

**Bending the Curve: Solutions to Climate Change
ECE/CRSN 80-H 1**

**Summer Session 2: July 31 – September 1, 2023
Monday & Wednesday
9:00 AM – 12:30 PM**

Syllabus

Description:

Catalog: <https://catalog.ucsc.edu/Current/General-Catalog/Courses>

Bending the Curve: Solutions to Climate Change. Climate Change is an interdisciplinary problem involving natural and social systems. The course will impart interdisciplinary knowledge, explore avenues for solutions, and empower students to emerge as critical thinkers and actors. Class sessions will be devoted to student discussion of the course materials, including readings and prerecorded videos, and for individual/group presentation of ideas for solutions, with the guidance from the instructor.

Learning outcomes:

<https://iraps.ucsc.edu/assessment/course-learning-outcomes.html>

Students will examine the interconnectedness of natural and social systems as they evaluate, interpret, and debate evidence and explanations of climate change. Class discussions and written assignments will require students to synthesize cross disciplinary subject matter and demonstrate critical thinking about human behavior and belief systems in relation to the implications of claims about anthropogenic climate change. A main focus of the course is on synthesizing knowledge and creative problem solving to identify solutions, while encouraging students to become “champions” in their own learning experience and as responsible citizen actors in their communities and in the world at large.

Prerequisites: None

Weekly Schedule:

MW 9:00 AM – 12:30 PM

Office Hours: MW 1:00 or by appointment

Textbook/Materials:

A digital textbook for the course is available without cost to students at:

https://escholarship.org/uc/bending_the_curve_digital_textbook

The digital textbook contains 19 substantive chapters that introduce key concepts, solutions, and current topics pertaining to climate change. The textbook comes with a companion instruction guide to assist students in managing their learning experience and to gauge their comprehension of key concepts and facts. The study guide contains a list of key questions, associated with each chapter of the textbook, that will be used as the basis for weekly quizzes and short written assignments.

In addition, prerecorded instructional videos will be used as foundational lecture material. The instructional videos were created by faculty from across the UC system, and reflect each faculty member's scholarly expertise.

Bending the Curve videos (see the weekly course syllabus below)

Student Hours: Student hours for class: Systemwide Senate Regulation 760 specifies that one academic credit corresponds to three hours of work per week for students. Example: Students in this class will be expected to work about 15 hours per week on the course material, including 3.5 hours twice per week in class with the instructor, and 8 or more hours per week of independent work on reading, video lecture viewing, homework, and other work to understand the material.

Schedule of Course Meetings

<i>Day</i>	<i>Date</i>	<i>Themes and Assignments</i>
1	Mon 7/31	<p><i>Theme: Climate Change Science</i></p> <p>INTRODUCTORY VIDEO (10:51) (Veerabhadran Ramanathan, UCSD)</p> <p>VIDEO 1: Climate Change: (Veerabhadran Ramanathan, UCSD)</p> <p><u>Lecture 1:</u> Climate Change (6:07)</p> <p><u>Module 1:</u> Anthropocene & Planetary Stewardship (7:50)</p> <p><u>Module 2:</u> Greenhouse Effect & Global Warming (10:26)</p> <p><u>Module 3:</u> Why & How is Climate Changing (11:58)</p> <p><u>Module 4:</u> Impacts (12:51)</p> <p><u>Module 5:</u> Projected Warming Summary (8:35)</p> <p><u>Required Textbook Reading:</u> Chapter 1: Climate Change</p> <p>Quiz 1</p> <p>Lecture 1 - Discussion Thread Questions: 1-2-3 (Chose one question)</p>
2	Wed 8/02	<p><i>Theme: Bending the Curve – An Introduction</i></p> <p>VIDEO 2: Ten Clusters & Ten Solutions: (Veerabhadran Ramanathan, UCSD)</p> <p><u>Lecture 2:</u> Introduction (4:33)</p> <p><u>Module 1:</u> Mitigation (8:22)</p> <p><u>Module 2:</u> Six Clusters (9:47)</p> <p><u>Module 3:</u> Ten Solutions (15:48)</p> <p><u>Module 4:</u> Living Laboratories (9:36)</p> <p><u>Required Textbook Reading:</u> Chapter 4 – Overview of the Ten Solutions for Bending the Curve</p>

