

ENGR 110/PSC 110

Introduction to Renewable Energy

Instructors: Professor Batchman and Simon

Contact info:

Ted Batchman, Ph.D.
 Professor & Founding Director,
 Renewable Energy Center
 Redfield Campus
 18600 Wedge Parkway
 Reno, Nevada 89511
 E-mail: batch_t@unr.edu
 Phone: 775-682-6443
 Office Hours: Tu & Th 2:30 – 4:00 pm SEM
 319A or by appointment

Christopher A. Simon, Ph.D.
 Professor & Director of Graduate Studies
 Department of Political Science
 University of Nevada, Reno, NV 89557
 Office: MSS 241; Voice: 775-682-7769;
 Fax: 775-784-1473
 E-mail: casimon@unr.nevada.edu
 Office Hours: Tues 12:00-12:45 pm;
 Thurs. 4:15 - 5:00 pm

Class Time: Tuesdays and Thursdays 1:00 – 2:15 pm

Class Location: MIKC 107

Class Information

Welcome to ENGR110/PSC110 Introduction to Renewable Energy. We assume that you have no previous knowledge of renewable energy systems and policy; however, the fact that you are here means that you have an interest in the subject. The course will inter-weave the technological, political, and economic feasibility of alternative energy, which includes renewable energy—the latter being a subset of alternative energy.

While global-warming is a concern, the modern world demands cheap and easily accessible sources of energy. Fossil energy, regardless of its environmental impact, has a short horizon at the current levels of global consumption. In short, we have to make real choices about our energy future and we need to do so now! It will not be easy or cheap to transition to alternative sources of energy—it will cost money and it will take time. Despite tremendous wealth, the United States will be hard pressed to come up with the resources needed to make this transition, and time is shorter than you might think.

Unique class procedures/structures

- Guest presentations from industry leaders and policymakers—renewable energy is changing so quickly, that it is important for students to gain information from “top name” leaders in the renewable energy marketplace as well as from national and state policymakers who make rules that govern markets and create incentives.
- Team-based problem solving. Students will work together to create optimal energy system designs for sustainable communities. The students will use a web-based free shareware program known as HOMER™, which is available for download from the National Renewable Energy Laboratory (NREL)-- <http://www.nrel.gov/homer/>.

- Class discussion. We will use the assigned texts, guest presentations and lectures as opportunities to discuss renewable energy issues.

Course Objectives

- Familiarize students with scientific terms and concepts related to energy. Students will understand what terms and concepts mean and learn how to apply concepts to real world energy applications.
- Familiarize students with the role of energy in modern society and trends in demand and supply. Students will learn about current estimates of energy inventories and the current and future need to pursue renewable energy and other alternative energies.
- Familiarize students with major national and state policy initiatives related to renewable energy. Student will develop a substantial understanding of how energy policy creates incentives for renewable energy development.

Course Books

Cravens, Gwyneth 2007. *Power to Save the World: The Truth About Nuclear Energy*. New York: Knopf. [Cravens]

Holland, Geoffrey and Provenzano, James. 2007. *The Hydrogen Age: Empowering a Clean Energy Future*. Layton, UT: Gibbs Smith Publishing. [HP]

Simon, Christopher A. 2007. *Alternative Energy: Political, Economic, and Social Feasibility*. Lanham, MD: Rowman & Littlefield. [Simon]

Williams, Wendy and Whitcomb, Robert. 2008. *Cape Wind: Money, Celebrity, Energy, Class, Politics, and the Battle for Our Energy Future*. New York: Public Affairs Publishing. [WW]

Evaluation Tools

Midterm	25%
Class Participation	20%
Book Reviews	15%
Team Assignments	10%
Final Examination	30%

Disability Statement

“Any student with a disability needing academic adjustments or accommodations is requested to speak with me or contact the Disability Resource Center (Thompson Building, Suite 101), as soon as possible to arrange for appropriate accommodations.”

Source: http://www.unr.edu/stsv/slservices/drc/workingwithfac.html#Statements_for_Syllabi, accessed October 11, 2007.

Grading Scale—The course will use the +/- grading system. Institutionally, there are no A+ grades.

100-96% A	89-87% B+	79-77% C+	69-67% D+	59% F
95-90% A-	86-84% B	76-74% C	66-64% D	
	83-80% B-	73-70% C-	63-60% D-	

Examinations:

Midterm and final examinations will be essay questions and basic calculations. On examination days, please bring #2 pencils, pens (blue or black indelible ink), and a calculator to class as well as 2 previously unused blue books.

