

Physics 12: Energy and the Environment

Course Outline

Spring Quarter, 2013

Website: physics.ucsd.edu/~tmurphy/phys12/

Course Description and Content

This course will look at the role that energy plays in our modern world. The average person in the United States consumes 60 barrels of oil per year and is responsible for 10,000 Watts of continuously-running power. This amounts to several hundred times our biological capability (i.e., muscle power), and is an important ingredient in our modern lifestyle. We will explore the *physics* of energy, learning to calculate the energy content of a wide variety of systems such as speeding cars, toasty houses and hot tubs, wind, solar illumination, gasoline, and hot dogs. We will apply these concepts to the various energy production schemes and usages found in our lives. We will discuss today's dominant energy sources, supply lifetimes, alternative energy sources, environmental impacts, and the future of energy in our world. This semi-quantitative course is meant to provide a scientific foundation for understanding the energy issues facing our country and world so that the student will be able to make informed decisions regarding—or even participate in—the ongoing debate surrounding this important societal issue.

Class Meeting Times:

Lecture: York 2622, MWF 3:00–3:50 PM

Discussion: CSB 005, W 4:00–4:50 PM

Professor Contact and Office Hours:

Professor: Tom Murphy

e-mail: tmurphy@physics.ucsd.edu

Phone: 858.534.1844

Office: SERF Building, Room 336 (4-story bldg. east of Price Center)

Hours: Thursday 1:30–2:30 PM, or by appointment

Teaching Assistant:

Name: Matthew Hasling

e-mail: mhasling@physics.ucsd.edu

Office: SERF 434

Hours: Thursday 2:30–3:50 PM, or by appointment

Required Textbook:

Energy and the Environment, Second Edition, by Robert Ristinen and Jack Kraushaar, John Wiley and Sons, Inc.

Transmitter Required:

For class participation credit, purchase an iClicker transmitter from the bookstore. See class web page <http://physics.ucsd.edu/~tmurphy/phys12/phys12.html> for more details.

Grading Scheme

- 20% from weekly graded homework (drop 1), due on Fridays in class. Homework questions will come from both the textbook and from the course website.
- 15% from weekly quizzes (drop 1) administered via TED; due Fridays by midnight
- 30% (or as little as 15%) from the midterm exam (**Monday, May 6, 3:00 PM**, in class)
- 35% (or as little as 20%) from the final exam (**Wednesday, June 12, 3:00 PM**)
- up to 15% based on class participation, as judged by the daily transmitter activity. This is an optional part of the grade, applying to your worst exam. For instance, if you bomb the midterm, and have 80% transmitter credit by the end, the midterm is only worth 18% instead of 30%, the other 12% of your final grade coming from participation credit. Do not bring multiple transmitters to class: extras may be confiscated.

Grades will be curved to fairly represent student capabilities/performance