

GEOG/EVS 363 (101/001/401)

Fall 2020

CLIMATE CHANGE: HUMAN CAUSES, SOCIAL CONSEQUENCES AND SUSTAINABLE RESPONSES

Instructors: Diana Liverman (liverman@email.arizona.edu), and Talia Anderson (taliaanderson@email.arizona.edu)

School of Geography, Development and Environment

Time: Tuesday and Thursday 11am-12.15pm Live Online or room S107 ENR2

Office Hours: Diana (Live online 10am on Mondays (usual class zoom link) or by appointment – send email). Talia Friday 10-11 or by appointment. Send email for zoom link.

Office location: ENR2 S-437 or meetings by appointment

NOTE: All information in this syllabus may be subject to change at the discretion of the instructors.

Course Description

Climate change has social causes and consequences, and the responses and solutions often involve transformative changes in human behavior, institutions, and technologies. This course analyses the social causes of climate change including the economic, political, social and cultural drivers of greenhouse gas emissions and land use, and the impacts of climate change on society such as vulnerability and impacts in sectors such as food, water, health, cities and sustainable development. We will also focus on solutions and responses to climate change such as changing policies, behavior and attitudes, climate mitigation and adaptation, and the role of governments, cities, the private sector, social movements and individuals from the local to the global level.

Course Instructors

Diana Liverman is Regents Professor and Director of the School of Geography, Development and Environment at the University of Arizona. Her work addresses the causes, consequences, and responses to climate change, especially climate vulnerability, adaptation and governance and the links between environment, sustainable development, and food security. Her regional interest is the Americas, especially Mexico, and she is an advocate for the significance of social sciences in global change research, for research to be more responsive to stakeholders, and for climate justice. She was a lead author for the recent Intergovernmental Panel on Climate Change (IPCC) Special Report on 1.5°C and is a member of the Earth Commission. More information at:

<https://liverman.faculty.arizona.edu>

Talia Anderson is a PhD student in the School of Geography and Development with interests in climate and its impacts, especially in Central America. She has worked with different types of data, from tree rings to satellite imagery, to explore the impacts of climate variability and change in localized areas and large, multi-country regions. Most recently, her work focused on studying how high elevation peatlands in the northern Chile respond to changes in climate and water availability. For her PhD, she hopes to participate in research that is collaborative and policy-relevant. Before moving to Arizona, she worked for the TRACE ([Tropical Responses to Altered Climate Experiment](#)) project, a forest warming experiment in Puerto Rico.

Course Objectives

This course addresses the social challenges of climate change by analyzing the causes, consequences and responses to anthropogenic climate change locally in Arizona, across the US, and globally. The objectives are to provide a comprehensive understanding of who and what is causing climate change and why, the distribution and nature of vulnerability and impacts, and the responses in terms of public attitudes and behavior and international, national and local policy. Lectures will examine the socio-economic drivers of climate change – including technology, consumption and population - of greenhouse gas emissions from energy use, land use and other human activities. We will examine who and where is most vulnerable to the impacts and why, including how climate change affects different sectors, places and populations. Options for reducing emissions and adapting to a changing climate will be examined from perspectives that include economic, technical, political and social feasibility and the associated social science methods. The course will explore the complexities of climate action and policy, from the local to the international level. Guest lectures from experts on climate change, including resource managers and climate activists will be included.

Expected Learning Outcomes

After participating in this course, you will be able to:

- Understand the societal causes of climate change associated with energy, land use and other human activities
- Analyze the impacts of climate change on people and places, especially on vulnerable populations
- Identify and evaluate responses and solutions to climate change including mitigation of greenhouse gas emissions, adaptation to warming, public perceptions, and policies from the local to the global
- Effectively communicate in writing the issues and debates around the human dimensions of climate change and climate justice

Course Modality/Format

This class is scheduled to be taught in the FLEX IN-PERSON modality (live online with the possibility of meeting in person when conditions permit) and online as LIVE ONLINE (live online lectures during the scheduled class period) and as an I-COURSE (course material available online, including recordings of the live online lectures).

We will meet on Tuesday and Thursday at 11am by Zoom for live lectures, discussions, guest interviews, and interactive polls and quizzes. The class is scheduled for 75 minutes and are designed to accommodate some breaks, varied activities, and discussion (see course schedule below).

Because of the uncertainties relating to the current pandemic we will use a variety of course formats in Fall 2020. Some of you have registered to take the course completely remotely – but please note we ask you to attend the live-online classes if possible for a more interactive experience. We will record lectures for later viewing and I-COURSE participants. For others, who hope to meet us and each other in person we will not offer in person contact **until the risks of infection decline significantly**. The most likely opportunity will be small group meetings to discuss class material and projects – hopefully outside once the weather cools down. We will also offer small group meetings for those who are taking the class remotely.

