



EBGN 430/530

Course Title: Energy Economics

Section: A

Semester/year: Fall 2017

Syllabus

Instructor: Professor Carol Dahl

Contact information

(Office/Phone/Email): EH 128/303-273-3921/cadahl@mines.edu

Office hours: T 6:15-8:15

Otherwise I am in most afternoons and evenings (W, Th, Sa, Su, M) just let me know when you would like to drop by or email your questions

Please start each email subject with 530 to get priority attention.

Class meeting days/times: Tu 3:30-6:15

Class meeting location: EH 211

Teaching Assistant (TA): TBA

TA Contact information

(Office/Phone/Email): TBA

TA Office hours: TBA

Instructional activity: 3 hour class (lecture&activities) with supplemental digital materials

Course designation: Economic and Public Policy Specialization

Course description from Bulletin: Application of models to understand markets for oil, natural gas, coal, electricity, and renewable energy resources. Models, modeling techniques, and issues included are supply and demand, market structure, transportation models, game theory, futures markets, environmental issues, energy policy, energy regulation, input/output models, energy conservation, and dynamic optimization. The emphasis in the course is on the development of appropriate models and their application to current issues in energy markets. Prerequisites: Principles of Microeconomics, MATH111, EBG509, EBG510, EBG511; or permission of instructor.

Required Textbook: Dahl, Carol A. International Energy Markets: Understanding Prices, Policies and Profits, 2nd edition.

Student learning outcomes: At the end of the course, the student will have gained a better understanding of the functioning of international energy markets and developed the tools and techniques to continue to learn and analyze these markets beyond the course. The student will:

- master theoretical models relating to energy markets, energy regulation and policy, environmental issues, risk management, energy and the economy, energy sustainability
- be able to work out quantitative examples and use computer applications to increase intuitive understanding of theoretical models
- understand the economic principles developed in the models
- understand how models can be used for forecasting, policy analysis and project evaluation
- have an understanding of terminology along with key drivers and interactions in energy markets
- be able to acquire and use information in major international energy data bases
- be familiar with important institutions, technologies, concepts, and public policy issues
- think critically and recognize energy myths and misconceptions

Here is the table of contents from the book. We will cover chapters 1-7 and as many other topics as time permits.

Introduction to Markets, Modeling and Policy

1. Introduction
2. Energy Lessons from the Past and Modeling the Future
3. Perfect Competition and the Coal Industry
4. Energy Taxes, Subsidies, and Social Welfare

Market Structure

5. Natural Monopoly and Electricity Generation
6. Restructuring in the Electricity Sector
7. Monopoly, Dominant Firm and OPEC

- 8. Transaction Costs and U.S. Natural Gas Markets
- 9 Monopsony - Japan and the Asia Pacific LNG Market
- 10 Game Theory in W. European Natural Gas Market

Energy and the Environment

- 11. Externalities and Energy Pollution
- 12 Public Goods and Global Climate Change
- 13. Energy Accidents

Dynamic Models and Model Inputs

- 14. Allocating Fossil Fuel Production over Time and Oil Leasing
- 15. Supply and Costs
- 16. Modeling Energy Demand
- 17. Refining, Transportation, and Linear Programming

Managing Risk

- 18. Energy Futures Markets for Managing Risk
- 19. Energy Options Markets for Managing Risk

Development and Sustainability

- 20. Climbing the Energy/Development Ladder to a Sustainable Energy Future
- 21. Sustainable Wealth in Fossil Fuel Rich Developing Countries

The End of the Journey

- 22. Managing in the Multicultural World of Energy

Higher Education and Disability: The Colorado School of Mines is committed to ensuring the full participation of all students in its programs, including students with disabilities. If you are registered with Disability Support Services (DSS) and I have received your letter of accommodations, please contact me at your earliest convenience so we can discuss your needs in this course. For questions or other inquiries regarding disabilities, I encourage you to visit disabilities.mines.edu for more information.

Policy on academic integrity/misconduct: The Colorado School of Mines affirms the principle that all individuals associated with the Mines academic community have a responsibility for establishing, maintaining an fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly

and effectively evaluate every student's academic achievements, and giving credence to the university's educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. The Colorado School of Mines desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times. Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student Academic Misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at Mines. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed. The complete policy is [online](#).

Coursework Return Policy: Graded material will be returned within two weeks of due date except under unusual circumstances.

