



Department of Economics Course Outline

		Term:	Winter 2010
Course:	Economics 327 [Petroleum Economics]	Section:	01
Time:	TR 12:30 – 13:45	Place:	ICT114 (subject to change)
Instructor:	K Pinno		
Office:	SS 405	Telephone:	220-5866
Office Hours:	TR 14:00 – 14:45	E-mail:	kpinno@shaw.ca
Textbook(s):			

Required Textbook: Folder of readings available from *Bound & Copied*

Book(s) on Reserve:

1. Adelman, M.A. *The Genie out of the Bottle: World Oil Since 1970*. MIT Press, 1995.
2. Adelman, M.A. *The Economics of Petroleum Supply*. MIT Press, 1993.
3. Parra, Francioso. *Oil Politics*. I.B. Tauris, 2004.
4. Frank, H.J. (ed.) *The World Petroleum Market: Past & Future*. International Association of Energy Economists, 1994.
5. Simmons, Matthew R. *Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy*. Wiley, 2005.
6. Yergin, Daniel. *The prize: The Epic Quest for Oil, Money & Power*. Free Press, 1992.
7. Sampson, Anthony. *The Seven Sisters: The Great Oil Companies and the World They Made*. Viking Press, 1975.
8. Horsnell, P. and R. Mabro. *Oil Prices and Markets*. Oxford University Press, 1997.
9. Stevens, Paul (ed.) *The Economics of Energy*. Volumes I and II, Edward Elgar, 2000
10. Adelman, M.A. *The World Petroleum Market*. Johns Hopkins Univ. Press, 1973.
11. Watkins, G. Campbell. *Petro makets: Probing the economics of continental energy*. Fraser Inst. 1989.
12. Hannesson, Rognvaldur, *Petroleum Economics: Issues and Strategies of Oil and Natural Gas production*. Quorum Books, 1998.
13. Marcel, Valerie. *Oil Titans*. Brookings Institution, Washington DC, 2006.
14. Pennwell Books. *International Petroleum Encyclopedia*. Pennwell Publications, Tulsa OK, 2007.
15. Maugeri, Leonardo. *The Age of Oil*. Lyons Press, 2007.

Other Reference Materials:

The US Department of Energy, Energy Information Administration (EIA) is an excellent source of current information on petroleum markets. Students should be familiar with its website (www.eia.doe.gov).

Students should be aware of a number of journals which include up-to-date material on the petroleum industry. Examples are:

For Canada:	Oilweek, Daily Oil Bulletin
For USA:	Oil and Gas Journal, Energy Users Bulletin
For International Industry:	Petroleum Economist, Petroleum Intelligence Weekly, Middle East Economic Survey, and Middle East Economic Digest

There are many articles in economic journals that may be of particular interest to this class, such as those published in *Annual Review of Energy*, *Journal of Energy and Development*, *The Energy Journal*, *Energy Economics*, *ENERGY--The International Journal*, and *Energy Policy*. For reference to other recent articles on the economics of the oil industry see the relevant sections (Q4) in the *Journal of Economic Literature*, the *Journal of Energy Literature*, and draw on ECONLIT as a journal search engine.

Governments also publish interesting material on energy industries. In Alberta, material from the Energy and Utilities Board and Alberta Department of Energy are of particular interest. For the Canadian federal government, see the National Energy Board, the Science Council of Canada, the Geologic Survey of Canada and Department of Natural Resources. For the US see the Department of Energy (especially the Energy Information Administration), and Federal Energy Regulatory Commission; also hearings before various Congressional Committees, including the House Ways and Means Committee, the Senate Committee on Commerce, the Senate Committee on Foreign Relations and the Joint Economic Committee. The OECD also has a number of interesting recent publications on energy, including publications of the International Energy Agency (IEA). So does OPEC, including the OPEC Review and OPEC Bulletin, as well as periodic statistical reviews and profiles of member countries. The Canadian Energy Research Institute (CERI) has published a monthly World Oil Market Analysis, which provides up-to-date information. Useful data on individual countries can be found in The International Petroleum Encyclopedia.

Course Objectives:

The course will introduce students to petroleum economics. The course materials and lectures will focus on the international crude oil market. (Econ325 focuses intensively on the US and Canadian crude oil market.)

Course coverage will include

- A review of the simple analytics of oil price determination and the history of international oil prices;
- Review of major sources of data on the international petroleum industry;
- Review of demand, supply, perfect and imperfect competition, and profit maximizing allocation of an exhaustible resource stock;

- Survey of major events in the evolution of the economics of the world crude oil market from 1900 to the present, with particular emphasis on the years since the formation of OPEC in 1960, and the commoditization of the oil market since 1980, and the evolution of the National Oil Companies that now control some ninety percent of the world's oil reserves;
- Overview of the refining sector, the transportation of petroleum products, and the market for finished products in an international context.
- Developing in students the skills necessary for the critical evaluation of news stories about the international petroleum industry.