Participation:

Class participation will be evaluated on the basis of random attendance taking as well as instructor and peer-group evaluations of your performance in class and in small group exercises.

Book Reviews

For *Cape Wind*, *The Hydrogen Age*, and *Power to Save the World*, you will need to write book reviews, due at the time you attend the assigned discussion day. Each review must be word-processed or typed, double spaced, and stapled (if more than one page). Be sure to type your name and the class information at the upper left hand corner of the first page—this information is single spaced. Also be sure to type the proper citation for the book being reviewed (use the syllabus book reading list as an example format). Each review should be *between* one FULL page and two FULL pages in length.

Plagiarism and Cheating

“Subsection A: Definitions

Academic dishonesty is against university as well as the system community standards. Academic dishonesty includes, but is not limited to, the following:

Plagiarism: defined as submitting the language, ideas, thoughts or work of another as one's own; or assisting in the act of plagiarism by allowing one's work to be used in this fashion.

Cheating: defined as (1) obtaining or providing unauthorized information during an examination through verbal, visual or unauthorized use of books, notes, text and other materials; (2) obtaining or providing information concerning all or part of an examination prior to that examination; (3) taking an examination for another student, or arranging for another person to take an exam in one's place; (4) altering or changing test answers after submittal for grading, grades after grades have been awarded, or other academic records once these are official.” *UNR Student Handbook*.

Changes to Syllabus

The instructors can make changes to this syllabus.

Group assignments:

Course design should fit course subject-matter. It is our contention that energy policy of the future will involve collaborative efforts at the community level. For this reason, we feel that team assignments are appropriate for this course. Team assignments will involve problem solving, using course material to brainstorm solutions to real energy problems affecting us today and very likely to affect us well into the future.

Tentative Course Outline

Date	Topic	Reading
25 AUG	What is energy?	
27 AUG 01SEP	Thermo Clinic	WW, Chs. 1-5 HP, Chs. 1-3
03 SEP	Industry Perspective/Guest Speaker	WW Chs. 6-7 HP, Chs. 4-6
08 SEP	What is the fossil energy paradigm?	www.eia.doe.gov/ www.eere.energy.gov/ WW, Ch. 8 HP, Chs. 7-9 Cravens, Part I
10 SEP	How the grid works. The grid and democracy.	WW, Ch. 9 HP, Chs 10-11
15, 17 SEP	Why alternative energy? Why now?	Simon, Ch I WW, Ch 10 HP, Chs. 12-13 Cravens, Part II
22, 24 SEP	The Nature of Goods and basic economic principles and tools	Simon, Ch. 11 WW, Ch. 11 HP, Chs. 14-15
29 SEP, 01 OCT	What is renewable energy?	Simon, Ch 3 WW, Ch. 12 HP, Chs. 16-17 Cravens, Part III

06 OCT	Energy as a public policy innovation/ Review for Examination	Simon, Chs. 2 & 4 WW, Ch. 13 HP, Chs. 18
08 OCT	Midterm Examination	
13, 15 OCT	Solar Energy	Simon, Ch 5 WW, Ch. 14 Cravens, Part IV
20, 22 OCT	Wind Energy	Simon, Ch 6 WW, Ch. 15 and Epilogue
27 OCT	Class discussion of <i>Cape Wind</i> (Discussion Group 1)	
29 OCT	Class discussion of <i>Cape Wind</i> (Discussion Group 2)	
03, 05 NOV	Geothermal Energy	Simon, Ch. 7 HP, Chs. 19-20 Cravens, Part V
10 NOV	How Fuels Work: New Century Fuels	Simon, Ch. 8
12 NOV	Class discussion of <i>The Hydrogen Age</i> (Discussion Group 1)	
17 NOV	Class discussion of <i>The Hydrogen Age</i> (Discussion Group 2)	
19 NOV	Transportation and Energy	
24NOV	Technical Feasibility, Political Consent, Institutions, and Legitimacy Issues, Overview Of Historic and Emerging Alternatives	Simon, Chs. 9-10 Cravens, Part VI
26 NOV	Thanksgiving Day	
01 DEC	Class discussion of <i>Power to Save the World</i> (Discussion Group 1)	
03 DEC	Class discussion of <i>Power to Save the World</i> (Discussion Group 2)	
08 DEC	Thermo Clinic Review/ Review for Final Examination	
10 DEC	Final Examination (noon til 2 pm)	Classroom