Climate Change: Science, Economics, and Policy (ECON/ENVI 235)

Macalester College – Fall 2020, Module 2

Class meetings: MTWThF 1.45 pm – 3.00 pm, at the Class Zoom Link, or asynchronously

Instructors:

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Office hours at Google Calendar or by appointment

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Office hours at Google Calendar Appointment Slots

Preceptor:

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Course description

The causes and effects of climate change are inextricably linked with the global economy. The combustion of fossil fuels produces carbon dioxide, which traps energy near Earth's surface and leads to warmer average global temperatures. The combustion of fossil fuels also forms the backbone of the modern economy, fueling cars, power plants, and everything in between. This team-taught course will provide a framework in which to consider the costs and benefits of fossil fuel consumption in the present, but also over the coming decades and centuries. We will use concepts from climate science and environmental economics to help evaluate existing and proposed policy interventions designed to reduce fossil fuel consumption, and we will similarly consider possible technological solutions to slow or even reverse climate change. We will spend a significant amount of time exploring how the preceding topics factor into Integrated Assessment Models. Governments and NGOs use these models to combine scientific and socioeconomic information in order to predict the outcomes of various climate and policy scenarios. These are the state of the art in climate science, economics and policy; students will be exposed to several of the most commonly used models and to research from their critics.

Goals for students

By the end of this course, students should be able to

- Explain the basic principles of climate science and economics to a non-technical audience
- Understand the costs and benefits of, prospects for, and obstacles to potential climate change policies
- Use an Integrated Assessment Model to simulate changes in natural and economic conditions and to analyze the relative effectiveness of policies intended to reduce greenhouse gases
- Critique Integrated Assessment Models and their alternatives using a number of scientific and economic criteria
- Communicate clearly and effectively through written presentations of ideas

Course texts and readings

Archer, David. Global Warming: Understanding the forecast, 2nd ed. Hoboken, NJ: Wiley, 2011.

Nordhaus, William. The Climate Casino: Risk, Uncertainty, and Economics for a Warming World. New Haven, CT: Yale University Press, 2013.

Various other videos, articles, textbook chapters, and reports will be required. They will be posted on Moodle.

Mode of Delivery
The typical plan will be to deliver technical material via video watched asynchronously, and to follow up with live remote class discussion. Unless you are in a time zone where it is late night or very early morning during classtime, we assume that you will participate in synchronous class sessions. If you are in a time zone that makes synchronous participation is impossible, please contact us now to discuss strategy.

Piazza
You'll use Piazza to ask questions and post answers to your classmates about homework and class material. You can use this App on your computer or phone. The site embeds an equation editor, so you can use that for equations if you'd like, or you can upload a picture of your work (uploading pics of graphs is especially helpful). Louisa, Sarah, and Grace will monitor the App for your questions, but the key to making this work well is for you to answer your classmates' questions too. We'll be sure to check the answers you give and endorse them if they are correct, or clarify them if necessary. Find our class page at: piazza.com/macalester/fall2020/econenvi23501/home

Grading
Your final grade for this course will be determined by the number of points you accumulate throughout the semester.

Point distribution	
Reading responses and Mini-assignments (14 @ 5 points each)	90
Homework (7 @ 20 points each)	140
Class Participation	50
TOTAL POSSIBLE	280

Reading Responses
We will require reading responses for 8 of the course readings (indicated on Moodle Reading responses will be graded on a check-plus/check/check-minus scale. Hand in each reading response on Moodle by **1:30pm** the day for which the reading is assigned.

Mini-assignments
Six mini-assignments will consist of short problems linked to class activities that will usually feed into a consequent homework. They will also be graded on a 5-point scale, and will be due to Moodle by **9pm** on the day for which they are assigned.

Homework
Seven homework assignments will enable you to apply climate-econ models and other course material and to demonstrate your ability to translate technical material into language understandable to policymakers. We urge you to work together on your homework, but **each of you must use your own words to write up your own assignment, and you must write on your**

homework the names of those with whom you worked. Especially because this course will not have exams, the homework will be challenging and comprehensive, so starting them early and working on a section each day is a good idea. Please upload your homework to Moodle as a pdf. You may write your problems out by hand, but your writing must be very neat and you must scan them to pdf before uploading. There are a number of free scan-to-pdf applications.

