Report from Committee to develop Bachelor of Arts Degree in Environmental and Sustainability Studies

April 12, 2012
Revised February 7, 2013

Background

This report summarizes the recommendations of the ad hoc committee charged to develop a new interdisciplinary degree program in Environmental and Sustainability Studies. The committee was convened at the request of Deans Larry Singell (the College) and John Graham (SPEA) in Fall 2011, in part as an action stemming from the President's New Academic Directions (NAD) Committee recommendations. The NAD report recommended ‘develop[ing] a new interdisciplinary undergraduate major and a strategic plan for service learning and community outreach in sustainable development.’ The work of this committee is intended to address the first component of this recommendation.

The committee was co-chaired by Phil Stevens (SPEA) and Tom Evans (Geography). Committee members included faculty members from the College of Arts & Sciences (4), SPEA (4), and HPER (1): Matt Auer (Honors College/SPEA), Burney Fischer (SPEA, former Director of Undergraduate Studies), Jeff White (SPEA), Ellen Ketterson (Biology), Doug Knapp (HPER - RPTS), Michael Hamburger (Geological Sciences), Todd Royer (SPEA), and Lisa Sideris (Religious Studies).

In coordination with the Student Sustainability Council (SSC), we enlisted two student representatives for the committee: Julia Denison (Undergraduate student-Fine Arts) and Sara Swan (Undergraduate Student-IMP). David Halloran (the College) and Doug Goldstein (SPEA) participated ex officio and provided valuable input throughout the process. The committee met on a roughly bi-weekly basis over the course of the fall semester, and concluded its deliberations in late January 2012.

Rationale

Why develop a new program in Environmental & Sustainability Studies? There is growing evidence, based on anecdotal information, interviews with IU students, and national student interest profiles, that environmental issues represent a substantial, and growing, area of undergraduate student interest. A recent poll conducted in Fall 2011 by the student representatives on the committee (Julia Denison and Sara Swan) demonstrates that there is substantial interest among current IU students in either majoring or double majoring in a sustainability-related degree (see survey results in Appendix B for additional detail). More importantly, we see considerable opportunities to attract students to IU Bloomington who currently are enrolling at other institutions.

Although IU-Bloomington offers a number of degree programs related to environmental studies, there is a sense among faculty and students that the needs of a substantial popula-
tion of students are not fully met by existing programs. Thus, a primary target audience of this new degree program is the population of students who are deeply interested in environmental issues but perhaps less inclined to focus on a traditional disciplinary line of education. In addition to the ‘traditional’ environmental studies field, there is a growing interest in sustainability studies, which focuses on systems-level interaction of the social and economic spheres with the natural environment. The growing interest in this arena is exemplified by the creation of IU’s Office of Sustainability, the steady growth in the number of courses devoted to sustainability issues, and the large numbers of IU students interested in internships and other practical experiences related to sustainability.

Similar integrative programs have developed at many of our peer institutions. Among the most prominent is Arizona State’s School of Sustainability which now offers three B.A. degree tracks and two B.S. tracks related to sustainability. Closer to home, the University of Michigan’s Program in the Environment offers a campus-wide interconnected program focusing on environmental issues, and Northwestern University’s Initiative for Sustainability and Energy offers campus-wide interdisciplinary courses in these areas. The University of Illinois at Urbana-Champaign has developed a new School of Earth, Society, and Environment, which has grown significantly over the past two years; the University of Wisconsin, already home to a number of interdisciplinary environmental programs through the Nelson Institute for Environmental Studies, has developed a new interdisciplinary B.A. program in Environmental Studies.

**Relation to Existing IU Bloomington Degree Programs**

A number of existing programs could benefit from the creation of a new, interdisciplinary Environmental & Sustainability Studies (E&SS) degree program. The programs, and a brief discussion of the anticipated impact of the creation of a new E&SS program, are described below:

**B.S. Environmental Science (BSES).** The BSES program is an interdisciplinary environmental science program jointly operated by the College and SPEA. The BSES program is a high-level science program requiring substantial exposure to allied sciences and independent undergraduate research. It typically graduates 10–15 students per year. Because of the stringent science requirements, intensive summer field experience requirement, and undergraduate research requirement, enrollments are typically limited to a small number of highly qualified science students. The B.A. program proposed here would not be expected to severely impact the numbers of BSES majors, though it is likely to offer a ‘lower-impact alternative’ for a modest number of less strictly science-oriented students.

