



# Bending the Curve: Climate Change Solutions

**Department of Political Science + Scripps Institution of Oceanography  
University of California, San Diego  
SIO 109R + POLSCI 117R**

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*Bending the Curve: Climate Change Solutions* is a multi-disciplinary undergraduate course on climate change solutions, created by the University of California. It focuses on solutions design to bend the warming curve, and to accelerate resilience and climate justice for our planet's most vulnerable people. The curriculum draws inspiration from the 2015 report, [\*Bending the Curve: 10 Scalable Solutions\*](#), authored by 50 University of California researchers representing dozens disciplines, including the natural and physical sciences, the social sciences, health, engineering and technology, business, arts and humanities.

## **Requirements and Grading**

- Attendance in weekly Discussion Section - 10%
- Participation in weekly Discussion Threads - 10%
- Weekly Review Quiz performance - 20% (your lowest two quiz grades will be dropped)
- Extra Credit: if you participate in the *Mindful Planet* survey (both pre- and post-), we will drop your three lowest quiz grades!
- Final project due during exam week - 60%

## **Class Protocols:**

**UC CANVAS:** Please note: all course materials are located on the University of California Canvas Platform.

**COURSE ANNOUNCEMENTS:** All course announcements will be posted through UC Canvas. Please check regularly. You should also receive emails when new announcements are posted.

**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 assigned videos and readings are provided in UC Canvas. It is essential to keep up with weekly videos and readings, before attending the weekly Discussion Sessions.

**WEEKLY DISCUSSION SESSIONS:** Students are expected to review all video lectures and associated readings assigned for each Discussion Session, and come prepared to discuss topics and raise questions. **If you can not attend your assigned session, you can drop into another session. Please let both your TA and the other section TA know in advance, so you receive credit for attendance!** We also encourage you to visit office hours. If you have ongoing challenges attending discussion sessions, based on extenuating circumstances, health, geographical location, please discuss with your TA.

**DISCUSSION THREADS:** Each week, students must complete six entries in the Discussion Threads on Canvas. Weekly questions are due by Friday at 6pm. Three entries must be a well-constructed paragraph of your own; three can be responses to other students' entries. Of course, you are encouraged to contribute as much and as often as you wish! Participation will comprise 10% of your final grade.

**WEEKLY REVIEW QUIZZES:** To ensure sure you are mastering the online materials; you must complete each week's low-stakes Review Quizzes by Friday at 6pm. Some weeks have more Review Quizzes than others. Please pay close attention. Your lowest two quiz grades will be dropped; and the remaining quizzes will together comprise 20% of your final grade.

**FINAL PROJECT:** Students will submit a final project, with project assignments due throughout the term. Prompt is attached to this syllabus.

### **Work-flow advice**

You will need to manage your time and the flow of course materials each week. We encourage you to develop a weekly rhythm, and engage the materials in the order they are presented in the syllabus. Some weeks contain one lecture, some contain two. You should try to view and read all materials before participating in weekly discussions. Quizzes and discussion threads are due on Fridays before 6pm, but we encourage you not to wait til the end of the week to do them! Material will be fresher in your mind just after viewing lectures and reading the materials. Project assignments are always due on Sundays by midnight.

So in general, some guidance:

- 1) View the **CANVAS LECTUREs** and **READING ASSIGNMENTs** before attending discussion section.
- 3) Attend weekly discussion section.

4) Don't wait until Friday to take quizzes and participate in discussion threads! Especially during weeks when you also have a Project Assignment due on a Sunday night.

5) Be aware of Project Assignment due dates!

6) Attending office hours; talk with Professor Forman and the TAs about your ideas and your work! We are here for you.

## SCHEDULE

**Key:**

VIDEO

READING

RECOMMENDED

<u>WEEK</u>	<u>CLUSTER</u>	<u>TOPIC / ASSIGNMENTS</u>
<b>WEEK 1</b>	Science Solutions	<b>Introductions / Protocols</b>  <b>Climate Change Science</b> LECTURE 1: Climate Change (Ramanathan, UCSD)  READING 1: (Ramanathan)  READ "Stopping Climate Change is Doable but Time is Short. U.N. Panel Warns," <i>New York Times</i> , April 4, 2022.  READ: Climate Change 2022, IPCC report, Section B
<b>WEEK 2</b>	All	<b>UC Bending the Curve: An Introduction</b> LECTURE 2: Ten Clusters & Ten Solutions (Ramanathan, UCSD)  READING 2 (Ramanathan + Cole)  <b>Obstacles</b> LECTURE 3: Obstacles to Climate Solutions (Davis, UCI)  READ: "We Are Wasting Time on These Climate

