

Multi-Campus UC Course for Bending the Curve

*Upper-Division Undergraduate Level Course for Majors in
Engineering, Humanities, Math/Science, & Social Science*



Bending the Curve: Climate Change Solutions

**Launch of the Course at the
University of California, San Diego**

January 8, 2018

**Syllabus, hybrid style of teaching
and grading procedures**

Instructors:

Fonna Forman (Political Sciences &
V. Ram Ramanathan (Scripps Institution of Oceanography)

BENDING THE CURVE: CLIMATE CHANGE SOLUTIONS

SIO 109 / POLSCI 117

Winter Quarter of 2018 (Jan 8th to March 21st, 2018)

Launch of the UC Climate Solutions course at UC San Diego by the Scripps Institution of Oceanography (SIO) and the Department of Political Science (PolSci)

Instructors:

Fonna Forman (PolSci): fonna@ucsd.edu

V. Ram Ramanathan (SIO): vramanathan@ucsd.edu

Office Hours

Teaching Assistants:

Leanne Hirsch: lhirsch@ucsd.edu

Hannah Campi: hacampi@ucsd.edu

Class meets Mondays and Wednesdays, 12:30 PM to 1:50 PM.

Instruction begins: January 08, 2018; ends: March 14, 2018.

Final Projects Due: March 21, 2018.

Project Presentations to Instructors and TAs: March 21, 2018, 11am-3pm.

The three top final group projects will be selected for archival in the California Digital Library. These projects will be announced through email at 10 AM on March 22nd. The three winning teams will come to the instructor's office at 1 PM on March 22nd and help the instructor upload their projects to the California digital library.

Syllabus: Hybrid Structure

- Students are expected to review the video lectures before coming to each class and arrive prepared with questions, discussion topics. The attached syllabus shows the videos that will be discussed in each class.
- Quizzes will be given periodically. This quiz will be conducted for the last 10 to 20 minutes of each class.
- 30% of the grade will be given for in-class participation and quiz.
- 70% of the grade is given for the final project - 50% for group work and 20% for individual work. Students will be divided into multi-disciplinary groups of 4 to 5 people. Each group will submit a group project executive summary in addition to an individual report that covers their contribution to the group report. Please see the last section for additional project and grading details.

Three among the total number of the submitted projects will be chosen for inclusion in the California Digital Library dedicated to Climate Solutions, which is a permanent archive.

- Please refer to the course overview document in the class web site for a more complete description of goals, objectives and the hybrid nature of this multi-campus course offered simultaneously in many UC campuses.

Schedule of Lectures and Lab Sessions		
Lecture	Cluster	Topics
PART I: SETTING THE STAGE: CLIMATE CHANGE DRIVERS & IMPACT		
1 Jan -08	Science Solutions	<p><u>In-Class Discussion Topics:</u> Introduction to Course Structure: Ram and Forman (20 mts) Climate Change Science: Ram (50 mts) Video Lectures: <i>Course overview and vision & Climate Change: V. Ramanathan</i></p> <p><i>For all lectures, students are expected to view the video lecture(s) before coming to the class and be prepared to discuss it in class.</i></p> <p>Quiz: 10 minutes:</p>
2 Jan-10	All Clusters	<p>Bending the Curve Solutions: Ram (60 mts) Video Lecture: Six Clusters & Ten Solutions for Bending the Curve: V. Ramanathan Quiz: 20 minutes</p>
Jan-15		Martin Luther King Holiday
3 Jan -17	Societal Transformation Solutions	<p>Humans & Nature: How Did We Get Here? Forman Video Lectures: I. Climate Justice & Equitable Approaches: F. Forman (UCSD) II. The Quest for Climate Justice: D. Pellow (UCSB)</p>
4 Jan-22	Science Solutions	<p>Impacts and Barriers to Solutions: Ram (40 mts) Video lectures: I. Obstacles to Climate Solutions <i>S. Davis (UCI)</i> II. Sea Level Rise from Melting Ice <i>E. Rignot (UCI)</i> <i>Last 40 mts: Present and Explain Projects to Students (Forman and Ram)</i></p>
PART II: LIVING LABORATORIES FOR BENDING THE CURVE: THE CALL TO ACTION		
5 Jan -24	Governance Solutions	<p>Bending the Curve Living Laboratory: Forman (60 mts) Video Lecture: Lessons from California D. Press (UCSC) <i>Last 20 mts: Students rank their projects. These rankings Will be used to assign projects and groups; will be overseen by TAs: Campi & Hirsch</i></p>