Absence Policy:

Homework: Homeworks with hard copies are to be turned in during class or placed in plastic holder by my door on the due date unless otherwise announced. We will give further instructions for delivery when digital copies are required. They can be turned in early if you know you will miss a class and will be accepted up until midnight of the day they are due without penalty. Homeworks turned in later than that will only be accepted under unusual circumstances.

Exams: If you will be absent during a scheduled exam, you should schedule a make-up time before the exam if at all possible.

Video Learning Modules: To make the class more interactive and class time more relaxed, each chapter is supplemented with video learning modules. These modules contain review material and new material to supplement and reinforce information from the book and lectures. You will be introduced to the format of these learning modules in assignment 1.

Self Tests: There are self tests posted at (<http://dahl.mines.edu/530>) for each chapter to help you with homeworks and to study for quizzes and exams. Answers to the questions are online. Self tests are not to be handed in. There are also complementary video learning modules for many of the chapters.

Edit4Credit: I will give one point of extra credit (up to 10 points per person) to the first person who finds substantive errors in the reading material, self tests or lecture notes. (Formatting issues won't count.) Post the errors on Canvas on the discussion board called Edit4Credit. Subject for your correction:

1. Lecture notes put LMonthDaySlide#

Sample if the lecture was on August 24, Slide 7: **L082407**

use 2 digits for month and day to avoid ambiguity and so they sort in order:

For other corrections, label topics starting with **Category** (book chapter (B), online self test question (Sq), online self test incorrect answer (Si), online self test correct answer (Sc) class task (Ct), study questions (St). If the correction is for the video learning modules lectures or self tests add a v in front of the category (e.g. vL,vSq, vSc, vSi). Next include a 2 digit **Chapter** number (01-22), if the correction is from a learning **Module** add an m followed by the module number next (m01,..,m22), last include the **Page/Slide/Question:** page if from the book (3 digits), slide if from a lecture (2 digits), or question number if from self tests or study question (2digits).

sample video learning module lectures, chapter 7, module 6, slide 3→**vL07m0603**

Extra Credit: Up to 10 points for edits4credits or see me for other opportunities

Course Requirements and Grading Procedures:

400 points – 1 Midterm (October 3) and 1 Final (probably Dec 14, 1-3 p.m.)

(I will weight 55% to the higher grade of the two, 45% to the lower grade)

100 points – 20 point quizzes, which may or may not be announced. I will drop your lowest quiz and prorate the rest to 100 points.

150 points – Activities and Assignments which will be prorated to 150 points.

50 points – Extra chapter. As we will not have time to cover all chapters, you will pick a later chapter to read and develop supplemental materials including updating data.

Grading Policy: Grades are based on % of total points using the following scale

A > 92.5 %

A-89.5-92.5%

B+ 87.5% – 89.5%

B 82.5% – 87.5%

B- 79.5% –82.5%

C+ 77.5% – 79.5%

C 72.5% – 77.5%

C- 69.5% – 72.5%

D+ 67.5% – 69.5%

D 62.5% – 67.5%

D - 59.5% -62.5%

Canvas: The course will use Canvas. To login, go to <http://canvas.mines.edu>. Click on login. I believe your mines username and password should get you in. You should have automatically been enrolled in the course when you are registered. As this system is new to me and many of you, let us know of tips and tricks and glitches you find and I will do the same.

I will typically use powerpoint slides for my lectures. These lectures notes will be posted on canvas under pptx usually in the evening after class. Assignments, handouts, review materials and grades will also be available on canvas. Initially I will also email materials to you until I am sure everyone has access to canvas.

Prerequisites for the Course (See me if you do not have the prerequisites)

EBGN 509 Mathematical Economics or Calculus I, II, II, and simple Matrix Algebra

To review math skills needed you can take self tests at

<http://dahl.mines.edu/courses/dahl/alg/>

<http://dahl.mines.edu/courses/dahl/MatA/690-MatA-st.htm>

<http://dahl.mines.edu/courses/dahl/calc/>

Introduction to Probability and Statistics

<http://dahl.mines.edu/courses/dahl/ps/>

Introduction to Microeconomics

<http://dahl.mines.edu/courses/dahl/micro/>

EBGN 511 Microeconomics



Cell phones are to be off during class.



works fine.

If you have a notebook computer, I will sometimes post a request by noon of the class day to please bring to class as we will do some in-class activities using excel. We will work in groups so 1 notebook for 2-3 students usually