		<p>Quiz 2</p> <p>Lecture 2 - Discussion Thread Questions: 1-2-3 (Chose one question)</p>
3	Mon 8/07	<p><i>Theme: Obstacles to Climate Change</i></p> <p>VIDEO 3: Obstacles to Climate Solutions (Steven Davis, UCI) <u>Module 1:</u> Technological & Economic Barriers (13:38) <u>Module 1:</u> Political & Behavioral Challenges (17:37)</p> <p>Quiz 3</p> <p>Lecture 3 - Discussion Thread Questions: 1-2 (Chose one question)</p>
4	Wed 8/09	<p><i>Theme: Communicating Climate Change</i></p> <p>VIDEO 4A: Climate Science Communication (Richard Somerville, UCSD) <u>Module 1:</u> Preparation (6:51) <u>Module 2:</u> Stories (5:47) <u>Module 3:</u> Metaphors (3:27)</p> <p><u>Module 4:</u> Language (2:40) <u>Module 5:</u> Solutions (6:55)</p> <p>VIDEO 4B: Climate Communication (Jon Christensen, UCLA)</p>

		<p><u>Module 1</u>: Why Communication Fails (6:30) <u>Module 2</u>: How Communication Works (8:47) <u>Module 3</u>: Moving Beyond Gloom & Doom (8:17)</p> <p><u>Required Textbook Reading</u>: Chapter 8 – Communicating Climate Change Science</p> <p>Quizzes 4A & 4B</p> <p>Lecture 4 - Discussion Thread Questions: 1-2-3-4 (Chose one question)</p>
5	Mon 8/14	<p><i>Theme: Climate Justice</i></p> <p>VIDEO 7A: Climate Justice & Equitable Approaches (Fonna Forman, UCSD) <u>Module 1</u>: Humans & Nature (14:45) <u>Module 2</u>: Social Impacts (9:12) <u>Module 3</u>: Disproportionate Impacts (4:42)</p> <p>VIDEO 7B: The Quest for Climate Justice (David Pellow, UCSB) <u>Module 1</u>: Climate Justice & Injustice (6:21) <u>Module 2</u>: Cases of Climate Injustice (9:17) <u>Module 3</u>: Policy Frameworks (10:24) <u>Module 4</u>: What Might Climate Justice Look Like (4:33)</p> <p><u>Required Textbook Reading</u>: Chapter 2 – Humans, Nature, and the Quest for Climate Justice</p> <p>Quiz 7</p> <p>Lecture 7 - Discussion Thread Questions: 1-2-3 (Chose one question)</p>

6	Wed 8/16	<p><i>Theme: California as a Model</i></p> <p>VIDEO 5: Lessons from California (Dan Press, UCSC/UCI) <u>Introduction:</u> Lessons from California (1:56) <u>Module 1:</u> Air Quality (7:30) <u>Module 2:</u> Energy (12:35) <u>Module 3:</u> Energy Demand (8:48) <u>Module 4:</u> AB32 (10:13) <u>Module 5:</u> AB32 Implementation (8:30) <u>Module 6:</u> Beyond AB32 (9:18)</p> <p><u>Required Textbook Reading:</u> Chapter 9 – Lessons from California</p> <p>Quiz 5</p> <p>Lecture 5 - Discussion Thread Questions: 1-2-3 (Chose one question)</p>
7	Mon 8/21	<p><i>Theme: International Governance</i></p> <p>VIDEO 11: International Governance (David Victor, UCSD) <u>Introduction:</u> (4:24) <u>Module 1:</u> International Cooperation (9:11) <u>Module 2:</u> Climate Diplomacy (11:22) <u>Module 3:</u> Paris Agreement (7:21) <u>Module 4:</u> Six Implementation Challenges (17:21)</p> <p><u>Required Textbook Reading:</u> Chapter 10 – The Paris Agreement and Its Implications</p> <p>Quiz 11</p> <p>Lecture 11 - Discussion Thread Questions: 1-2-3 (Chose one question)</p>
8	Wed 8/23	<p><i>Theme: Economics & Climate Policy</i></p>

