SUSTAINABILITY STUDIES PROGRAM

Minor:

• Sustainability, Energy, and the Environment (p. 1)

The Sustainability Studies Program (SSP) is a multidisciplinary effort to encourage students to explore complex societal sustainability issues that do not fit easily into one traditional academic discipline. The genesis of this program lies in the realization that a scientific and technical knowledge of environmental, ecological, and energy system challenges will not be sufficient to develop viable answers. Many disciplines at the University make contributions to these issues, ranging from ethical, spiritual, and artistic, to economic, political, and sociological approaches. Students will take interdisciplinary courses and will participate in interdisciplinary research.

Interested students should notify the program director.

Sustainability Studies Program Advisory Committee

Rebecca Potter (English), Program Director

Beagle (Chemistry), Bednarek (History), Bohrer (Fitz Center), Brecha (Physics), Cuy Castellanos (Dietetics), Hallinan (Mechanical Engineering), Holcomb (Sociology), Jablonski (Marianist Environmental Education Center and Religious Studies), Jennings (Art and Design), King (Rivers Institute), McEwan (Biology), Pautz (Political Science), Schoenenberger (Hanley Sustainability Institute and Geology), Wu (Geology)

Minor in Sustainability, Energy, and the Environment (SEE)

Sustainability, Energy and the Environment 1

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEE 250</td>
<td>Introduction to Sustainability, Energy &amp; the Environment</td>
<td>3</td>
</tr>
</tbody>
</table>

SEE Core 6-9

Select one or two courses (3-6 hours) from:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASI 320</td>
<td>Cities &amp; Energy</td>
</tr>
<tr>
<td>ASI 322</td>
<td>Cities &amp; Suburbs: The Influence of Place (Social Science)</td>
</tr>
<tr>
<td>ASI 345</td>
<td>Special Topics in Social Science</td>
</tr>
<tr>
<td>SEE 303</td>
<td>Constructions of Place</td>
</tr>
<tr>
<td>SEE 390</td>
<td>Special Topics in Sustainability, Energy and the Environment</td>
</tr>
</tbody>
</table>

Select no more than one course (0-3 hours) from: 2

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEE 301</td>
<td>Global Change &amp; Earth Systems</td>
</tr>
<tr>
<td>BIO 310</td>
<td>Ecology</td>
</tr>
<tr>
<td>BIO 359</td>
<td>Sustainability &amp; the Biosphere</td>
</tr>
<tr>
<td>BIO 395</td>
<td>Global Environmental Biology</td>
</tr>
<tr>
<td>GEO 208</td>
<td>Environmental Geology</td>
</tr>
<tr>
<td>CHM/GEO 234</td>
<td>Energy Resources</td>
</tr>
<tr>
<td>PHY 220</td>
<td>Energy &amp; Environmental Physics</td>
</tr>
</tbody>
</table>

SEE Depth 6-9

(one course with experiential or research component) 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEE 401</td>
<td>Sustainability Research I (SEE Depth Courses)</td>
</tr>
</tbody>
</table>

Sustainability Research II SEE 402

Experiential Study in Sustainability, Energy and the Environment SEE 490

Conservation Biology BIO 370

Plant Diversity & Ecology BIO 407

Ecological Restoration BIO 409

Environmental Plant Biology BIO 441

Biological Rivers & Lakes BIO 452

Environmental Ecology BIO 459

Biological Infectious Disease BIO 466

Water Resources Engineering CEE 333

Environmental Pollution Control CEE 390

Water & Wastewater Engineering CEE 434

Hazardous Waste Treatment CEE 463

Economics of the Environment ECO 435

Economic Development & Growth ECO 460

Urban & Regional Economics ECO 485

Engineering Design & Appropriate Technology ENG 342

Glacial Geology GEO 302

Surface & Groundwater Hydrology GEO 309

Applied Geographic Information Systems GEO 450

Environmental Remote Sensing GEO 455

Community Nutrition HSS 302

Food Justice HSS/SOC 384

Environmental History HST 342

History of American City Planning HST 359

Energy Efficient Buildings MEE 420

Sustainable Energy Systems MEE 464

Design for Environment MEE 472

Renewable Energy Systems MEE 473

Energy Efficient Manufacturing MEE 478

Sustainable Manufacturing & Product Design MFG 438

Environmental Ethics PHL 321

Philosophy & Ecology PHL 334

Environmental Policy POL 371

Christian Theology and Environmental Ethics REL 365

Ecology & Religion REL 472

Social Work & Environmental Justice SWK 335

Art and Social Practice VAR 350

Total Hours 18

1 Students who wish to minor in Sustainability, Energy and the Environment should contact the coordinator of the Sustainability, Energy and the Environment minor.

2 Students with a major not otherwise requiring a biology course must complete either SEE 301 (with its prerequisite) or BIO 359 or BIO 395.

3 Additional courses may be approved by SEE coordinator.
Courses

SEE 250. Introduction to Sustainability, Energy & the Environment. 3 Hours
A multidisciplinary introduction to Sustainability, Energy and the Environment (SEE) and to the SEE minor. Emphasis on learning how to view complex issues from different disciplinary points of view, developing reading and critical thinking skills about current issues in sustainability, gaining an awareness of different ethical positions and how these influence the quest for solutions, and learning how scientific and sociopolitical processes work to investigate and address sustainability issues.

SEE 280. Sustainable Communities. 3 Hours
Introduction to fundamental concepts in Sustainability with a focus on the built environment, locality, and community. Includes investigation of how the relationship of social and environmental justice is intrinsic to the study of sustainable communities. Key concepts include social constructions of privilege and social inequality, as well as the characteristics of resilient and adaptive communities.

