

ECON 481A2: THE SCIENCE AND ECONOMICS OF CLIMATE CHANGE SPRING 2018

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COURSE DESCRIPTION

The course considers one of the key challenges for the 21st Century, from both natural and social science perspectives. Starting from Earth's energy budget, we derive climate sensitivity, and explore climate models and scenarios. We then survey the core insights from economics that must be understood to develop an effective response. Topics include the origins of the problem in market failure, the use of integrated assessment models in cost-benefit analysis, the determinants of carbon leakage in models of international trade, and insights from game theoretic models of international environmental agreements. Throughout, we emphasize active learning through exploration with simplified models of climate and the economy, and through the use of in-class experiments in which students play the role of market participants.

COURSE OBJECTIVES

- To apply economic tools—models or statistical methods—to analyze policy challenges associated with human caused climate change
- To communicate results in oral and written forms
- To learn to work effectively in a group setting

TEXTBOOKS

- Required: *The Climate Casino: Risk, Uncertainty, and Economics for a Warming World*, by William Nordhaus (Yale University Press, 2013)

EVALUATION

Your grade will be determined by your point total. Points are earned as follows:

Homeworks	60
Midterm	20
Final Exam	<u>20</u>
Total:	100

The grading scale is

A ⁺	960 – 1000	C ⁺	750 – 779
A	920 – 969	C	690 – 749
A ⁻	890 – 919	D ⁺	650 – 689
B ⁺	860 – 889	D	590 – 649
B	810 – 859	F	Below 590
B ⁻	780 – 809		

The instructor reserves the right to lower the number of points required for any grade.

MISSED ASSIGNMENTS

If you must unexpectedly miss an exam or assignment, you must present written evidence of a medical or family emergency in order to take the exam or submit the assignment at a later date. If you know in advance that you will be unable to take an exam or meet an assignment due date, contact the professor as soon as possible to make other arrangements. In general, with an acceptable reason, such as a university sanctioned activity, you may be able to arrange to take an exam or submit an assignment early, but never late.

ACCOMODATION FOR STUDENTS WITH DISABILITIES

If you require special accommodation to complete the requirements of this course, please provide documentation and verification from the office of Resources for Disabled Students (see <http://rds.colostate.edu/>).

EXPECTED WEEKLY EFFORT

<u>Activity</u>	<u>Hours Per Week</u>
Attend class	3
Read assigned readings	2
Work on research project and/or presentation	4
TOTAL:	9

ACADEMIC INTEGRITY:

This course will adhere to the Academic Integrity Policy of the General Catalog and the Student Conduct Code. As stated in university policy, "Any student found responsible for having engaged in academic dishonesty will be subject to academic penalty and/or University disciplinary action." (General Catalog 2011-2012, 1.6, p.8). Any academic dishonesty in this course may result in a grade of "F" for the course and may be reported to the Office of Conflict Resolution and Student Conduct Services.

Please be aware that the General Catalog specifically identifies the following examples of academic dishonesty: cheating in the classroom, plagiarism, unauthorized possession or disposition of academic materials, falsification, and facilitation of cases of academic dishonesty. Plagiarism is defined as follows:

"Plagiarism includes the copying of language, structure, ideas, or thoughts of another, and representing them as one's own without proper acknowledgment. Examples include a submission of purchased research papers as one's own work; paraphrasing and/or quoting material without properly documenting the source." (General Catalog 2011-2012, 1.6, p. 8).

While you are not required to sign the honor pledge, I will ask each of you to write and sign the following statement on the chapter quizzes, the sections of your papers and the final version of the paper that you submit:

"I have not given, received, or used any unauthorized assistance."

SCHEDULE:

Date	Topic	Reading	Deadlines
17-Jan	Simple, Serious, & Solvable	National Academies Booklet	
19-Jan	Energy & Radiation 1	Archer, Chapter 2	
22-Jan	Energy & Radiation 2		
24-Jan	Greenhouse Effect 1	Archer, Chapter 3	
26-Jan	Greenhouse Effect 2		
29-Jan	Greenhouse Gases	Archer, Chapter 4	
31-Jan	Earth's Energy Budget 1	Trenberth article	
2-Feb	Earth's Energy Budget 2		HW1. Greenhouse Effect
5-Feb	Climate Sensitivity 1	Knutti article	
7-Feb	Climate Sensitivity 2		
9-Feb	Past Climate Change 1	Goose article	
12-Feb	Past Climate Change 2		
14-Feb	Recent Climate Change		
16-Feb	Fossil Fuels		
19-Feb	Global Carbon Cycle	Denning article	HW2. Climate Sensitivity & Change
21-Feb	Climate Models 1		
23-Feb	Climate Models 2		
26-Feb	Future Climate 1	IPCC WG1 SPM	
28-Feb	Future Climate 2		
2-Mar	Climate Impacts 1		
5-Mar	Climate Impacts 2		
7-Mar	Technological Solutions 1	MacDonald article	
9-Mar	Technological Solutions 2		HW3. Future Climate Change
SPRING BREAK			
19-Mar			Midterm
21-Mar	Markets and why they work		
23-Mar	Market failure and why it matters		
26-Mar	ICE		
28-Mar	ICE		
30-Mar	Market failure and why it matters		
2-Apr	Impacts and damages	N6, N7	HW4. Based on ICE
4-Apr	Impacts and damages	N8, N9	
6-Apr	Impacts and damages	N10, N11	
9-Apr	Impacts and damages	N12	
11-Apr	Impacts and damages	Burke, Hsiang, Miguel 2015.	
13-Apr	Cost of mitigation	N14	
16-Apr	Cost of mitigation	N15	HW5. DICE 1
18-Apr	Discounting	N16	

20-Apr	Cost benefit/IAM/Etc.	N18	
23-Apr	The central role of carbon pricing	N19	
25-Apr	Free riding, prisoner's dilemma, leakage	N20, 21, 22	
27-Apr	Free riding, prisoner's dilemma, leakage	N20, 21, 22	HW6. DICE 2
30-Apr	Free riding, prisoner's dilemma, leakage	N20, 21, 22	
2-May	Climate clubs	Nordhaus 2015	
4-May	Climate clubs	Nordhaus 2016	