		<p>VIDEO 10: Economics / Designing Climate Policy (Max Auffhammer, UCB) <u>Introduction:</u> (3:10) <u>Module 1:</u> Mitigation Challenges (18:50) <u>Module 2:</u> Economic Impacts (11:30) <u>Module 3:</u> Economic Policy & Market Failures (19:22)</p> <p><u>Required Textbook Reading:</u> Chapter 11 – Economics: Emissions, Impacts, and Policy</p> <p><u>Recommended:</u> Chapter 12 – Cost Effective Climate Policies</p> <p>Quiz 10</p> <p>Lecture 10 - Discussion Thread Questions: 1-2 (Chose one question)</p>
9	Mon 8/28	<p><i>Theme: Social Movements</i></p> <p>Video 9: Social Movements & Social Solutions to Climate Change (Hahrie Han, UCSB) <u>Introduction:</u> (4:25) <u>Module 1:</u> Why Collective Action (8:06) <u>Module 2:</u> What Is a Social Movement (9:17) <u>Module 3:</u> The Role of Leadership (13:03) <u>Module 4:</u> What Can I Do - Part 1 (8:16) <u>Module 5:</u> What Can I Do - Part 2 (10:16)</p> <p><u>Required Textbook Reading:</u> Chapter 5 – Your Leadership: Social Movements & Social Solutions to Climate Change</p> <p>Quiz 9</p> <p>Lecture 9 – Discussion Thread Questions: 1-2-3 (Chose one question)</p>

Grading/Assessments:

- Class Attendance (10%)
 - Participation in Class Discussions (10%)
 - Weekly Review Quiz Performance (10%)
 - Weekly Written Discussion Thread Question Assignments (10%)
 - Newsworthy Oral Report(s) (10%)
 - Climate Change Topic Essay (25%)
 - Lessons Learned Essay (25%)
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- Attendance & Participation. Students are required to attend all class sessions, unless there is an excused absence. Students are also required watch the video lectures and complete assigned readings in advance; and be prepared with questions and discussion topics for open class discussions. (20%)
 - Weekly Quizzes. The study guide, which contains a list of key questions, associated with each chapter of the textbook and weekly video assignments, will be used as the basis for weekly quizzes. Each student will be required to answer each of the quiz questions, which are scored automatically by the system. (10%)
 - Weekly Written Discussion Thread Questions. The video lectures and assigned readings will be used as the basis for students to complete brief written answers to assigned discussion questions. Students are encouraged to engage in discussion threads with each other. Written answers to discussion thread questions are expected to be one or two paragraph in length, at a minimum, and written in the student's own words. Extra points may be awarded based on original thinking, supported by factual information and references drawn from course materials and outside sources, e.g., newspaper articles, media reports, academic literature, subject matter from other courses. Students will be required to select **one** of the discussion thread questions from the list (There are typically 1-4 questions to choose from in each module.) (10%)
 - Newsworthy Oral Report(s): At each class session one or more students will give a brief 3-minute oral presentation on a newsworthy environmental or climate topic taken from a reputable news source, such as the *New York Times*, or from an academic journal or other publication. (10%)
 - Climate Change Essay. UCSC is a treasure trove of interesting projects dealing with the subject of climate change. Faculty and students are involved in research projects and practical applications on a wide variety of natural and social scientific endeavors concerning climate change. Each student will be required to seek a campus project related to climate change and write a 3-5-page narrative account of the project. Students will be expected to interview faculty, students, or staff principals responsible for the

project. Students who are unable to visit the campus during the summer session may substitute a community project for the campus-based project. All projects, whether campus- or community-based must be approved in advance by the instructor. (25%)

