Syllabus for ENST 320b Fall 2014

The Science, Policy, and Business of Energy and Air Sustainability

Monday/ Wednesday 2pm- 3:20pm, WPH 207
Tuesday/ Thursday 11am- 12:20pm VKC 151

COURSE INSTRUCTOR:

Lisa E. Collins, Ph.D.
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Email: lecollin@usc.edu
Office Hours: T/Th, 12:30pm-1:30pm and by appointment

COURSE TEXTS:

Wolfson, R., *Energy, Environment, and Climate 2nd Ed.*, W.W. Norton, (2011, ISBN 978-0-393-91274-6).

Oreskes, N. and Conway, E.M. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*, Bloomsbury Press (2011, ISBN 978-1608193943)

The following review by Mark Z. Jacobson and coauthors will be posted on blackboard as a pdf: "Review of solutions to global warming, air pollution, and energy security." *Energy and Environmental Science*, *2*, **2009**, 148-173.

Recent journal articles to supplement the course texts, provided by instructor

COURSE OVERVIEW:

ENST 320b presents an overview of issues related to energy and air sustainability including the science and to a lesser extent, policy and business aspects. We will also get into the issues of how our energy choices are affecting Earth's climate, specifically how climate change has become a political and emotionally charged topic.

Recommended preparation: ENST-100 and Chemistry 103 or its equivalent.

Everyone who considers himself or herself an environmentalist knows that some sources of energy are "bad" and others are "good". But how are these forms of energy harnessed by people, especially in the US, and how exactly are they good or bad? This course explores these questions, considering "cradle-to-grave" issues ranging from extraction of the energy resources from the environment to pollution from emissions or disposal of wastes.

HOMEWORK

The transformations of energy among different forms and from energy to work are governed by quantitative physical principles, so it is important for us to carry out calculations in this course. Problems will be assigned most weeks. Students will work selected problems on the board in class from time to time. Additional problems will be assigned from time to time and your work on these will usually be collected and peer-graded in class. Please purchase either a green or red pen specifically for this course.

This semester, no late assignment will be accepted for credit.

COURSE GRADING:

You will be graded on the basis of your performance on two midterms, a final, homework assignments, and a team video project. Test questions will be drawn from the material presented in lecture. Missing more than one or two lectures for other than illness or approved travel will be detrimental to success. At least 20% of the graded material will be quantitative analyses, you will need a scientific calculator. Cell phones **ARE NOT** allowed as calculators on exams. The lecture presentations will be posted on the Blackboard system for download and subsequent study. Test questions will include short essay questions and quantitative analysis. Below is a list of the graded assignments, due date and their weighted value.

Homework	To be announced	10%
Midterm 1	Mon 9/22 & Tues 9/23	23%
Midterm 2	Mon 10/20 & Tues 10/21	23%
Team Video Project	Mon 12/1 & Tues 12/2	15%
Individual Project Write-Up	Mon 12/1 & Tues 12/2	6%
Final	MW course: Fri Dec 12 2pm-4pm	23%
	TTh course: Tues Dec 16 8am-10am	

COURSE SCHEDULE:

For the best learning experience, you are expected to have read the material listed below by the date it is discussed in class. The readings and schedule of topics may be adjusted throughout the semester depending on the progress of the class and addition of new content.

Week 1, Aug 25-28: Introduction (Wolfson Ch. 1); High Energy Society (Wolfson Ch. 2)

Mon Sept 1: NO CLASS LABOR DAY

Week 2, Sept 2-4: Energy: A Closer Look (Wolfson, Ch. 3)

Week 3, Sept 9-11: Energy: A Closer Look cont'd (Wolfson, Ch. 3, Grimm, *et al*. 2008); Energy and Heat (Wolfson, Ch. 4)

Week 4, Sept 15-18: Energy and Heat con't (Wolfson, Ch. 4, Meinshausen, *et al.* 2009); Fossil Energy (Wolfson, Ch. 5)

Week 5, Sept 22-25: ***Midterm 1 Sept 22 & 23 (Wolfson Ch 1-4 and articles)***; Environmental Impacts of Fossil Fuels (Wolfson, Ch. 6, Brantley, *et al.*, 2014)