SEE 301. Global Change & Earth Systems. 3 Hours
Multidisciplinary introduction to the science of the earth system. Focus is on the interrelatedness of geological, biological, chemical and physical processes, and on methods used to understand both the past natural history and potential future scenarios for change in the earth system.

SEE 303. Constructions of Place. 3 Hours
Multidisciplinary, arts-based course that explores the complex connections between our sense of place and the physical and environmental conditions that influence landscapes and communities.

SEE 310. Sustainability Scenarios. 3 Hours
Introduction to the structure, development, communication, and limitations of scenarios used for visioning trajectories and outcomes for human and environmental systems. The course more deeply examines the structure of scenarios as frameworks and stories for engaging critically with a multiplicity of possible outcomes. In analyzing and developing scenarios that address environmental risks and sustainable practices, students learn what a scenario is, how a scenario is created, and in what ways a scenario can be applied, compared and evaluated. Prerequisite(s): SEE 250 or SEE 280.

SEE 325. Sustainable Development Goals. 3 Hours
Analysis of the Sustainable Development Goals as a framework for approaching complex, international challenges of sustainable development, environmental sustainability, climate change mitigation and adaptation, and human rights. Background to the goals, metrics for evaluating progress toward the goals, and interactions between various goals will be evaluated through readings and discussion. Prerequisite(s): SEE 250 or SEE 280.

SEE 390. Special Topics in Sustainability, Energy and the Environment. 1-3 Hours
Examination of a specific problem or topic relating to sustainability, energy and the environment at the regional, national, or global scale including particular topics relating to global sustainability policy and sustainable development goals, human rights and climate change and access to modern energy systems. Students will analyze the topic from multiple perspectives possibly including artistic, technical, scientific, social, economic, ethical, and faith-based. Students will apply interdisciplinary knowledge to characterize systems, resources, and stakeholders relevant to the particular problem or topic and discuss solutions to establish more resilient and sustainable systems. Prerequisite(s): SEE 250.

SEE 398L. Experiential Learning Laboratory. 1-3 Hours
Students participate and contribute in experiential learning projects connected to the SEE ‘verticals’ (e.g., projects linked to UD external communities with long-term SEE commitment). In the experiences, students team with faculty mentors to address real needs in the targeted communities; analyzing and developing solutions from integrative perspectives; communicating results; identifying future projects for achieving desired impact or growing impact. Students are required to develop and maintain a portfolio to archive collective learning and results; document individual learning; and to document reflection about the impact of the experience on their vocation. Students must co-enroll in designated primary course to which the Experiential Learning Lab is attached. This course cannot be taken independently, and must be taken concurrently with the primary course. (For example, a student can take the Experiential Learning Lab for SEE 303 only during the semester she is enrolled in SEE 303). Co-requisite(s): SEE 303 or SEE 310 or SEE 325 or SEE 390 or SEE 401 or SEE 402.

SEE 401. Sustainability Research I. 3 Hours
Interdisciplinary exploration of the issues of sustainability. The scientific, moral, spiritual, social, political, historical, ethical and economic dimensions of sustainability will be explored. Exploration of the foundations of ethical theory and their application to environmental issues. Students will pursue a research project with the primary focus on sustainability on campus. Prerequisite(s): PHL 103 or ASI 112 or ASI 120; completion of General Education Natural Science or CAP Natural Science Requirements: junior or senior standing.

SEE 402. Sustainability Research II. 3 Hours
Interdisciplinary exploration of the issues of sustainability as they affect the Dayton community. Course will also explore political philosophy and the ethical foundations of public policy. Students will choose an in-depth community-based research project. CAPSTONE COURSE for the BS in Sustainability, Energy and Environment, or BA in Sustainability Studies. Prerequisite(s): PHL 103 or ASI 120; SEE 250; SEE 280 and Junior or Senior standing.

SEE 435. System Modeling for Sustainability. 3 Hours
Interdisciplinary approach and means to modeling as a tool for determining successful sustainability related systems. Students learn to translate qualitative scenario descriptions for environmental, socioeconomic and energy systems into quantitative output. The course focuses on defining needs and requirements for success, documenting requirements, then proceeding with systems design synthesis and system validation while considering environmental, socioeconomic, and resource impacts, as well as schedule. This subject emphasizes the links of systems fundamentals of decision theory, statistics, and optimization. It also introduces the most current, commercially successful computer-based systems modeling tools. Prerequisite(s): SEE 250 and MTH 138, or MTH 148 or MTH 168 and MTH 207 or MTH 367 or DSC 210 or PSY 216.

SEE 477. Sustainability, Energy & Environment Honors Thesis Project. 3 Hours
First of two courses leading to the selection, design, investigation, and completion of an independent, original Honors Thesis project under the guidance of a faculty research advisor. Restricted to students in the University Honors Program with permission of the program director and department chairperson. Students pursuing an interdisciplinary thesis topic may register for three semester hours each in two separate disciplines in consultation with department chairpersons. Prerequisite(s): Approval of University Honors Program.
SEE 478. Sustainability, Energy & Environment Honors Thesis Project. 3 Hours
Second of two courses leading to the selection, design, investigation, and completion of an independent, original Honors Thesis project under the guidance of a faculty research advisor. Restricted to students in the University Honors Program with permission of the program director and department chairperson. Students pursuing an interdisciplinary thesis topic may register for three semester hours each in two separate disciplines in consultation with department chairpersons. Prerequisite(s): Approved 477; approval of University Honors Program.

SEE 490. Experiential Study in Sustainability, Energy and the Environment. 1-3 Hours
Experiential study of a topic in Sustainability, Energy and the Environment. Students will study a topic of their choosing in consultation with instructor or faculty advisor. Topics will be problem-driven and focused on developing sustainable solutions at the local, national, or global scale. Prerequisite(s): SEE 250.