**B.S.P.A. Environmental Management.** The BSPA program, administered by SPEA, is focused on applied aspects of environmental policy, and prepares students for professional careers in government, the non-profit sector, and private industry. A new program in environmental studies focused on human-environment interactions may offer an alternative to some of these students—particularly those with interests in humanities and social sciences. On the other hand, the proposed E&SS program, as a joint program between the College and SPEA, will open access to SPEA courses and prospective majors to a large number of
students in the College. A significant percentage of the courses identified in the course proposal are in SPEA, and thus credit hours could substantially increase.

**HPER Recreation & Park Administration.** The RPA program includes a strong component of environmental education, and would make an excellent complement to the program proposed here. Many HPER courses are included in the E&SS program proposal as electives. We anticipate that some students in the RPA program would select E&SS as a double major.

**Other College Departments.** Given the breadth of the fields of Environmental & Sustainability Studies, many disciplines could be positively affected by the new major. Those most closely aligned are the departments of Geography (which currently offers a Sustainable Systems track), Anthropology (whose focus on Human-Environment Interaction is central to the new major), Human Biology (with a Human-Environment track), Biology (with an Evolution & Ecology track), and Geological Sciences (with an Environmental Geology track). Many current and future students might elect to add E&SS as a second major while also completing B.A.s in these existing degrees.

**Logistical & Financial Issues**

It is beyond the charge of this committee to fully explore all of the financial, administrative, and human resource issues involved in the creation of a new degree program. Nonetheless, we have conducted our deliberations in full awareness of the current economic climate and limitations on new faculty and infrastructure resources. Thus we have strived to create a program that maximizes the use of existing faculty and coursework, and which would be likely to have only minimal budgetary impact on participating schools and departments. We briefly review several of the critical logistical and support issues involved in implementation of the proposed new degree program. Overall, our belief is that the creation of this program would be budget neutral—and could eventually develop significant sources of external support.

1. **Faculty Resources.** We believe that there already exists a critical mass of IUB faculty involved in teaching environmentally related courses at the undergraduate level that could collectively support the creation of this new academic program. These include faculty in numerous departments in the College and SPEA, as well as many distributed across the other professional schools. These faculty leaders would enable the program to get off the ground, but over time as the program grows in enrollment, additional faculty hires in sustainability science would help the program mature and meet future student needs.

2. **Incentivizing faculty participation.** The creation of a new interdisciplinary program would require effort by a core set of faculty from numerous departments and schools. This understandably raises issues of instructional demands in home units as well as course offerings central to the new proposed program. The current degree proposal primarily relies on existing courses – but we see value in providing resources to enable new courses to be developed that directly contribute to future
student needs. Faculty review and reward systems will also need to adjust in order for faculty contributions to this collaborative program to be properly recognized.

3. **Program Management.** The program will require administrative resources to ensure a successful initiation. A successful management scheme can be built upon models from other interdisciplinary programs on the IUB campus. We envision the need for a program director, some staff support, and resources for marketing, communication, website development, and advising.

4. **Student Advising.** Based on feedback from student participants, we conclude that one of the issues critical to the success of the program is student advising. The success of the new proposed program will depend on advising at both the University Division level to promote this program to UDIV students, and to students who have decided to pursue the E&SS B.A. degree. The new degree program will offer a myriad of options for new students, in addition to the numerous programs related to the environment. University Division and College and SPEA advisors will need to be well versed in the options for various degrees, and will need to work to steer prospective students toward the option(s) most appropriate for their interests.

