

SUSTAINABILITY AND ENVIRONMENTAL STUDIES

Students who matriculated in fall 2024 are eligible for the Sustainability and Environmental Studies major and minor. Students who matriculated in fall 2021, 2022, or 2023 may follow the Environmental Studies major and minor requirements. Any Environmental Studies major or minor who matriculated prior to fall of 2024 must work closely with the program to ensure that they are meeting all requirements appropriately.

Mission Statement

Sustainability and Environmental Studies (SES) offers an in-depth, holistic examination of the relationship between humans and the environment. Our curriculum integrates critical perspectives on coupled human-natural systems relationships and their impacts, while also focusing attention on the action steps individuals, organizations, and societies can take to prevent and reduce lasting harm to the Earth. We explore and work to implement sustainable alternatives to business-as-usual practices. We bridge intellectual approaches from all divisions of the college and help our students develop depth in a particular area or theme of interest within the broad fields of sustainability and environmental studies.

Faculty

Professor Abram Kaplan, Director

Sustainability and ENVIRONMENTAL STUDIES FACULTY

Abram Kaplan, Lucy McAllister, Douglas Spieles, Tom Henshaw (visiting)

AFFILIATED FACULTY

Quentin Duroy (Economics), Jonathan Maskit (Philosophy), Shiri Noy (Anthropology and Sociology), Sarah Supp (Data Analytics), James Weaver (English)

RESOURCE FACULTY

Annabel Edwards (Chemistry), David Goodwin (Earth and Environmental Science), Amanda Gunn (Communication), Rebecca Homan (Biology), Matt Jungers (Earth and Environmental Science), Jordan Katz (Chemistry), Rebecca Kennedy (Classics), Erik Klemetti (Earth and Environmental Science), Andrew McCall (Biology), Trey Proctor (History), Joe Reczek (Chemistry), Jessica Rettig (Biology), Karl Sandin (Art History and Visual Culture), Geoff Smith (Biology), Keith Spencer (Studio Art), Catherine Stuer (Art History and Visual Culture), Andrea Ziegert (Economics).

Academic Administrative Assistant

Brenda Franks

Requirements

The Sustainability and Environmental Studies (SES) Major requires eight courses, one sustainability-themed experiential learning component, and a five-course area of concentration.

1. Four required core courses:

Code	Title
SES 100	Introduction to Sustainability and Environmental Studies
SES 200	Environmental Analysis

SES 301	Sustainability Practicum
SES 401	Sustainability and Environmental Senior Project

*Generally speaking, majors enroll in SES 401 - to complete the senior experience requirement: SES requires a one-semester experience. Alternatives include one semester of senior research independently arranged with a faculty member (typically SES 451 - ; may be extended to a second semester with the addition of SES 452 -), or an approved senior experience in the area of study for a second major – e.g., DA 401 - Seminar in Data Analytics, GH 400 - Global Health Capstone, or ENGL 453 - Senior Writing Project/ENGL 454 - Intensive Senior Writing Project. Students planning to fulfill the SES senior experience other than through SES 401 - are expected to consult with the SES Program Director prior to registration for the Fall of their senior year.

2. Four distribution courses:

Students are to fulfill the requirements of the distribution categories listed below. No double counting is permitted among these distribution categories or between the distribution courses and the concentration.

See the SES myDenison page for an updated list of courses that may be used to fulfill these categories. Also note that some of these courses have prerequisites.

a. One environmental/sustainability course from the Humanities or the Arts. Examples include:

Code	Title
AHVC 263	World Views: Spatial Imagination in East Asia
AVHC 302	
CLAS 312	Ancient Identities
ENGL 291	Environmental Literature
ENGL 391	Nature's Nation
SES 256	Farmscape: Visual Immersion in the Food System
HIST 240	Advanced Studies in Latin American History
PHIL 260	Environmental Philosophy
REL 205	Religion and Nature
See the SES myDenison page for a complete and current list.	

b. One environmental/sustainability course from the Social Sciences. Examples include:

Code	Title
ECON 202	Economic Growth and Environmental Sustainability
ECON 427	Environmental Economics
COMM 215	Special Topics in Communication
SES 240	Environmental Politics and Decision-Making
SES 262	Environmental Dispute Resolution
SES 284	
SES 334	Sustainable Agriculture
See the SES myDenison page for a complete and current list.	

c. A pair of Natural Science courses providing environmental and/or sustainability relevance

Code Title

Examples include:

EESC upper-level environmental science course (e.g., 200, 240, 270, 313) with EESC 100-level prereq)

BIOL 230 Ecology and Evolution (with BIOL 210/ BIOL 220 prereqs)

ENVS 222 & ENVS 223 Geographic Information Systems I and Geographic Information Systems II (with EESC 100, BIOL 210, or ENVS 102 as prereq/co-req)

or EESC 234 Applied GIS for Earth and Environmental Sciences

ENVS 274 Ecosystem Management (with EESC 100-level, BIOL 210, or ENVS 102 as prereq)

See the SES myDenison page for a complete and current list.

3. Experiential Component

The SES major requires students to engage in a minimum of one sustainability experience. A list of approved experiential opportunities is available on the SES myDenison webpage, and is updated each semester to provide real-time information. The webpage includes an overview of sustainability themes, concepts, and criteria for the approval of experience options so that students understand the parameters under which this experiential component operates. Experiential activities are long-term (minimum 100 hours) and involve articulated learning objectives. Students may propose alternative experiences for approval by the SES program director, and must be approved in advance. The SES Program Director may seek input from the SES FTE's and/or SES Program Committee regarding approval. Examples:

- 1) Internship of 200 minimum hours (summer) and/or 100 minimum hours (school-year)
- 2) Summer research, on or off campus
- 3) Project-based study abroad programs
- 4) Completion of the Sustainability Professionals Initiative
- 5) Pre-approved non-credit-bearing long-term sustainability project

In order to manage the degree evaluation process for SES majors, students will enroll in a zero-credit course, SES 123-01, to certify completion of their experiential requirement.

4. SES Concentration Options

The Sustainability and Environmental Studies major involves both breadth and depth. In addition to fulfilling the eight core/distribution courses itemized above, each student identifies a concentration, a five-course area of depth relevant to the field. Concentrations fall into two categories: thematic and sub-disciplinary. Students are required to have one area of concentration, and select either a thematic or sub-disciplinary option. Dual concentrations are permissible for double majors where a sub-disciplinary concentration is feasible.

THEMATIC CONCENTRATIONS

Thematic concentrations delve into particular topics that integrate multiple disciplines and approaches, and provide students with skills and perspective on areas of particular interest. At present, SES has identified seven themes, itemized below. A list of qualifying courses,

and the structure associated with each theme, is available from the SES office and on the SES myDenison webpage, each semester. Additionally, students may propose individually-designed thematic concentrations in consultation with the SES Program Director. These are reviewed by the SES Program Committee.

Note that students seeking to major in SES are required to submit a concentration proposal early in the Spring of the sophomore year, and should make sure to declare the SES major in order to receive email information regarding the proposal process.

Also note that a maximum of two study-abroad courses from a summer or single semester program may count toward the SES major, and must be approved in advance by the SES Program Director. Off-campus courses may be applied to the distribution course requirements and/or the area of concentration, within the two-course limit.

Established thematic concentrations:

- # Creative Environments
- # Ecosystem Conservation
- # Environmental Decision-Making
- # Global Environmental Justice
- # Sustainable Agriculture
- # Sustainable Design
- # Sustainable Development

Creative Environments

This arts- and humanities-based concentration offers students the opportunity to explore a range of ways humans and societies have represented, performed, mediated, and otherwise imagined built and natural environments. By studying verbal, visual, and performative representations of the environment across periods and traditions, students will think critically about cultural constructions of built and natural environments. By immersing themselves in the imaginative process and creating artistic works that engage the environment, students will reflect on the ways our personal and cultural assumptions about the environment inflect the ways we represent, narrate, and otherwise imagine both built and natural environments. SES majors with this concentration will achieve a solid grounding both in the critical assessment and interpretation of mediated environments and in the creative, imaginative making of such mediations. Students who pursue this concentration will be well-equipped for jobs in the environmental arts and humanities in particular, but the skills developed in this concentration have broad application to a wide array of career paths.

