

Sustainability

Karen L. Eckert, Professor

Nicholas H. Johnson, Assistant Professor

This interdisciplinary degree program provides students the opportunity to focus their intellectual inquiry on issues and problems related to local and global sustainability. The program emphasizes connections between society – including economy, production systems, and governance – and the natural environment. Students prepare for global citizenship by learning how to simultaneously maintain ecological and environmental health, create economic prosperity, and pursue social justice amid the complexities of the 21st century. In so doing, they join a community of peers, faculty and staff committed to seeking solutions to some of the world's most pressing problems in ways that “meet the needs of the present without compromising the ability of future generations to meet their own needs” (UN World Commission on Environment and Development, 1987).

Students pursuing a major in Sustainability are required to also major in a second discipline. The impetus behind this requirement is to encourage students to apply the unique “triple bottom line” perspective in the context of their career discipline. With a focus on place-based study and the integration of knowledge across disciplines, the contemporary sustainability lens, interwoven into the tapestry of a liberal arts education, prepares the next generation of thought leaders to communicate effectively, resolve conflict, solve complex problems, and employ effectual, ethical leadership styles. The degree intentionally exposes the student to a diversity of theories, methods, and approaches that are pertinent to comprehending and creating solutions for the evolving social and environmental challenges facing humankind.

The major requires 12 courses, including a capstone project and two electives chosen from one of four content spheres. Electives in the *Sociology, Ethics and Leadership* sphere look at how human behavior and relations, ethical and theological values, and societal organization function as related to increasing sustainability. Electives in the *Economy and Governance* sphere deal with business practices and governance systems that lead to sustainable societies. Electives in the *Environment and Natural Resources* sphere focus on sustainable natural resource use and management, analyze environmental issues, and seek solutions to today's resource needs while also conserving for future generations. Electives in the *Production Systems and the Built Environment* sphere examine how agriculture, architecture, industrial ecology, energy, and other systems of everyday life can be designed to reduce resource consumption and environmental damage, promote regenerative processes, encourage innovation, build community, and enhance quality of life.

The minor requires six courses, including an introductory course, one elective chosen from each of four content spheres (described above), and a culminating independent project. To be listed as an elective, a course must address at least one of the sustainability learning outcomes and must include a significant project or assignment looking at sustainability from the perspective of the course discipline. In the case of the minor, no more than two courses may be taken from any single academic department other than sustainability. SUS 280 Topics in Sustainability can be applied to any one of the content spheres, depending on the specific course topic when it is offered. SUS 395 Sustainability Internship must be taken

2 Sustainability

for a minimum of 3 SH in order to count toward the major. SUS 395 Sustainability Internship and SUS 401 Sustainability Project must be taken for a minimum of 3 SH to be included in the six courses required to achieve the minor.

Departmental Learning Outcomes

1. *Be able to explain the key factors of sustainability*
 - a. Demonstrate an understanding of key concepts in sustainability; e.g., scientific literacy, systems thinking, triple bottom line, ecological footprint, cost-benefit analysis
 - b. Recognize fundamental linkages between ecological, political, social, and economic systems
 - c. Explain how sustainability relates to our lives and values, and how our actions impact issues of sustainability
 - d. Demonstrate knowledge of sustainable practices and their effects on the environment, social equity, and the economy
2. *Be able to discuss sustainability from different perspectives and scales*
 - a. Recognize the social justice implications of resource allocation, food production, energy consumption, and waste production – including causal complexities and applications across systems and at scale
 - b. Think critically about the diversity of scientific and ethical issues raised by human interactions with the environment, and to use these insight as a foundation for promoting sustainable behavior or policy
 - c. Understand the process and intent of environmental policy-making, including the roles and influence of specific actors and institutions
 - d. Display the ability to think across scales, from individual to global
3. *Be able to research, design, apply, and evaluate solutions to sustainability problems*
 - a. Demonstrate a knowledge of technical, scientific, and/or institutional (including political) strategies and techniques that foster sustainable development
 - b. Apply the concepts of sustainability in critically examining socio-cultural issues related to the use of the Earth's natural resources
 - c. Think critically and make informed evaluations about trade-offs using quantitative methods (e.g., cost-benefit, risk analysis, life cycle analysis)
 - d. Apply relevant methods, theories, and analytical frameworks to researching and evaluating solutions to complex (multi-dimensional) problems
4. *Be able to demonstrate the leadership skills necessary to be an “agent for change”*
 - a. Effectively communicate (e.g., orally, writing, media applications) sustainability positions and strategies that are scientifically and technologically informed
 - b. Understand the importance of leadership as central to social change and technical innovation with respect to creating more sustainable communities
 - c. Demonstrate an ability to be innovative and creative, to imagine new solutions, to seek out unlikely partners, and to be entrepreneurial

- d. Demonstrate an ability to identify different perspectives and their underlying values and to persuasively make the case to different stakeholders – in other words, to translate sustainability goals in ways that will effect change

Major

- B.A. Major in Sustainability (<http://catalog.principiacollege.edu/majors-minors/sustainability/ba/>)

Minor

- Minor in Sustainability (<http://catalog.principiacollege.edu/majors-minors/sustainability/minor/>)

SUS 095 Internship - No Credit 0.0 SH []

The issue of sustainability is one of the most theoretically and practically complex questions of our time. Experiential learning outside the classroom provides an opportunity to gain hands-on experience with corporations, organizations, and agencies successfully acting as change agents in solving problems related to local, national, and global sustainability. May be taken three times.