This report consists of the following components:

1) Draft B.A. Degree Program

2) Summary results from survey of existing students regarding interest in sustainability-related degree programs
ENVIRONMENTAL AND SUSTAINABILITY STUDIES DEGREE PROGRAM

Objectives and Rationale

Environmental and sustainability studies define a new pedagogical domain for education. Understanding human-environment interactions and their connection with ecological, societal, and economic processes at local, regional, and global scales is a core competency in today’s world. The study of sustainability bridges the arts and humanities, social sciences, and the physical and life sciences. It complements traditional disciplines by offering an opportunity for education in the area of coupled natural and human systems that encompasses study of the environment, society, and economy. The goal of the B.A. degree in Environmental and Sustainability Studies is to provide students a broad introduction to the complex system-scale challenges of sustainability as well as the tools needed to address problems that transcend solely social or environmental domains.

Although this is designed as a stand-alone major, students are encouraged to pursue this degree program as a second major opportunity. Pursuing two majors enables students a combination of depth in a core discipline and breadth across the range of topics that are inherent in environmental and sustainability studies. The Environmental and Sustainability Studies degree also emphasizes training in the area of human-environment interactions, objectives that may not be part of other degree programs. In addition, students can also obtain a minor in environmental and sustainability studies to complement their major degree program.

Degree Requirements (Bachelor of Arts Major)

The B.A. program educates students in broad issues of environmental and sustainability studies (E&SS) in the context of real-world environmental, social, and economic challenges. The proposed program is designed to balance disciplinary depth with mastery in the interdisciplinary area of human-environment interactions. Students will be encouraged to pursue one of four distinct concentration areas within the B.A. program for upper-level coursework, but all students will engage in common course experiences that provide an introduction to core issues in sustainability, ecological footprint, and ecosystem services, and training in human-environment systems synthesis, tools, and applications.

All students are expected to fulfill campus General Education requirements, which include a breadth of courses mostly at the introductory (100–200) levels.

In addition to the University and school-mandated distribution requirements, this major requires one mandatory introductory-level environmental sustainability foundation course, one intermediate-level human-environment systems training course, three skills-based courses, including one focused environmental science course and one economics course, and four concentration courses. One of the 3-credit (CR) courses counted toward the E&SS degree may be counted toward a second B.A. or B.S. degree. The specific course requirements include:
1. One introductory environmental sustainability foundation course from the list in Appendix A (3 CR)

2. Upper-level human-environment systems training course (3 CR) – must be selected from list in Appendix B.

3. Three environmental skills/research methods courses (9 CR) – must be selected from the list in Appendix C. At least one of the courses must come from a list of environmental science courses (Group IV), and the other from a list of economics courses (Group V).

4. A series of courses from one of several defined concentration areas that enable students to develop a specialization in a subfield of sustainability science (12 CR).

Note: A single course that is co-listed as either a human-environment systems training course, a skills/research methods course, or a track course may count toward two of the degree requirements.

1. **Introductory Environmental Sustainability Foundation Course (3 CR)**

The B.A. degree requires one introductory course addressing the intersections and feedbacks between social and environmental systems. This course explicitly incorporates integrated, coupled social-environmental concepts in a single course to develop a path of critical thinking that students will use as a platform for more advanced study later in the program. After completing the introductory course requirement, students will have gained core knowledge of the following topics:

- **Basic ecology and ecosystem services**
  1. Roles of geosphere, hydrosphere, atmosphere, and biosphere in life-support processes of ecosystems
  2. Connection between food, energy, and environment
  3. Basic models of climate change, role of greenhouse gases

- **Human-environment interaction and ecological footprint**
  1. Population, consumption, and environmental change (e.g., land-use change, alterations to biogeochemistry, biodiversity change)
  2. Global development issues, linkage to environmental challenges
  3. Sense of place; intentional and reflective study of human relations to the natural world

- **Sustainability**
  1. Linkages between social, economic, and environmental issues
  2. Climate change mitigation and adaptation
  3. Sustainable systems for energy, agriculture, and the built environment
2. Upper-Level Human-Environment Systems Training Course (3 CR)

Human-environment systems courses integrate methods, theories, and concepts from multiple disciplines into a single course. The ability to think across disciplines is an important objective for students in the E&SS degree program, particularly the ability to cross boundaries between natural sciences and social and humanities studies. These courses will teach students how to communicate and engage with individuals from different disciplinary backgrounds, and how to translate theories, methods, and concepts from one discipline to another. Human-environment systems course offerings for this major include upper-level courses in several departments and are summarized in Appendix B.

