

## AEC 122: INTRODUCTION TO CLIMATE CHANGE ECONOMICS AND POLICY

Lecture TR 10:00 – 11:20 am

ILLC 155

Fall 2023

### Professor

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**Extra Help Hours:** Mondays 11 am to 12 noon and Thursdays 3 pm to 4 pm. I am also available by email appointment at other times.

### Teaching Assistant

#### **Hunter Riccardelli**

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**Extra Help Hours:** Wednesdays and Fridays 10 am to 12 noon

### Course Catalog Description

Examines the role of economics and policy to mitigate greenhouse gas (GHG) emissions and adapt to climate change. Explores the challenges in global policy cooperation, the unequal distribution of economic damages across space and time, and the uncertainties inherent in every climate policy decision. Analyzes strategies to mitigate GHG emissions, including market-based solutions like cap and trade, along with adaptation policy options related to sea-level rise, natural disasters, agriculture, forests and human migration. (Bacc Core Course)

**Credits:** 3

**Prerequisites:** none

### Course Objectives

Climate change is a grand societal challenge for Oregon and the world. At its core, anthropogenic climate change results from a market failure associated with greenhouse gas (GHG) emissions and therefore can be viewed as a fundamentally economic problem. GHG emissions are cumulative and cause irreversible harm, the global scale requires unprecedented international cooperation, there is tremendous uncertainty in projecting future impacts, and those impacts, along with the costs of mitigation and adaptation, vary across time and space in large ways. The focus of this course is the development of economic thinking and intuition applied to the policy challenges associated with climate change. This course will assess regional, national and international policy design and issues with current implementation, evaluate adaptation incentives and impediments, and survey the economic tools needed to evaluate current and

future climate change policies. The course will be discussion-oriented and will require a high degree of participation by students in the classroom.

My objectives for this course are to:

- Introduce students to the economic issues (e.g., global scale, uncertainty, intergenerational and distributional impacts) that make climate change a complex and urgent problem.
- Provide students with a clear understanding of the current landscape of domestic and international GHG mitigation policy planning and implementation.
- Introduce students to the theory, empirical evidence, and important policy implications of the economics of climate change at a level appropriate for undergraduate students with no prior experience with economics.
- Provide students with a clear understanding of the economic incentives that can support and hinder effective adaptation to climate change across various sectors of the economy.

### **Measurable Student Learning Outcomes**

Upon successful completion of this course, a student will be able to:

1. Recognize how economics can inform and improve climate policies.
2. Describe the fundamental economic challenges associated with policy options for global intergenerational problems such as climate change.
3. Compare and evaluate the effectiveness of alternative market-based policy solutions to reduce GHG emissions and help society adapt to climate futures.
4. Explain and quantify the impacts of climate change on human well-being and the natural world and evaluate adaptation options to reduce these impacts.
5. Define climate problems through an economic lens and interpret climate change science and communication.

### **Baccalaureate Core**

This course fulfills a Baccalaureate Core requirement for the *Social Processes and Institutions (SPI)* category. Upon successful completion of this Baccalaureate Core *Perspectives* course, a student will be able to:

1. Use theoretical frameworks to interpret the role of the individual within social process and institutions.
2. Analyze current social issues and place them in historical context(s).
3. Critique the nature, value, and limitations of the basic methods of the social sciences.

This course contains lectures, discussion activities, homework assignments, a group project, and a final exam designed to align with these baccalaureate core learning outcomes (BCLO) and to



assess student success in achieving these goals. This course provides a non-technical introduction to microeconomic theory necessary for understanding how individuals and firms interact in markets that generate carbon emissions. Students will develop an understanding of how aligning individual decisions with a society goal of mitigating climate change can produce successful policy interventions (BCLO1). Students will also assess how adaptive behavior may reduce projected climate impacts and how adaptation policies can generate economic incentives that can either enhance or detract from policy goals based on induced behavior of individuals (BCLO1). AEC 122 addresses social and economic issues that arise from climate change and provides historical context of the problem by analyzing the evolution of global and national climate policy (BCLO2). This course exposes students to economic theory and intuition that helps drive climate problems but also demonstrates how thinking like an economist can lead to policy designs and adaptation options that are foundational to climate solutions (BCLO3). AEC 122 also provides a critique of traditional economic thought as applied to equity and distributional impacts of climate change and demonstrates significant limitations of using economic efficiency as a criterion for some climate policy choices (BCLO3) Emphasis will also be given to the interdisciplinary nature of the climate problem and the need for new transdisciplinary efforts across both natural and social sciences to address these challenges (BCLO2, 3).