6 Jan-29	All Clusters	<p>Living Laboratories: Ram (30 mts)</p> <p>Video Lectures</p> <ul style="list-style-type: none"> I. Carbon Neutrality Initiative of UC M. St. Clair (UCOP) II. Energy Efficiency Management at UCI J. Brower (UCI) <p>Lab Session (50 mts): Student groups will be announced: Campi & Hirsch. Each group will meet in the classroom and discuss organization of the report and develop a strategy. Forman and Ram and the two TAs will circulate among groups</p>
PART III: SOLUTIONS: CLIMATE MITIGATION & SOLUTIONS		
7 Jan 31	Science & Technology-Based Solutions	<p>Science & Technology Pathways for Bending the Curve: Ram (60 mts)</p> <p>Video Lecture</p> <ul style="list-style-type: none"> I. Energy Technology Pathways, S. Samuelsen (UCI) II. Transportation Pathways for BtC, D. Sperling (UCD) <p>Quiz: 20 minutes</p>
8 Feb 5		<p>Presentations: Student teams make brief presentation of their proposals, including the challenges they face.</p>
9 Feb 07	Societal Transformation Solutions	<p>Social Change: Forman</p> <p>Video lectures:</p> <ul style="list-style-type: none"> I. Changing Social Norms & Behavior, F. Forman (UCSD) II. Social Movements & Social Solutions to Climate Change, H. Han (UCSB) <p>Presentations continued: Student teams make brief presentation of their proposals, including the challenges they face.</p>
10 Feb 12	Societal Transformation Solutions	<p>Climate Change & Public Health: Forman (30 mts)</p> <p>Video lecture:</p> <p>Climate Change: Health Impacts, G. Solomon (UCSF)</p> <p>Lab session: 40 mts.</p> <p>Quiz: 10 minutes</p>
11 Feb 14	Societal Transformation Solutions	<p>Public Opinion & Communication: Forman</p> <p>Video lectures:</p> <ul style="list-style-type: none"> I. Climate Science Communication, R. Somerville (UCSD) II. Climate Communication, J. Christensen (UCLA)
Feb 19		Presidents Day Holiday
12 Feb 21	Market- & Regulations-Based Solutions	<p>Market Based Solutions: Forman</p> <p>Video lectures:</p> <ul style="list-style-type: none"> I. Consideration of Economics for Designing Climate Policy, M. Auffhammer (UCB) II. Cost Effective & Efficient Climate Policies, M. Jacobsen (UCSD) <p>Quiz: 10 minutes</p>
13 Feb 26	Governance Solutions	<p>International Governance: Ram</p> <p>Video lecture: International Governance, D. Victor (UCSD)</p>
14 Feb 28	Technology Based Solutions	<p>Fast Tracking Mitigation: Ram (40 mts)</p> <p>Video lecture:</p> <p>Technologies for SLCPs Mitigation, Ramanathan (UCSD) & D. Zaelke (UCSB)</p> <p>Lab Session: 40 mts: Oral group progress report due, during lab session</p>

15 March 5	Technology- Based Solutions	Bending the Curve with Sustainable Transportation: Ram (40 mts) Video lecture: Energy Implications of Transportation, M. Barth (UCR) <i>Lab Session: 40 mts: Continue with Oral group progress</i>
16 March 7		<i>Groups present near-final version of projects and receive feedback from Instructors</i>
17 March 12	Natural & Managed Ecosystem Solutions	Local Solutions: Pezzoli Video Lecture: Making Urban & Rural Areas Resilient (Living Laboratory: UCSD), K. Pezzoli (UCSD)
17 March 14	Review of the 10 Solutions	Open discussion led by Forman <i>Students report on their perception of the climate change problem; Their outlook on if and when society will solve the problem; And what are the consequences if there are not adequate measures put into place in time.</i>

For detailed outline of taped lectures, see the course overview document:

Guidelines for Projects & Grading

Students will work in interdisciplinary groups of 4-5 students each. During week 3, each student will be asked to rank his or her preferences from a set of project options. Course instructors will assemble teams, based on preferences, as well as interdisciplinary distribution considerations.