3. Three Environmental Studies Skills/Research Methods Courses (9 CR)

The skills requirement is intended to provide E&SS majors with specific expertise using the methods/tools commonly used in the study of human-environment interaction and change, including scientific methods, sociological approaches (e.g., interviews, surveys), quantitative analysis (e.g., modeling, statistics), and qualitative analysis (e.g., ethnography), as well as rhetorical analysis and communications skills. Methodological competencies can be defined in relation to the student’s focus within the realm of E&SS. Examples of course topics that fulfill the methods competency include field ecology, social-cultural and ethnographic methods, geographic information systems (GIS), ethnobotany, and laboratory methods. At least 3 CR must be taken from a list of environmental science courses (Group IV), another 3 CR must be taken from a list of economics courses (Group IV), and the other 3 CR can come from one of several methods areas (Groups I, II, III).

4. A Series of Courses from One of Several Defined Concentration Areas (12 CR)

At least 9 CR must be 300- or 400-level courses. See details of concentration areas (5.1) Sustainable Food Systems, (5.2) Sustainable Energy and Resources, (5.3) Environmental Justice/Ethics, (5.4) Biodiversity and Sustainability, and (5.5) Sustainability Individualized Program.

Minor in Environmental and Sustainability Studies

Students must complete a minimum of 15 CR to receive a minor in Environmental and Sustainability Studies. This 15 CR minimum must include the following: (1) Introductory Foundation Course (3 CR), (2) Upper-Level Human-Environment Systems Training Course (3 CR), and (3) 9 CR of elective courses selected from the degree program Concentration Areas listings (see B.A. Major Degree Requirements document for a complete listing). At least 6 CR must be completed at the 300 or 400 level.
Environmental and Sustainability Studies Concentration Areas

5.1. Sustainable Food Systems Concentration

This concentration area focuses on issues of sustainable food systems and food security. It provides students with a broad understanding of food production, including cultural and nutritional aspects of food systems. Also emphasized are the relationships between sustainable food systems and climate change, water resources, and other environmental concerns. This concentration prepares students for successful careers in environmental and sustainability policy as related to food production and food security.

Course Requirements

The concentration is designed to demonstrate depth and academic rigor in academic coursework related to sustainable food systems. The concentration requires 12 CR and ensures that students within the concentration experience a common core of coursework as well as flexibility to design majors that meet their particular academic interests.

Required Core Courses:

Geography
   G478 - Global Change, Food, and Farming Systems

Anthropology
   E421 - Food and Culture

Elective Courses: Students must select two from the following list.

Anthropology
   A200 - Topics in the Sciences: Bizarre Foods
   A211 - Topics in the Sciences: Anthropology of Hunger
   A221 - Topics in the Sciences: Anthropology of Food
   P375 - Food in the Ancient World
   E426 - Coffee Culture, Production and Markets

Geography
   G306 - The Geography of Current Issues - Geography of Food

Health, Physical Education and Recreation
   N220 - Nutrition for Health
   N321 - Quantity Food Purchasing and Production
   N366 - Community Nutrition

Latin American Studies
   L426 - Roots, Fruits, and Jamaican Ecologies

Public and Environmental Affairs
   SPEA-E400 - Topics in Environmental Studies: Farming the City: Global Perspectives on Urban Agriculture & Food Security
5.2. Sustainable Energy and Resources Concentration

This concentration area focuses on issues of sustainable energy systems and stewardship of mineral, biological, and water resources. It is designed to provide students with a strong foundation in the theories and methods from both the social and environmental sciences. This human-environment systems approach is critical to finding practical solutions to environmental challenges that fit the specific social and cultural contexts within complex coupled human-natural systems. This concentration area allows students to develop complementary skills from both the social and environmental sciences and integrate them in research and analysis. Students will learn how to study human behavior as it impacts natural resource systems, address social science dimensions of how culture relates to environmental studies, identify degradation in natural resource systems, examine feedbacks among social and biophysical components of social-ecological systems, and explore approaches to assess change processes and resilience in social-ecological systems. This concentration allows students to learn quantitative and qualitative methods and analytical skills to prepare for successful careers in environmental and sustainability policy, urban and land-use planning, environmental education, and international development, among others.