### **Communication**

Please post all questions about assignments, readings, or lectures in the Q&A Discussion Forum on Canvas. Posts there may address questions that more than one of you may have so please make use of this resource so all may benefit from the questions and answers provided. I encourage you to answer questions posted by classmates if you can. I will monitor this board each weekday afternoon and respond to any unanswered questions or provide any needed clarifications. Any question posted after 5 pm PT or on weekends or holidays will be answered on the next business day.

If you have questions about grading or other matters of a personal nature or you would like to meet with me outside of my posted office hours, please contact me directly via email (preferred) or the Canvas Inbox starting the subject with "AEC122:" This will help me prioritize the many emails I receive each day and ensure timely feedback to your inquiry. I am available via email during normal business hours M-F 8 am to 5 pm. You can expect same day responses to emails during those times and the next business day for emails outside of those times.

### **Learning Resources**

#### **Required Text:**

***The Climate Casino: Risk, Uncertainty, and Economics for a Warming World* (2013)**

Author: William Nordhaus

Yale University Press, New Haven, CT

#### **Recommended Additional Resource:**

***Climate Shock: The Economic Consequences of a Hotter Planet* (2015)**



Authors: Gernot Wagner and Martin L. Weitzman  
Princeton University Press, Princeton, NJ.

Both books listed above are available electronically free of charge through the OSU library. You will need to use your ONID login to access these titles at the links below:

[The Climate Casino](#)

[Climate Shock](#)

If you prefer physical copies, both books are available from the bookstore and/or online sellers for under \$15. Additional course content is available via Canvas. The course Canvas site contains the syllabus, lecture notes, additional readings, discussion board activities and weekly low-stakes quizzes. **Please note:** Assigned readings are essential to your success in this course.

### **Evaluation of Student Performance**

Your performance in this course will be evaluated as follows:

<b>Assignment</b>	<b>Percentage of Final Grade</b>
Weekly Quizzes (on Canvas)	10
In-Class Activities and/or Canvas Discussion Boards	20
Homework Assignments (3)	30
Group Project	20
Final Exam	20
<b>Total</b>	<b>100</b>

The following scale will be used in assigning final grades:

<b>Grade</b>	<b>Percent Range</b>
A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	Below 60

\* I reserve the right to adjust/curve the final grades if this is deemed necessary.

### **Weekly Quizzes**

There are short, low-stakes online quizzes on Canvas each week associated with the assigned readings and lecture material.

### **In-Class Assignments and Discussion Board Activities**

In-class group assignments and discussion boards in Canvas are used in this course to encourage debate on current events related to climate change. There will be at least one (1) of these activities each week this term. Examples of topics covered in these activities include climate mitigation policy at local, regional, and national scales and adaptation discussions about housing markets and sea-level rise, changing agricultural practices, or climate refugees. In-class assignments and discussion boards are designed to meet learning outcomes for this course as well as *SPI* BCLOs.

### **Homework**

Homework in this course includes online research into climate change issues, short answer questions, and short research activities. Homework assignments are designed to meet learning outcomes for this course as well as *SPI* BCLOs.

### **Group Project**

The group project in this course is an international climate forum where students will prepare a report on a chosen country about their concerns and interests regarding climate change. Our final two (2) classes will be used to debate important economic policies and draft a global climate agreement. Given the class size, this is likely to be a small group effort (~ 3 people per country). More details to follow once the term begins.

### **Final Exam**

A final exam is given at the assigned time during finals week (**Fri 12/15 at 9:30 am**). The exam will test high-level concepts learned throughout the term and provide an opportunity to develop a critical perspective on a climate change policy issue based on an assigned reading. It is designed to meet learning outcomes for this course as well as *SPI* BCLOs.

**Late Assignment Policy:** Any Canvas assignment (quiz, discussion board, homework) submitted after the due date and time is considered late. Each student has **two times** during the term where late work may be accepted under the following conditions:

- 1) Each student will have 2 late passes for the term that will allow an assignment turned in late to be graded at full credit, **if and only if** the late assignment is turned in **within 24 hours of the original due date and time**.
- 2) Any late assignments turned in more than 24 hours after the due date **will not be accepted for any credit**.
- 3) Any assignment turned in late after the 2 late passes have been used **will not be accepted for any credit**.



In other words, there is no partial credit offered for assignments in this course. It is either turned in on time, graded at full credit if late under the above conditions, or it is graded as a zero.

For in-class assignments, there is not any alternative offered if missed. Being in class and participating in the assignment is the only way to earn points.

