

## CUMBERLAND COUNTY COLLEGE

Course: PI 104 Energy the Environment and Society

Credits: 3

Prerequisite: MA 094

### Description:

This course provides an overview of the ways modern society utilizes and converts energy in its quest for technological and economic advancement. The course covers important topics such as energy (fundamental units, concepts, history of development and current problems) and its impact on the global environment. An overview of the current unsustainable (coal, oil, natural gas, nuclear, transport, etc.) as well as sustainable technologies (solar, wind, wave, biomass, geothermal, tidal, hydropower, alternative transport, etc.) is provided. In addition, the student is made aware of the important role energy conversion and utilization by industrialized and industrializing countries presently plays in global climate change. The course forms a foundation to a student's understanding of how important affordable and available energy is to economic prosperity in society.

### Learning Outcomes:

Upon completion of this course, students should be able to:

- Apply basic mathematical techniques to convert energy from one type to another and determine its carbon footprint
- Discuss the international and global issues that make sustainable energy development important
- Determine the suitability of sites for renewable energy development
- Describe the fundamentals of energy conservation
- Recognize the basic elements of a conventional power station
- Describe the mode of operation of various renewable energy systems
- Create a balanced assessment of the benefits and environmental costs of the many different methods of generating electricity
- Describe the basic processes associated with acid rain and global climate change.

### Topical Outline:

- The students will be able to define energy, power and work.
- Students will be able to convert numbers into different units.
  - Students will learn the train track method for conversions.
  - Students will be required to complete single step and multi-step conversions.
  - The students will be capable of converting various types of energy to other types (BTUs, kWh, Joules, etc.)
- Students will gain a historical perspective of energy use.
  - Industrial Revolution and its impacts on society and the environment
  - Identify the major energy sources used throughout history.
- Students will be able to define efficiency and calculate efficiency of various processes.
- The students will be able to quantify the environmental impact of various types of energy

- Students will be able to identify types and differences between sustainable and unsustainable energy sources.
- Students will have a fundamental understanding of fossil fuel formation and general characteristics of fossil fuels used in daily life.
  - The main components of natural gas
  - Difference between gasoline and diesel fuels and engines
  - Identify a few major types of coal compare based on energy and carbon content.
- Students are expected to understand the basics of most major sustainable energy sources.
- Students should be able to compare and contrast energy production from sustainable energy sources and unsustainable energy sources.
- Students should be able to identify the most important environmental impacts associated with energy production
  - Climate Change
  - Acid Rain
- Students will understand what carbon footprint.
  - Identify major impacts of carbon emissions
  - Ways to lower carbon footprint
- Appliances

Text:

Energy and the Environment, J. J. Kraushaar and R. A. Ristinen, © 2006 John Wiley and Sons, ISBN 978-0-471-73989-0 (P/B)

Student Assessment:

Assessment may be accomplished through projects, portfolios, exams, presentations and/or papers

Academic Integrity:

Plagiarism is cheating. Plagiarism is presenting in written work, in public speaking, and in oral reports the ideas or exact words of someone else without proper documentation.

Whether the act of plagiarism is deliberate or accidental [ignorance of the proper rules for handling material is no excuse], plagiarism is, indeed, a “criminal” offense.

As such, a plagiarized paper or report automatically receives a grade of **ZERO** and the student may receive a grade of **F** for the semester at the discretion of the instructor.

Tutoring & Project Assist:

If you are having difficulty with work in this class tutoring is available through the Center for Academic & Student Success. If you think that you might have a learning disability, contact Project Assist at 856.691.8600 x 1282 for information on assistance that can be provided to eligible students.

**Before Withdrawing From This Course:**

If a student experiences adverse circumstances while enrolled in this course and considers withdrawing, s/he should see an advisor (division or advisement center) BEFORE withdrawing from the class. A withdrawal may cause harmful repercussions to completion rate standards and

overall GPA, which can limit or eliminate future financial aid in addition to causing academic suspension.