Course Outline:

The course draws heavily on articles from journals and various government and non-government agency reports. Students at this stage of studies should be able to gain useful information from reading journals, industry periodicals, and professional reports. Students in this course will not be held responsible for any sophisticated mathematical or statistical material that may appear in the assigned readings.

1. Background: A Brisk Introduction to the Petroleum Supply Chain and the World Oil Market

*Abdullah M. Aitani. "Oil refining and products." In *Encyclopedia of Energy*, Volume 4, Elsevier, 2004.

A Crude Awakening: The Oil Crash. <http://www.oilcrashmovie.com/film.html>

**Oil.* "origins of oil, the methods of searching for oil bearing formations, the location of oil wells, oil refining, and the transportation of oil." 18 minutes XMV5630301

Oil Search 39 min XMV56305

*Crude Diplomacy/*Power to the Producers* XMV5923701

**Tinderbox/*The New Order of Oil.* XMV-59238

Offshore 39 min XMV56306

**Gasoline.* "an all-encompassing look at the world's most important fossil fuel". XMV62468 (Introduction to petroleum refining, simple distillation, upgrading processes, etc.)

Pay Dirt: Making the Unconventional Conventional. "the development of the Alberta oil sands, the largest reserve of oil in the world". XDV 450

* See the current version: [The BP Statistical Review of World Energy.](#)

* Background material from the EIA website: [Oil Market Basics](#) and [Chronology of World Oil Market Events.](#)

* From the EIA website, [International Energy Outlook.](#)

M. A. Adelman, *The World Petroleum Market*, Resources for the Future, 1972.

M.A. Adelman, "World Oil Production and Prices 1947-2000" *The Quarterly Review of Economics and Finance* 42, 2002, 169-191.

Edith T. Penrose. [Profit Sharing Between Producing Countries and Oil Companies in the Middle East](#), *Economic Journal* 59:238-54, June 1959.

Edith T. Penrose. [Vertical Integration with Joint Control of Raw Material Production: Crude Oil in the Middle East](#) in *The Growth of Firms, Middle East Oil and Other Essays*, Chapter 11. London: Frank Cass & Co Ltd, pages 200-216, 1965 and 1971.

*Paul Stevens. "[The Determination of Oil Prices 1945-95](#)". *Energy Policy*, 23(10):861-70, October 1995.

Michael C. Lynch. [Shoulder against Shoulder: The Evolution of Oil Industry Strategy](#), *Journal of Energy and Development*, 19(1):15-56, 1995. Optional.

The International Petroleum Encyclopedia, Pennwell Publications.

The Oil and Gas Journal. See various special issues (refining, petrochemicals, etc.).

William L. Leffler. *Petroleum Refining in Nontechnical Language*, Pennwell Publishing, 2000.

*"Petroleum refining." In: Encyclopedia of Earth. Eds. Cutler J. Cleveland (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment). [First published in the Encyclopedia of Earth September 2, 2006; Last revised January 31, 2007; Retrieved June 25, 2008].

<http://www.eoearth.org/article/Petroleum_refining>

*Oil Refinery Processes. SET Laboratories.

<http://www.setlab.com/Resources/Refining/tabid/57/Default.aspx>

*OSHA. Petroleum Refining Processes. U.S. Department of Labor.

http://www.osha.gov/dts/osta/otm/otm_iv/otm_iv_2.html

2. Analytics of Dynamic Resource Allocation: Uses and Abuses of Hotelling Theory

*J. Griffin and H. Steele. "Criteria for efficient dynamic resource allocation." Chapter 3 from *Energy Economics & Policy*. Second edition, Academic Press, 1986. [[Presentation Slides](#)]

Adelman, M A, Watkins, G C. [Reserve asset values and the hotelling valuation principle](#). *Southern Economic Journal*. Vol. 61, Iss. 3; p. 664-674, January 1995.

M A Adelman, G C Watkins. [U.S. oil and natural gas reserve prices, 1982-2003](#). *Energy Economics*. Vol. 27, Iss. 4; p. 553-571, July 2005. .../5

Krautkraemer J., and M. Toman. "Fundamental Economics of Depletable Energy Supply." Resources for the Future, Discussion Paper 03-01 (2003). [\[PDF\]](#)

Gary D. Libecap, James L Smith. [Regulatory remedies to the common pool: The limits to oil field unitization](#). *The Energy Journal*. Cleveland: 2001. Vol. 22, Iss. 1; p. 1 (26 pages)

3. Crude Oil Supply: Adelman versus Hubbert?

*M.A. Adelman and G. C. Watkins. "Reserves prices and mineral resource theory." *The Energy Journal*, pp. 1-16, 2008.

M.A. Adelman, Chapter 2, "Economics of Oil Supply," in Adelman, *The Genie out of the Bottle: The World Oil Market Since 1970*, MIT Press, 1993. (Exclude the Appendices.)

G.C. Watkins, "Oil Scarcity: What Have the Last Three Decades Revealed?" *Energy Policy*, 2006.