Please note all instruction is remote after Thanksgiving.

Equipment and software requirements: For this class you will need daily access to the following hardware: a laptop or web-enabled device with webcam and microphone; regular access to reliable internet signal; and free VPN software for use of some on campus resources such as library materials and videos. We will provide guidance about the D2L online class tools, VPN and any other software. You will need to monitor your UA email address for class notices and alerts (or forward it to your preferred contact mode). For lecture recordings, students must access content in D2L only. Students may not modify content or re-use content for any purpose other than personal educational reasons. All recordings are subject to government and university regulations. Therefore, students accessing unauthorized recordings or using them in a manner inconsistent with UArizona values and educational policies are subject to suspension or civil action.

Grading and exams

The course grade will be based on the following activities.

1. Assignments: includes reflections, responses to readings, and short research assignments (10 at 2% each for a total of 20% or 20 points)
2. Weekly quizzes to test knowledge and record attendance (10 quizzes, 0.5% each for a total of 5% of grade or 5 points, 1% of this 5% is extra credit)
3. Exams: a take home midterm and final exam (20% each = 40% for 40 points)
4. Reports: Climate Impacts and Climate Solutions oral and written reports, group projects (8% each = 16% for 16 points)
5. Final Essay (20% for 20 points)
Total possible is 101% or 101 points)

Please note that all exams are take-home, to be completed in a defined time period and submitted to D2L or emailed to the instructors.

The class follows the standard UA grading scheme: A = 90-100%; B = 80-89%; C = 70-79%; D = 60-69%; E = below 60%.

Important dates (also see syllabus and D2L)

- Assignments and Quizzes – should be done by Tuesday following the lectures relating to the assignment (see syllabus)
- Midterm Take Home Exam: Released on October 15 at noon. Due on October 19 at noon
- Impact reports: Present to class on Oct 6 or 8, writeup due Oct 13th at 11pm
- Solutions reports: Present to class on Nov 10 or 12, written summary due Nov 17 at 11pm
- Final Essay: Draft for comment due on Nov 30 11pm, final version due December 9 at 11pm
- Final Take Home Exam: Released on Dec 10 at noon. Due on December 15 at noon

All work for the class must be completed by deadlines and the final exam must be submitted by Monday December 15th at noon

Participating in the course, attending class sessions and completing online activities in a timely way are vital to the learning process. As such, attendance is expected at lectures and if taking the I-COURSE you are expected to complete each week/module by the deadlines given in the syllabus. If you anticipate being absent, are unexpectedly absent, or are unable to participate in class online activities, please contact the instructor as soon as possible.

Academic advising: If you have questions about your academic progress this semester, or your chosen degree program, please note that advisors at the [Advising Resource Center](#) can guide you toward university resources to help you succeed.

Life challenges: If you are experiencing unexpected barriers to your success in your courses, please note the Dean of Students Office is a central support resource for all students and may be helpful. The [Dean of Students Office](#) can be reached at 520-621-2057 or [DOS-deanofstudents@email.arizona.edu](mailto:deanofstudents@email.arizona.edu).

Physical and mental-health challenges: If you are facing physical or mental health challenges this semester, please note that Campus Health provides quality medical and mental health care. For medical appointments, call (520-621-9202. For After Hours care, call (520) 570-7898. For the Counseling & Psych Services (CAPS) 24/7 hotline, call (520) 621-3334. Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See:

<https://deanofstudents.arizona.edu/absences>. The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: <http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop> The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy> At the University of Arizona, we strive to make learning experiences as accessible as possible. If you anticipate or experience barriers based on disability or pregnancy, please contact the Disability Resource Center (520-621-3268, <https://drc.arizona.edu/>) to establish reasonable accommodations. If you are experiencing unexpected barriers to your success in your courses, the Dean of Students Office is a central support resource for all students and may be helpful. The Dean of Students Office is located in the Robert L. Nugent Building, room 100, or call 520-621-7057. Electronic equipment in class (Laptops & phones): Students who inappropriately use laptops and phones in live or online lectures distract other students and disadvantage their own learning. Cell phones should be put on silent during live classes.

