Economics 323 (L01) (Natural Gas Markets)

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Office: SS 410
Office Hours: R 12:30-13:30 F 11:15-12:30

Lecture Location: ST 139
Lecture Days/Time: TR 11:00 - 12:15

Winter 2020

Course Description:


Course Objective:

Students will understand issues in natural gas supply (including exploration, storage, transportation, pricing, and local distribution) and demand (including environmental externalities, and substitutes for natural gas use). Students will gain expertise in conducting literature reviews, plotting data in R, and use economics to evaluate policies.

Course Learning Outcomes:

a. Understand natural gas markets, from exploration and development, to transmission, distribution, and end use.
b. Introduce theory of extraction of exhaustible resources.
d. Introduce natural gas transportation networks and how this impacts natural gas pricing and policies.
e. Develop theory of price ceilings. Introduce allocative costs of price ceilings and the historical context of inefficient regulations. Empirical literature on estimating the size of the inefficiency.
g. Gain expertise in synthesizing information from the academic literature.
h. Get practice in writing computer code in R.

Course Outline:

Topics and readings include:
1 Overview
Natural Resources Canada's Natural Gas Primer: https://www.nrcan.gc.ca/energy/natural-gas/5641


Natural Resources Canada's Natural Gas Facts: https://www.nrcan.gc.ca/energy/facts/natural-gas/20067#details-panel4

“Natural Gas Liquids Primer – With a Focus on the Appalachian Region” US Dept of Energy, June 2018 (page 2 has table of uses for natural gas liquids; page 33 describes ethylene crackers).

"Alberta at a Crossroads: Royalty Review Advisory Panel Report"

2 Natural gas supply: upstream exploration and extraction

Catherine Hausman and Ryan Kellogg, "Welfare and Distributional Implications of Shale Gas," Brookings Papers on Economic Activity, Spring 2015, (Section III.A. and III.C)


Chapter 6 from Markets and the Environment by Keohane Olmstead


3 Natural gas supply: externalities


"Incremental CH4 and N2O mitigation benefits consistent with the US Government's SC-CO2 estimates" Alex L. Marten, Elizabeth A. Kopits, Charles W. Griffiths, Stephen C. Newbold & Ann Wolverton, Climate Policy

4 Natural gas pricing


5 Natural gas transportation
"Linking Natural Gas Markets – Is LNG Doing its Job?" Anne Neumann, *Energy Journal*, 2009 (Section 2)

6 Consumption: demand elasticities and effect of price ceilings


7 Consumption: natural monopoly regulation
Chapters 11 and 12 of *Economics of Regulation and Antitrust* by W. Kip Viscusi, Joseph E., Jr. Harrington, and John M. Vernon

Muehlegger, Erich; Davis, Lucas W "Do Americans consume too little natural gas? An empirical test of marginal cost pricing" *The RAND Journal of Economics* 2010 (sections 1 and 4)

Muehlenbachs, Lucija and Catherine Hausman " Price Regulation and Environmental Externalities: Evidence from Methane Leaks," *Journal of the Association of Environmental Economists*. 2019 (Section 1)

8 Consumption: natural gas in the electricity sector

"Measuring market power and the efficiency of Alberta’s restructured electricity market: An energy-only market design," David P. Brown Derek E. H. Olmstead *Canadian Journal of Economics*


9 End-of-life Issues
"All’s Well that Ends Well: Addressing End-of-Life Liabilities for Oil and Gas Wells" (Page 3, Figure 1)

Muehlenbachs "80,000 Inactive Oil Wells: A Blessing or a Curse?” SPP Briefing Paper, 2017.

**Prerequisites/corequisites:**
Economics 201 and 203

**Required Textbook(s):**
None

**Recommended Textbook(s):**
Markets and the Environment by Keohane Olmstead

**Books on Reserve:**
None

**Desire2Learn:**
This course will make use of the Desire2Learn (D2L) platform. Students who are registered in the course can log on at [http://d2l.ucalgary.ca](http://d2l.ucalgary.ca) through their student centre. Please note that D2L features a class e-mail list that may be used to distribute course-related information. These e-mails go to your University of Calgary e-mail addresses only.

**Grade Determination and Final Examination Details:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIDTERM EXAM</td>
<td>30%</td>
</tr>
<tr>
<td>FINAL EXAMINATION</td>
<td>50%</td>
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<tr>
<td>ASSIGNMENTS</td>
<td>20%</td>
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<td></td>
<td>100%</td>
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The official grading system will be used. See [http://www.ucalgary.ca/pubs/calendar/current/f-1-1.html](http://www.ucalgary.ca/pubs/calendar/current/f-1-1.html).

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

If a student’s letter grade on the final exam exceeds their midterm(s) letter grade, the weight of the midterm(s) is (are) transferred to the final exam. The student must have written the midterm(s) or provided supporting documentation for the absence(s) such as a medical note or statutory declaration.

As per the Writing Across the Curriculum Statement in the Calendar, writing and grading thereof will be a factor in the evaluation of student work. See [https://www.ucalgary.ca/pubs/calendar/current/e-2.html](https://www.ucalgary.ca/pubs/calendar/current/e-2.html).

Any student work which remains undistributed after the last day of classes will be available to students through the instructor’s office during the instructor’s office hours.

