

*H A&S 222d Spring 2009*

*Syllabus and logistics*

*Tues-Thurs 10.30-12.20 MGH 284*

*labs: Oceanography*

*OTB206/OSB107*

This course, Introduction to Energy and Environment is about the natural environment and human interaction with it. We see through the eyes of natives of the far north how the environment...air, sea, ice, land...shape their lives and how global change is affecting them. We develop tools from physics and chemistry to understand energy cycles both in Nature, and in human energy utilization. We will use the web site, [www.ocean.washington.edu/courses/as222d](http://www.ocean.washington.edu/courses/as222d) regularly and much course material will accumulate there. Google Documents will be your 'journal' for recording impressions on reading, lectures, developing essays and problem assignments.

*Student responsibilities.* Students' will use lecture material, handed-out notes, handed-out excerpts from books, text-book reading together with material found from libraries and web to write 5-page essays during the term (including the shorter 'favorite place' essay of week 1. The longer essays will be due roughly in weeks 4, 7, and 10.

Problem solving is important in the 'science core' of energy and environment. These will involve in-class problem sessions and some homework assignments.

The philosophy of the course has been described in the introductory material: grading will be heavily involve essay and journal writing, and you will be able to choose topics with a range of science content (from rather small to rather large). Ability to work with the basic ideas about energy, and manipulate large numbers is important however, and will be practiced through problems and included in quiz and exam.

Grading formula: 30% essays, 25% Google Doc journal, 20% problem sets, 25% quiz and exam.

The course will have a mid-term quiz at roughly the 5<sup>th</sup> week and a final exam. Monday, JUNE 8, 2009, 10.30-12.20 Location: [MGH](#) 284

# Syllabus

<i>Week /dates</i>	<i>lectures/reading</i>	<i>events</i>	
	(1) <i>science core and (2) global environment</i>	(3) <i>humans and global energy.</i>	
		(4) <i>life in the Arctic</i>	
1 30 iii/3 iv	mechanical energy power, energy flux units. orders of magnitude  thermal energy and radiation	the global environment 20 <sup>th</sup> C history of human energy consumption <i>McNeill Ch. 1</i> <i>McKibben End of Nature</i> space and deep time pace and scale of env change	
2 6/10 iv	the sun's energy spectrum a first look at global climate physics of energy: mechanical a first look at biology	air: <i>McNeill</i>	Louise Richards: Web searching for enviro
3 13/17 iv	thermal energy conversions from heat to mech. energy chemical bonding, chemical energy heat engine phase change: ice, water, steam	success or failure of civilizations <i>Diamond</i>	lab I: energy I
4 20/24 iv	energy in fuels circulation of atmosphere and ocean	are we running out of oil? <i>McNeill, other sources</i>	lab 2: climate storms, circulation Earth Day 22 iv problem solving
5 27 iv/1v	global warming, greenhouse gases quiz review energy in foods  the 'eat'-engine	pollutant movement in O & A  are we running out of food?	quiz
6 4/8 v	photosynthesis carbon cycle the global ecosystem: primary production	are we running out of environment?  biosphere: <i>McNeill</i>	lab 3: energy II
7 11/15 v	water, ice, water vapor: the hidden climate engine	global water use by humans and its supply; <i>McNeill</i> more global warming and precipitation the environmental skeptics: do they have a point?	
8 18/22 v	review and problem lab solving	a can-do future: solutions:  <i>Lovins et al. Natural Capitalism</i> working within the profit system a visit to Curitiba	lab 4: biology & ecosystems
9 25/29 v	review & ps		the Arctic Climate Impacts Assessment
10 1/5 vi	review & ps		an ice-free Arctic? (the Earth has not been free of ice for 35 million years)
Exam week 4-8vi			

final exam Monday, JUNE 8, 2009,  
830-1020 Location: [MGH284](#)