

Chemistry 2024 Course Description

Instructor:

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Textbook:

Chemistry: A Worlds of Choices, 2nd Ed., by Kelter, Carr and Scott from McGraw-Hill (2003). ISBN 0-07-119937-3

About this Course:

This course satisfies the course-laboratory requirement for Block III and is a required course for a major in Energy Management. There are two major components of the course: lecture and lab. The lecture portion of the course is to provide students with enough of a chemical background to understand the issues associated with energy production and the movement toward a renewable energy economy. The laboratory portion of the course will focus on the feasibility of producing wind energy in Oklahoma. The working hypothesis of the class is that building a wind farm in Oklahoma is economically feasible. To examine this hypothesis, students will conduct research. Much of this research will require the collection and analysis of data, drawing conclusions, and asking additional questions. Students will participate in the actual scientific process, as the result of the research can be obtained only from the analysis of collected data.

Lecture Topics Included in the Course:

Understanding heat, energy and temperature
Origins of the universe and the elements it contains
Atomic structure
The periodic table
Density
Food as an energy source
First Law of Thermodynamics
Electronic structure
Bonding within molecules
Oxidation and reduction
Chemical equations
Biofuels
Carbon cycle

Hydrologic cycle
Nitrogen cycle
Oxygen cycle
Fuels
Batteries
Fuel cells
Energy of phase changes
Acid rain
Smog
Particulate matter
Ozone depletion
Hydrogen economy

Laboratory Assignments:

There are 5 laboratory assignments. Laboratory assignments will require obtaining, manipulating and analyzing weather data and predicting the potential for developing a functioning wind farm in Oklahoma. As this is a science course, the scientific method will be used. Students will make extensive use of Oklahoma Mesonet data.

All reports must be written in Microsoft Word and must be submitted via Vista on WebCT.

Poster Presentation:

The poster presentation is the culmination of the laboratory experience. During the semester, each student will select a wind farm site somewhere in Oklahoma. Students will prepare a poster summarizing their work for their wind farm site. Students will present their poster in a public setting. Guests from outside of the class will be present and will be welcome to ask students questions about their work.