Syllabus EC438/538 Fall 2016

James Woods

Course Description

The official description of the course is:

> Economics and structure of energy markets, with a focus on electricity. Examines current policy issues arising from energy production and use.

Since I am teaching this course for the first time, there will be changes from previous terms and I will be making official changes in description and prerequisites during the year.

This is a companion course to EC 437/537 which will address regulatory and competitive policies in electricity, public transportation, water, natural, and telecommunications. The order of the courses has changed to reflect the evolving nature of the field.

New Kind of Slash Course

Students that have been at PSU for a while are familiar with "slash courses" where both undergraduates and graduate students are in the same classroom but have different assignments, readings and standards. This course take it another step. Undergraduate will meet in Mondays and Wednesdays and graduate students will meet on Mondays and Friday. In short, we will be together on Monday. Undergraduates will meet alone on Wednesday and Graduate students will meet alone on Friday. All students may attend all sessions if they wish. This arrangement should allow the graduate students to explore topics in more depth.

Prerequisites

The undergraduate section has microeconomic theory, EC 311, or the calculus based version, EC 415, listed as prerequisites. The graduate section requires only graduate standing.

As with most economics courses, the more background you bring to the class, the more get from the class. For this class it means microeconomic theory and econometrics. Not all students will have a background in both and many of the graduate students from outside of economics will have neither. Any technical skills that students are missing will be supplemented with in-class tutorials. Sometimes this will mean learning about constrained optimization or breaking out laptops for a tutorial on running regressions in R.

Key Dates

- Last day to drop or change grade option: November 13th
- Holidays: November 11th, 24th and 25th.

Contact Information

The best ways of contacting me, in decreasing order of effectiveness:

- IM/hangout: woodsj@pdx.edu

- Phone/text: (503) 465-4883
- Email:woodsj@pdx.edu (Answered only on M W and F)
- D2L email: Do not use. I will not respond.

You are encouraged to use the IM function of your PSU email account, or text, rather than email. This will allow me to get back to you more quickly and more conversationally. Please be aware that I will likely not reply till the next day if you IM me after 5pm or on the weekend.

Office Hours:

- My office is in CH 241-O.
- Drop in office hours are Tuesday 3-4pm through the last week of class. There is no need to make an appointment for these hours – just come.
- If you can't attend regular office hours, please check my calendar https://woodsj.youcanbook.me/. I will make a limited number of 15 minute slots available each week. If you make an appointment and fail to show up without first canceling, I will penalize you one quiz grade.

Textbook and Other Resources

The main text for the course is Dahl, Carol. *International Energy Markets: Understanding Pricing, Policies, & Profits.* PennWell Books, 2015. It was chosen undergraduates in mind and illustrates many of the concepts they learned in EC 311/415.

This text will be heavily supplemented with material from the Energy Information Administration (EIA) https://www.eia.gov/, the textbook authors website (http://dahl.mines.edu/), and journal articles available electronically through the library.

Assessments and Grade Policy

This class will be taught as a collaborative seminar with limited traditional lecture. There are no exams but there will be a considerable amount of writing and analysis, presentations by teams of student researchers and several referee reports. Nearly all work product will be made public to the class though your grade will not.

Team Assignments

Teams will be assigned by the instructor after the first week of class. They will be composed of at least one graduate student and one undergraduate student. Assignments will be made based a survey of completed math, economics and statistics courses. The intent is to ensure that each team has the skills it needs to succeed.

The teams are intended to encourage cooperative learning where graduate students can assist undergraduate students with concepts they are unsure of and those with exceptional skills can share insight with others.

A team may remove a member by an anonymous 3/4th majority vote of a current members. Removed members will act as a team of one until other teams remove members or students join the class. Removed members may join other teams by an anonymous 3/4th majority vote of the receiving team. All votes will be conducted by the instructor should two students on a team request a vote. The instructor reserves the right to reassign students to teams should there be large differences in team size.

Team assignments will be a diverse selection of activities that will range from creating a day ahead electricity forecast, explaining a crack spread with current data, or just sorting out a nasty diagram in the book.

