

ATS 150: Science of Global Climate Change Spring 2023

CLASS TIMES AND LOCATION: Tuesday and Thursday from 9:30-10:45 AM Mountain Time in Wagar 232.

TEXTBOOK (optional): *Global Warming, Understanding the Forecast*, by David Archer. Other readings will be distributed each week through the Canvas

PROFESSOR: Jeff Pierce, Atmospheric Science, jeffrey.pierce@colostate.edu

Office hour: Thursday 10:45-11:45 in room A102F of the Engineering Building.

TEACHING ASSISTANT: Olivia Sablan, Atmospheric Science, olivia.sablan@colostate.edu

Office hour: Tuesday 10:45-11:45 in room A102F of the Engineering Building.

CLASS WEBSITE: CSU Canvas (<https://colostate.instructure.com/>)

I will distribute the notes for every lecture on Canvas ahead of time. This is where homework will be assigned. You don't have to bring the book (ever), but I make **printable handouts of all the notes with four slides to a page so you can make notes** in the margins (available on Canvas).

GRADING:

Your semester grade will be computed as follows:

- 1/5 Homework (average of ~3 assignments plus weekly readings)
- 1/5 Exam #1 (in class, tentatively Feb 23)
- 1/5 Exam #2 (in class tentatively Apr 3)
- 1/5 Late-semester post-lecture write-ups
- 1/5 Final essays

HOMEWORKS:

There will be ~3 homework assignments throughout the semester.

WEEKLY READINGS:

In weeks without a homework or exam, you are expected to read 3 articles on climate from the news, blogs, or journal articles, and you will turn in several sentences to Canvas describing your reading. I will generally reserve class time each week for students to discuss or ask questions about what they read that week.

LATE-SEMESTER POST-LECTURE WRITE-UPS:

Starting with later lectures covering material that will not be on an exam, you are expected to write 5+ sentences on the main points that you took from each lecture. Each write-up is due 24 hours after the lecture. The write ups will be graded from 0-2 points each (0 points for <5 sentences, 1 point for greatly misunderstanding the lecture, 2 points for mostly/fully understanding it).

FINAL ESSAYS:

Rather than a traditional Final Exam, we will have take-home "short" (~500 word) essays on your choice of topics that we will provide. Details will be posted on Canvas after Spring Break.

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SCHEDULE:

Topic	Readings
Introduction: Science, Impacts, Potential Solutions	
Earth System Overview	Chapter 1
Energy & Electromagnetic Radiation	Chapter 2
Layer Model of the Greenhouse Effect	Chapter 3
Greenhouse Gases, Lapse Rate	Chapter 4
Energy Budget of the Earth	Chapter 5
EXAM #1 (in class, tentatively 2/23)	
Weather	Chapter 6
Climate Sensitivity & Feedback	Chapter 7
Climates of the Past	Chapter 8
Fossil Fuel & Carbon Cycle	Chapter 9
Future Climate Change	Chapter 11
Climate Change Impacts	Chapter 12
Air pollution and climate	
EXAM #2 (in class, tentatively 4/3)	
Climate and health (Brooke Anderson guest lecture, 4/27)	
Energy	Chapter 14
Climate Change Communication (Ashley Anderson guest lecture, 4/18)	
Climate Change Economics (Terry Iverson guest lecture, TBD)	
Climate Change Policy (Ryan Scott guest lecture, 5/2)	

INCLUSION STATEMENT:

CSU Atmospheric Science is a leading global institution, and as such, all members of our community regardless of race, ethnicity, culture, religion, sexual orientation, gender identity and expression, physical ability, age, socioeconomic status or nationality are welcome as equal contributors. We value and appreciate diversity, and we believe that diversity on our campus strengthens our entire scientific community. It is my intent that students from all backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that the students bring to this class be viewed as a resource, strength, and benefit. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally, or for other students or student groups.

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ACADEMIC INTEGRITY:

All students are subject to the policies regarding academic integrity found in the 2022 – 2023 General Catalog, found at <http://catalog.colostate.edu/general-catalog/policies/>, and the student conduct code (<http://resolutioncenter.colostate.edu/conduct-code>). Other information on academic integrity can be found at <https://resolutioncenter.colostate.edu/academic-integrity/>. Examples of academic dishonesty can be found in these sources. At a minimum, violations will result in a grading penalty in this course and a report to the Office of Conflict Resolution and Student Conduct Services.