# SIO25: Climate Change and Society - Fall 24

Instructor: Professor John Hildebrand

Lectures: MWF 3-3:50 pm Location: SOLIS 107

Podcast <https://podcast.ucsd.edu/watch/fa24/sio25_a00>

**Professor Hildebrand’s Office hours:** Wed 4-5pm zoom id: 8585344069

**e-mail:** [jhildebrand@ucsd.edu](mailto:jhildebrand@ucsd.edu) **Course website:** [canvas.ucsd.edu](https://canvas.ucsd.edu/courses/59930)/

**Discussion Board:** <https://piazza.com/ucsd/fall2024/sio25_fa24_a00/home>

# Graduate student Teaching Assistants (TAs)

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Section A01 M 4:00p-4:50p HSS 2154

Section A02 M 5:00p-5:50p HSS 2154

Section A03 Tu 5:00p-5:50p HSS 2154

Section A04 W 10:00a-10:50a HSS 2154

Section A05 W 11:00a-11:50a HSS 2154

Section A06 W 4:00p-4:50p HSS 2154

Section A07 F 1:00p-1:50p HSS 2154

Section A08 F 4:00p-4:50p HSS 2154

# Course Objectives

This course will focus on understanding of global climate change, mitigation and adaptation options, and policy issues. By the end of this course, you should be able to (1) understand and describe the physical basis of climate change, (2) identify and explain global indications of climate change, (3) be familiar with proposed technological, economic and political solutions for mitigation and adaptation, (4) be able to effectively engage in the public policy debate on climate change solutions, and (5) be able to accurately and effectively relate information on climate change to a general audience.

# Course Reading Assignments

**Required Book**: Introduction to Modern Climate Change 3rd edition, Andrew Dessler, Cambridge University Press. 2022. This required textbook is available for purchase in the UCSD bookstore. You can also purchase a copy or an *etextbook* at amazon.com or several other on-line book providers.

**Additional articles:** We will also read government reports, journal articles and news articles. Generally, you will access these articles online, and the websites will be provided on the syllabus or added on the course website. The most important of these readings, and how they are abbreviated on the syllabus, are listed below.

1. The 2021 Intergovernmental Panel on Climate Change Assessment Report 6 (2021) Working Group 1 Summary for Policy Makers (IPCC AR6 SPM)

<https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf>

1. The Fifth National Climate Assessment: Report-in-Brief (NCA5)

<https://nca2023.globalchange.gov/downloads/NCA5_Report-In-Brief.pdf>

1. The Intergovernmental Panel on Climate Change Special Report 1.5°C Summary for Policy Makers. (IPCC SR15 SPM)

<https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SPM_version_report_LR.pdf>

**Discussion Board:** <https://piazza.com/ucsd/fall2024/sio25_fa24_a00/home>

We will use Piazza for class discussion. The system provides help efficiently from classmates, the TAs, and me. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza.

# Course Format

Class will consist of lectures, assigned reading, section discussion, quizzes, Homework assignments, a mid-term, and a final exam. The lectures and required reading assignments form the significant portion of the class material. Weekly quizzes will give you practice and experience with the material in the reading and the lecturers. The mid-term and final will assess your overall understanding of the course material.

Students are expected to follow the lectures and to attend the weekly discussion sections. If you are not able to attend the lectures they will be recorded and posted on canvas, where you will be able to view them asynchronously. Lectures and discussion sections are an important aspect of the course, and attending these regularly will enhance your ability to achieve the course objectives. Participating in lectures synchronously will also provide opportunities for students to participate in real time polls to test their knowledge, and to engage in in-class discussions with their peers. Discussion sections, run by your TAs, will provide an opportunity for you to clarify quiz and Homework assignments, lecture and reading material, ask questions about grading or other feedback, and to discuss course topics in more detail with a group of your peers.

# Course Policies

**Extra Credit.** There will be extra-credit opportunities throughout the course. Some opportunities will be available during in-class discussion and other opportunities will be for outside of class time, including some that can be completed asynchronously.

**Statement on Academic Integrity.** Integrity of scholarship is essential for an academic community. This course will adhere strictly to the UCSD policy on academic integrity: “Students are expected to do their own work without unauthorized aids of any kind,” as outlined in the UCSD Policy on Integrity of Scholarship. In particular, students agree that by taking this course, all required written homework and scholarship will be their own writing and sources will all be correctly referenced. Cheating on exams will not be tolerated and all detected cheating will be considered academic misconduct and subject to disciplinary process. For more details on what constitutes cheating see here: <https://academicintegrity.ucsd.edu/excel-integrity/define-cheating/index.html>.

**ADA statement:** Your instructor and your TAs are happy to provide accommodations for this course for students with documented disabilities. Students must provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD). I request contact from the student and the OSD office be provided in advance so that accommodations may be arranged.

# Grading:

20% Quizzes

20% Homework Assignments

20% Mid-term Exam

40% Final Exam (cumulative)

Extra credit: Extra-credit will available periodically. Additional campus seminars and other campus opportunities to earn extra credit will be announced **in class** throughout the quarter.