Ecosystem Conservation

The Ecosystem Conservation concentration offers students an integrated understanding of ecological systems, including theoretical foundations, practical applications, and socio ecological connections. The three required foundational courses provide a conceptual basis of systems ecology and the field, lab and data management skills that are essential for ecosystem practitioners. The subsequent electives in the concentration provide opportunities for application of conservation concepts in complex political and biological environments. SES majors with a concentration in Ecosystem Conservation will be well-prepared for

careers in such fields as environmental consulting, land use planning and regulation, land and water stewardship and geospatial analysis.

Environmental Decision-Making

This theme offers a lens onto the process by which environmental decisions are – and can – be made. It is not content-specific, though certainly a student could focus attention on a particular category of decisions – a particular policy area – for some of the coursework chosen as part of the theme. The courses included in the list below are all aimed at better understanding the factors that affect behavior and various frameworks in which environmental decision-making takes place ranging from the individual to the group, from the community to the institutional.

Some courses aim at skill-building while others emphasize a normative exploration or an emphasis on theory-building.

Global Environmental Justice

Global environmental justice is an important field of academic study and the basis for a major form of social action and practice. Questions of justice are multi-scalar and arise within societies and across nations, cultures and species. This theme examines how and why certain populations experience disproportionate environmental and health harms as well as unequal access to resources associated with well being. Key focus areas of the concentration include studying: 1) the structural factors underpinning injustices and inequalities, and 2) the meaningful inclusion of all people in environmental and social decisions impacting their communities. In sum, this concentration involves an interdisciplinary investigation of all three concepts in its title as ones that require careful analysis, and are often contested by activists and scholars: “global,” “environmental” and “justice.”

Sustainable Agriculture

This concentration addresses interdisciplinary perspectives on the issue of food production and food distribution. These perspectives allow students to think critically about the environmental, social, and economic impacts of food and agriculture, writ large. To this end, students are expected to take two science courses related to plant biology, earth systems or climate change. Additionally, students take a course on social movements and/or issues of justice to help identify the social factors that have played a role in the sustainability of food systems (e.g., worker’s rights, labor movement). The last requirement is flexible to include any pre-approved food-related course.

Sustainable Development

In 1987, the Brundtland Commission defined this term for the ages: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (*Our Common Future*). While its focus may be largely on parts of the world where “needs” are unmet and poverty is endemic, a concentration in sustainable development will also seek to address the systemic nature of ecological, social, historical, and economic crises the world over. Therefore, the courses in this theme are generally international in their orientation and aimed at fostering a culturally sensitive understanding of the distinct challenges faced by developing countries and post-industrial societies in their socio-economic development trajectory.

Sustainable Design

This theme interrogates the ways we construct our built environment, with an eye to approaches that emphasize ecological harmony, local

materials, waste reduction, energy efficiency, and stewardship in the form of both cultural and environmental sensitivity. While Denison does not have any curricular dedication to city planning or architectural studies, there are a variety of courses which students can combine into a liberal arts examination of the core issues in these areas of study. Students who select this theme have the option of choosing a technological/ structural or behavioral approach, and should be able to articulate individualized reasoning as to why particular courses are chosen for the orientation of interest.

SUB-DISCIPLINARY CONCENTRATIONS

Students majoring in SES have the option to focus their area of concentration in an environmental or sustainability-focused sub-discipline instead of a particular theme. Examples of disciplines where this may be possible are Art History and Visual Culture, Biology, Communication, Data Analytics, Environmental Writing, Economics, Global Commerce, Global Health, and International Studies. Like thematic concentrations, all sub-disciplinary options involve five courses, and are either subsumed under the heading of the particular discipline (e.g., Biology, Economics) or connect directly with the advanced specialization designated for the field in question (e.g., global focus in Global Commerce, thematic focus in International Studies, area of domain in Data Analytics). All sub-disciplinary concentrations must be developed in close association with the director of SES and the chair/director of the discipline in question. Proposals are submitted in the same way as thematic concentration proposals, and are reviewed by the SES Program Committee for final approval.