Course Requirements

The Sustainable Energy and Resources Concentration is designed to demonstrate depth and academic rigor in academic coursework related to sustainable energy and resources. The concentration requires 12 CR at the 300 and 400 levels. It ensures that students within the concentration experience a common core of coursework as well as flexibility to design majors that meet their particular academic interests. Thus, the concentration requirements include 300- to 400-level courses from a suite of core courses, as well as elective courses from the broader sustainability course list. Core courses may count as elective selections as well.

Required Core Courses: Students must select two from the following list.

**Geography**
- G411 - Sustainable Development Systems
- G442 - Sustainable Energy Systems
- G451 - Water Resources: Semi-Arid Environments
- G461 - Human Dimensions of Global Environmental Change

**Physics**
- P310/510 - Environmental Physics

**SPEA**
- E400 - Environmental Sustainability
- E476 - Environmental Law and Regulation
E lective Courses: Students must select two from the following list.

**Anthropology**  
E328 - Ecological Anthropology  
E418 - Globalization and Consumer Culture  
E444 - People and Protected Areas  
**Apparel Merchandise/Interior Design**  
R416 - Sustainability in Product Design  
**Biology**  
L350 - Environmental Biology  
L473 - Ecology  
**Business**  
L302 - Sustainability Law and Policy  
G456 - Sustainable Enterprise  
**Central Eurasian Studies**  
R394 - Environmental Problems and Social Constraints in Northern and Central Eurasia  
**Chemistry**  
A314 - Biological and Environmental Chemical Analysis  
**Criminal Justice**  
P410 - Environmental Justice  
**Geography**  
G305 - Environmental Change: Nature and Impact  
G307 - Biogeography: Distribution of Life  
G411 - Sustainable Development Systems  
G442 - Sustainable Energy Systems  
G451 - Water Resources: Semi-Arid Environments  
G461 - Human Dimensions of Global Environmental Change  
G475 - Climate Change  
**Geological Sciences**  
G341 - Natural History of Coral Reefs  
G416 - Economic Geology  
G451 - Principles of Hydrogeology  
**History**  
W300 - Global Environmental History  
**Health, Physical Education and Recreation**  
R323 - Ecosystem Management  
R350 - Sustainable Tourism  
R355 - Outdoor Recreation Consortium  
R385 - Wilderness and Protected Lands  
R429 - Ecotourism: Administration and Management  
**Labor Studies**  
L390 - Labor and Global Warming  
**Physics**  
P310 - Environmental Physics  
**Political Science**  
Y313 - Environmental Policy  
**SPEA**  
E311 - Introduction to Risk Assessment and Communication  
E332 - Introduction to Applied Ecology  
E340 - Environmental Economics and Finance  
E363 - Environmental Management  
**Topical courses**  
E400 - The Foundations of LEED (Leadership in Energy and Environmental Design)  
E400 - Environmental Sustainability  
E400 - Biological Assessment and Criteria  
E400 - Environmental Topics: Farming the City  
E400 - Environmental Topics: Radiological Hazard Management  
E400/V450 - Leadership and Creativity in Environmental Policy  
E422 - Urban Forest Management  
E426 - Applied Mathematics for Environmental Sciences  
E431 - Water Supply and Wastewater Treatment  
E451 – Air Pollution and Control  
E452 - Solid and Hazardous Waste Management  
E456 - Lake and Watershed Management  
E460 - Fisheries Wildlife and Management  
E476 - Environmental Law and Regulation  
H316 - Environmental Health Science  
V450 - Public Transit Management  
V450/462 - Community Development  
V450 - Climate Change and Electricity  
V462 - Community Development
5.3. Environmental Ethics/Justice Concentration

