

**ECONOMICS 132 – FALL 2005**  
**ENERGY ECONOMICS**

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Classroom:	Center Hall 115
Class Time:	MWF 1:00 – 1:50 p.m.
Class Web Page:	<a href="http://weber.ucsd.edu/~gpeters/econ132/">http://weber.ucsd.edu/~gpeters/econ132/</a>

### **COURSE DESCRIPTION**

Each and every day, you are an energy consumer. Maybe your morning shower is heated by natural gas. The milk for your cereal is kept cold in your electric refrigerator. The car or bus you use to get to school probably requires gasoline.

In this class you will be introduced to the way that economists view energy choices by examining some of the more pressing energy issues faced by nations around the world. In particular, we will discuss recent trends in oil production and consumption, the economic viability of alternative energy sources, and the structure of electricity markets.

### **PREREQUISITES**

The prerequisites for this class are Economics 1 and Economics 2.

### **TEXTS AND COURSE READINGS**

The required textbook is *Introduction to Energy: Resources, Technology, and Society*, 2<sup>nd</sup> Edition by Edward S. Cassedy and Peter Z. Grossman. Additional required readings are available on UCSD library electronic reserves. The required readings are listed below. Since the pace will be rapid, you are strongly encouraged to read the required materials ahead of each lecture.

### **QUIZZES**

There will be three online quizzes to be completed on the course Web CT website this quarter. The quizzes will be due at 7:00 p.m. on **Monday, October 10<sup>th</sup>**, **Monday, October 31<sup>st</sup>**, and **Monday November 28<sup>th</sup>**. To access the Web CT website (<http://webct.ucsd.edu>), follow the guidelines posted at [http://iwdc.ucsd.edu/step1\\_webct4.pdf](http://iwdc.ucsd.edu/step1_webct4.pdf).

### **EXAMINATIONS**

Two midterm exams and one final exam will be given in this section. The midterm exams will be given in class on **Wednesday, October 19<sup>th</sup>** and **Wednesday, November 9<sup>th</sup>**. The final exam will be held on **Friday, December 9<sup>th</sup> from 11:30 a.m. – 1:30 p.m.**

All three exams must be taken at the scheduled time and place; they will not be given “early”. Students who arrive late will not receive extra time to complete their exam. Once a student completes the exam and leaves the exam room, no other student will be permitted to start the exam.

No study aids, notes, books, or electronic devices will be allowed in the exams.

Any student suspected of cheating on an exam will be brought to the attention of the Dean.

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**MAKE UP EXAMINATIONS**

No make-up exams will be given in this class. Students who miss the midterm exam without a university accepted excuse will receive a grade of zero (0) for that exam. Students who miss the midterm with a university accepted excuse will have the weight of the final exam increased accordingly. You must take the final exam to receive a grade in this course.

Excuses for missed exams must be **pre-approved** by the instructor (except when this is not possible in an emergency situation). Students who make initial contact after the exam will have to document why they could not make contact prior to the exam. In addition, any student who misses an exam due to physical illness will be required to provide documentation from a health care professional indicating why the student was physically unable to take the exam. All documentation and an additional signed written statement explaining the relevant circumstances of the absence must be provided to the instructor within two working days of the student's return to campus. Failure to comply with any of the above in the specified manner will result in a grade of zero (0) for the exam.

**ATTENDANCE**

Class attendance is an individual student responsibility. Although daily attendance is not recorded, the lectures will cover more material than the readings, and I will frequently provide analysis during lectures that don't appear in the readings but are fair game for examination. Thus frequent absences may adversely affect your performance in this course.

**GRADING**

Your raw numerical score will be determined as follows:

Web CT Quiz 1	=	5%
Midterm Exam 1	=	25%
Web CT Quiz 2	=	5%
Midterm Exam 2	=	25%
Web CT Quiz 3	=	5%
<u>Final Exam</u>	=	<u>35%</u>
Total Raw Score	=	100%

Your final letter grade will be determined by the distribution of raw numerical scores in the class.