Additional Points of Interest

Choosing a Concentration for the SES major

Students who major in SES choose an area of concentration during the sophomore year. Prospective majors are encouraged to discuss possible concentrations with any of the SES-affiliated faculty listed on the SES myDenison web page prior to the sophomore year. The concentration proposal deadline is typically early in the Spring semester.

SES courses and General Education (GE) requirements

Courses taken under the SES heading typically fulfill the Interdivisional (I) General Education requirement. In the case of cross-listed courses, students may choose to enroll under the SES heading to earn the Interdivisional (I) GE, or the heading of the home department to earn the GE designation appropriate for that department. In either case, the course will count toward the SES major or minor. Students are typically able to fulfill a maximum of five GE requirements through the SES major.

Off-Campus Study

Students are encouraged to participate in study abroad programs when appropriate to enhance the concentration area or otherwise supplement course offerings at Denison. Students who want to study abroad should plan to do so during their junior year. Courses taken abroad that serve as substitutes for courses listed above or that are otherwise used to satisfy elements of the SES major must be approved in advance by the SES Program Director, prior to the student’s departure for the off campus program. A maximum of two off-campus courses may be used to satisfy requirements in the major for students who spend one semester (or summer) off-campus, and a maximum of three off-campus courses may be used to satisfy requirements in the major for students who spend two semesters off-campus.

Sustainability and Environmental Studies Minor

The Sustainability and Environmental Studies (SES) Minor requires six courses and one experiential component. Regular offerings are listed here for each category. Check with the SES program office or website for a list of special offerings that may be allowed to fulfill each requirement. Also note that some of these courses have prerequisites.

1. SES 100 - Introduction to Sustainability and Environmental Studies - Integrated Environmental Studies
2. SES 200 - Course SES 200 Not Found

Four distribution courses: Students are to fulfill the requirements of the distribution categories listed below. No double counting is permitted among these distribution categories. Specific courses that may count toward these requirements are listed under the distribution requirements for the SES major above, and are available on the SES myDenison webpage, providing real-time information. Note that some of these courses have prerequisites.

3. One environmental/sustainability course from the Humanities or the Arts.
4. One environmental/sustainability course from the Social Sciences.

5-6. A two-course sequence in the Natural Sciences. # match with language for major above

The SES minor requires students to engage in a minimum of one sustainability experience. A list of approved experiential opportunities is available on the SES myDenison webpage, and is updated each semester to provide real-time information. The webpage includes an overview of sustainability themes, concepts, and criteria for the approval of experience options so that students understand the parameters under which this experiential component operates. Experiential activities are long-term (minimum 100 hours) and involve articulated learning objectives. Students may propose alternative experiences for approval by the SES program director, and must be approved in advance. The SES Program Director may seek input from the SES FTE's and/or SES Program Committee regarding approval. Examples:

- 1) Internship of 200 minimum hours (summer) and/or 100 minimum hours (school-year)
- 2) Summer research, on or off campus
- 3) Project-based study abroad programs
- 4) Completion of the Sustainability Professionals Initiative
- 5) Pre-approved non-credit-bearing long-term sustainability project

In order to manage the degree evaluation process for SES minors, students will enroll in a zero-credit course, SES 123-01, to certify completion of their experiential requirement.

Courses

SES 100 - Introduction to Sustainability and Environmental Studies (4 Credit Hours)

In this course, students consider environmental problems through the lenses of many different academic disciplines. The purpose of this approach is two-fold: 1) to enhance the student's understanding of environmental issues as multi-dimensional dilemmas, and 2) to evaluate and promote sustainable alternatives to business-as-usual. In the first part of the course, students consider the human relationship with the non-human world, including problems of ethics, social and psychological connections with nature, ecological services, and common pool resources. The subsequent sections address historical and current environmental concerns, including population growth, food systems, resource limitation, pollution, biodiversity, and environmental justice. We explore sustainable solutions, remedies, and actions, including regulation and law, restoration, and sustainable lifestyles. The laboratory component of the course exposes students to local and regional environmental geographies, problems, and tools for sustainable solutions. Field trips, guest speakers, and films emphasize the necessity of multidisciplinary integration in the design of sustainable environmental systems.