This concentration emphasizes the role of the environmental humanities in understanding and analyzing the human-nature relationship. Environmental ethics focuses on ethical arguments governing human interaction with the nonhuman environment and the moral status of nonhuman entities such as animals, plants, species, and ecosystems. Environmental justice is concerned that people have equal access to a healthy environment and environmental protection, regardless of race, color, nation of origin, or income. Students in this concentration will gain familiarity with, and critically evaluate, the strengths and weaknesses of contemporary approaches to environmental ethics. These may include animal rights and liberation, holistic environmental approaches, religion and ecology, feminist environmental ethics, deep ecology, and place-based environmentalism. Students will also learn to apply traditional ethical theories (e.g., deontology, consequentialist theories, and virtue ethics) to environmental issues. Students may choose courses pertaining to the creative arts, such as writing and media applications; religion and philosophy; or environmental education.

Course Requirements

The concentration is designed to demonstrate depth and academic rigor in academic coursework related to Environmental Ethics and Justice. The concentration requires 12 CR and ensures that students within the concentration experience a common core of coursework as well as flexibility to design majors that meet their particular academic interests.

Required Core Courses:

- Religious Studies
  REL-D350 (formerly R371) - Religion, Ethics, and the Environment
- Criminal Justice
  P401 - Environmental Justice

Elective Courses: Students must select two from the following list.

- Anthropology
  E328 - Ecological Anthropology
  E444 - People and Protected Areas

- Biology
  L222 - The City as Ecosystem
  L208 - The Literary and Legal Animal

- Communication and Culture
  C212 - Communicating Sustainability
  C348 - Environmental Communications

- Geography
  G315 - Environmental Conservation
  G449 - Political Ecology
  G461 - Human Dimensions of Global Environmental Change

- Religious Studies
  REL P250 - Religion, Ecology, and the Self
  REL R202 - Religion and Animals
5.4. Conservation, Biodiversity and Sustainability Concentration

This area of concentration focuses on balancing the essential goals of sustaining biodiversity in harmony with the need to accommodate present and future human needs. Achieving the first goal of sustaining biodiversity will require the preservation of variety and variability among living organisms and the ecological complexes in which they occur, including systems, species, genes, and their relative abundance. Achieving this goal in harmony with the needs of the human population represents one of the great challenges of the 21st century.

Meeting this challenge will be addressed by enhancing appreciation for diverse life forms through knowledge of their ecology, evolution, and behavior. It will also be achieved by imparting an appreciation for a ‘sense of place’ as gleaned from the study of geography, geology, and cultural history. Students in this concentration will acquire deep knowledge of fundamental ecological principles, regional and global biogeography, and the nature of environmental impacts engendered by human populations. They will emerge with a strong foundation in theory and methodology derived from basic biology, geography and geology and from the social and environmental sciences. The interdisciplinary approach pursued will be critical to finding practical solutions to the threats to biodiversity that also incorporate meeting the specific social and cultural needs arising from complex human-natural systems.

This concentration will allow students to develop research and analytical skills derived from the social, biological, and environmental sciences and to apply those skills to pressing problems related to the maintenance of biodiversity and human well-being. Students will learn how to study human behavior as it impacts biotic systems, how culture impedes or enhances sustainability of natural systems, how degradation in natural resource systems can be identified, and how feedbacks among social and biophysical components of socio-ecological systems can be assessed and addressed. Students will explore and weigh different approaches to assessing environment change, biodiversity, and the resilience of socio-ecological systems. Students will be able to employ the quantitative and qualitative methods and analytical skills they acquire in meaningful careers in natural resources, environmental and sustainability policy, urban and land-use planning, environmental education, and international development, among others.

