits)

Environmental Policy (63 credits)

ENSP 35/36: One Earth: Global Environmental Science plus lab (4)
ENSP 37: Environmental Case Analysis (3)
ENSP 41: Principles of Geology (4)
ENSP 61: Environmental Sociology (3)
ENSP 65: Introduction to GIS (3)

Economic Foundations (6)

Introductory Level:

ECON 2: Microeconomics

Advanced Level (take one of the following):

ECON 109: Public Economics

ENSP 153: Ecological Economics

ENSP 154: Environmental Decision-Making

Advisor-approved 100-level or above economic elective (usually in the ENSP program or Economics department) where the course focuses on the application of economic reasoning to environmental or resource-related issues.

Historical Foundations (6)

Take 2 of the following:

HIST 67: Sustainable Development in Africa

HIST 194: Urban Environmental History

ENSP 103: Foundations of Natural History and Environmentalism

Advisor-approved history elective (usually in the ENSP program or History department) where the course focuses on the history of an important environmental issue or topic.

Curriculum Continued:

Social Foundations (6)

Take 2 of the following:

ENSP 71: Environmental Movements

ENSP 111: International Environmental Seminar

ENSP 157: Environmental Justice

Advisor-approved social elective (usually in the ENSP program or SCS department) where the course focuses on the interaction between social and environmental aspects of a topic.

Political Foundations (6)

Take 2 of the following:

POLS 155: American Public Policy

ENSP 107: Civic Environmentalism/Smart Growth

ENSP 156: Environmental Politics and Policy

Advisor-approved political elective (usually in the ENSP program or Politics department) where the course focuses on the political process in a way that helps students to understand the development, implementation, or effects of environmental policies.

Area of Specialization (3)

100-level ENSP course or Advisor-approved elective (100-level or above) in an area of specialization that complements and deepens the student's understanding of one of the foundational areas.

Science-Policy Integration (6 credits from):

ENSP 135: Global Change; ENSP 125: Conservation Biology;

ENSP 150: Water Resources

(or advisor approved elective where there is significant consideration of scientific content as well as how the science relates to important discussions in the policy realm).

Capstone (3)