There will be occasions when the undergraduates in a team will operate without the associated graduate students. This will be for Wednesday class meetings when only undergraduates will be present.

Grad students will also be formed into teams for assignments that are specific to them.

Individual/Group Term Paper

The largest assignment will be a term paper and will account for X% of your grade. The term paper may be either a literature review, in which case it must be completed by an individual or an empirical/theoretical paper which may have up to three co-authors. Graduate students must complete an empirical/theoretical paper. Term paper preparation and evaluation will be in stages.

1. Authors and co-authors must publish an abstract, including a few key references, in the "Draft Abstracts" discussion topic and schedule a 30 minute review meeting with the instructor by October 24th. Scope and depth changes will be agreed to in the meeting.
2. A revised abstract must be submitted by October 28th and will be published in the "Final Abstracts" discussion topic. Abstracts will be discussed in class and online. A minimum of two reviewers will be assigned to each paper. Ideally no reviewer will be assigned more than one paper.
3. Authors and co-authors will construct an annotated bibliography. A reasonably complete annotated bibliography will be available for the class to review by November 4th and should be provided in "Final Abstracts" discussion topic. Here are some links on how to create an annotated bibliography, http://guides.library.cornell.edu/annotatedbibliography and https://www.bethel.edu/library/research/apa-annobib-sixth.pdf
4. Authors and co-authors that are pursuing an empirical paper must schedule a 20-minute presentation to the class on data collection, design and analysis approach prior to completion of the draft paper. Additional problem solving presentations are encouraged. Students conducting a literature review should schedule a similar session for a key papers in their literature review.
5. A draft of the paper must be published in the "Draft Papers" discussion topic by November 18th. The referees will deliver a referee report on your draft by November 23rd as a comment to your original post. The instructor will make additional comments after the reports are received.
6. The final paper must be published to the "Final Papers" discussion topic by December 2nd at 8pm. Term papers must be less than 20 pages.

Referee Reports

A referee report is a critical examination of an academic paper. There is a split in their purpose, help the editor make a determination or help the author, but in either case, you typically make the deepest read of an academic paper when you review it. The official guidance from the AEA is (https://www.aeaweb.org/content/file?id=222) but there is some more detailed guidance here that is more helpful to authors (http://are.berkeley.edu/courses/ARE251/2004/assignments/RRGuidelines.pdf)

- A referee report on a student's or group's draft paper. You will be assigned a paper to review. The report must be less than five pages, will be evaluated on a 0 to 5 scale and will constitute 10% of your grade. This is due by November 23rd and must be posted as a comment on the draft paper in the "Draft Papers" topic.
- A referee report on a student's or group's final paper. This will be a second review of the paper you previously reviewed. The report must be less than five pages, will be evaluated on a 0 to 5 scale and will constitute 5% of your grade. This referee report will be delivered by, December 8th and published as a comment to the paper in the "Final Papers" topic.

The report will be evaluated on a 0 to 5 scale with the following rubric.

- 0 Points Base
- 1 Points Rudimentary synopsis and minor criticism of the paper.
- 2 Points Report gives an accurate synopsis of paper and the contribution it makes to the literature.
- 3 Points 2 AND identifies and explains weaknesses in the analysis or gaps in the literature.
- 4 Points 3 AND provides suggested articles to be included and several options that would improve analysis.
- 5 Points Exemplary example of 4.

Topics and Readings

Do not let this section alarm you. We will only address part of this outline in the class. As with most of my upper-division courses, we will complete a small subset at the start of the class and then vote on each succeeding topic. Each topic will have an assignment, usually working with real data or using a model from the readings in a slightly different context.

Each topic has some readings that both undergraduates and graduate students will read and some that are specific to each. If you are a graduate student that is trying to rapidly get up to speed on a topic, I recommend looking at the undergraduate readings in addition to your own.

Note that some of these modules will be shared with the Public Utility Economics course.