		Debates. The Next Steps are Clear,” New York Times, April 10, 2022.
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## DUE: FINAL PROJECT TOPIC PREFERENCES

<b>WEEK 3</b>	Governance Solutions	<p><b>California as a Living Laboratory</b> LECTURE 4: Lessons from California (Press UCSC)</p> <p>READING 4 (Millard-Ball + Press)</p> <p>READ: “Learning from California’s Ambitious Climate Policy,” <i>Center for American Progress</i>, April 2021</p>
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<b>WEEK 4</b>	Governance Solutions	<p><b>International Governance</b> LECTURE 5: International Governance (Victor, UCSD)</p> <p>READING 5 (Victor)</p> <p>READ “COP 26: Key Outcomes from the UN Climate Talks in Glasgow,” <i>World Resources Institute</i>, November 17, 2021.</p> <p><b>Economics and Climate Policy</b> LECTURE 6: Economics / Designing Climate Policy (Auffhammer, UCB)</p> <p>READING 6 (Aufhammer)</p>
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## DUE: OUTLINE / SUMMARY

<b>WEEK 5</b>	Social Solutions	<p><b>Climate Justice</b> LECTURE 7A: Climate Justice &amp; Equitable Approaches (Forman, UCSD)</p> <p>LECTURE 7B: The Quest for Climate Justice (Pellow, UCSB)</p> <p>READING 7: Forman + Pellow</p> <p>READ: "The climate crisis, migration and</p>
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		refugees”, <i>Global Economy &amp; Development, Brookings</i> , 2019.
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<b>WEEK 6</b>	Social Solutions	<p><b>Social Norms + Behavior</b> LECTURE 8: Changing Social Norms and Behavior (Forman, UCSD)</p> <p>READING 8 (Forman)</p> <p><b>Communication</b> LECTURE 9: Climate Communication (Christensen, UCLA)</p> <p>READ: “The Youth Movement Trying to Revitalize Climate Politics, <i>The New Yorker</i>, February 2022</p>
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<b>WEEK 7</b>	Technology Solutions	<p><b>Transportation</b> LECTURE 10: Transportation Pathways (Sperling, UCSD)</p> <p>READING 10 (Barth + Sperling)</p> <p>READ: “SANDAG 2021 Regional Plan,” <i>San Diego Forward</i>, December 2021, pages 4-24, 36-37.</p> <p>READ: “SANDAG adopts \$160B regional transportation plan,” <i>CBS8</i>, December 10, 2021.</p> <p><b>Super-Pollutants</b> LECTURE 11: Technologies for SLCP Mitigation (Ramanathan, UCSD and Zaelke, UCSB)</p> <p>READING 11 (Ramanathan, Zaelke + Cole) – only pp. 1-17 and 37-48</p> <p>READ: “A Possible North American path forward on short-lived climate pollutants,” <i>Brookings</i>, April 11, 2022.</p>
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**DUE: COMMUNICATION STRATEGY**

<b>WEEK 8</b>	Technology Solutions	<b>Renewables</b>
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		<p>READ: "A Roadmap to 100% Clean Electricity by 2035", Stokes, Ricketts &amp; Quinn, <i>Evergreen Collaborative</i>, 2021.</p> <p>Watch:  "Renewable Energy 101," <i>National Geographic</i>.</p> <p>"Why the US isn't ready for clean energy," <i>Vox</i>.</p>
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<b>WEEK 9</b>	Ecosystem Management Solutions	<p><b>Carbon Sinks</b>  LECTURE 12: Enhancing Carbon Sinks (Silver, UCB)</p> <p>READING 12 (Silver)</p> <p><b>Negative Emissions:</b>  LECTURE 13: Negative Emissions Technology</p> <p>READING 13 (Aines)  READ: "Vacuuming carbon from the air could help stop climate change. Not everyone agrees," <i>NPR</i>, May 2, 2022.</p>
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**DUE: EXECUTIVE SUMMARY**

<b>WEEK 10</b>	Technology Solutions	<p><b>Nuclear</b>  LECTURE 14: Nuclear Energy (Peterson, UCB)</p> <p>READ:  "Nuclear Energy Will Not Be the Solution to Climate Change," <i>Foreign Affairs</i>, July 8, 2021.</p> <p>"3 Reasons Nuclear Power Has Returned to the Energy Debate," <i>Foreign Policy</i>, January 3, 2022.</p> <p>"We've been having the wrong debate about nuclear energy," <i>Yale Climate Connections</i>, July 28, 2020</p>
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**DUE: FINAL ESSAY**

# Final Project Guidelines: Design an Integral Climate Change Solution

Students will design an integral solution to a climate change challenge facing California, demonstrating an ability to synthesize diverse approaches, and to communicate to diverse audiences. Students will research the challenge, focusing on a particular location (local, regional or statewide), and will write a final essay of 8-10 pages that defines / describes the challenge, designs an integral solution(s), and explains how they will communicate their proposed solution(s) to diverse audiences.