**IMPORTANT DATES**

Monday, October 10 <sup>th</sup>	Web CT Quiz 1 due at 7:00 p.m.
Wednesday, October 19 <sup>th</sup>	Midterm Exam 1 (In class)
Monday, October 31 <sup>st</sup>	Web CT Quiz 2 due at 7:00 p.m.
Wednesday, November 9 <sup>th</sup>	Midterm Exam 2 (In class)
Friday, November 11 <sup>th</sup>	University Holiday – Lecture and Office Hours Cancelled
Friday, November 25 <sup>th</sup>	University Holiday – Lecture and Office Hours Cancelled
Monday, November 28 <sup>th</sup>	Web CT Quiz 3 due at 7:00 p.m.
Friday, December 9 <sup>th</sup>	Final Exam (11:30 a.m. – 1:30 p.m.)

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**READING LIST**

**NOTATION:**

- Required Readings
  - *Recommended Readings*

**Energy crisis of the 1970s**

- Cassedy & Grossman, Ch. 1

**Energy conversion calculations**

- Cassedy & Grossman, App. A, pp. 324-327 (Energy Conversion, Units of Measure, Forms of Energy)

**Fossil fuel resources**

- Cassedy & Grossman, Ch. 2, pp. 9-25
- Cassedy & Grossman, Ch. 5, pp. 103-114 (World Energy Supply)
- Cassedy & Grossman, App. C, pp. 378-379 (Enhanced Oil Recovery)
- Cassedy & Grossman, App. C, pp. 397-401 (Shale Oil, Tar Sands, Unconventional Natural Gas)

**Demand for energy**

- Cassedy & Grossman, Ch. 4, pp. 64-80
- Cassedy & Grossman, Ch. 5, pp. 99-103
  - *Cassedy & Grossman, Ch. 3*

**Environmental impacts of fossil fuels**

- Cassedy & Grossman, Ch. 6
- Cassedy & Grossman, App. C, pp. 379-381 (Fluid-bed Combustion)
- Cassedy & Grossman, App. C, pp. 391-397 (Coal-Derived Synthetic Fuels)

**Conservation potential**

- Cassedy & Grossman, Ch. 2, pp. 28-32 (Conflicting Views Concerning Resource Depletion)
- Cassedy & Grossman, Ch. 4, pp. 80-95 (Conservation Potential)
- Cassedy & Grossman, Ch. 5, pp. 123-130 (Resources and Development: The North-South Question)
  - *Cassedy & Grossman, App. C, pp. 374-376 (Technical Efficiency)*
  - *Cassedy & Grossman, App. C, pp. 385-386 (Heat Pumps)*

**Renewable resources**

- Cassedy & Grossman, Ch. 2, pp. 25-28 (Renewable Resources)
- Cassedy & Grossman, Ch. 5, pp. 114-123 (World Renewable Energy Resources)

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**Alternative energy technologies/adoption paths**

- Cassedy & Grossman, Ch. 10
- Cassedy & Grossman, Ch. 11
- Cassedy & Grossman, App. C, pp. 382-384 (Resource Recovery)
- Cassedy & Grossman, App. C, pp. 386-391 (Wind Power)
- Cassedy & Grossman, App. C, pp. 402-412 (Geothermal, Direct Solar Conversion, Advanced Storage)
- Cassedy & Grossman, App. C, pp. 418-422 (Fuel Cells, Hydrogen Economy)

**Nuclear fission**

- Cassedy & Grossman, Ch. 7
- Cassedy & Grossman, Ch. 8

**Risk analysis**

- Cassedy & Grossman, App. B

**Unique attributes of electricity technology**

- Rosenberg, N. The Role of Electricity in Industrial Development. *The Energy Journal* 19 (1998): 7-24

**Calculating electricity production costs**

- Cassedy & Grossman, Ch. 9, pp. 230-239
- Cassedy & Grossman, App. C, pp. 377-378 (Small Hydroelectric Generation)
- Owen, A.D. Environmental Externalities, Market Distortions and the Economics of Renewable Energy Technologies. *The Energy Journal* 25 (2004): 127-156

**Unique attributes of electricity markets**

- Cassedy & Grossman, Ch. 9, pp. 239-245 (Demand Side Management, The New Electric Market)
- Borenstein, S., Bushnell, J., and C.R. Knittel. Market Power in Electricity Markets: Beyond Concentration Ratios. *The Energy Journal* 20 (1999): 65-88
- Borenstein, S. and J. Bushnell. Electricity Restructuring: Deregulation or Reregulation? *Regulation* 23 (2001): 46-52
- Bushnell, J. California's Electricity Crisis: A Market Apart? *Energy Policy* 32 (June 2004): 1045-1052