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Energy (ENER) 1510 Introduction to Energy (3 Units) CSU:UC

Advisory: Eligibility for English 1500 and Math 1050 strongly recommended

Total hours: 48 hours lecture

Catalog Description: This course is a survey of the energy industry. The course is intended to provide an overall understanding of the various fields and types of energy, the role it plays in the national and global economy as well as challenges and opportunities. This class will discuss the various types of energy sources, which include wind, solar, and others. Field trips are required.

Type of Class: Degree credit

Text: McElroy, Michael B. *Energy: Perspectives, Problems, and Prospects*. New York: Oxford University Press, 2010. Print.

Additional Instructional Materials:

<http://energyalmanac.ca.gov/>
<http://cwec.ucdavis.edu/training/>
<http://www.techtionary.com/>
<http://www.msnbc.msn.com/id/27344659/>
<http://www.energy.ca.gov>
<http://www.consrv.ca.gov>
http://www.coeccc.net/solar/documents/GSac_KeyFindings.pdf
<http://www.tfssolar.com/solar-commercial-tucson/>
http://www.oerb.com/Portals/0/docs/Advance/fall_2007lowres.pdf
<http://www.nextgenerationnuclearplant.com/you/energy-of-industry.shtml?gclid=CMXDhujh2ZYCFQsQagodQSlj1g>

Course Objectives:

By the end of the course, a successful student will be able to

1. understand the alternative energy sources available,
2. evaluate the earth's potential for energy sources,
3. identify the methods of capturing and/or storing alternative energy sources, and
4. report on the history and growth of alternative energy in Kern County.

Course Scope and Content:

- Unit I Alternative Energy Resources
 - A. A Brief History of the Sources
 - B. Potential Alternative Sources of Energy

- Unit II Electricity
 - A. Overview
 - B. Sources and Uses

- Unit III Hydroelectricity
 - A. Overview
 - B. Sources and Uses

- Unit IV Wind Energy
 - A. History
 - B. Characteristics and Resource Assessment
 - C. Aerodynamics
 - D. Structures and Loads
 - E. Operations and Maintenance
 - F. Electrical
 - G. Environmental
 - H. Grid Integration

- Unit V Solar Energy
 - A. Overview
 - B. Sources and Uses

- Unit VI Steam and Geothermal Energy
 - A. Overview
 - B. Sources and Uses

- Unit VII Creation, Transportation and Storage
 - A. Overview
 - B. Methods and Types
 - C. Impacts

- Unit VIII Economics
 - A. Costs and Revenue
 - B. Production

- Unit IX Conversion or Interacting with Petroleum Energy
 - A. Options
 - B. Development

- Unit X Uses for Alternative Energy Sources
 - A. Options
 - B. Development

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 6 hours per week outside of the regular class time doing the following:

1. Reading the required text and other background materials
2. Answering questions
3. Studying class materials and notes
4. Researching
5. Problem solving activities and exercises
6. Field trips to Kern Country alternative energy operations
7. Written reports

Method of Instruction:

1. Lecture and discussion
2. Guest lecture and presentations from energy company representatives
3. Outside activities including field exploration/trips to energy company and production sites as needed
4. Group activities and projects

Method of Evaluation:

1. Written assignments, including:
 - a. reports, written assignments
2. Exams and quizzes:
 - a. computational or non-computational problem-solving demonstrations
 - b. multiple choice; true/false; matching
3. Skills demonstrations, including:
 - a. class performance
4. Participation
 - a. class and group activities
 - b. field trips