Class participation
In addition to regularly attending live sessions and working actively with classmates in those sessions, students will be occasionally responsible for leading class discussion or assuming a role in a debate. We also expect you to make positive contributions to the intellectual community of the course more regularly, which might include active participation in breakout room/small group discussions, asking and/or answering questions in larger discussions, asking and/or answering questions on Piazza, listening to and responding respectfully to others' ideas, and coming to class fully prepared. At the end of the course we will ask you to provide us with a short written evaluation of your own participation with respect to these general criteria and assign yourself a grade. As long as it is broadly consistent with our observations of your work, that will be your participation grade for the course.

Academic integrity
Cheating on homework, including by using another's solutions, or any failure to acknowledge the contributions of others' work—including classmates—to your own are serious offenses. Cheating will result in a **grade of F for the assignment and may result in a failing grade for the course**. It is your responsibility to become familiar with Macalester's policies on what constitutes these offenses and to behave accordingly. We will report all cheating and plagiarism to the Dean of Academic Programs. For more information,
see http://www.macalester.edu/academicprograms/integrity.html.

Disabilities
We are committed to providing assistance to help you be successful in this course. Accommodations are available for students with documented disabilities. Follow the links on this page to request or renew accommodations. Please do this early in the semester to ensure that necessary accommodations are approved so that you can begin the semester successfully.

Concern for Students' Overall Well-Being
We care first and foremost about your overall well-being. If you are struggling in this class or in life, please let us know. We can help you strategize about the course and can refer you to great people who can help you. *This* is a list of resources.

Recordings
In order to accommodate students who cannot attend synchronous class meetings, we will record some of our synchronous class sessions in a manner consistent with Macalester's classroom recording policy. We will share these recordings to Moodle, which is a password-protected place. If you download any class recordings, you must store them in a password-protected file or on a password-protected site. Please note that the recording policy clearly states that *you may not*

share, replicate, or publish any class recording, in whole or in part, or use any of the recordings for any purpose besides knowing what happened during the class period, without my written approval. If we use any recorded content from any of our classes for purposes beyond our class, we will – in accordance with the policy – obtain your written permission to do so.

Inclusivity

We are committed to providing a safe and equitable learning environment for students. We insist that we all treat each other with respect and act professionally, adhering to the American Economic Association code of conduct. We will respect all viewpoints and identities, and all levels of comfort with the material. We as learners and teachers all bring various experiences and life contexts to this course. These differences will emerge in class and be part of what we negotiate and benefit from as a developing community. We hope you will feel comfortable coming to us to express any concerns or suggestions; this is an iterative process that requires the collaboration of all.

Miscellany

If you have concerns about any aspect of this course, please come see one of us sooner rather than later. We will respond to Piazza and email during 'normal business hours.' While it is possible that we will check our email at 2am, we probably won't write you back until at least the next morning. So, don't wait until the last minute to email with that question about your assignment that's due tomorrow.

We are learning from each other in addition to conveying our expertise and learning with you. We will do our best to indicate which instructor to seek out for clarification or feedback about a particular topic.

Please turn off (all the way off, or Do Not Disturb on, not just to vibrate) your cell phone before coming to class.

Course Schedule: Subject to Change

	Topic	Due
	Week 1	
Oct. 28	Introduction	
29	How Integrated Assessment Models Work	MA1
30	IAMs: Production and Emissions	RR1
	Week 2	
Nov. 2	Externalities and Public Goods	
3	DICE optima	
4	IAMs science	
5	IAMs - GHG/layer	HW1
6	IAMs - climate models, delta T intro	RR2
	Week 3	
9	Intro: Temperature Sensitivity	
10	Technical discussion	RR3
11	DICE/Policy	MA2
12	Recap	
13	Intro: The Discount Rate	HW2
	Week 4	
16	Technical discussion	RR4
17	DICE/Policy	MA 3
18	Recap	
19	Intro: The Science of Sea Level Rise	HW3
20	Technical discussion	RR5
	Week 5	
23	DICE/Policy	MA 4
24	Recap	
25	Intro: The Economics of Sea Level Rise	HW4
26	Thanksgiving	
27	Thanksgiving	

	Week 6	
30	Technical disc	RR6
Dec. 1	DICE/Policy	MA5
2	Recap	
3	Intro: Carbon Taxes or Carbon Permits?	HW5
4	Technical discussion	RR7
	Week 7	
7	DICE/Policy	MA6
8	Recap	
9	Geoengineering	HW6
10	Catastrophe/Critique of IAMs	
11	Catastrophe/Critique of IAMs	RR8
	Week 8	
14	To be determined	
15	Where do we go from here?	
16	Study Day	
17	Exam Day	HW7 due on Exam Day
18	Exam Day	