**To ensure this policy is enforced fairly, the instructor or TA will reply to any request for special considerations with a copy of this late policy text.**

**Makeup Exams:** Makeup exams will be given only for missed exams where a discussion is had **in advance** between the student and instructor and the reason for missing the exam is deemed valid by the instructor. This determination is at the sole discretion of the instructor. For instance, travel plans or attending to personal matters are not likely to be deemed valid and a make-up exam will not be offered. Make up exams will not be given **under any circumstances** if student contacts the instructor after the exam has occurred regardless of the reason.

**Please note: I DO NOT offer extra credit opportunities on an individual basis**, so please do not ask. If you are struggling with the course material, make the effort to come see me during office hours or make an appointment sooner rather than later.

### Course Content

Week	Topics	Learning Activities
<b>0:</b> <b>Class Overview and Introductions</b>	<ul style="list-style-type: none"> <li>Review Course/Canvas/Syllabus</li> </ul>	Introductions
<b>1:</b> <b>Introduction to Climate Change Economics</b>	<ul style="list-style-type: none"> <li>What is Climate Change?</li> <li>Climate Policy Options</li> <li>Challenges to Effective Policy Solutions</li> <li>Defining Climate Change as an Economic Problem</li> </ul>	In-Class/Discussion Board (IC/DB) #1 Quiz #1
<b>2:</b> <b>Economic Fundamentals</b>	<ul style="list-style-type: none"> <li>How Markets Work</li> <li>How Markets Fail</li> <li>Negative Externalities</li> </ul>	IC/DB #2 Homework #1 Quiz #2
<b>3:</b> <b>Assessing the Impacts of Climate Change</b>	<ul style="list-style-type: none"> <li>Vulnerable Economic Sectors</li> <li>Measuring Economic Impacts</li> <li>Attribution &amp; Valuation of Impacts</li> <li>Tipping Points</li> </ul>	IC/DB #3 Quiz #3

Week	Topics	Learning Activities
<b>4: Historic &amp; Current Climate Policies</b>	<ul style="list-style-type: none"> <li>• Kyoto Protocol to the Paris Agreement</li> <li>• U.S. National Climate Policy</li> <li>• Regional, State, &amp; Local Climate Policies</li> </ul>	IC/DB #4 Quiz #4
<b>5: Social Cost of Carbon &amp; The Discount Rate</b>	<ul style="list-style-type: none"> <li>• Social Cost of Carbon: what is it and how is it used?</li> <li>• Discounting</li> <li>• Ethical Dimensions of Discounting</li> </ul>	IC/DB #5 Homework #2 Quiz #5
<b>6: Carbon Pricing</b>	<ul style="list-style-type: none"> <li>• Carbon Tax and Cap-and-Trade</li> <li>• Revenues from Carbon Pricing</li> <li>• Distributional effects of Carbon Pricing</li> </ul>	IC/DB #6 Quiz #6
<b>7: Adaptation in Land Use</b>	<ul style="list-style-type: none"> <li>• Changing Land Use (e.g., crop choice, forest type) as Climate Adaptation Strategies</li> <li>• Adaptation in Agriculture</li> <li>• Forests and Climate Change</li> </ul>	IC/DB #7 Homework #3 Quiz #7
<b>8: Coastal Climate Adaptation</b>	<ul style="list-style-type: none"> <li>• Coastal Adaptation Strategies</li> <li>• Economic &amp; Institutional Barriers to Coastal Adaptation</li> <li>• Perverse Incentives and Unintended Consequences</li> </ul>	IC/DB #8 Quiz #8
<b>9: Human Migration</b>	<ul style="list-style-type: none"> <li>• Climate Migration</li> <li>• Climate Gentrification in the U.S.</li> <li>• Migrants or Refugees?</li> </ul>	IC/DB #9 Quiz #9
<b>10: Global Climate Negotiations (Group Project)</b>		Executive Summary Class discussion
<b>Finals Week</b>		Final Exam <b>Friday 12/15 9:30 am</b>

## Course Policies

I have scheduled open office hours each week and I am also available by appointment subject to my availability. **Individual office visits may be one of the most productive parts of the course for you if you are struggling with the material.** Don't forget...I am here to help.

**Class attendance** is not a required element for your course grade; however, you are responsible for all material covered in class, regardless of whether you decide to attend. If you miss a class, you will need to get the notes from a classmate. Additionally, unscheduled in-class assignments will be given throughout the quarter so unexcused absences have the potential to harm your final grade. In terms of classroom etiquette, please turn any unnecessary electronic devices off and keep them off your desk. I expect you to engage in class – or at the very least, you should not be a distraction by being rude.