SUS 151 Introduction to Sustainability 3.0 SH [GESN]

An introduction to the basic principles (e.g. triple bottom line, ecological footprint, systems thinking) underlying the topic of sustainability. Students explore how sustainability relates to their lives and values, and demonstrate knowledge of sustainable practices and their effects on the economy, the environment, and social equity. Guest lecturers provide views of contemporary issues from a multi-disciplinary approach.

SUS 190 Sustainable Food Systems 3.0 SH []

An introduction to the resilience, sustainability and equity of local and global food systems. Students examine relevant theories within the sector, using a systems approach to discuss achievements, challenges and trends. Students interact with farmers, vendors and chefs, consider how their own decisions and actions influence food systems, and explore how innovative solutions might be scaled for greater impact.

SUS 240 Modern Climate Change 3.0 SH [GESN]

This course introduces the science, economics, and policy of modern climate change. Students will understand the drivers of climate change cycles and how they affect human society and ecological systems, analyze the impacts and costs of climate change, define solutions for mitigation and adaption, engage in informed discussions of public policy, and communicate effectively about these issues.

Prerequisite: This course is suitable for non-science majors, but it is expected that students have knowledge of algebra and either high-school level chemistry or physics.

SUS 250 Energy and Living Systems 3.0 SH []

In this course students begin to think about the mechanical and living systems in everyday life and how to make them more sustainable. The course focuses on air, water, and energy flows; the properties of different structures and building materials; the importance of insulation and other conservation measures; and the role of 'green building' certifications, such as LEED and LBC.

SUS 260 Sustainable Development 3.0 SH []

In this course students explore the interdisciplinary field of sustainable development. Drawing from the social, policy, and natural sciences, this course explores how the world economy can continue to develop in ways that are socially inclusive and environmentally sustainable. This course offers a broad overview of the key challenges and potential solutions to achieve sustainable development in the 21st century.

Prerequisite: GLBS 225 or SUS 151.

SUS 280 Topics in Sustainability 1.0-4.0 SH []

Offered when regular or visiting faculty are available to work with students on advanced topics in sustainability. May be offered on Principia abroads. The title will be extended to describe the current topic or region. May be repeated more than once for a maximum of 8 SH, provided the topics differ.

4 Sustainability

SUS 310 Environ Decision Analysis 3.0 SH []

Course content covers decision analysis methods - in particular cost-benefit analysis, life cycle assessment, and risk management - that are widely used in business, the environmental field, and by regulatory agencies. For each method students will explore the theoretical underpinnings, appropriate applications, and the benefits and drawbacks. Both qualitative and quantitative methods are used.

Class Level Restriction: Junior and Senior only.

SUS 340 Climate Science Seminar 1.0 SH []

Seminar examines the science of modern climate change, including the drivers of climate change cycles and how they affect human society and ecological systems. Emphasis is on reading scientific literature with understanding, including interpreting charts and graphs for a broad range of physical sciences, and exploring the role of uncertainty in interpreting scientific data and forging policy. May be repeated.

Prerequisite: SUS 240.

SUS 395 Sustainability Internship 1.0-3.0 SH []

The issue of sustainability is one of the most theoretically and practically complex questions of our time. Experiential learning outside the classroom provides an opportunity to gain hands-on experience with corporations, organizations, and agencies successfully acting as change agents in solving problems related to local, national, and global sustainability. May be taken three times up to six semester hours.

SUS 401 Sustainability Project 1.0-3.0 SH []

The project serves to culminate the minor in sustainability. Projects are designed under faculty supervision in accordance with student qualifications and interests. May include multidisciplinary research, internships, case studies, field work, or campus projects. May receive a star (*) grade if the project spans more than one semester, may be repeated up to a maximum of 6 SH.

Class Level Restriction: Junior and Senior only.

SUS 410 Capstone Seminar 1.0 SH []

This course is designed to assist sustainability majors in the development of their capstone project. Weekly class activities may include presentations from a research librarian, discussions with Sustainability faculty about project design and methodology, preparation of an annotated bibliography, or coaching on presentation skills.

Class Level Restriction: Junior and Senior only.

Field of Study Restrictions: Sustainability Majors only.

SUS 411 Capstone 2.0-5.0 SH []

A selected topic culminates the major and provides students the opportunity for survey, investigation, research, or creative activity that synthesizes and extends classroom material. May include multidisciplinary research, case studies, field work, or campus projects. May receive a star (*) grade if the project spans more than one semester, may be repeated up to a maximum of 10 SH.

Prerequisite: SUS 410, may be taken concurrently.

Class Level Restriction: Junior and Senior only.

Field of Study Restrictions: Sustainability Majors only.