# Course Schedule\*

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| **Meeting Type and Date** | **Topic** | **Assignments and Reading** |
|  | **Week 0** |  |
| Lecture  Sept 27 | Top 10 Climate Stories of 2023-24  Attitudes on Climate Change | Course syllabus |
|  | **Week 1** |  |
| Lecture Sept 30 | What is Climate? | Dessler, Chapter 1 |
| Lecture  Oct 2 | Units of Energy, Heat, Humidity |  |
| Lecture  Oct 4 | Intro to Atmosphere | **Quiz #1 and Homework #1 Due**  **What is climate/units** |
| *Discussion*  *Sections* | *Lecture review and Questions on HW #1* |  |
|  | **Week 2** |  |
| Lecture Oct 7 | Intro to Oceans |  |
| Lecture  Oct 9 | How is the Climate Changing? | Dessler, Chapter 2 |
| Lecture  Oct 11 | Earth’s Paleoclimate | **Quiz #2 and Homework #2 Due**  **Atmosphere/oceans** |
| *Discussion Sections* | *Lecture review and Questions on HW #2* |  |
|  | **Week 3** |  |
| Lecture  Oct 14 | Radiation and Energy Balance | Dessler, Chapter 3 |
| Lecture Oct 16 | Radiation and Energy Balance |  |
| Lecture Oct 18 | Simple Climate Model | Dessler, Chapter 4  **Quiz #3 and Homework#3 Due**  **Changing climate/paleo** |
| *Discussion Sections* | *Lecture review and questions on HW #3* |  |
|  | **Week 4** |  |
| Lecture Oct 21 | Impacts: Extreme weather | Dessler, Chapter 9 |
| Lecture Oct 23 | Impacts: Shrinking Snowpack, Melting Ice |  |
| Midterm Oct 25 | **Midterm** | **Quiz #4 and Homework #4 Due**  **Radiation/simple model** |
| *Discussion Sections* | *Lecture Review and questions on HW #4*  *Midterm Review* |  |

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|  | **Week 5** |  |
| Lecture Oct 28 | Impacts: Sea Level |  |
| Lecture  Oct 30 | Impacts: Ocean Acidification |  |
| Lecture Nov 1 | Impacts: Vegetation and Agriculture | **Quiz #5 and Homework #5 Due**  **Ice snow/sealevel** |
| *Discussion*  *Sections* | *Lecture Review and questions on HW #5* |  |
|  | **Week 6** |  |
| Lecture Nov 4 | The Carbon Cycle | Dessler, Chapter 5 |
| Lecture  Nov 6 | Climate Forcing, Feedback and  Sensitivity | Dessler, Chapter 6 |
| Lecture Nov 8 | Why is Climate Changing | Dessler, Chapter 7  **Quiz #6 Homework #6 Due**  **Ocean /Vegetation/Carbon cycle** |
| *Discussion Sections* | *Lecture Review and questions on HW #6* |  |
|  | **Week 7** |  |
| **No Class Nov 11** | Veterans Day Holiday |  |
| Lecture Nov 13 | Why is Climate Changing |  |
| Lecture Nov 15 | What the Future Holds: Climate Predictions | Dessler, Chapter 8  **Quiz #7 and Homework #7 Due**  **Forcing feedback/why changing** |
| *Discussion*  *Sections* | *Lecture Review and questions on HW #7* |  |
|  | **Week 8** |  |
| Lecture Nov 18 | What the Future Holds: Growth and Social Cost | Dessler, Chapter 10 |
| Lecture Nov 20 | Climate Change Solutions: Adaptation | Dessler, Chapter 11 |
| Lecture Nov 22 | Climate Change Solutions: Renewables | **Quiz #8 and Homework #8 Due**  **Predictions/growth** |
| *Discussion Sections* | *Lecture Review and questions on HW #8* |  |

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|  | **Week 9** |  |
| Lecture Nov 25 | Climate Change Solutions: Carbon Capture |  |
| Lecture Nov 27 | Climate Change Solutions: Mitigation | Dessler, Chapter 12  **Quiz #9 and Homework #9 Due**  **Adaptation/renew/capture** |
| No Class  Nov 29 | No Class - Thanksgiving Break |  |
| *Discussion Section March 4* | *Lecture Review and questions on HW #9* |  |
|  | **Week 10** |  |
| Lecture Dec 2 | History of Policy | Dessler, Chapter 13 |
| Lecture Dec 4 | Long Term Policy | Dessler, Chapter 14 |
| Lecture Dec 6 | Impacts of 1.5° C warming and sustainable  development goals | IPCC SP15 SPM Sections A-D https[://w](http://www.ipcc.ch/sr15/)ww[.ip](http://www.ipcc.ch/sr15/)c[c.ch/sr15/](http://www.ipcc.ch/sr15/)  **Quiz #10 and Homework #10 Due**  **Mitigation/policy** |
| *Discussion Sections* | *Questions on HW #10 and review for final* |  |
| **Final Exam Dec 10** | **Final Exam** |  |

**\*Note:** The schedule of topics and assignments set forth in this syllabus is tentative and may be modified as needed throughout the quarter. In particular, additional reading may be assigned. Notice of such changes will be by announcement in class or by written or email notice and any updates or changes to this syllabus will be posted on the course website at canvas.ucsd.edu