

**ECON 492: SENIOR CAPSTONE SEMINAR
THE ECONOMICS OF CLIMATE CHANGE
SPRING 2021**

Professor: Dr. Terry Iverson

Office Hours: 11:00-1:00 on Wednesdays

Zoom link for Office hours: <https://zoom.us/j/95853139502>

Contact: terry.iverson@colostate.edu (please **do not** use Canvas to contact me, **only email!**)

COURSE DESCRIPTION

However you look at it, the prospect of human-caused climate change presents an enormous policy challenge that has been the subject of intense international debate for over 30 years. While uncertainty persists about several important features of the problem, the basic mechanism linking higher concentrations of greenhouse gases to global warming is well understood, and the consequence of proceeding as usual on the current trajectory of economic growth grounded on fossil-fuel-based energy will be severe. The field of economics provides powerful theoretical and empirical tools for understanding the key policy challenges and for devising an effective response. Reflecting this, the 2018 Nobel Prize in Economics went to William Nordhaus for his work developing a subfield in economics focused on climate change policy. We will build on Nordhaus's famous DICE model to explore a variety of policy questions related to the optimal response to the various threats posed by global climate change. Students will work together in groups and present the findings of their research in two presentations.

COURSE OBJECTIVES

- Learn basic ideas from the economics of climate change
- Become proficient at solving dynamic economic models in Excel
- Use data and empirical analysis to calibrate an economic model
- Pose a clear research question and use an economic model to answer it
- Learn to navigate the challenges of group work
- Communicate findings in a clear and effective way

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:

Participation	100
Midterm	150
Homeworks	100
First group presentation	150
Model evaluation exercise	150
Second group presentation	250
Econ Department Assessment exam	<u>100</u>
Total:	1,000

The grading scale is

A ⁺	967 – 1000	B ⁻	800 – 832
A	933 – 966	C ⁺	766 – 799
A ⁻	900 – 932	C	700 – 765
B ⁺	867 – 899	D	600 – 799
B	833 – 866	F	Below 599

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

PARTICIPATION

During the group work portion of the class, I will take attendance at the beginning of class, before putting students into Zoom breakout rooms with their group. I will use this information to help in evaluating your participation in group work. In addition to counting for 10 percent of your grade, I reserve the right to subtract additional points from any student who consistently misses class if there arise large frustrations in the group about the same person not contributing to the project. It is critical that you show up for your group.

HOMEWORK

There will be three homeworks due during the first third of the semester. The first two assignments will be submitted individually, while the third assignment will be submitted jointly with your group. The purpose of the assignments is to teach you the tools you will need to conduct dynamic economic analysis in Excel, and to build an Integrated Assessment Model to explore research questions related to climate policy. The model you build by the end of homework 3 will form the starting point for your research project during the remainder of the semester.

GROUP PROJECTS

You will organize into groups of two to three students by the end of the fifth week. Your group will pick from a list of project topics that I will present and discuss in class. Once you have chosen a broad topic, you will build a model in Excel to explore interesting questions that will form the basis for your final presentation at the end of the semester. Along the way, your group will be responsible for the following:

1. Homework 3 submitted jointly as a group
2. First presentation
3. Model evaluation exercise
4. Final presentation

FIRST PRESENTATION

The first presentation (worth 150 points) will present your research question and lay out your motivation for why it is important. You should also sketch briefly what you intend to accomplish in your research over the remainder of the semester. You should view the audience as your fellow classmates. Your goal is to teach your classmates about this interesting problem and the interesting work that you intend to accomplish in the following weeks. I expect presentations to be well-organized, professional presentations that include visual aides (such as PowerPoint). I will post an evaluation rubric on Canvas that you should review when preparing your presentations.

MODEL EVALUATION EXERCISE

You will submit your main Excel model when you have completed the basic structure for your analysis. The submitted model should be accompanied by a two-page explanation of what the model does and how it works. This portion of the project is worth 150 points. I will post an evaluation rubric on Canvas.

FINAL PRESENTATION

The final presentation (worth 250 points) will present the final results of your research. The presentation should briefly remind your audience of the problem you are studying (which you motivated in detail in the first presentation). The presentation should be organized around the most interesting graphs that you are able to generate using your excel model. Supporting empirical work should also be described. Good presentations will have a clear thesis, with clear arguments supporting the main point. I leave it open for you to decide what it is that you are trying to argue! A detailed evaluation rubric will be posted on Canvas.

ASSESSMENT EXAM

During the week of finals (or the end of the last week of class), each student must take the Assessment Examinations in microeconomics and macroeconomics. The exams will be available on Canvas. The exams consist of 20 multiple choice questions pertaining to microeconomics and 20 multiple choice questions pertaining to macroeconomics. Each correct answer is worth 3 points. Each exam must be completed within one hour.

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 a 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	1
Work on research project and/or presentation	<u>6-10</u>
TOTAL:	10-14

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).

Important information for students on COVID-19:

All students are required to follow public health guidelines in any university space, and are encouraged to continue these practices when off-campus(es). Students also are required to report any COVID-19 symptoms to the university immediately, as well as if they have potentially been exposed or have tested positive at a non-CSU testing location. If you suspect you have symptoms, please fill out the COVID Reporter (<https://covid.colostate.edu/reporter/>). If you have COVID symptoms or know or believe you have been exposed, it is important for the health of yourself and others that you complete the online COVID Reporter. Do not ask your instructor to report for you; if you report to your instructor that you will not attend class due to symptoms or a potential exposure, you are required to also submit those concerns through the COVID Reporter. If you do not have access to the internet to fill out the online COVID-19 Reporter, please call (970)491-4600.

If you report symptoms or a positive test, your report is submitted to CSU's Public Health Office. You will receive immediate, initial instructions on what to do and then you will also be contacted by phone by a public health official. Based on your specific circumstances, the public health official may:

- choose to recommend that you be tested and help arrange for a test
- conduct contact tracing
- initiate any necessary public health requirements or recommendations and notify you if you need to take any steps

If you report a potential exposure, the public health official will help you determine if you are at risk of contracting COVID.

For the latest information about the University's COVID resources and information, please visit the CSU COVID-19 site (<https://covidrecovery.colostate.edu/>).

SCHEDULE:

Week of	Readings	Topics	Graded Assignments
1 1/20(W)		Introduction; climate science	
2 1/25		Emissions; abatement; Excel	
3 2/1		Integrated assessment modeling	F: HW1 due
4 2/8		Integrated assessment modeling	
5 2/15		Integrated assessment modeling	M: HW2 due W: Midterm F: Deadline for final group formation
6 2/22		In-class work week	F: HW3 due
7 3/1		In-class work week	
7 3/1		In-class work week	
9 3/8			
10 3/15		In-class work week	
11 3/22		In-class work week	W, F: First presentation
12 3/29		In-class work week	
13 4/5		In-class work week	F: Deadline for group paper
		SPRING BREAK	
14 4/19			
15 4/26			W, F: Final presentation