

Geology 09: ENVIRONMENTAL SCIENCE: GLOBAL WARMING & ENERGY RESOURCES

LECTURE: M/W 8:30 am – 9:50 am (ESNH 107)

FACULTY: Whitey Hagadorn (ph: 2714; email: jwhagadorn; office: ESNH 312)
Office Hours: MWF 10-11, and by appt.

TEXTS: Many course readings will be made available electronically on the course website. These readings will consist of journal articles, book chapters, and/or videos. In addition, two texts are required:

1. *Global Warming: The Complete Briefing*, 3rd edition, John Houghton.
2. *State of Fear*, Michael Crichton.

Both are available in the Jeffrey Amherst Bookstore.

COURSE OBJECTIVES:

1. To understand how the Earth's climate system works, including what does and does not cause significant global warming;
2. To learn what our renewable and nonrenewable energy resources are;
3. To examine how usage of energy, non-energy natural resources, and climate change are linked;
4. To assess possible mitigating mechanisms from a scientific and engineering perspective.

COURSE EXPECTATIONS:

Participate in science-based evaluation of environmental issues. Come to class. Read before you come to class, so you get the most out of lectures. Complete written assignments on time; 10% off for every day assignments are late. Please see the attached Statement of Intellectual Responsibility.

COURSE REQUIREMENTS:

Case Study Analysis: Students will complete a collaborative analysis of an environmental case study. These analyses will be grounded in the peer-reviewed scientific literature. The projects will involve oral presentation of results, including student-led in-class discussions of each case and a written summary.
(30% of final grade)

Exams: Three one-hour, closed-book, comprehensive exams.
(30% of final grade)

Assignments: Several out-of-class assignments and labs.
(20% of final grade)

Quizzes: Weekly quiz on that week's reading assignment(s). Quizzes cannot be made up; the lowest quiz grade will be dropped.
(20% of final grade)

MISCELLANEOUS:

MoPhos: Please turn off your mobile phone and pager before class. If your moby or pager goes off during lecture or lab, I will take it.

Plagiarism/Cheating: Violation of the SIR will result in failure of the course.

Other: If you have a special learning need or related characteristic that requires additional consideration, please let us know ahead of time.

Email: I will occasionally send out additional WWW- and PDF-based reading assignments via email. You will be responsible for these materials on exams and in lectures, and the materials will be posted to the course website.

Absences: Unless you have a compelling reason to miss an exam/quiz, you will receive a zero. If you are sick or have a compelling reason to miss these assignments, you should have the Dean email me and I will either allow you to make up or omit the missed item(s) when calculating your final grade.

Extra Credit: There may be occasional bonus questions on your exams.

<u>DATE</u>	<u>LECTURE</u>	<u>TOPIC</u>	<u>READING</u>
W Sep 3	1	NRG Reserves, Distribution, Impact	Ch 1, 12, WWW 1
M Sep 8	2	Your impact, Atmosphere, Plate Tectonics <i>Analysis: "The Day After Tomorrow"</i>	WWW 2-4
W Sep 10	3	Energy, Climate	Ch 2
M Sep 15	4	Climate Controls: Atmosphere, H ₂ O circulation	WWW 5
W Sep 17	5	The carbon cycle, weathering	WWW 6
M Sep 22	6	Triggering Climate Change	Ch 3, WWW 7
W Sep 24	7	Climate Feedback Mechanisms	WWW 8
M Sep 29	8	Record of Climate Change	Ch 4, WWW 9, 10
W Oct 1	9	The Younger Dryas	WWW 11
M Oct 6		Exam I: (Take-home; due Fri Oct 10)	
W Oct 8		<i>Analysis: "State of Fear"</i>	
W Oct 15	10	Climate Change & NRG	Ch 5-6, WWW 12
M Oct 20	11	NRG Resources I	Ch 7, WWW 13
W Oct 22	12	NRG Resources II	Ch 9-10, WWW 14
M Oct 27	13	NRG Resources III	Ch 11, WWW 15
W Oct 29	14	CS 1: Middle eastern oil: Does it matter anymore?	WWW 16, 17, 18
M Nov 3	15	CS 1: Middle eastern oil: Saudi Arabia <i>Analysis: "An Inconvenient Truth"</i>	
W Nov 5	16	CS 2: ANWR: Caribou or oil?	WWW 19
M Nov 10	17	CS 3: Arctic drilling: Polar bear killers?	TBA
W Nov 12		Exam II: (Take-home; due Mon Nov 17)	
M Nov 17	18	CS 4: Fuel cells: Where does the H ₂ come from?	WWW 20, 21
W Nov 19	19	CS 5: Biodiesel: Frying fossil fuels	TBA
M Dec 1	20	CS 6: Photovoltaics: Energy of the future?	WWW 22-24
W Dec 3	21	CS 6: PV: Why doesn't every flat-topped building have them?	
M Dec 8	22	CS 7: Wind energy: NIMBY or impractical?	WWW 25-27
W Dec 10	23	CS 7: Wind energy: The U.S. continues to lose its edge?	
F Dec 12, 4-6 pm		Field Trip: Carbon neutral & Zero-Net-Energy Home, 4-6 pm	
F Dec 19		Exam III due: (Take-home)	

Statement of Intellectual Responsibility

Preamble

Every person's education is the product of his or her own intellectual effort and participation in a process of critical exchange. Amherst cannot educate those who are unwilling to submit their own work and ideas to critical assessment. Nor can it tolerate those who interfere with the participation of others in the critical process. Therefore, the College considers it a violation of the requirements of intellectual responsibility to submit work that is not one's own or otherwise to subvert the conditions under which academic work is performed by oneself or by others.

Article I Student Responsibility

Section 1. In undertaking studies at Amherst College every student agrees to abide by the above statement.

Section 2. Students shall receive a copy of the Statement of Intellectual Responsibility with their initial course schedule at the beginning of each semester. It is the responsibility of each student to read and understand this Statement and to inquire as to its implications in his or her specific courses.

Section 3. Orderly and honorable conduct of examinations is the individual and collective responsibility of the students concerned in accordance with the above Statement and Article II, Section 3, below.

Article II Faculty Responsibility

Section 1. Promotion of the aims of the Statement of Intellectual Responsibility is a general responsibility of the Faculty.

Section 2. Every member of the Faculty has a specific responsibility to explain the implications of the statement for each of his or her courses, including a specification of the conditions under which academic work in those courses is to be performed. At the beginning of each semester all members of the Faculty will receive with their initial class lists a copy of the Statement of Intellectual Responsibility and a reminder of their duty to explain its implications in each course.

Section 3. Examinations shall not be proctored unless an instructor judges that the integrity of the assessment process is clearly threatened. An instructor may be present at examinations at appropriate times to answer questions.

For further information regarding academic honesty and plagiarism, students are suggested to visit <http://www.amherst.edu/~dos/plagiarism/index.html>