Sustainability Pathway Certificate

Description, Goals, Sample Student Learning Outcomes, and Sample Assessments

Description

West Chester University's Sustainability Pathway Certificate enables students to become competent, engaged leaders in a world that faces unprecedented threats and opportunities. In order to thrive in this context, students will need to understand the many facets of our sustainability challenges while applying their learning in local and global contexts, all in the service of a positive vision of the future.

Background and Sustainability Definition

Sustainability is often associated with a narrow environmentalism, but students in WCU's Sustainability Certificate Pathway will learn that sustainability is a multi-faced field that ranges from the economic, the social, and the environmental, to the aesthetic, the philosophical and the cultural. While there is no single universally accepted understanding of "sustainability," there is a widely shared desire to cultivate individual and collective potential and to increase the possibility that humans and other life can flourish within Earth systems now and into the future. At its core, educating for sustainability reflects an intention to engage students in a process of learning and leading change toward a desirable future characterized by the following: improved quality of life and wellbeing for all; meeting the needs of present and future generations; justice and equity; and living within ecosystem limits. Toward these ends, students in the Pathway will learn practical skills and habits of thinking and apply them in their personal, professional, and civic lives.

Action

While respecting students' individual right to reach their own conclusions about what to do with what they learn, a core principle of educating for sustainability is that everything we do and everything we don't do makes a difference. The reality of interdependence means we are all responsible for the difference our action and inaction makes to ourselves, to one another, to the natural world and to future generations. The Sustainability Pathway Certificate encourages students and all university and community members to apply what they learn in authentic contexts and to practice acting in ways that contribute to a positive vision of a sustainable future.

Pedagogy

One of the hallmarks of robust sustainability education is how faculty and students pursue learning in the context of the local and global community. While there are many valuable pedagogical approaches that are not particular to educating for a sustainable future, what is particular is a commitment to place-based, project-based, authentic, and service-oriented pedagogies.

Goals

Students completing West Chester University's General Education Sustainability Pathway Certificate should understand and be able to demonstrate at least two learning outcomes related to each of four main goals. Sample student learning outcomes are provided below.

Goal 1: Envision and create positive futures

***1A**. Students will identify their role in the local and global community and reflect on their own values, perceptions, feelings, desires and actions as they relate to living sustainably*

***1B**. Students will be called to critique their thinking and to compare their ways of knowing in an effort to learn and to flourish over time in a diverse, interconnected world*

***1C**. Students will imagine, create, and express their own positive visions for the future and for socio-environmental change (i.e. visions that promote improved quality of life and wellbeing for all; meeting the needs of present and future generations; justice and equity; and living within ecosystem limits)*

***1D**. Students will anticipate and construct plausible futures, and implement actions in the service of their individual and collective visions.*

Goal 2: Cultivate a sustainability perspective

***2A**. Students will develop a perspective that recognizes and integrates multiple dimensions of sustainability (e.g. social, economic, environmental, historical, cultural, aesthetic, etc.)*

***2B**. Students will identify the ethical implications of their actions and assess the potential of ethical systems to guide humans to live sustainably*

***2C**. Students will explain the value of multiple, diverse perspectives in creating shared visions and actions that contribute to a sustainable future locally and globally.*

***2D**. Students will question norms, practices and opinions and formulate a position in the sustainability discourse.*

Goal 3: Understand and employ systems thinking to solve problems

***3A**. Students will apply the tools and concepts of system dynamics and systems thinking to their present lives, and to choices that will affect our future.*

***3B**. Students will plan and organize efforts to advance sustainability in their local and global communities*

***3C**. Students will apply different problem-solving frameworks to complex sustainability problems and develop viable, inclusive and equitable solution options that promote sustainable development.*

***3D**. Students will explore the link between the health of the biosphere and the health of the "ethnosphere" and will assess what to preserve and what to change in order for future generations of cultures and communities to thrive over time.*

Goal 4: Understand the dynamics and limits of natural and social systems

***4A**. Students will explain the origins and meanings of sustainability and living sustainably*
***4B**. Students will explain characteristics of sustainable and unsustainable social, economic, and political systems*
***4C**. Students will describe the interrelationships among the social, economic, environmental, historical and other facets of our bioregion and contribute to its regeneration and health.*
***4D**. Students will identify the laws and principles that govern life on Earth, and will describe their interdependence with other humans and their dependence on natural systems*

Sample Assessments for Sample SLOs Listed Above (Note: course proposals for inclusion in this pathway should outline relevant assessments for the SLOs being proposed.)