Challenges and proposed solutions should be connected to a particular place of your choice – local, regional or statewide.

The paper should provide 1-3 main solutions or recommendations. Each proposed recommendation should include specifics, discussion of positives and negatives, and details of how the recommendation should be implemented effectively. The recommendations should be designed to specifically address the challenge that you discuss.

The project should incorporate concepts from at least two of the six climate change clusters: Social Pathway Solutions, Societal Transformation Solutions, Governance Solutions, Market- and Regulation- Based Solutions, Technology-Based Solutions, and Natural and Managed Ecosystem Solutions.

Final projects should cite at least three readings or videos from the syllabus, and at least two outside sources, with in-text citations and a works cited page.

The final project should roughly include the following components:

- Executive summary
- Introduction
- Discussion of challenge/background information, including other previous attempts to address it
- Discussion of 1-3 main solutions/recommendations in detail, including benefits and drawbacks
- Communications strategy/how you will market your solutions to specific groups
- Conclusion

The final project is a total of 100 points, and will constitute 60% of your grade in this course. There are 5 component deliverables due throughout the term, as follows:

## COMPONENT DELIVERABLES

1. **TOPIC PREFERENCE:** Submit topic preference from the list below, with one paragraph about why you feel the topic is urgent, and why you have chosen the topic. If you wish to propose another topic, not in the list, please confer with your TA before submitting this assignment. 5 points.
2. **OUTLINE / SUMMARY:** Provide a summary paragraph, and an outline of your proposed

essay, including small descriptions for each bullet. At this stage you should be ready identify the location / scale you wish to focus on. The outline should give your reader a roadmap of your essay, and the research and writing you intend to do over the next weeks. 15 points.

3. **COMMUNICATIONS STRATEGY:** Provide a summary of your communications strategy, drawing on the communications materials we reviewed in the course. You should identify 2-3 main groups that you will target. These could be policymakers, elected officials, voters, corporations, entrepreneurs, youth, etc. How will you communicate your proposed solution to these different groups? How will your messaging differ between those likely to support your vision and those who might be apathetic or skeptical? Your communications strategy should be 1-2 pages in length. 10 points.
4. **EXECUTIVE SUMMARY:** Your Executive Summary should clearly articulate your proposed solution(s), and convey the main components of your argument. Imagine the executive summary as a tight, concise brief that you would submit to a busy policy-maker, encouraging them to read your full paper. Your executive summary should be no more than 750 words. 10 points.
5. **FINAL ESSAY:** An essay of 8-10 pages (12 pt., double spaced) that designs an integral solution(s) to a particular climate-related challenge. The essay is meant to demonstrate your mastery of the course materials, and your ability to navigate across and integrate the clusters. The essay should conclude with a section describing how you would communicate your proposed strategy to the specific groups/individuals you identified above. 60 points.

#### **PROJECT TOPICS:**

1. A climate strategy for a city or the state of CA for the next 10 years, specifically relating to one of the following components: environmental policy, energy, or transportation. Your paper should discuss how this strategy would help meet CA's emission goals
2. A report to the US climate negotiators about how lessons/policies from CA could advise international agreement and strategy.
3. A campaign strategy for any CA elected official's race focused on the environment, with policy specifics and how you would message the campaign to influence public opinion.
4. A report on addressing the unequal effects of climate change across populations, and particularly the impact on disadvantaged populations. These disproportionate effects could include physical, health, mental health and economic impacts (choose 1-2 areas to focus on).
5. California adaptation strategies to sea-level rise and flooding, fires, precipitation whiplash, heat waves (choose 1). Discuss how climate change is impacting this issue area, and design strategy(ies) for adaptation.
6. Address the connection between food production and climate change in California. This may include both the impact of climate change on food production, and how food production leads to climate change. Focus on 1-2 main topics: food waste, fossil fuel production from food production or transportation, carbon sinks, food disparities from climate change, impacts of climate change on farming.
7. Campus carbon neutrality – design a solution for your UC campus or the UCs overall.
8. Start a youth movement committed to climate action. This should be focused on a particular goal or campaign, for example a campaign to pass specific legislation, prevent the development of new carbon emitting infrastructure, vote for a particular



candidate or party, etc. Include discussion about how the youth movement would be organized and its key goals and priorities.

**LEARNING GOALS:**

1. Research and gain insight into an active climate change challenge and its impacts, and to design an integral solution.
2. Access relevant online primary sources, literature, review articles, news and articles about your topic.
3. Think critically an about how to effectively convey information about your topic, and motivate action in an audience.