SES 200 - Environmental Analysis (4 Credit Hours)

In this course, students will learn and practice different methods of addressing environmental questions and expressing environmental perspectives. Central themes are writing and quantitative analysis: for each of the topics and methods used, students will gain experience with a variety of professional writing styles and analytical approaches. Environmental issues will be investigated through both quantitative and qualitative methods of data collection and statistical analysis, along with a variety of writing styles. Students will also examine the human connection with the nonhuman world through the use of media and spatial representation. Through successful completion of this course, students will have applied a variety of methods to the analysis of environmental issues. Prerequisite: SES 100.

SES 215 - Renewable Energy Systems (4 Credit Hours)

Renewable Energy Systems provides students with a comprehensive overview of the different alternative energy systems that are in use today. The course will introduce the basic scientific and engineering concepts used in designing and analyzing different energy technologies. Some emphasis will be placed on real-world applications of such technologies through the introduction of several case studies related to the field.

SES 217 - Sustainable Development Goals (4 Credit Hours)

Imagine the world in five years. The Sustainable Development Goals (SDGs) are a part of the United Nations' 2030 Agenda to create a healthier, more peaceful, and prosperous planet for all. The international community created the SDGs as both a guide for future development as well as an urgent call to action to address today's most pressing global challenges. All SDGs are inherently interrelated and difficult to unravel, for example, SDG13 Climate Action includes creating both: SDG11 Sustainable Cities and Communities and SDG7 Affordable and Clean Energy. Moreover, many argue climate change is the result of severe global inequality and unsustainable consumption and production, addressed by SDG10 and SDG12 respectively. Nonetheless, the SDG framework breaks these global challenges down in a way that productively channels resources and focuses attention on more targeted solutions. This course will examine the creation, history, and evolution of the SDGs as well as the myriad solutions being implemented at the state level, and across civil society and the private sector to address the SDGs. Students in this course will explore an SDG of interest in-depth through a series of oral presentations & projects focusing on existing solutions to these pressing global challenges. Students will therefore gain both depth and breadth of knowledge about the SDGs and 21st century integrated sustainability value creation.

SES 222 - Geographic Information Systems I (2 Credit Hours)

This course is an introduction to the concepts and uses of Geographic Information Systems (GIS) with particular application to environmental issues. The course consists of laboratory exercises on GIS data structures and sources of data, on the use of specific GIS tools, and on practical applications of GIS to real-world tasks. The student will gain skills in spatial data analysis, map generation, and data presentation using ArcGIS software. After successful completion of this course, students who wish to develop advanced GIS skills may enroll in SES 223.

SES 223 - Advanced GIS (2 Credit Hours)

This course is intended to give the student experience with advanced GIS applications. The focus will be on novel analyses of spatially explicit data about real-world environmental issues.

Prerequisite(s): GEOS 222, ENVS 222, or SES 222.

SES 240 - Environmental Politics and Decision-Making (4 Credit Hours)

This course gives students a chance to explore the realm of proactive change in the environmental arena. It combines the theories of policy, the tools of problem-solving, and the practice of dealing with environmental challenges in the real world of the American government. The premise of the course is this: if you want to improve the state of the planet, you have to propose a solution. To make a solution happen, you should understand the process of getting an idea through the decision-making system. Effecting change requires a background in the system(s) that make things happen, whether you ultimately want to work within the system or outside it. This course is divided into two main components: an overview and implementation of problem-solving techniques, and an in-depth examination of the U.S. Congress' role in environmental policy formation. The latter section culminates in a "Moot Congress" undertaken by students at the end of the semester. Not recommended for first-year students.