- [Earth Systems Science Course] Students are tasked with using the knowledge and skills that they have developed in the course to analyze an environmental problem. They then explore the causes/triggers of the environmental problem and analyze how the different components of the earth system are impacted. Students must find a specific solution or mitigation to the environmental problem that they select and then re-analyze the Earth system looking at how their mitigation impacts the system. The assignment culminates in a paper that is posted to a discussion forum for their classmates to read. Students are expected to read several of their classmate's papers and provide feedback. **(3A, 4D)**

- Students calculate their footprint (ecological, water, carbon, food, etc.) using at least two on-line tools – one that asks 11 simple questions (e.g. www.footprintcalculator.org), and one that asks for more detailed information. They then write an essay answering questions prompting them to reflect on the results provided. **(1A, 4B)**

- Students identify an issue (environmental, economic, social) that impacts their local place and space (residence hall, apartment, house, etc.) and research the issue from multiple perspectives and write a newspaper op-ed in which the students convey their opinion on the matter using evidence to support a solution/action to address the issue. The key components here are (1) seizing and holding the attention of your audience, and (2) conveying complex concepts effectively, and in simple terms. **(1A)**

- Students could develop and implement a project with the Gordon Natural Area (GNA) steward and community members to identify and issue of sustainability as it relates to the GNA (i.e. restore a water stream; plant trees in a biodiversity restoration project; restore fish habitat. **(1A)**

- An exploration of West Chester University through a "Sustainability Lens" and place-based education approach will inform students about systems and their interaction. Myriad approaches could be taken depending on the focus of the course.
  --Students develop smart phone applications that give visitors an experience of how water, energy, food and waste systems work at West Chester University. (Computer/Coding)
  --Students develop a Public Service Announcement (PSA) for the University website that illustrates the systems of sustainability at work. (Communications/English Studies)
  --Students create a brochure for the University website that illustrates the systems of sustainability at work (electronic/hardcopy). **(2A)**

- Students calculate home energy use, transportation, food, and housing footprint using online tools. Also calculate a number of combined integrated indices such as carbon and ecological footprints. Critique the assumptions of these calculations. What activities do you undertake that influence these indices the most? How do you compare to your classmates? Suggest an amalgam of these indices to produce a "West Chester resident calculator" which provides a more realistic estimate of resource use within the United States. **(3C)**

- Students research indigenous stories as a resource to illustrate ideas of systems thinking and sustainability perspectives demonstrating the differing and similar ways in which diverse cultures interpret the ideas of earth, ecology, and environment through artifacts and practices in different ways. **(4A)**

- Students examine systems and sustainability using an interdisciplinary approach. For example students might analyze and illustrate the incorporation of certain biological processes and characteristics into architecture, frequently referred to as ecotecture (New York Times, May 20, 2007). **(4A)**

- Write a letter to your great grandchild in which you imagine and express your hope for a sustainable world. Draw on and include concepts of sustainability; civil and environmental justice; systems thinking; ethical understanding and leadership; climate change as a social, political, psychological, moral, and scientific issue; and other sustainability perspectives. **(1C, 2A, 2B, 2D, 4B)**

- Students are challenged to identify and implement residential energy saving activities that will result in a minimum of 10 million Btu in gross energy savings annually. A sheet of suggested activities showing a sample of how to calculate the energy savings for each activity is provided for each student. Each class member reports their activities as well as the project location, the

gross energy savings, materials cost and time invested. As a class, calculate the total class savings, materials cost and time invested. With that data, determine the hourly wage value of their volunteer time that will generate a maximum 3-year simple payback. **(3B, 3C)**

- In teams, determine the number of hydration station refills required to save the equivalent of one barrel of oil (currently worth about $100). Consider the cost of making plastic bottles and the landfill cost for disposal; the average transportation cost of delivering each bottle of water from the bottler to the campus; the energy cost of processing the water itself. Present a final report to the class. **(3A)**

- Students learn about restoring water quality in a local stream via a campus tour and a short film about a West Chester area environmental group (Brandywine Red Clay Alliance). They can:
  --Describe the components of the socio-hydrologic system (human & natural);
  --Explain the origin of the water quality problems with reference to system pathologies;
  --Assess the BRCA's efforts to improve water quality by changing the system; and
  --Propose actions they can take as individuals, home owners, etc., to help improve their relationship with the watershed. **(3A, 3B, 3C)**

- Students learn about the significance of place by reading about and hearing from representatives of indigenous cultures that are grounded in local environments. They can:
  --Describe some characteristics of ways indigenous cultures relate to natural systems that distinguish them from modernist cultures;
  --Explain how the patterns of indigenous cultures reflect a more meaningful understanding of the interdependence of humans on the land, and
  --Propose lesson that people in modernist cultures can learn from indigenous peoples to lead them toward a more sustainable. **(3D, 4C)**
- Students do walks in the GNA and North Campus to observe the patterns of characteristic of natural and human-built landscapes. Students can:
  --Describe the differences between the human and natural patterns;
  --Explain how the patterns of natural systems are more compatible with sustainability;
  --Give examples from class materials of how human systems can be changed to incorporate natural patterns and propose additional applications (e.g., biomimicry) **(4B, 4C)**

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Sample References

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https://sustain.ubc.ca/courses-teaching/sustainability-learning-pathway/sustainability-attributes

147 Practical Tips for Teaching Sustainability: Connecting the Environment, the Economy, and Society (2nd Ed.) by William M. Timpson, et al.