

COURSE: JPG 1407F: EFFICIENT USE OF ENERGY – Fall 2018
INSTRUCTOR: Danny Harvey
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LOCATION: SS 1072
TIME Wed 5-7, occasional Wed tutorials (7:10 until 8:00, same location) (see schedule on reverse)
OFFICE HOURS: MF11-12, W2-5 or by appointment

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 include: energy use in buildings, transportation, industry 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 will be posted on Blackboard. These files are a good starting point for studying the course material but will need to be supplemented with notes from the textbook.

Requirements

There will be 2 major computational assignments and 1 minor computational assignment to give students a hands-on feel for the subject matter and to develop quantitative skills in a progressive manner. The 3 computational assignments will involve using Excel spreadsheets. The assignments will be worth 50% of the final mark in total. As well, additional meetings with graduate students will be held at a mutually-convenient time to discuss supplemental readings.

There will be one mid-term test and a 2-hour exam (with the exam covering only the second half of the term work), each being worth 25% of the final mark.

Penalty for late work:

5% per weekday.

Pre-requisite: Some first-year math and/or physics will be very helpful. *Ontario Grade 11 Physics (or the equivalent from elsewhere) is an absolute minimum pre-requisite.*

Exclusion: JPG 1406

**JPG 1407F – Efficient Use of Energy
OUTLINE OF LECTURES - 2018**

Week Number	Topic (and chapter from textbook)	Fall 2018 Date
1	Introduction (Chapters 1 and 2)	12 Sept
2	Transportation (Chapter 5)	19 Sept
3	Transportation	26 Sept
4	Industry (Chapter 6)	3 Oct
5	Industry/Agriculture (Chapter 7)	10 Oct
6	Agriculture/Buildings (Chapter 4)	17 Oct
7	Term Test (Covers weeks 1-5, 1 st half of week 6)	24 Oct
8	Buildings	31 Oct
9	Buildings	7 Nov
10	Buildings	14 Nov
11	Buildings	21 Nov
12	Buildings/Scenarios, Policy (Chapters 10 & 11)	28 Nov

JPG 1407F - PROBLEM SETS

PS #	Topic	Assigned	Due	Taken Up	Contribution to final mark
1	Transportation	19 Sept	10 Oct, in class	19 Oct	20%
2	Buildings	31 Oct	21 Nov, in class	30 Nov	25%
3	Windows	28 Nov	2 January, 2019		5%

JPG 1407F – DATES OF WEDNESDAY TUTORIALS AFTER CLASS

Date	Activity
19 Sept	Hand out and explain first part of PS#1
26 Sept	Explain second part of PS#1, respond to questions
17 Oct	Take up PS#1
31 Oct	Take up Term test, Hand out PS#3, explain first part
7 Nov	Explain second part of PS#2
28 Nov	Take up PS#3, present supplemental problem set (PS#3)

JPG 1407F – Schedule of meetings to discuss supplemental readings

Date	Activity
Week of Oct 1 st	1 st meeting to discuss supplemental readings
Week of Oct 29 th	2 nd meeting to discuss supplemental readings
Week of Nov 12 th	3 rd meeting to discuss supplemental readings