



Core Concepts in Sustainability

Course Outline

COURSE DESCRIPTION

This self-paced, 6.5-hour online course is designed to equip students with a strong foundational knowledge of sustainability and the balance between environmental, social, and economic systems. The materials provide students with a thorough introduction to sustainability topics. The course incorporates hands-on activities, online modules, discussion forums, and dynamic instruction methods.

LEARNING OUTCOMES

1. Understand the role of the U.S. and European industrial revolutions on the human ecological footprint and the ways in which developing nations are following suit.
2. Identify the multiple contributors to human's ecological footprint, including agriculture, energy, food, poverty, and the built environment.
3. Differentiate between renewable and nonrenewable energy sources, and identify the key components of the green economy.
4. Understand the role of the U.S. and European industrial revolutions on the human ecological footprint and the ways in which developing nations are following suit.
5. Identify the multiple contributors to human's ecological footprint, including agriculture, energy, food, poverty, and the built environment.

INSTRUCTIONAL RESOURCES

The 6.5 hours of directed instruction is accessed online through any internet connection. The course consists of three sequential units, which contain all of the instructional resources participants will need to complete the course. These include a variety of instructional formats, such as video, animations, presentations, guided activities, and readings.

DATES AND TIMES

This online course is self-paced and will take about 6 hours to complete. Students must have an internet connection and access to GEF's learning management system in order to complete the course. Course access expires after 90 days of enrollment.

COURSE REQUIREMENTS

Participants are expected to complete both units, which include the following components:

1. Pre- and Post-Self Assessments
2. Guided Activities
3. Unit Readings
4. Check for Understanding Questions

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Unit 1: Human's Ecological Footprint

Essential Question: How has human impact on ecosystems changed over time through the early stages of civilization development to today's industrialized and growing societies?

The Big Idea: Over the course of time, humanity's impact on the earth has grown from small regional effects to large-scale disruptions. At present, there are very significant challenges we face as a global civilization: climate change, species extinction, deforestation, resource depletion, and widespread economic inequality. By 2050, Earth will be host to between 9 and 10 billion humans. With a population of this size and with growing per capita resource use, humanity has an enormous and increasing impact on the ecological systems on which it depends. This unit explores the concept of ecological footprint: a measure of human resource use and pollution, compared with the Earth's capacity to regenerate, called biocapacity. When we use ecological footprints to compare different modes of living, it can point the way towards a sustainable society.

Topics Covered:

- The Ecological Footprint Concept
- Emergence of Modern Humans and the Development of Agriculture
- Population Growth and Carrying Capacity
- The Industrial Revolution
- Variations in Ecological Footprint
- Climate Change and its Causes
- Climate Change Effects
- Carbon Footprints

Unit 2: Primary Sustainability Issues: Energy, Food, Water and Pollution

Essential Question: What are the primary ways in which impact measurements are useful tools and what are the long-term effects of human ecological footprints?

The Big Idea: Several sustainability issues stand out for their vital importance to humanity: energy, food, water, and toxic pollution. A great deal of the day-to-day work of sustainability is focusing on making these focus areas work better for people and fit into the ecological systems of the planet. Transforming them is presenting enormous challenges, but people around the world are becoming increasingly engaged with this important task.

Topics Covered:

- The Central Role of Energy
- Sustainable Agriculture
- Sustainable Water Systems
- Industrial Pollution and Toxins

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Unit 3: The Global Ecosystem

Essential Question: How are the Earth’s systems connected and why is it important to understand the concept of interdependency?

The Big Idea: Creating a sustainable society and economy means understanding how human civilization is embedded within, and dependent upon, the natural environment. The science of ecology teaches us to look at connections—between parts of the Earth as well as between the Earth and human civilization. Ecology and sustainability are integrating frameworks that tie together ideas, such as the environment, energy use, and economics, that are often considered in isolation. In this unit, we will investigate natural systems, how they support human activities, and how sustainability teaches us to see parts in terms of their connection to whole systems.

Topics Covered:

- Our Planet in Context
- The Earth as a System: Biogeochemical Cycles
- The Importance of Ecosystems
- Sustainability as an Integrating Concept: STEM Application

Unit 4: The Importance of Biodiversity

Essential Question: Why is biodiversity an important feature of healthy, vibrant ecosystems?

The Big Idea: Just like cities full of people, businesses, and transportation networks, ecosystems depend on life-supporting cycles of energy and nutrients. Similarly, cities and ecosystems both depend on diversity: a wide range of services, occupations, and infrastructure in cities; and a range of species, biological “jobs,” and ecological services in ecosystems. This unit explores the biocentric viewpoint of sustainability, which values biodiversity as a primary measure of ecosystem health. Currently, human activity is decreasing global biodiversity by driving the extinction of many species. An understanding of biodiversity, threats to biodiversity, and tools for protecting biodiversity is essential to creating sustainability that is successfully aligned with natural systems.

Topics Covered:

- Where Does Life Exist? Defining the Earth’s Biosphere
- Biodiversity as Nature’s Risk Management Tool
- The Benefits of Biodiversity to Humans
- The Biodiversity Crisis: Tropical Forests and Oceans
- Biodiversity Threats and Protection Strategies