Course Requirements

The Biodiversity and Sustainability Concentration is designed to demonstrate depth and academic rigor in academic coursework related to biodiversity and sustainability. The concentration requires 12 CR at the 300 and 400 levels. It ensures that students within the concentration experience a common core of coursework as well as flexibility to design a major that meets their particular academic interests. The concentration requires that students experience some exposure to 300- and 400-level courses from each of three suites of ‘core courses’ related to sustainability.
### Required Core Courses: Minimum 9 CR

1. **BIOL L350** - Environmental Biology
2. One of the following two courses:
   - **SPEA E457** - Introduction to Conservation Biology
   - **GEOG G315** - Environmental Conservation
3. Either
   a. **BIOL L479** - Evolution and Ecology or
   b. **Both BIOL L473** - Ecology, **BIOL L318** - Evolution

### Elective Courses: Students must select one from the following list.

**Anthropology**

- E328 - Ecological Anthropology
- E444 - People and Protected Areas: Theories of Conservation

**Biology**

- B300 - Vascular plants
- B351 - Fungi
- B364 - Summer Flowering Plants
- B368 - Ethnobotany
- B371 - Ecological plant physiology
- L318 - Evolution
- L369 - Heredity Evolution and Society
- L376 - Biology of Birds
- L433 - Tropical Biology
- L472 - Microbial Ecology
- Z373 - Entomology
- Z374 - Invertebrate Zoology
- Z406 - Vertebrate Zoology
- Z460 - Animal Behavior
- Z476 - Biology of Fishes

**SPEA**

- E332 - Introduction to Applied Ecology
- E363 - Environmental Management
- E422 - Urban Forest Management
- E456 - Lake and Watershed Management
- E460 - Fisheries Wildlife and Management
- E476 - Environmental Law and Regulation

**Health, Physical Education and Recreation**

- R323 - Ecosystem Management
- R385 - Wilderness and Protected Lands
- R323 - Ecosystem Management
- R350 - Sustainable Tourism
- R385 - Wilderness and Protected Lands

**Geography**

- G451 - Water Resources: Semi-Arid Environments
- G461 - Human Dimensions of Global Environmental Change

**Geological Sciences**

- G308 - Paleontology and Geology of Indiana
- G329 - Introductory Field Experience in Environmental Science
- G341 - Natural History of Coral Reefs
- G415 - Geomorphology
- G429 - Field Geology in the Rocky Mountains
- G451 - Principles of Hydrogeology
5.5. Sustainability Individualized Program (Concentration option)

In some cases, students may find new and innovative sustainability dimensions that do not fit the existing concentration areas. To accommodate these cases, students should discuss with the program director individualized courses of study to pursue the Environmental and Sustainability Studies B.A. degree. After this discussion, students are responsible for composing a proposal for a Sustainability Individualized Program (SIP), which must be approved by the program director. Students pursuing the SIP option are required to fulfill the core requirements of the Environmental and Sustainability Studies degree program.

Appendix A – Approved Introductory Foundation Courses

ANTH E101 Ecology and Society
GEOL G105 Earth, Our Habitable Planet
SPEA E162 Environment and People
GEOG G208 Human Environment Interactions

Appendix B - Approved Human-Environment Systems Courses

ANTH E328 Ecological Anthropology
ANTH E380 Urban Anthropology
ANTH E418 Globalization and Consumer Culture
ANTH E444 People and Protected Areas: Theories of Conservation
BIOL T312 Societal Issues in Biotechnology
GEOG G315 Environmental Conservation
GEOG G411 Sustainable Development Systems
GEOG G442 Sustainable Energy Systems
GEOG G449 Political Ecology
HPSC X338 Science and Religion
HPSC X370 Science and Gender
HPSC X394 Structure and Methods of the Life Sciences
HPSC X451 Scientific Understanding
HPSC X452 Modern Philosophy of Science
HPSC X456 Philosophy of Science in Antiquity
SPEA E324 Controversies in Environmental Health
SPEA E422 Urban Forest Management
SPEA E457 Introduction to Conservation Biology
Appendix C – Approved Skills/Research Methods Courses

