

ENCO 4312: Energy Economics

Syllabus Fall 2009

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<i>Office hours</i>	Monday through Thursday, 2:00-3:00 PM Monday and Wednesday, 12:00-12:55 PM and by appointment.
<i>Website</i>	http://giberson.ba.ttu.edu/ENCO4312
<i>Class</i>	MWF 11:00-11:50PM, BA 266

Course description

Focus on oil and gas project economics, with emphasis on project cost and revenue forecasting, and interaction of wholesale and retail energy markets. Economic analysis of environmental policies affecting energy production and use.

Course materials

- Bosselman, Eisen, Rossi, Spence & Weaver, *Energy, Economics and the Environment: Cases and Materials*, Foundation Press, 2d Edition (2006).
- The course will primarily rely on a wide range of other materials available through the library or online. Links will be provided via the course outline on the class website.

Expected Learning Outcomes

After completing this course, students will be able to:

- Describe current energy market trends and relate current conditions to historical market performance;
- Explain basic oil market and gas market dynamics, focusing on consumer and producer responses to prices;
- Evaluate project economics for an oil or gas resource and produce a report in a standard format;
- Identify uncertain factors in long-term forecasts (especially as relate to project evaluation) and employ analytical tools to guide decision making under uncertainty;
- Explain concepts fundamental to the economics of natural resources;
- Describe the cost-benefit approach to evaluation of public policy toward energy resources; and,
- Discuss the use of cap-and-trade, pollution taxes, and other economic approaches to environmental regulation.

Methods of Assessing Outcomes

The expected learning outcomes will be assessed by review of written assignments (project reports), class participation, and performance on the Mid-term and Final Exams.

Homework – Each major unit of the course will include a homework requirement by which the student demonstrates understanding of the material covered.

Class participation – The primary focus of many class periods will be classroom discussion of the assigned materials facilitated by the instructor. Students are expected to contribute to discussions and other classroom activities.

Mid-Term Exam – Test date *estimated* to be October 16 (may change as needed).

Final Exam – Test scheduled for Friday, December 11 at 1:30 AM – 4:00 PM.

Grading

- Homework 50%
- Class participation 10%
- Mid-Term Exam 20%
- Final Exam 20%

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/ENCO4312>).

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Course Outline Fall 2009

Consult the online version of this document for current assignment dates and other changes:
<http://giberson.ba.ttu.edu/ENCO4312>.

Outline of topics

<u>Topics</u>	<u>Resources and assignments</u>	<u>Date</u>
1. Introducing the course	Peak oil assignment (via email)	Aug 28
2. Scarce oil resources and energy supply and demand		
a) The fundamentals of energy (and any other kind of) economics	In class auction exercise	Sep 2
b) More on supply and demand	In class auction exercise ASSIGNMENT DUE	Sep 4
c) Supply and demand analysis – interpretation		Sep 9
3. Oil resources – economic considerations		
a) Reserves and resources; Introduction to discounted cash flow analysis	Reading assignment: SPE Petroleum Resources Management System - Guide for Non-Technical Users , SPE et al.(2007), [OPTIONAL: More information on SPE definitions of petroleum reserves and resources .]	Sep 11
b) Role of oil prices in reserve valuation	BACKGROUND: Bosselman, et al., Ch. 6A, "Domestic Petroleum: Some Basics."	Sep 14
c) Understanding oil markets and oil prices	Reading assignment: Hamilton, " Understanding Crude Oil Prices ." (December 2008)	Sep 16 Sep 18
d) The role of OPEC	Reading assignment: Adelman, " The Real Oil Problem ," <i>Regulation</i> , Vol.27, No. 1 (2004).	Sep 21
4. Natural gas resources		
a) Natural gas markets and prices	" Natural gas prices: Do oil prices still matter? " BACKGROUND READING: Bosselman, et al., Ch. 6 A, "Natural Gas: Some Basics"	Sep 23
b) Economics of natural gas	EIA, " Is natural gas production increasing "	Sep 25

	supply		
c)	Natural gas markets and prices	Reading TBD	Sep 28
d)	LNG, Alaskan natural gas, and future natural gas prices	Reading TBD	Sep 30
e)	An international gas cartel?	Reading TBD	Oct 2
5. Risk and uncertainty in reserve evaluation			
a)	Risk and uncertainty	Bailey et al., " Taking a calculated risk ", <i>Oilfield Review</i> , 2000, pp. 20-29 only.	Oct 5
b)	Using decision trees and other techniques	Bailey et al., "How oil companies use real option valuation", p. 9 only in " Unlocking the value of real options ," <i>Oilfield Review</i> , 2003/2004. [OPTIONAL: Read full article.]	Oct 7
c)	Portfolios and risks	Smith, " Petroleum project evaluation ," MIT working paper 03-011, 2003, pp. 9-13 only . [OPTIONAL: Read full article.]	Oct 9
d)	Introduction to Monte Carlo analysis	In class activity [OPTIONAL: Scheig and Barnett, " Monte Carlo Simulation Improves Decision Making ," <i>Natural Gas & Electricity</i> , May 2007.]	Oct 14
Mid Term exam			Oct 16
6. Retail markets for oil and gas			
a)	Gasoline prices	Assignment (To come) " Do Gas Prices Rise Faster Than They Fall? "	Oct 19
b)	Industry structure: Refiners, pipelines and retail markets	Trench, " How pipelines make the oil market work ,"	Oct 21 Oct 23
c)	Industry structure: Retail and wholesale gasoline market interaction	FTC, Gasoline Price Changes: The Dynamic of Supply, Demand, and Competition , 2005. Read the Executive Summary and Chapter 4, "Supply, Demand and Competition at the Regional Level," (pp. 69-97)	Oct 26 Oct 28
7. Natural resource and environmental economics			
a)	Externalities	Reading TBD	Oct 30
b)	Tragedy of the commons	Reading TBD	Nov 2 Nov 4

c) Rules and resource use	Reading TBD	Nov 6
d) Economic analysis of environmental policy	Paul Portney, " Benefit-Cost Analysis ," The Concise Encyclopedia of Economics, 2008	Nov 9 Nov 11
e) Experience with SO2 permit trading	Reading TBD	Nov 13 Nov 16
f) Regulating greenhouse gases: cap-and-trade or carbon tax?	Reading TBD	Nov 18 Nov 20 Nov 23

8. The changing energy economy

		Nov 30 Dec 2 Dec 4 Dec 7 Dec 9 Dec 11
Final Exam	<u>1:30 PM – 4:00 PM.</u>	