- Introduction of Core Topics
  - Starting on Topic
    - "Energy Primer: A Handbook of Energy Market Basics", FERC, 2015 (http://www.ferc.gov/market-oversight/guide/energy-primer.pdf), Chapter 1
    - Dahl, Ch 1-2.
  - Coal
    - Dahl, Ch 3.
    - *Murray, Michael P.. 2006. "Avoiding Invalid Instruments and Coping with Weak Instruments." Journal of Economic Perspectives, 20(4): 111-132. http://stats.lib.pdx.edu/proxy.php?url=https://www.aeaweb.org/articles?id=10.1257/jep.20.4.111
  - Natural Gas
    - Dahl, Ch 8.
    - Energy Primer, Ch 2.
    - Joskow, Paul L.. 2013. "Natural Gas: From Shortages to Abundance in the United States." American Economic Review, 103(3): 338-43. http://stats.lib.pdx.edu/proxy.php?url=https://www.aeaweb.org/articles?id=10.1257/aer.103.3.338
  - Electricity
    - Energy Primer, Ch 3.
    - Dahl, Ch 5-6.
    - Joskow, Paul L. "Markets for power in the United States: An interim assessment." The Energy Journal, Vol. 27, No. 1. http://economics.mit.edu/files/1184
    - Joskow, Paul L.. 2012. "Creating a Smarter U.S. Electricity Grid." Journal of Economic Perspectives, 26(1): 29-48. http://stats.lib.pdx.edu/proxy.php?url=https://www.aeaweb.org/articles?id=10.1257/jep.26.1.29
    - Covert, Thomas, Michael Greenstone and Christopher R. Knittel. 2016. "Will We Ever Stop Using Fossil Fuels?" Journal of Economic Perspectives, 30(1): 117-38. http://stats.lib.pdx.edu/proxy.php?url=https://www.aeaweb.org/articles?id=10.1257/jep.30.1.117

    - Borenstein, Severin. 2012. "The Private and Public Economics of Renewable Electricity Generation." Journal of Economic Perspectives, 26(1): 67-92. http://stats.lib.pdx.edu/proxy.php?url=https://www.aeaweb.org/articles?id=10.1257/jep.26.1.67
    - Puller, Steven L. and Jeremy West. 2013. "Efficient Retail Pricing in Electricity and Natural Gas Markets." American Economic Review, 103(3): 350-55. http://stats.lib.pdx.edu/proxy.php?url=https://www.aeaweb.org/articles?id=10.1257/aer.103.3.350
  - Oil
    - Dahl, Ch 7.
    - Energy Primer, Ch 4.
    - Smith, James L.. 2009. "World Oil: Market or Mayhem?" Journal of Economic Perspectives, 23(3): 145-64. http://stats.lib.pdx.edu/proxy.php?url=https://www.aeaweb.org/articles?id=10.1257/jep.23.3.145
    - Baumeister, Christiane and Lutz Kilian. 2016. "Forty Years of Oil Price Fluctuations: Why the Price of Oil May Still Surprise Us." Journal of Economic Perspectives, 30(1): 139-60. http://stats.lib.pdx.edu/proxy.php?url=https://www.aeaweb.org/articles?id=10.1257/jep.30.1.139

- Topic Options, Voted on in Class
  - Financial Markets
    - Energy Primer, Ch 5.
    - Dahl, Ch 18 - 19.
  - Intro to Externalities and Public Goods
    - Dahl, Ch 11 - 12.
    - Metcalf, Gilbert E.. 2009. "Market-Based Policy Options to Control U.S. Greenhouse Gas Emissions." Journal of Economic Perspectives, 23(2): 5-27. http://stats.lib.pdx.edu/proxy.php?url=https://www.aeaweb.org/articles?id=10.1257/jep.23.2.5
  - Natural Gas Outside the US
    - Dahl, Ch 9 - 10.
    - "International Energy Outlook", 2016, EIA, Ch 3. (https://www.eia.gov/forecasts/ieo/nat_gas.cfm)
  - Price Controls and Subsidies (Not Carbon Taxes and Implicit Subsidies)
    - Dahl, Ch 4
  - Market Monitoring
    - Energy Primer, Ch 6.
  - Hotelling's Rule and Dynamic Extraction
    - Dahl, Ch 14
  - Unit Commitment
    - Dahl Ch 15
  - Energy Demand
    - Dahl Ch 16
    - Allcott, Hunt and Michael Greenstone. 2012. "Is There an Energy Efficiency Gap?" Journal of Economic Perspectives, 26(1): 3-28. http://stats.lib.pdx.edu/proxy.php?url=https://www.aeaweb.org/articles?id=10.1257/jep.26.1.3

The course requires a term paper. It is a good idea to do some broad reading to see the breadth of topics in energy economics, which roughly means the economic effects of using and generating energy. Here are some sources for keeping up on current events and research topics.