Week 6, Sept 29- Oct 2: Nuclear Energy (Wolfson, Ch. 7)***;*** Fukishima case study (Wolfson, Ch. 7, Lake, et al. 2001) ***STORYBOARDS DUE Oct 1***

Week 7, Oct 6-9: Energy From Earth and Moon (Wolfson Ch. 8), Direct From the Sun: Solar Energy (Wolfson Ch. 9)

Week 8, Oct 13-15: Direct From the Sun: Solar Energy cont'd (Wolfson Ch. 9, Smil 2014; and Jacobson and Delucchi, 2009); Indirect From the Sun: Water, Wind, and Biomass (Wolfson Ch. 10)

Week 9, Oct 20-23: ***Midterm 2 Oct 20 & 21 (Wolfson Ch 5- 9 and articles),*** Indirect From the Sun: Water, Wind, and Biomass, cont'd (Wolfson Ch. 10, Ashnani, *et al.* 2014)

Week 10, Oct 27-30: Energy Carriers: Electricity and Hydrogen (Wolfson Ch. 11); Armaroli and Balzani, 2011)

Week 11, Nov 3-6: The Science of Climate (Wolfson Ch. 12); Bonan, 2008
Week 12, Nov 10-13: The Politicization of Climate (Oreskes & Conway)
Week 13, Nov 17-20: Solutions to Global Warming, Air Pollution, and Energy Security (Jacobson, 2009 p.148- 158; Jacobson, 2009 p.159- 173
Week 14, Nov 24-25: Energy and Climate: Breaking the Link (Wolfson Ch. 16)
Weds Nov 26: NO CLASS, THANKSGIVING RECESS

Week 15, Dec 1-4: Class Presentations

MW class: December 13 (F): Final Exam 2pm-4pm (Wolfson Ch. 10-12, 16, articles)
TTh class: December 16 (Tu): Final Exam 8am-10am (Wolfson Ch. 10-12, 16, articles)

FINAL PROJECT:
Students will be assigned collaborative working groups of ~3 people to create a short (~3 minute) informational or journalistic style video that addresses an environmental victory related to air or energy sustainability. Groups may choose a case study, such as air pollution efforts in Los Angeles that lead to the Clean Air Act, or focus on a particular place such as Germany and their efforts to invest in solar energy. Each individual member must also provide a written account of the process and information sources they used to complete the project, based on a template the instructors will provide. The goal of the project is to create information videos, which showcase environmental victories. So often we focus on the ways that humans are destroying the planet, leading to eco-depression. In this project, groups are asked to focus on the ways humans have worked collaboratively to make real change and better then environment. The project will be evaluated for originality, accuracy and thoroughness of research, attention to detail, and quality of finished project. Storyboards, which map out the planned video, will be due during the 6th week of the semester.

STATEMENT FOR STUDENTS WITH DISABILITIES
Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

STATEMENT ON ACADEMIC INTEGRITY
USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. ***The instructor maintains a zero tolerance policy for plagiarism and cheating***. Any instances of plagiarism or cheating will be reported to Student Judicial Affairs and Community Standards and will result in failure of the course as recommended by the University of Southern California. All students are expected to understand and abide by these principles. *Scampus,* the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A:

http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/.

GRADING AND CORRECTION OF GRADES

Excerpts for this section have been taken from the University Grading Handbook, located at htttp://www.usc.edu/dept/ARR/grades/gradinghandbook/index.html. Please see the link for more details on this and any other grading concerns.

A grade of Missing Grade (MG) "should only be assigned in unique or unusual situations... for those cases in which a student does not complete work for the course before the semester ends. All missing grades must be resolved by the instructor through the Correction of Grade Process. One calendar year is allowed to resolve a MG. If an MG is not resolved [within] one year the grade is changed to [Unofficial Withdrawal] UW and will be calculated into the grade point average a zero grade points.

A grade of Incomplete (IN) "is assigned when work is not completed because of documented illness or other 'emergency' occurring after the twelfth week of the semester (or 12th week equivalency for any course scheduled for less than 15 weeks)."