Student groups can choose one of the following two options for projects:

- 1) *Living Laboratories of Climate Solutions* (Corporation, University or Jurisdictional Unit: City / Village, Nation, International body);
- 2) Proposed climate solutions by students for a jurisdiction of their choice.

Topics and Issues to Consider in the Project (not ranked or prioritized)

Do not need to consider all of the topics and issues listed below; a subset of at least three is mandatory.

If you think of other issues or topics, you can bring them up.

- What “Climate Action Plan” does your case study have?
- How does it fit or map onto the six clusters and 10 solutions? Which curves are they bending?
- How do they motivate people to take action?
- How are people convinced of the legitimacy of climate change science; the need for actions; and convey the sense of urgency?

- Technologies deployed and barriers: Off-the shelf versus new technologies; How will you improve it? • Are they scalable? How; if not why not?
- Short Lived Climate Pollutants: Marrying local interests with global policies: Methane Recovery from landfills/food wastes/farm manure; Same for HFCs.
- Role of Behavioral Changes Market Mechanisms employed Corporate Support
- How fast can it be done given the constraints of public and political support;
- What governance practices are being deployed?

Grading:

Group Project: 50%

Individual Project Report: 20%

In-Class Participation: 30%

There will be no midterms or final in this course. Students grades will be based on 1) class participation, 2) a group project (which contains several components – proposal, an oral progress report, an executive summary, and a final in-class presentation) and 3) a 7-10 page individual project report, which will be graded on an individual basis. Course requirements are described in detail below.

Proposal Due fourth week (Feb 5): The team proposal will detail the specific case study, focusing on understanding what is currently being done, going over CAPs, looking at any progress towards goals since they were announced etc. and a work plan for the project over the course of the quarter. Proposals will be presented to the entire class on Feb 5-7.

Progress Report eighth week (Feb 28): Groups will provide an oral update of their progress to date.

Preliminary Presentation ninth week (March 7): Group presentation to the entire class. 5 minutes.

Final materials due, and team presentation eleventh week (March 21): Group executive summary and individual project reports are due. Final group presentations scheduled between 11am-3pm on March 21.

Final Paper and Presentation:

Each student will be asked to submit a 7-10 page paper (size 12 font and 1.5 line spacing) on their project, and each group will submit a five-page executive summary that draws on each individual's work. Look to the Bending the Curve full report and Executive Summary as an example of how information from individual projects should be organized in the Executive Summary. The in-class presentation will be done as a team.

Executive Summaries should address:

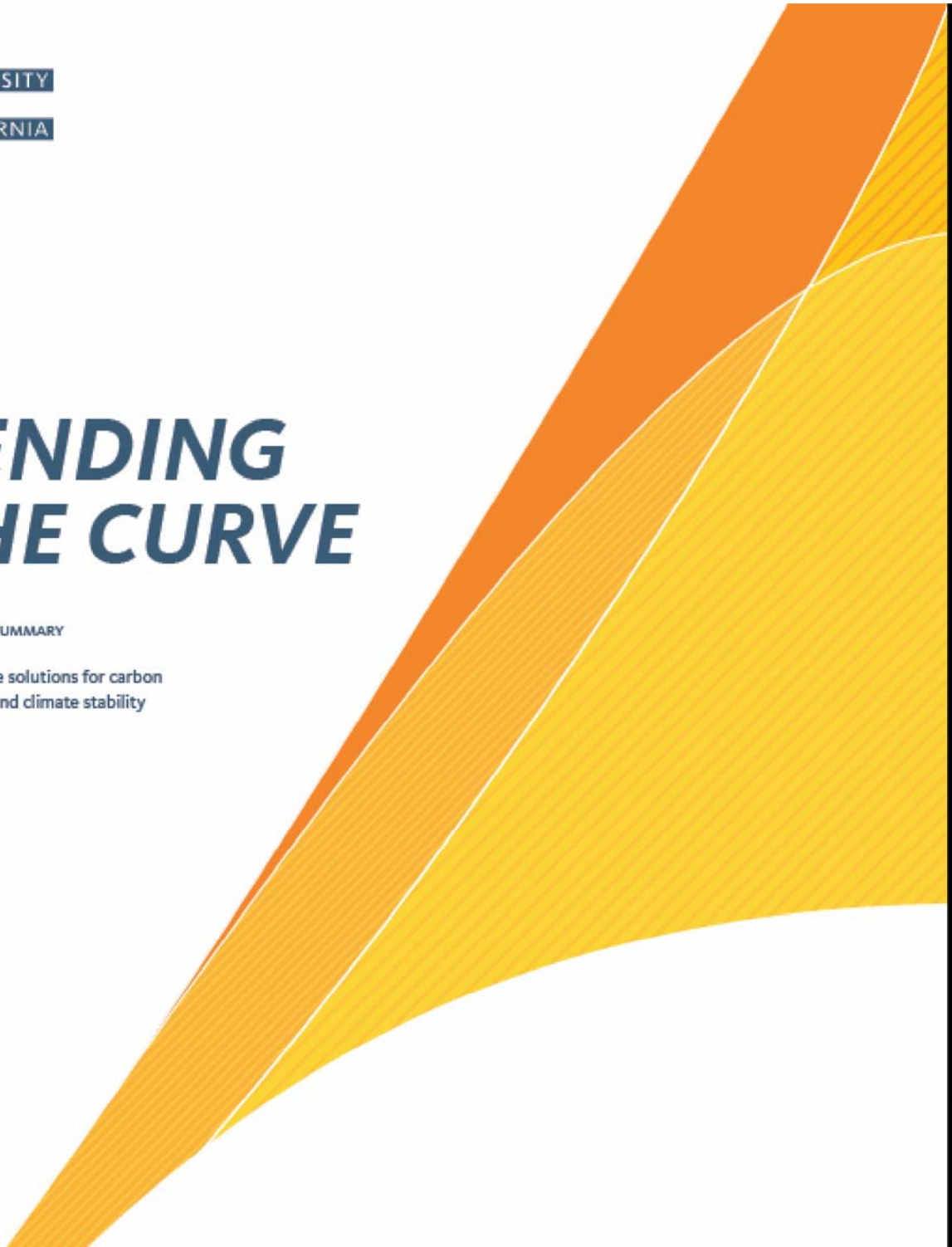
- Your case study's history of addressing climate change and future goals
- What has been successful so far
- How the six clusters and ten solutions relate to what is being done
- Areas for improvement and solutions not utilized
- A plan for improvement moving forward

Individual Papers will explore in depth one of the themes or examples covered in the Executive Summary. Grade for individual papers is not part of the 50% group work grade.

BENDING THE CURVE

EXECUTIVE SUMMARY

Ten scalable solutions for carbon
neutrality and climate stability



Ramanathan et al, 2015:

[Executive Summary of the Report, *Bending the Curve: 10 scalable solutions for carbon neutrality and climate stability.*](#)

Published by the University of California, October 27, 2015

https://uccarbonneutralitysummit2015.ucsd.edu/_files/Bending-the-Curve.pdf



Carbon Neutrality Initiative

Berkeley
UNIVERSITY OF CALIFORNIA

UC DAVIS
UNIVERSITY OF CALIFORNIA

UC Irvine
UNIVERSITY OF CALIFORNIA, IRVINE

UCLA

UNIVERSITY OF CALIFORNIA
UC MERCED

UNIVERSITY of CALIFORNIA
Office of the President

UCSF
University of California
San Francisco

UC San Diego

UNIVERSITY OF CALIFORNIA
SANTA CRUZ

UCSB
UNIVERSITY OF CALIFORNIA
SANTA BARBARA

UNIVERSITY OF CALIFORNIA
UC RIVERSIDE