SES 256 - Farmscape: Visual Immersion in the Food System (4 Credit Hours)

Every human being has an intimate relationship with food, often with deep emotional facets. Yet we in the U.S. know very little about the food system that sustains us – it is a mysterious and often invisible set of processes, organizations, and people. This remarkably complex web of inputs, labor, machinery, laws, subsidies, mergers, and so many other components is one that we take largely for granted. This class seeks to align that reality with another: we are an intensely visual species. A critical part of our existence that we experience through all of our senses is one we fail to comprehend through our primary sense. And we have this occasion to use sight in a formalized way – photography – to tell new stories, and to bring an artistic sensibility to our understanding of food, and perhaps ourselves. Through imagery, writing, and the curatorial process of exhibiting our work in a public setting, we have a truly unique opportunity. Our immersion in these critical issues can bring full circle the understanding we gain through many eyes to enhance awareness in other people about how our food system connects us all.

SES 262 - Environmental Dispute Resolution (4 Credit Hours)

An in-depth investigation of alternative dispute resolution (ADR) as an improved means to affect change in environmental conflict. Both an intellectual and hands-on introduction to the theory and practice of ADR, relying on research into theoretical aspects of conflict, attendance at both conventional litigatory and ADR hearings, and actual participation in ADR exercises.

SES 264 - Environmental Planning and Design (4 Credit Hours)

This course examines a variety of local environmental planning processes and issues, focusing primarily on the communities surrounding Denison (Granville, Licking County), as well as the theories, concepts, and tools of design, both at a community level and for individual buildings. Particular attention will be paid to controversial models of architecture and planning to understand some of the negative implications of conventional approaches. Field trips, group exercises, research, and project competitions will form the basis for course evaluation.

SES 274 - Ecosystem Management (4 Credit Hours)

Many of Earth's ecosystems are stressed and degraded as a result of human activities. Ecosystem management is the process of evaluating the biotic and abiotic features of ecosystems and stressors and manipulating those features toward a defined goal, such as conservation or restoration. In this course, students will apply aspects of systems ecology to management scenarios in particularly stressed ecosystems. Students will gain an understanding of systems ecology and will learn how ecological communities function within ecosystems and landscapes. After establishing this foundation, students will lead the exploration of some of our planet's greatest ecological systems. Lab sessions will allow students to construct a computer-based simulation of an ecosystem and to apply ecological modeling as a management tool in both lab and field settings.

SES 280 - Ecofeminist-Ecowomanist Theory & Practice (4 Credit Hours)

This course introduces the conceptual frameworks of ecofeminism and ecowomanism, exploring how environmental issues impact vulnerable communities and in particular, women of color. It uses an intersectional race-gender-class approach to help students analyze ecofeminist and ecowomanist principles around views of nature, spirituality, human and non-human relations, capitalism, indigeneity and ongoing colonization, globalization, and various forms of activism. Students will work toward understanding both ecofeminist and ecowomanist theoretical frameworks and their application in their own lives. This is a special topics course crosslisted with WGST 280 and BLST 280.

SES 282 - Religion vs Science (4 Credit Hours)

This is a special topics course crosslisted with REL 282.

SES 285 - Food Ethics (4 Credit Hours)

"What should I eat?" is both a familiar and ethical question. It's not surprising that ethics, a discipline that focuses on questions about what we should do, has a lot to say about our food. In this course, we will cover arguments for diets that are organic, locavore, vegetarian, and vegan. We will also examine topics such as food aid, autonomy, and identity. We will explore these topics for their own sake, and to gain insight into broader questions in ethics such as the scope of morality, the limits of moral obligation, and the most plausible general theory of ethics. We will also encounter ambiguous terminology in discussions of food, such as "natural," "sustainable," "organic," "healthy," "obese," "local," and "authentic." The problem with such terms is that each has multiple meanings with varying (and sometimes conflicting) significance for ethical decision-making. We aim to better understand what these terms mean in different contexts and how their meanings are constructed so that we can productively articulate ethical food recommendations. This is a special topics course.

Crosslisting: PHIL 294.

SES 291 - Environmental Careers (1 Credit Hour)

How can you extend your passion for environmental issues beyond Denison? How do the knowledge and skills developed in your liberal arts education translate into a meaningful and fulfilling career? In this course, you will take stock of your own experiences and consider potential professional trajectories. We will survey a wide variety of environmentally relevant career paths, including sustainable business, nonprofit organizations, government and public service, academia and research, and the legal and financial sectors. For each, we will review underlying principles, consider the current state of the field, conduct self-assessments, and connect with Denison alumni who currently work, or have worked, in that realm. This course adheres to Denison's Academic Credit policy.