The final examination will be comprehensive, scheduled by the Registrar, held in a classroom, and last 2 hours. If a student cannot write their final exam on the date assigned by the Registrar’s Office, they
need to apply for a deferred exam [https://www.ucalgary.ca/pubs/calendar/current/g-6.html](https://www.ucalgary.ca/pubs/calendar/current/g-6.html). Under no circumstance will this be accommodated by the Department.

Tests and exams will involve multiple choice questions.

Programmable calculators, cellphones, textbooks, course notes, and other electronic devices will not be allowed during the writing of tests or final examinations. Students are reminded that simply being able to access their cellphone during an exam is academic misconduct.

The exact date for the in-class midterm will be announced at least one week in advance.

THERE WILL BE NO MAKEUP OR DEFERRED QUIZZES/TESTS/EXAMS under any circumstances, nor may the quizzes/tests/exams be written early. Students unable to write the quizzes/tests/exams because of documented illness, family emergency, religious observance, or university-sanctioned event will have the weight shifted to the final examination; otherwise a grade of zero will be assigned.

**Reappraisal of Grades and Intellectual Honesty:**
*For Reappraisal of Graded Term Work, see Calendar I.2*
[http://www.ucalgary.ca/pubs/calendar/current/i-2.html](http://www.ucalgary.ca/pubs/calendar/current/i-2.html)

*For Reappraisal of Final Grade, see Calendar I.3*

*Statement of Intellectual Honesty, see Calendar K.4*
[http://www.ucalgary.ca/pubs/calendar/current/k-4.html](http://www.ucalgary.ca/pubs/calendar/current/k-4.html)

*Plagiarism and Other Academic Misconduct, see Calendar K.5*
[http://www.ucalgary.ca/pubs/calendar/current/k-5.html](http://www.ucalgary.ca/pubs/calendar/current/k-5.html)

**Academic Accommodations:**
Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services. SAS will process the request and issue letters of accommodation to instructors. Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at [http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf](http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf).

**Freedom of Information and Protection of Privacy (FOIP) Act:**
Personal information is collected in accordance with FOIP. Assignments can only be returned to the student and will be accessible only to authorized faculty and staff. For more information, see [http://www.ucalgary.ca/legalservices/files/legalservices/faq-students.pdf](http://www.ucalgary.ca/legalservices/files/legalservices/faq-students.pdf) and [http://www.ucalgary.ca/legalservices/files/legalservices/faq-faculty_0.pdf](http://www.ucalgary.ca/legalservices/files/legalservices/faq-faculty_0.pdf).

**Internet and Electronic Communication Device information:**
The use of cell phones for any purpose in class is prohibited. Computers and tablets may be used for note taking only unless otherwise authorized by the instructor.

**Copyright Legislation:**
Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

**Recording of Lectures:**
Recording of lectures is prohibited, except for audio recordings authorized as an accommodation by SAS or an audio recording for individual private study and only with the written permission of the instructor. Any unauthorized electronic or mechanical recording of lectures, their transcription, copying, or distribution, constitutes academic misconduct. See [https://www.ucalgary.ca/pubs/calendar/current/e-6.html](https://www.ucalgary.ca/pubs/calendar/current/e-6.html).

**Important Dates:**
Please check: [http://www.ucalgary.ca/pubs/calendar/current/academic-schedule.html](http://www.ucalgary.ca/pubs/calendar/current/academic-schedule.html).

**Student Organizations:**
Faculty of Arts Students’ Association (F.A.S.A.):
- Economics Department Representative
- Office: SS 803, E-mail: econrep@fasaucalgary.ca and Web: [www.fasaucalgary.ca](http://www.fasaucalgary.ca).

Society of Undergraduates in Economics:
- [https://www.ucalgarysue.com/](https://www.ucalgarysue.com/).

Society of Undergraduates in Economics is a student run organization whose main purpose is to assist undergraduate economics students to succeed both academically and socially at the University of Calgary. Services include access to the exam bank, career events such as Industry Night and information sessions, mentorship programs, and social events for members. They invite you to join by contacting SUE at societyofundergradsineconomics@gmail.com.

**Faculty of Arts Program Advising and Student Information Resources:**
- Have a question, but not sure where to start? The Arts Students’ Centre is your information resource for everything in Arts! Drop in at SS102, call them at 403-220-3580, or email them at artsads@ucalgary.ca. You can also visit the Faculty of Arts website at [http://arts.ucalgary.ca/undergraduate](http://arts.ucalgary.ca/undergraduate), which has detailed information on common academic concerns, including program planning and advice.
- For registration (add/drop/swap), paying fees and assistance with your Student Centre, contact Enrolment Services at 403-210-ROCK [7625] or visit them in the MacKimmie Library Block.

**Student Support and Resources:**
- See [https://www.ucalgary.ca/registrar/registration/course-outlines](https://www.ucalgary.ca/registrar/registration/course-outlines) for information on campus mental health resources, the Student Ombuds’ Office, Student Success Centre, Safewalk, and Emergency Evacuation and Assembly.

**Notes:**
1. Students are responsible for all assigned material, e.g., supplementary material posted on D2L, regardless of whether or not the material was covered in class.

LM
2019-11-21