**Use of AI/Chatbots:** I view AI chatbots like ChatGPT as a tool and not a substitute for creative input and thinking. In this class, you will develop strong analytical skills using real-world examples, which cannot be outsourced to generative AI tools. AI tools based on a large language model provide responses based on the vast amount of text in its database. While they can provide helpful information and may spur your thinking, they are not a reliable source and cannot provide citations or references to reliable data or evidence. ([For example, 2 NY lawyers were sanctioned by the court for submitting fake cases in a legal brief that they wrote using ChatGPT!](#))

I expect that all of your submitted work (including quizzes, homework, or discussions) is your own. **If you copy and paste text from any source, including ChatGPT, you must put it in quotation marks and cite it (See [How to Cite ChatGPT \(APA style\)](#)).** Please add a parenthetical explaining how you prompted the AI tool if you quote or otherwise use ideas from an AI tool. Remember that the OSU Student Conduct Code defines Academic Misconduct as “an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research.” You may not use the output of an AI tool and claim it as your own, for your own integrity and to develop your own skills.

**Academic Calendar:** All students are subject to the registration and refund deadlines as stated in the Academic Calendar: <https://registrar.oregonstate.edu/osu-academic-calendar>

**Statement Regarding Students with Disabilities:** Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

**Statement Regarding Religious Accommodation:** Oregon State University is required to provide reasonable accommodations for employee and student sincerely held religious beliefs. It is incumbent on the student making the request to make the faculty member aware of the request

as soon as possible prior to the need for the accommodation. See the [Religious Accommodation Process for Students](#).

**Expectations for Student Conduct:** Student conduct is governed by the university's policies, as explained in the Student Conduct Code (<https://beav.es/codeofconduct>). Students are expected to conduct themselves in the course (e.g., on discussion boards, email postings) in compliance with the university's regulations regarding civility.

**Reach Out for Success:** University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it's important to reach out. Consider discussing the situation with an instructor or academic advisor. Learn about resources that assist with wellness and academic success at [oregonstate.edu/ReachOut](http://oregonstate.edu/ReachOut). If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255)

**Academic Integrity:** Integrity is a character-driven commitment to honesty, doing what is right, and guiding others to do what is right. Oregon State University Ecampus students and faculty have a responsibility to act with integrity in all our educational work, and that integrity enables this community of learners to interact in the spirit of trust, honesty, and fairness across the globe.

Academic misconduct, or violations of academic integrity, can fall into seven broad areas, including but not limited to: cheating; plagiarism; falsification; assisting; tampering; multiple submissions of work; and unauthorized recording and use.

It is important that you understand what student actions are defined as academic misconduct at Oregon State University. The OSU Libraries offer a [tutorial on academic misconduct](#), and you can also refer to the [OSU Student Code of Conduct](#) and [the Office of Student Conduct and Community Standard's website](#) for more information. More importantly, if you are unsure if something will violate our academic integrity policy, ask your professors, GTAs, academic advisors, or academic integrity officers.

**Lauren's Promise:** I will listen and believe you if someone is threatening you.

Lauren McCluskey, a 21-year-old honors student athlete, was murdered on October 22, 2018, by a man she briefly dated on the University of Utah Campus. We must all take actions to ensure this never happens again. Any form of sexual harassment or violence will not be excused or tolerated at Oregon State University. All individuals who are participating in university programs and activities have the right to do so fully, free from sexual discrimination, misconduct, and retaliation. The university prohibits sexual misconduct of any kind, including sexual harassment, intimate partner violence, sexual exploitation, and stalking. When such misconduct occurs, the university will take steps to stop, prevent recurrence, and remedy the impacts of such behavior. **If you feel you are in danger, call 911.**

All Oregon State University employees are considered "Responsible Employees" and must consult with the Office of Equal Opportunity and Access when they are ***made aware or have reason to believe*** that a violation of the Sexual Misconduct and Discrimination policy has occurred. However, the university makes several confidential offices available to those who have been affected by sexual misconduct or discrimination. The following offices do not report sexual assaults or other sexual misconduct or discrimination claims to other university offices, but can

refer students and employees to resources and services both on campus and within the community: [Survivor Advocacy and Resource Center \(SARC\)](#), [Counseling and Psychological Services \(CAPS\)](#), [Student Health Services \(SHS\)](#), and the [University Ombuds](#).

**Student Evaluation of Courses:** During Fall, Winter, and Spring term, the online Student Evaluation of Teaching system opens to students the Wednesday of week 8 and closes the Sunday before Finals Week. Students receive notification, instructions and the link through their ONID. They may also log into the system via Online Services. Course evaluation results are extremely important and used to help improve courses and the hybrid learning experience for future students. Responses are anonymous (unless a student chooses to “sign” their comments, agreeing to relinquish anonymity) and unavailable to instructors until after grades have been posted. The results of scaled questions and signed comments go to both the instructor and their unit head/supervisor. Anonymous (unsigned) comments go to the instructor only.