

## Syllabus for PHY 398: Junior Seminar in Energy and its Impacts

**Instructors:** Peter R. Saulson (Physics), head instructor; other members of instructional team: Mark Braiman (Chemistry), Matt Huber (Geography), Chris Scholz (Earth Sciences), Peter Wilcoxon (Economics)

### Course Meetings:

Regular course meetings will be Wednesdays from 3:45 to 5:05 p.m., in Physics Building Room 106. Some meetings may be rescheduled at a time convenient to all enrolled students. Some weeks (mainly in the second half of the semester) will involve field trips to nearby sites.

### Prerequisites:

Ordinarily students must have junior standing and be enrolled in the ILM on Energy and its Impacts. In exceptional cases, other students may enroll with the permission of the instructor.

### Required reading:

No required textbook. Students are encouraged to download a free copy of *Sustainable Energy – Without the Hot Air* by David J.C. MacKay, at <http://www.withouthotair.com>. Other readings will be supplied by the instructors.

### Learning outcomes:

Students in PHY 398 will:

- Understand the physical nature of energy and the scientific basis of energy-related issues,
- Understand how economic considerations can be applied to analyze energy supplies and energy impacts,
- Examine tradeoffs between benefits and costs, including considerations of affordability, safety, environmental impact, national security, and quality of life,
- Become aware of energy issues that arise in or are relevant to Syracuse and its environs, and
- Confront the interdisciplinary nature of the study of energy issues.

### Course requirements:

Students will participate actively in weekly discussions. For each week, readings of one or two articles or chapters will introduce a topic. Students will be responsible for coming to class prepared to discuss the topic and to pose questions raised by the reading. A brief response paper will be assigned after every guest speaker or field trip. As a summary project, students will write a proposal for a senior capstone project in Energy and Its Impacts.

Grades will be based on the quality of: participation in weekly discussions, response papers, and the capstone project proposal.

**Course calendar:**

Jan 18: Introduction to PHY 398; Physical Science of Energy I (Saulson)  
Jan 25: Physical Science of Energy II: Forms of energy; energy conversions (Saulson)  
Feb 1: Physical Science of Energy III: Energy supplies and uses;  
prospects for renewables (Saulson)  
Feb 8: Economics of Energy I: Risk and uncertainty (Wilcoxon)  
Feb 15: Economics of Energy II: Energy costs (Wilcoxon)  
Feb 22: Physical Science of Energy IV: Fundamental boundaries of  
energy conversion efficiency (Braiman)  
Feb 29: Case study: Micro-hydropower from Cazenovia Lake (Braiman)  
Mar 7: Energy geographies (Huber)  
Mar 14: SPRING BREAK  
Mar 21: Case study TBD  
Mar 28: Case study TBD  
Apr 4: Case study TBD  
Apr 11: Case study TBD  
Apr 18: Case study TBD  
Apr 25: Lessons learned; planning for senior capstone project

**Academic integrity:**

Complete academic honesty is expected of all students. Any incidence of academic dishonesty, as defined by the SU Academic Integrity Policy (see the [Academic Integrity Policy and Procedures \(PDF\)](#), will result in both course sanctions and formal notification of the College of Arts & Sciences. In this course, students are allowed and encouraged to work together to help in learning, but all assignments turned in must be the work of the individual student and may not be copied from another student's work, the assigned readings, or any other source, except for short quotations with proper attribution.

**Disability-related accommodations:**

If you believe that you need accommodations for a disability, please contact the Office of Disability Services (ODS), <http://disabilityservices.syr.edu>, located in Room 309 of 804 University Avenue, or call (315) 443-4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible for coordinating disability-related accommodations and will issue students with documented disabilities Accommodation Authorization Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.