**University of California Berkeley**

**Spring term 2016**

**L&S c46, ESPM c46**

**Climate Change and the Future of California**

**Instructors**

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Department | Email (@berkeley.edu) | Office hours |
| David Ackerly | Integrative Biology (L&S) | dackerly | 4004 VLSBMon 2:15-3:45\* |
| David Sedlak | Civil and Environmental Engineering (CEE) | sedlak | 657 DavisWed 10-11\* |
| Whendee Silver | Environmental Science, Policy and Management (CNR) | wsilver | 319 HilgardTBA\* |
| Steve Weissman | Goldman School of Public Policy | sweissman | 644 Sutardja DaiOH: MW by appt\* |
| GSIs: |  |  |  |
| Leslie McGinnis | Environmental Science, Policy and Management (CNR) | lamcginnis | 209 WellmanTBA |
| Adam Schneider | Integrative Biology (L&S)(Head GSI) | acschneider | 1127 VLSBTBA |
| Carrie Tribble | Integrative Biology (L&S) | cmt2 | 431 KoshlandTBA |

\* Office hours may only be held in weeks when instructor is lecturing - check bcourses

**Meeting time/place**

Lecture: MWF, 9-10A, 101 Barker

 Sections

1: Wed 3-4P, 35 Evans (AS) 4: Th 11-12P, 214 Haviland (LM)

2: Wed 4-5P, 55 Evans (AS) 5: Th 1-2P, 259 Dwinelle (CT)

3: Th 8-9A, 201 Giannini (CT) 6: Th 4-5P, 45 Evans (LM)

**Course website: bCourses (https://bcourses.berkeley.edu/courses/1409032)**

**Course abstract**

Global environmental change, particularly climate change, is rapidly emerging as the defining environmental issue of the twenty-first century. Climate change is already impacting California in many ways, with increasing wildfires, heat waves, and drought. It is also presenting opportunities for new innovation and global leadership to reduce the rate of change and adapt to new challenges. California has exceptional natural resources, high levels of biological and societal diversity, a vibrant economy and is a global leader in technological innovation. California is also intimately linked to the rest of the world through physical, biological and social connections (e.g., climate dynamics, invasive species, economic markets, etc.). In this class, we will explore potential impacts of climate change on California’s environment, people and economy, and consider solutions that can reduce the rate and magnitude of climate change and the severity of impacts. Course material will draw from science, engineering, economics and public policy. Our goal is to provide a broad and interdisciplinary perspective that will prepare you as a citizen, voter and future leader to address these grand challenges of the 21st century.

**Breadth requirements:** This course satisfies the L&S Biological Sciences breadth requirement.

**Pre-requisites:** None.

**Reading:**

ESPM/L&S c46 Course Reader, purchase from Copy Central (2576 Bancroft St.)

Global Weirdness, by Climate Central ([amazon link](http://www.amazon.com/Global-Weirdness-Relentless-Drought-Weather/dp/0307743365/ref%3Dmt_paperback?_encoding=UTF8&me=))

Water 4.0, by David Sedlak ([amazon link](http://www.amazon.com/Water-4-0-Present-Future-Resource/dp/0300212674))

pdfs and online readings to be assigned during the semester

**Requirements:**

* Attendance at all lectures and participation in weekly discussion sections
* Assigned readings
* Two hour-exams and a final exam
* Two written assignments and two quantitative problem sets
* Final group project with written and oral presentation; an integrated regional case study of climate adaptation for a selected location in California.

**Grading**: Letter grade with +/- and P/NP option.

Student performance in the course will be assessed on a total of 100 possible points:

homework (4 x 7 points each) 28 points

hour-exam 1 12 points

hour-exam 2 12 points

final exam 25 points

discussion participation                              8 points

group project (regional case study) 15 points

total                                                   100 points

We do not grade on a curve (i.e. predetermined percentages). The table below shows the minimum grade you will receive based on your cumulative numeric score across all required assignments and exams. At our discretion, we may lower the numeric breakpoints (i.e. you could get a higher grade than indicated here), but we will not raise them.

|  |  |  |  |
| --- | --- | --- | --- |
| Score | Minimum letter grade | Score | Minimum letter grade |
| ≥ 93.5 | A | ≥ 73.5 - 77 | C |
| ≥ 90 - 93.5 | A- | ≥ 70 – 73.5 | C- |
| ≥ 87 – 90 | B+ | ≥ 65 - 70 | D+ |
| ≥ 83.5 - 87 | B | ≥ 60 - 65 | D |
| ≥ 80 – 83.5 | B- | < 60 | F |
| ≥ 77 - 80 | C+ |  |  |