- A list of energy related glossaries http://dahl.mines.edu/GlossaryLinks.pdf. Some of the links are 404 but the one at the California Energy Commission is pretty good.

- EIA Today in Energy (https://www.eia.gov/todayinenergy/) New topics every day.
- Journals that focus on energy economics issues
  - Energy Economics http://www.journals.elsevier.com/energy-economics/
  - The Energy Journal https://www.jstor.org/journal/energyj
  - Resource and Energy Economics http://www.journals.elsevier.com/resource-and-energy-economics/
  - Energy: The International Journal has economics and engineering http://www.journals.elsevier.com/energy/
  - Energy Policy http://www.journals.elsevier.com/energy-policy/
  - Utilities Policy for more electricity focused reading http://www.journals.elsevier.com/utilities-policy/
- Working Paper Sources
  - IDEAS has a curated weekly summary of energy working papers https://ideas.repec.org/n/nep-ene/
  - r/EconPapers has a weekly summary of working papers from National Bureau of Economic Research (NBER). They usually lead with energy and natural resource economics https://www.reddit.com/r/EconPapers.
- The Journal of Economic Perspectives (https://www.jstor.org/journal/jeconpers) has many easy to read symposia and review articles. Here are a few from the last decade or so.
  - SYMPOSIUM: OIL AND GAS MARKETS WINTER 2016 (https://www.jstor.org/stable/i40149800)
  - SYMPOSIUM: TRADING POLLUTION PERMITS WINTER 2013 (https://www.jstor.org/stable/i40086192)
  - SYMPOSIUM: ENERGY CHALLENGES WINTER 2012 (https://www.jstor.org/stable/i40064264)
  - SYMPOSIUM: CLIMATE CHANGE SPRING 2009 (https://www.jstor.org/stable/i27740519)

Other Rules

- Begging for grades will result in an immediate lowering of your course grade by a full letter grade.
- When completing assignments you may use your book, wiki, calculator, spreadsheets, notes, or other resources as long as it is not another student or person unless the assignment allows. *The work must be authentically and genuinely your own. In other words, if you are copying answers you found online, it is not your work.*
- Go to office hours at the first sign of trouble – not as a last resort.
- In this classroom, we support and value diversity. To do so requires that we:
  - Respect the dignity and essential worth of all individuals
  - Promote a culture of respect toward all individuals
  - Respect the privacy, property, and freedom of others
  - Reject bigotry, discrimination, violence, or intimidation of any kind
  - Practice personal and academic integrity and expect it from others
  - Promote the diversity of opinions, ideas, and backgrounds, which is the lifeblood of a university

For additional information, please see the Office of Affirmative Action & Equal Opportunity at http://www.pdx.edu/diversity/affirmative-action.

- Accommodations are collaborative efforts between students, faculty, and the Disability Resource Center. If you have a documented disability and require accommodation, you must arrange to meet with the course instructor prior to or within the first week of the term. The documentation of your disability

must come in writing from the Disability Resource Center (Faculty letter). Students who believe they are eligible for accommodations but who have not yet obtained approval through the DRC should contact the DRC immediately. Reasonable and appropriate accommodations will be provided for students with documented disabilities. For more information on the Disability Resource Center, please see http://www.drc.pdx.edu/.

- Academic honesty is expected and required of students enrolled in this course. Suspected academic dishonesty in this course will be handled according to the procedures set out in the Student Code of Conduct.
- I am sympathetic to family emergencies but you must inform me as soon as possible. If the notice is verbal, please email me with your understanding of our agreement. All agreements have to be in writing.

Link to this syllabus https://github.com/woodsjam/Course-Energy-Economics. Check branch for this term.