**GROUP I: APPLIED SUSTAINABILITY**

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tr>
<td>HPER</td>
<td>Community Nutrition</td>
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<td>HPER</td>
<td>Ecosystem Management</td>
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<td>HPER</td>
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<td>SPEA</td>
<td>Introduction to Applied Ecology</td>
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<td>SPEA</td>
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<td>SPEA</td>
<td>Wetlands Biology &amp; Regulation</td>
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<td>SPEA</td>
<td>Solid and Hazardous Waste Management</td>
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<td>Lake and Watershed Management</td>
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<td>SPEA</td>
<td>Fisheries &amp; Wildlife Management</td>
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<td>Financial Management</td>
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<td>SPEA</td>
<td>Nonprofit Management &amp; Leadership</td>
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<td>SPEA</td>
<td>Government Finance &amp; Budgets</td>
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<td>SPEA</td>
<td>Financial Analysis &amp; Cost Benefit</td>
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**GROUP II: COMMUNICATION**

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<tr>
<td>BIOL</td>
<td>Writing Workshop in Biology</td>
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<td>CMCL</td>
<td>Motion Picture Production</td>
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<td>CMCL</td>
<td>Documentary Filmmaking</td>
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<td>ENG</td>
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<td>Introduction to Risk Assessment and Risk Communications</td>
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<td>SPEA</td>
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**GROUP III: DATA COLLECTION & ANALYSIS**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>ANTH</td>
<td>Laboratory in Ethnography</td>
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<tr>
<td>ANTH</td>
<td>Anthropological Statistics</td>
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<tr>
<td>ANTH</td>
<td>Life Histories</td>
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<tr>
<td>ANTH</td>
<td>Arts and Crafts of Ethnography</td>
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<tr>
<td>BIOL</td>
<td>Environmental Biology</td>
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<tr>
<td>BIOL</td>
<td>Ecology</td>
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<tr>
<td>CMCL</td>
<td>Ethnography as Cultural Critique</td>
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<tr>
<td>ECON</td>
<td>Statistical Analysis for Business and Economics</td>
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<tr>
<td>GEOG</td>
<td>Remote Sensing</td>
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<tr>
<td>GEOG</td>
<td>Geographic Information Science</td>
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<tr>
<td>GEOG</td>
<td>Instrumentation &amp; Field Methods in Atmospheric Science</td>
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<tr>
<td>GEOG</td>
<td>Advanced Synoptic Meteorology &amp; Climatology</td>
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<tr>
<td>GEOG</td>
<td>Applied Spatial Statistics</td>
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<tr>
<td>GEOL</td>
<td>Principles of Hydrogeology</td>
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<tr>
<td>POLS</td>
<td>Quantitative Political Analysis</td>
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<tr>
<td>SOC</td>
<td>Research Methods in Sociology</td>
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<td>SOC</td>
<td>Statistics for Sociology</td>
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<tr>
<td>SPEA</td>
<td>Introduction to Risk Assessment &amp; Risk Communication</td>
</tr>
</tbody>
</table>
SPEA  E418  Vector-Based GIS
SPEA  E419  Applied Remote Sensing of the Environment
SPEA  E442  Habitat Analysis – Terrestrial
SPEA  E443  Habitat Analysis – Aquatic
SPEA  E426  Applied Mathematics for Environmental Science
SPEA  K300  Statistical Techniques
STAT  S320  Introduction to Statistics

GROUP IV: ENVIRONMENTAL SCIENCE COURSES
BIOL  L111  Foundations of Biology: Evolution and Diversity
GEOG  G107  Physical Systems of the Environment
GEOG  G109  Weather & Climate
GEOL  G111  Physical Geology
GEOL  G131  Oceans & Our Global Environment
GEOL  G171  Environmental Geology
SPEA  E272  Introduction to Environmental Sciences

GROUP V: ECONOMICS COURSES
ECON  E201  Introduction to Microeconomics
ECON  E321  Intermediate Microeconomic Theory (P: E201)
ECON  E364  Environment and Resource Economics (P: E321)
SPEA  E340  Environmental Economics and Finance
Selected results from survey of current IU students (N=152). Data compiled by Julia Denison and Sara Swan, student representatives to the committee.
How interested would you be in a minor focused on sustainability?

- Very Interested
- Somewhat Interested
- Not Interested