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ENV 462H1: Energy and Environment:
Economics, Politics, and Sustainability

CALENDAR DESCRIPTION:
This is an interdisciplinary course that examines key ideas in economics, politics and security that are essential to understanding energy and environmental issues. The course will cover energy markets, energy security, and the increasing role that sustainability plays in setting policies.

The interdisciplinary nature of energy issues calls for a 'big ideas' approach to both energy teaching and research. This course will begin by suggesting ten 'big ideas' that are fundamental to understanding energy issues and that will help to form a thematic framework for course material. The course will then cover energy markets – their successes and failures, and outline basic remedies for the latter. It will discuss how energy security has shaped world politics in the 20th and 21st centuries. It will then proceed to a discussion of regulatory institutions, their design, efficiency and efficacy. Considerable time will be devoted to alternative energy resources. The importance of resources and energy in shaping Canada's past, present and future will also be discussed. Whatever the specialization of the student, this course will seek to instill a search for connections with other disciplines, as well as the development of a broad perspective on understanding energy issues.

INSTRUCTOR:
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LOCATION AND TIME: Winter (S) term 2-5, Tuesday, Rosebrugh 208

EVALUATION: Evaluation for this course consists of a research paper worth 50%, and two tests Tuesday February 11, 2020 and Tuesday March 31 2020), each worth 25%. The only generally acceptable reason for missing an exam or term test is illness. A medical certificate is required.

Research paper: Outline, which is worth 10 out of the 50 marks allocated to the paper, is due by midnight Tuesday, February 25, 2020. Please submit the outline electronically through Quercus and name the file using your name. For example, my outline would be "YatchewOutline.doc" or "YatchewOutline.pdf". Your outline must contain the following: a thesis statement, a bibliography, an outline of the structure of the paper, and your preliminary conclusions. The outline should be about two pages in length. The final paper is due by midnight Friday March 20, 2020. **Late penalties of 10% per day will apply to the outline and the paper.** The target length should be about 3000 words, not including tables, graphs and

bibliography. Longer papers are acceptable. There should be an abstract not exceeding 200 words on the title page. Use a citation format with which you are familiar (APA, Chicago…). Please submit the paper electronically through Quercus in pdf or Word format.

Readings [1]

Required:

1. Richard Muller, *Energy for Future Presidents*, *The Science Behind the Headlines*, Norton 2012. Hardcopy and Kindle editions available.
2. Jeffrey Sachs, *The Age of Sustainable Development*, Columbia University Press, 2015, selected chapters. Available electronically through UofT Libraries. Hardcopy and Kindle editions available.
3. Bruce Usher, *Renewable Energy: A Primer for the Twenty-First Century*, Columbia University Press, 2019. Available electronically through UofT libraries. Hardcopy and Kindle editions available.

Recommended:

1. Vaclav Smil, *Energy and Civilization: A History*, 2017, MIT Press. Hardcopy and Kindle versions available.
2. Vaclav Smil, *Energy: Beginner's Guide*, 2006. Kindle version available.
3. Daniel Yergin, *The Quest*, The Penguin Press, 2011. Hardcopy and Kindle versions available.

Additional Resources:

1. *Encyclopedia of Energy, ed. Cutler Cleveland. Available electronically through UT Libraries.*
2. *BP (formerly British Petroleum) www.bp.com/statisticalreview, Statistical Review of World Energy, Statistical Review Workbook (Excel spreadsheet).*
3. *Lawrence Livermore Laboratories. Energy and Carbon Flow Charts.*

IN THE NEWS

Students will follow current issues in energy by signing up for news alerts (e.g., through Google Alerts). Visit MIT Energy Initiatives at http://mitei.mit.edu/ where you can also subscribe to regular updates. Each class will begin with a brief discussion of the week's developments in energy. MIT Technology Review http://www.technologyreview.com/ reviews advances in energy. For insightful commentary on a range of issues, some related to energy, please sign up for the weekly briefing from Project Syndicate http://www.project-syndicate.org/.

[1] In some cases Kindle editions are available and less costly than hardcopy. You do not need a Kindle device as Kindle books can be read on Macs and PCs.

LECTURE TOPICS and READINGS (Tests are held in Weeks 6 and 12)

1. Ten Big Ideas, Weeks 1 and 2
2. Background and Introduction, Weeks 3 and 4
    a. Muller – Chapters 1-6
    b. Review of Richard Muller's book by Bill McKibben: "The Scientist Who Made a Total Turnaround", New York Review of Books, October 11, 2012. Reply by Richard Muller: "On Turning Down the Heat", New York Review of Books, November 22, 2012.
    c. Usher – Chapters 1, 2
    d. Sachs – Chapters 1, 2, 3, 6, 14
3. Politics, Economics, Security and Regulation, Weeks 5, 7 and 8 (Test held in Week 6)
    a. Yatchew, A. 2014, "Economics of Energy: Big Ideas for the Non-Economist", Energy Research and Social Science, 1(1), 74-82.
    b. Sachs – Chapter 4, 5
    c. Nordhaus, W. "The Pope and the Market", The New York Review of Books, issue dated October 15, 2015.
    d. Muller, Section V. "Advice for Future Presidents"
    e. Alan Riley, "The Geostrategic Implications of the Shale Gas Revolution", NATO Paper 10, 2012.
4. Alternative Energy, Weeks 9 and 10
    a. Sachs – Chapter 12
    b. Usher – Chapters 3-10
    c. Muller – Chapters 7-19
    d. Yatchew, A. 2016, "Rational vs. 'Feel-Good' Carbon Policy – Transferability, Subsidiarity and Separation" Energy Regulation Quarterly, 4:3, 31-40. Available at http://www.energyregulationquarterly.ca/articles/rational-vs-feel-good-carbon-policy-transferability-subsidiarity-and-separation#sthash.u6jtvAJI.dpbs.
    e. Socolow, R. and S. Pacala "A Plan to Keep Carbon in Check", Scientific American, pp. 50-57. September 2006.
    f. Ted Nordhaus, Shaiyra Devi, Alex Trembath "Debunking Microenergy, The Future Lies with Urbanization" Foreign Affairs, August 2016.
5. Energy Policy, Week 11 (Test held in Week 12)
    a. Usher – Chapters 11, 12
    b. Energy Policy, Canadian Encyclopedia http://www.thecanadianencyclopedia.com/en/article/energy-policy/

c. Energy in Society, Canadian Encyclopedia
http://www.thecanadianencyclopedia.com/en/article/energy-in-society/

ACCESSIBILITY

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible: email disability.services@utoronto.ca or consult http://studentlife.utoronto.ca/accessibility.

ACADEMIC INTEGRITY

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. submissions may be processed through plagiarism software. The University of Toronto's Code of Behaviour on Academic Matters outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. (www.governingcouncil.utoronto.ca/policies/behaveac.htm) . Potential offences include, but are not limited to:

In papers and assignments:

1. Using someone else's ideas or words without appropriate acknowledgement.
2. Submitting your own work in more than one course without the permission of the instructor.
3. Making up sources or facts.
4. Obtaining or providing unauthorized assistance on any assignment.

On tests and exams:

1. Using or possessing unauthorized aids.
2. Looking at someone else's answers during an exam or test.
3. Misrepresenting your identity.

In academic work:

1. Falsifying institutional documents or grades.
2. Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see www.utoronto.ca/academicintegrity/resourcesforstudents.html).