4. OPEC Behavior and World Oil Prices

* J. Griffin and H. Steele. "OPEC Behavior and World Oil Prices." Chapter 3 from *Energy Economics & Policy*. Second edition, Academic Press, 1986.

D. Gately, "A Ten Year Retrospective: OPEC and the World Oil Market," *Journal of Economic Literature*, XXII, (3), 1984, pp. 1100-1114.

J. M. Griffin and D. J. Teece, (editors), *OPEC Behaviour and World Oil Prices*. George Allan & Unwin, 1982.

5. National Oil Companies: The "new" seven sisters?

V. Marcel. *Oil Titans: The National Oil Companies of the Middle East*. Chatham House/Brookings, 2005.

J. J. Wang. *China's Oil Industry and Market*. Elsevier, 1999.

*Keun-Wook Paik, Valerie Marcel, Glada Lahn, John V. Mitchell and Erkin Adylov. [Trends in Asian NOC investment abroad](#). Chatham House, 2007.

*Paul Stevens, [National oil companies and international oil companies in the Middle East: Under the shadow of government and the resource nationalism cycle](#). *Journal of World Energy Law & Business*, Vol 1, No. 1, pp. 5-30, 2008.

6. Energy and the Future of Oil

*D. Reynolds. "The economics of oil definitions: The case of Canada's oil sands." *The OPEC Review*, 2005.

*OPEC World Oil Outlook.

<http://www.opec.org/library/World%20Oil%20Outlook/WorldOilOutlook08.htm> Required

reading: Executive Summary only. Recommended reading: Section 1.

IEA, World Energy Outlook. <http://www.worldenergyoutlook.org/>

7. Trade in Crude Oil: How International Crude Oil Markets Really Work

*P. Horsnell and R. Mabro, "Physical trading." Chapter 2 in *Oil Markets and Prices: The Brent Market and the Formation of World Oil Prices*, Oxford University Press, 1993.

*P. K. Verleger, "The Evolution of Oil as a Commodity," Chapter 7 in R. L. Gordon, *et al.* (eds.), *Energy: Markets and Regulations*, Ballinger, 1982.

*P. Horsnell and R. Mabro, "World oil spot trade." Chapter 14 in *Oil Markets and Prices: The Brent Market and the Formation of World Oil Prices*, Oxford University Press, 1993.

R. Hagen, "How is the International Price of a Particular Crude Determined," *OPEC Review*, XVIII, 1994, pp. 127-135.

P. Horsnell. [Oil in Asia: Markets, Trading, Refining, and Deregulation.](#) Oxford University Press, 1997.

J. Hamilton. ["Understanding crude oil prices."](#) Energy Journal, 2009.

8. Refining for Export: Growing International Trade in Refined Products

Crack Spread Handbook. New York Mercantile Exchange.
<http://www.nymex.com/media/cracksread.pdf>.

W.D. Walls and F.W. Rusco. "Refining for export and the convergence of petroleum product prices."

W.D. Walls and F.W. Rusco. "Biofuels, petroleum refining, and the transportation of motor fuels." In *Transportation and Management Science*, Proceedings of the 13th International Conference of the Hong Kong Society for Transportation Studies, December 13-15, 2008.
[\[biofuels paper preprint\]](#)

W.D. Walls. "Petroleum refining industry in China." Forthcoming in *Energy Policy*, 2009.
[\[presentation slides\]](#) [\[paper draft\]](#)

Grade Determination and Final Examination Details:

The final grade will be based on a mid term exam, home work assignment and final exam as follows:

Mid-term Exam	40%
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Assignment	10%
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Final Exam	50%
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The final exam will be scheduled by the Registrar and held in the classroom. It will be of two hours duration.

The final course grade will be obtained by weighting the numerical values (rather than letter grades) on the various exams and translating the numerical result back into a final letter grade for the course. The numerical-letter grade cut-off values will be as follows:

A+	99-100	B	82-87	C-	70-71
A	92-98	B-	80-81	D+	68-69
A-	90-91	C+	78-79	D	60-67
B+	88-89	C	72-77	F	0-59

A passing grade on any particular component of the course is not required for a student to pass the course as a whole.

Non-programmable calculators will be allowed during the writing of tests or final examinations.

Notes:

- Students seeking reappraisal of a piece of graded term work (term paper, essay, etc.) should discuss their work with the Instructor *within fifteen* days of the work being returned to the class.
- Students' papers will be returned during regular class time or at the time of the final exam. Papers may also be picked up by students during regular Office Hours. Student coursework not picked up by the date of the final exam will be discarded.
- Make-up examinations and deferred examinations will not be given except in cases of extreme personal emergencies. Also examinations will not be given before the indicated examination dates.
- It is the student's responsibility to request academic accommodations. If you are a student with a documented physical, mental or social disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at 220-8237. Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than fourteen (14) days after the start of the course.

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Society of Undergraduates in Economics (S.U.E.):

www.ucalgary.ca/sue

Safewalk / Campus Security: 220-5333
Emergency Assembly Place – SS Food Court

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