- Lessons Learned Essay. This course will not have a final exam. Instead, students are required to write an original essay 3-5-pages in length that takes as its starting point one of the substantive themes covered in the course. The essay is expected to delve into the substantive topic in greater depth beyond the material covered in the text and video lectures. The essay should aim to synthesize topics covered in the course and draw connections to other themes presented in the course. Each student will be allotted approximately 5-10 minutes to make an oral presentation to the class on their essay. (25%)

Final Grading: See above

Support

- **Support for students with disabilities** UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by appointment, preferably within the first two weeks of the quarter. At this time, I would also like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089 or by email at drc@ucsc.edu.
- **Support for students with other difficulties** While we sincerely hope that you will be able to pursue your studies peacefully and worry-free, we are aware that in some cases difficulties happen that are beyond your control. You should always feel free and comfortable to bring up any problem with the instructor, but if this is not sufficient, or if you prefer professional help, here are several campus resources that you may want to consider contacting:
 - UC Care which is a confidential space to discuss issues of dating violence, sexual assault and stalking.

- o [Slug Support](#) where you can ask for help on many practical issues, including dealing with a financial crisis, problems with your living situation, computers, books, etc.
- o [CAPS](#), which provides counseling and psychological services to students
- **Title IX reporting disclosure:** Title IX prohibits gender discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking. If you have experienced sexual harassment or sexual violence, you can receive confidential support and advocacy at the Campus Advocacy Resources and Education (CARE) Office by calling (831) 502-2273. In addition, Counseling and Psychological Services (CAPS) can provide confidential, counseling support, (831) 459-2628. You can also report gender discrimination directly to the University's Title IX Office, (831) 459-2462. Reports to law enforcement can be made to UCPD, (831) 459-2231 ext. 1. For emergencies call 911. Faculty and Teaching Assistants are required under the UC Policy on Sexual Violence and Sexual Harassment to inform the Title IX Office should they become aware that you or any other student has experienced sexual violence or sexual harassment. If you prefer to speak to someone confidentially, please contact UC Care (see above).

Work ethics

Academic Integrity Academic integrity is the cornerstone of a university education. Academic dishonesty diminishes the university as an institution and all members of the university community. It tarnishes the value of a UCSC degree. All members of the UCSC community have an explicit responsibility to foster an environment of trust, honesty, fairness, respect, and responsibility. All members of the university community are expected to present as their original work only that which is truly their own. Plagiarism of any kind is unacceptable. All members of the community are expected to report observed instances of cheating, plagiarism, and other forms of academic dishonesty in order to ensure that the integrity of scholarship is valued and preserved at UCSC. Any student found in violation of the UCSC Academic Integrity policy may face both academic sanctions imposed by the instructor of record and disciplinary sanctions imposed by the graduate division. Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student's transcript. For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the [Academic Integrity page](#) at the [Division of Undergraduate Education](#) or [Graduate Division](#).

Class Protocols:

UC Canvas: This is an online course. Please note: all course materials are located on the University of California Canvas Platform. NOT on UCSC Canvas.

Course Announcements: All course announcements will be posted on the course homepage through UC Canvas. **Please check the homepage regularly.**

Online Videos and Readings: As an online course, the instructional dimension of the course is conducted through online pre-recorded videos and associated reading assignments, authored by climate change experts across the University of California system, and beyond. Links for weekly assignments are all provided in UC Canvas. It is essential to keep up with weekly videos and readings, before attending the Zoom Discussion sessions.

Zoom Class Sessions: Designed for synchronous participation, but can be viewed asynchronously. Students are expected to review all video lectures and associated readings assigned for each Zoom class session, and come prepared to discuss topics and raise questions.

Discussion Threads: Students must complete assigned entries in the Discussion Threads on Canvas. Answers to questions are **due prior to each class session**. The assigned entries must each be a well-constructed paragraph of your own. Students are encouraged to respond to other students' entries. Of course, you are encouraged to contribute as much and as often as you wish! Students are encouraged to seek additional information on relevant topics from trustworthy news sources, such as the *New York Times* or other periodicals, or from academic literature.

Weekly Review Quizzes/Short Paper Assignments: To demonstrate that you are mastering the online materials, you must complete each lesson's **Review Quizzes and Written Assignments prior to each class session.**