Prerequisite(s): Declared SES majors or minors only.

SES 301 - Sustainability Practicum (4 Credit Hours)

This core major course is primarily for SES majors; minors are welcome. This course provides the opportunity for students to gain hands-on experience working on real-world environmental problems. As a group, students work in an intensive format with a real "client" and real deadlines to research a problem, assess options, recommend solutions, and evaluate outcomes. Examples of projects include energy and water conservation, local land use planning, wetlands management, reuse/recycling programs, agriculture preservation, and environmental education. Should be taken during the junior year.

Prerequisite(s): ENVS or SES 202, ENVS/SES major or minor.

SES 310 - Wetland Ecology (4 Credit Hours)

This course is a comprehensive study of wetland ecology, management, and policy. The main emphasis is on biological, chemical, and physical aspects of major wetland ecosystems found in North America. The course also deals with valuation, classification, and delineation of wetlands. A significant portion of the course focuses on local and regional wetland ecosystems: their history, ecology, and current status. Labs will be field-based explorations of the biology, chemistry, and ecology of these regional wetlands.

Prerequisite(s): BIOL core or consent, and CHEM 131.

Crosslisting: BIOL 310.

SES 334 - Sustainable Agriculture (4 Credit Hours)

This course will expose students to the purposes and methods associated with sustainable agriculture. We will do this through readings, discussion, and experience on local and sustainable farms. Throughout the semester we will reflect on the social, economic, and environmental aspects associated with sustainable agriculture as well as actual practices affiliated with the modern sustainable agriculture movement. Students must be prepared to commit to working on farms each week as part of the lab requirement of this course.

SES 352 - Planetary Health (4 Credit Hours)

Human health is intimately linked to the natural systems on which it depends. With advances in technology, agriculture, and health knowledge, humans are living longer than ever. However, those same technologies have pushed planetary systems to a breaking point. This class seeks to elaborate a path forward that recognizes the profound impact human 'progress' has on our planet and the reciprocal impact changes in natural systems will have on the future of human health. Crosslisted with GH 352.

Prerequisite(s): GH 100.

SES 361 - Directed Study (1-4 Credit Hours)**SES 362 - Directed Study (1-4 Credit Hours)****SES 363 - Independent Study (1-4 Credit Hours)****SES 364 - Independent Study (1-4 Credit Hours)****SES 401 - Sustainability and Environmental Senior Project (4 Credit Hours)**

This course is required for SES majors with senior standing unless they are pursuing senior research (SES 451/452 or equivalent). This course provides an integrating and culminating experience for students, individually or in small groups, to engage with an environmental issue, either by conducting research related to this issue or by taking action on it in a way that is informed by their academic understanding. The primary objective is for each student to integrate their study of environmental issues at Denison and to develop skills in critically analyzing environmental problems and promoting environmental change. A primary focus is on writing: crafting a project proposal, communicating objectives and cogent arguments, reviewing and incorporating relevant literature, analyzing results, and synthesizing conclusions. Students will have the opportunity to hone a major written work through several stages and to provide and receive peer review on written work.

Prerequisite(s): SES core and SES 301, or consent of instructor.

SES 427 - Environmental Economics (4 Credit Hours)

This course provides an examination of various economic issues facing business and government regarding the use of natural resources and the management of environmental quality. Students will develop an understanding of both the economic nature of environmental problems and the economic tools necessary to explore and devise potential policy solutions for environmental problems. In addition, students will examine the institutional framework within which environmental problems exist to understand those factors that may mitigate against economic solutions. The course fulfills the SES Social Science requirement.

Prerequisite(s): ECON 302.

Crosslisting: ECON 427.

SES 451 - Senior Research (4 Credit Hours)

Independent research arranged with a faculty advisor.

SES 452 - Senior Research (4 Credit Hours)

Independent research arranged with a faculty advisor. SES 452 is the continuation of SES 451.