

ENCO 4364: Alternative Energy Markets

Syllabus Fall 2008

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<i>Office hours</i>	Monday and Wednesday, 1:00-2:00 PM; Tuesday and Thursday, 2:00-3:00 PM; and by appointment.
<i>Website</i>	http://giberson.ba.ttu.edu/ENCO4364
<i>Class</i>	TR 12:30-1:50PM, BA 157

Course description

Compares market economics and technology of conventional and unconventional fossil fuels to emerging alternatives and renewable energy sources of electricity generation.

Course materials

- Paul Komor, *Renewable Energy Policy*, (iUniverse; 2004).
- Packet of readings for purchase at BA Copy Center. [NOT YET AVAILABLE]
- Brown and Sedano, *Electricity Transmission: A Primer*, National Council on Electricity Policy (June 2004). Available free online at: <http://www.oe.energy.gov/DocumentsandMedia/primer.pdf>.
- Short, et al., *A Manual for the Economic Evaluation of Energy Efficiency and Renewable Energy Technologies*, NREL/TP-462-5173 (March 1995). Available free online at: <http://www.nrel.gov/csp/troughnet/pdfs/5173.pdf>.
- Texas Comptroller of Public Accounts, *The Energy Report 2008*, (May 2008). Available free online at: <http://www.window.state.tx.us/specialrpt/energy/>.

Also recommended is Bosselman, et al., *Energy, Economics and the Environment: Cases and Materials*, 2d edition (2006), which provides background for topics addressed in this and other Energy Commerce courses. You should consider the book, but it is not required for this course.

Expected Learning Outcomes

After completing this course, students will be able to:

- Describe the role played by electricity in the energy economy;
- Identify the basic elements of the electric power system – generation, transmission, and local distribution – and describe the role played by each element;
- List common conventional and alternative methods for producing electrical power and describe basic characteristics of each method;
- Describe how wholesale power markets function in both traditional regulated utility power systems and in integrated regional power markets;

- Evaluate project economics for an electric power project and produce a report in a standardized format;
- Identify uncertain factors in long-term forecasts (especially as relate to project evaluation) and employ analytical tools to guide decision making under uncertainty; and,
- List the key public policies affecting renewable power generation and identify the role played by these policies in shaping the electric power industry.

Methods of Assessing Outcomes

The expected learning outcomes will be assessed by review of written assignments (project reports), class participation, and performance on the unit tests and the final exams.

Class participation - The primary focus of most class periods will be classroom discussion of the assigned materials facilitated by the instructor. Students are expected to read assigned materials prior to assigned dates and to contribute class discussions.

Project Reports – Each major unit of the course will require the student to demonstrate understanding of the material covered by submission of a project report.

Unit Tests – Dates to be announced.

Final Exam – Test scheduled for December 10 at 4:30 AM – 7:00 PM.

Grading

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|-----------------------|-----|
| • Class participation | 15% |
| • Project Reports | 50% |
| • Unit Tests | 20% |
| • Final Exam | 15% |

Additional class policies

In general, the class will follow standard university policies as described in the Texas Tech University Operating Policies (<http://www.depts.ttu.edu/opmanual/>). In addition, please note:

Academic Honesty: It is the aim of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. Academic dishonesty will not be tolerated and will be treated according to the rules outlined in the Student Handbook.

Absences - A student who will miss class due to a university-approved trip or to observe a religious holy day should make that intention known to the instructor prior to the absence so that accommodations can be made in accordance with university policies.

Disabilities - Any student who, because of a disability, may require some special arrangements in order to meet course requirements should contact the instructor to request necessary accommodations.

Syllabus and Course Outline Changes - The instructor may adjust the syllabus or course outline during the course of the semester. Updated versions of the syllabus and course outline will be maintained on the class website (<http://giberson.ba.ttu.edu/ENCO4364>).

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Course Outline Fall 2008

Consult the online version of this document for current assignment dates and other changes:
<http://giberson.ba.ttu.edu/ENCO4364>.

Topic	Assignment	Date
1 – Introduction to wind power		
What do we want to know about wind energy?	<ul style="list-style-type: none"> • CNBC, "Texas OKs Big-Bucks Wind Power Project," (2008 July 17) • U.S. News, "Why T. Boone Pickens could be the best hope for wind energy," (2008 August 22) 	(Aug 28)
2 – Electric power grid		
a) Electric transmission, reliability	Brown and Sedano, pp 1-11; 22-28	(Sept 2)
b) Economic dispatch of generation	Brown and Sedano, pp 29-28; Reading: [economic dispatch]	(Sept 4)
c) Power markets	Reading: [how RTO power markets function]	(Sept 9)
3 – Evaluating wind power		
a) Tools for analyzing projects		(Sept 11)
b) Wind generation characteristics		(Sept 16)
c) Wind generation		(Sept 18)
4 – Conventional generation		
a) Coal and nuclear		(Sept 23)
b) Natural gas		(Sept 25)
c) Hydropower		(Sept 30)
d) Evaluating conventional generation		(Oct 2)
5 – Solar energy		
a) Technologies and costs		(Oct 7)

b)	(Oct 9)
6 – Geothermal energy	(Oct 14)
7 – Other renewables Ocean energy, Biomass	(Oct 16)
8 – Electric power and consumers	
a) Demand for electricity; Energy efficiency	(Oct 21)
b) Demand for renewable power	(Oct 23)
c) Retail power prices; Demand response	(Oct 28)
d)	
8 – Public policy and alternative energy supplies	
a) The case for policy intervention	(Oct 30)
b) Renewables and electric power restructuring	(Nov 4)
c) U.S. green power experience	(Nov 6)
d) Renewable Portfolio Standards (RPS)	(Nov 11)
e) The Texas RPS and Renewable Energy Credit trading	(Nov 13)
9 – Energy off the grid	(Nov 18)
	(Nov 20)
	(Nov 25)
Last class	(Dec 2)
FINAL EXAM	(Dec 10)