**ESPM/L&S c46 - Lecture Schedule - 2016**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Day** | **Class** | **Unit** | **Topic** | **Instructor** | **Assignments** |
| 1/20 | W | 1 |  | Course intro | ALL |  |
|  |  |  | **1: Geography** |  |  |
| 1/22 | F | 2 |  | Geography & Climate of CA | Silver | HW 1 assigned |
| 1/25 | M | 3 |  | People of CA: Past, Present & Future I | Sedlak |  |
| 1/27 | W | 4 |  | People of CA: Past, Present & Future II | Sedlak |  |
|  |  |  | **2: Climate Science** |  |  |
| 1/29 | F | 5 |  | Earth's Energy Balance | Silver |  |
| 2/1 | M | 6 |  | Global and Regional Climates | Silver | HW 1 due |
| 2/3 | W | 7 |  | Carbon cycle | Silver | HW 2 assigned |
| 2/5 | F | 8 |  | Anthropogenic climate change | Silver |  |
| 2/8 | M | 9 |  | Future Climate Scenarios | Silver |  |
|  |  |  | **3: Governance** |  |  |
| 2/10 | W | 10 |  | Structure of CA political system | Weissman |  |
| 2/12 | F | 11 |  | Political tools | Weissman | HW 2 due |
| 2/15 | M |  |  | *Holiday* |  |  |
| 2/17 | W | 12 |  | Current policies | Weissman |  |
| 2/19 | F | 13 |  | EXAM (lectures 1-11) | (Silver) | Exam 1 |
|  |  |  | **4: CA Energy** |  |  |
| 2/22 | M | 14 |  | The Grid & CA's Energy Balance | Weissman |  |
| 2/24 | W | 15 |  | Energy Technologies I | Weissman |  |
| 2/26 | F | 16 |  | Energy Technologies II | Weissman |  |
| 2/29 | M | 17 |  | Energy Policy | Weissman | HW 3 assigned |
| 3/2 | W | 18 |  | Future Energy Scenarios | Weissman |  |
|  |  |  | **5: Water in CA** |  |  |
| 3/4 | F | 19 |  | History of water in CA | Sedlak |  |
| 3/7 | M | 20 |  | Water Allocation in CA | Sedlak |  |
| 3/9 | W | 21 |  | Water for Cities | Sedlak |  |
| 3/11 | F | 22 |  | Water for Agriculture | Sedlak | HW 3 due |
| 3/14 | M | 23 |  | Water for Ecosystems | Sedlak |  |
| 3/16 | W | 24 |  | EXAM (lectures 12-23) | (Weissman) | Exam 2 |
| 3/18 | F | 25 |  | Carbon Footprint & Offsets | Guest |  |
| 3/21-25 | M |  |  | *Spring break* |  |  |
|  |  |  | **6: CA Ecosystems** |  |  |
| 3/28 | M | 26 |  | Regional Climates & Ecosystems | Ackerly | HW 4 assigned |
| 3/30 | W | 27 |  | Ecosystems & Biodiversity | Ackerly |  |
| 4/1 | F | 28 |  | Fire & Drought | Ackerly |  |
| 4/4 | M | 29 |  | Agriculture I | Silver |  |
| 4/6 | W | 30 |  | Agriculture II | Silver | Final project assigned |
|  |  |  | **7: Health & Env Justice** |  |  |
| 4/8 | F | 31 |  | Air Quality and Public Health | Guest |  |
| 4/11 | M | 32 |  | Climate Justice | Weissman | HW 4 due |
| 4/13 | W | 33 |  | Economic Impacts of Climate Change | Ackerly |  |
|  |  |  | **8: Economy & Resilience** |  |  |
| 4/15 | F | 34 |  | Land Use Planning | Ackerly |  |
| 4/18 | M | 35 |  | Transportation | Ackerly |  |
| 4/20 | W | 36 |  | Cities & Economy | Sedlak |  |
| 4/22 | F | 37 |  | Disasters & Disaster Response | Ackerly |  |
| 4/25 | M | 38 |  | Global Context | Ackerly |  |
|  |  |  | **9: Wrap-up** |  |  |
| 4/27 | W | 39 |  | Recap I: The science | ALL | Project presentations |
| 4/29 | F | 40 |  | Recap II: The policy & solutions | ALL |  |
| 5/2 | M | RRR |  |  |  | Final project due |
| 5/4 | W | RRR |  |  |  |  |
| 5/6 | F | RRR |  |  |  |  |
| 5/9 | M |  |  | Final exam: 7-10pm |  |  |