

## COURSE OUTLINE

**COURSE:** JGE 347F: EFFICIENT USE OF ENERGY  
**INSTRUCTOR:** Danny Harvey  
SSH 5032, Telephone: 978-1588; email: harvey@geog.utoronto.ca  
**LOCATION:** SS2127 (Fall 2010)  
**TIME** Mon 4-6, occasional tutorials after class (6:10 until 7:00 or longer if needed, same location) (see schedule on reverse)

### Outline

The course examines the options available for dramatically reducing our use of primary energy with no reduction in meaningful energy services, through more efficient use of energy at the scale of energy-using devices and of entire energy systems. Topics covered are: generation of electricity from fossil fuels and energy use in buildings, transportation and agriculture. Each topic will cover (i) the underlying physical principles that determine the potential of and the limits to energy efficiency improvements, (ii) the difference in potential savings when focusing on individual energy using devices rather than entire energy-using systems, (iii) examples of efficiency improvements that have been achieved in practice in various countries around the world, and (iv) the cost and financing of energy efficiency improvements. As well, the role of the so-called rebound effect in eroding the energy-saving benefit of efficiency improvements will be discussed.

### Text

The course text is my own book, *Energy and the New Reality, Volume 1: Energy Efficiency and the Demand for Energy Services* (Earthscan, March 2010), and is available in the university bookstore. Powerpoint files for each chapter are available on my website (<http://faculty.geog.utoronto.ca/Harvey/Harvey/publications.htm#pub>) (only the chapters indicated in the outline are needed)

### Requirements

There will be 3 major computational assignments to give students a hands-on feel for the subject matter and to develop quantitative skills in a progressive manner. The assignments will involve using Excel spreadsheets. The assignments will be worth 48% of the final mark in total.

There will be one mid-term test and a 2-hour exam (with the exam covering only the second half of the term work). The term test and exam will each be worth 26% of the final mark.

### Penalty for late work:

5% per weekday. No marks will be given after an assignment is taken up in class, which is usually one week after it is due, so plan your work carefully.

**Pre-requisite:** Some first-year math and/or physics will be very helpful.

**Exclusion:** GGR 333

## JGE 347F – Efficient Use of Energy OUTLINE OF LECTURES

Week Number	Topic	Fall 2010 Date
1	Introduction (Chapter 1 and 2)	13 Sept
2	Generation of electricity from fossil fuels (Chapter 3)	20 Sept
3	Transportation (Chapter 5)	27 Sept
4	Transportation	4 Oct
5	Agriculture (Chapter 7)	18 Oct
6	Term Test	25 Oct
7	Buildings (Chapter 4)	1 Nov
8	Building	15 Nov
9	Buildings	22 Nov
10	Guest lectures (date could be adjusted)	29 Nov
11	Buildings, intro to Scenarios	6 Dec
12	Scenarios, Policy (Chapters 10 & 11)	8 Dec

### JGE 347F - PROBLEM SETS

PS #	Topic	Assigned	Due	Taken Up	% Contribution to final mark
1	Fossil fuel electricity	20 Sept	30 Sept, < 5 PM	4 Oct	12
2	Transportation	4 Oct	14 Oct, < 5 PM	18 Oct	12
3	Buildings	1 Nov	29 Nov, in class	6 Dec	24

### JGE 347F – DATES OF MONDAY TUTORIALS AFTER CLASS

Date	Activity
20 Sept	Hand out and explain PS#1
4 Oct	Take up PS#1, Hand out and explain PS#2
18 Oct	Take up PS#2, answer questions concerning upcoming term test
1 Nov	Take up term test, hand out PS#3, explain first part
15 Nov	Explain second part of PS#3, answer questions on work in progress. <b>Note:</b> questions on the first part of PS#3 will not be answered after this date, so this date serves as a deadline for getting the first part largely finished.
6 <sup>th</sup> Dec	Take up PS#3