

# Minnesota State University Moorhead

## PHYS 140: Introduction to Sustainability

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course introduces the concept of environmental sustainability using energy as a theme. We will examine how a variety of cultures utilize energy and how these cultures approach sustainability. Using a systems approach we will explore current energy trends and discuss future energy scenarios. relevant topics from physics, chemistry, biosciences and earth science will be covered as they relate to sustainability. The tradeoffs (environmental as well as economic) associated with generating and using energy for different cultures will be examined. Finally we will explore what actions are needed to work towards a sustainable energy future. Students should have completed or be concurrently enrolled in College Algebra.

**B. COURSE EFFECTIVE DATES:** 08/21/2011 - 05/15/2020

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Investigate possible careers available in the green economy.
2. The history and present condition of global energy use and its benefits and consequences of those sources .
3. The use of the physical and social science and applicable technology in understanding and presenting solutions to global environmental problems.
4. Look at how global energy use, world population growth, and world environmental degradation, have affected various cultures and global regions.
5. Investigate possible paths to world sustainability .

#### **D. LEARNING OUTCOMES (General)**

1. Become aware of a variety of physics, chemistry, bioscience and earth science concepts pertaining to energy.
2. Develop an understanding of different cultures and their energy use patterns.
3. Develop critical thinking skills through analysis, oral and written communication.
4. Develop estimating and unit analysis skills along with understanding exponential growth.
5. Become familiar with the scientific process.
6. Students will become aware of, and be able to articulate problems and solutions in the following areas:
  1. Energy sources available to our civilization as it exists today
  2. Benefits and consequences of various energy paths/supplies
  3. How energy use affects world ecosystems
  4. How past cultures have failed or survived based on their energy usage and environmental stewardship
  5. How societies change and adapt to new paradigms
7. Learn to recognize valid sources of information and distinguish between valid and invalid arguments.

#### **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

None

#### **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

#### **G. SPECIAL INFORMATION**

None noted