Academic Integrity: Students are encouraged to share their views and discuss course material with each other. Study groups for exams are often helpful. But all graded work must be done independently (unless otherwise specified) and you are expected to adhere to the UA Code of Academic Integrity deanofstudents.arizona.edu/policies-and-codes/code-academic-integrity

This Code prohibits all forms of academic dishonesty, including, but not limited to:

Cheating, fabrication, facilitating academic dishonesty, and plagiarism as set out and defined in the Student Code of Conduct, ABOR Policy 5-308-E.6, E.10, and F.1

- Submitting an item of academic work that has previously been submitted or simultaneously submitted without fair citation of the original work or authorization by the faculty member supervising the work
- Violating required disciplinary and professional ethics rules contained or referenced in the student handbooks (hardcopy or online) of undergraduate or graduate programs, or professional colleges
- Assisting or attempting to assist another to violate this Code

Threatening behavior: Threatening behavior is prohibited in the classroom and in online materials relating to this class (e.g. chat rooms, discussions) and will be reported. "Threatening behavior" is defined by UA to mean any statement, communication, conduct or gesture, including those in written form, directed toward any member of the University community that causes a reasonable apprehension of physical harm to a person or property. A student can be guilty of threatening behavior even if the person who is the object of the threat does not observe or receive it, so long as a reasonable person would interpret the maker's statement, communication, conduct or gesture as a serious expression of intent to physically harm. See <http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>

The University is committed to creating and maintaining an environment free of discrimination. See <http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>

Course Schedule

The textbooks for the class are listed below and are all available through the UA library or the D2L site. All other required additional reading and/or visual media will be posted on the course D2L site. Students are expected to complete the required reading by the deadlines provided in the syllabus. Some assignments will require you to find sources beyond the course material.

Core Readings (all available online or D2L, some through UA library – may require VPN if off campus)

Leichenko, R., & O'Brien, K. (2019). [Climate and Society, Transforming the Future](#). John Wiley & Sons. (if you wish to buy it the paperback is ~\$25)

IPCC 2018. *Special Report on Global Warming of 1.5°C* <https://www.ipcc.ch/sr15/>

Project Drawdown. Drawdown Review. <https://drawdown.org/drawdown-framework/drawdown-review-2020>

Dryzek J.S., Norgaard R.B. and Schlosberg D. 2011. [The Oxford Handbook of Climate Change and Society](#). (available online through library - chapters will be assigned for specific weeks and some are recommended but not required)

USGCRP 2018: *4th US National Climate Assessment* <https://nca2018.globalchange.gov/>

Key Journals

Climatic Change
Climate and Development
Local environments
Nature - Climate Change

Climate Services
Climate Policy
Global Environmental Change
WIRES- Climate Change

Course format

Each live online class will be structured according to the following format and begins at 11am sharp. Recorded lectures and slides will be posted within 24 hours of the live class unless there is a technical glitch. We will send a reminder of all activities for the coming week on Sunday at 11pm

COURSE SCHEDULE (Full details, readings, assignments posted to D2L at beginning of each module)

Week	Date of event or due dates	Lectures, Assignments, Quizzes and Exams	Readings from Leichenko and O'Brien and other sources (D2L)
MODULE 1: VIEWS OF CLIMATE CHANGE			
1	8/25	Introduction to the course Reasons for concern about climate change Interview with Diana Liverman by Talia Anderson	Ch. 1
	8/27	American views on climate change Survey design Breakout discussion on why views of climate change differ	
	Due 9/1	Assignment 1: Reflections on Climate Change and you (2 points)	
	Due 9/1	Quiz 1: not for grade but for practice	
2	9/1	How the media covers climate change Climate skepticism Introduction to key web sites on climate change	Ch. 4
	9/3	Climate change discourses Art and climate change 'Cli-Fi'	
	Due 9/8	Assignment 2: Reflections on Art, Film, Fiction and Climate change (2 points)	
	Due 9/8	Quiz 2: not for grade but for practice	
3	9/8	Communicating climate change Interview with Susi Moser	Ch. 3
	9/10	Climate justice principles Interview with Max Boykoff	
	Due 9/15	Assignment 3: Reflections on Climate Justice (2 points)	
	Due 9/15	Quiz 3: not for grade but for practice	
MODULE 2: CLIMATE SCIENCE (Talia Anderson)			
4	9/15	Global warming and the radiation budget Climate models Local climate change	Ch. 2
	9/17	Observations of climate change Oceans and ice	

		Interview with Valerie Trouet	
	Due 9/22	Assignment 4: Climate Impact Map (2 points)	
	Due 9/22	Quiz 4: Will be graded (0.5 points)	
MODULE 3: CAUSES OF CLIMATE CHANGE			
5	9/22	Trends in greenhouse gas emissions Geography of GHG emissions Introduction to datasets on emissions	Ch. 5
	9/24	Land Use Drivers of emissions Equity and Responsibility for Emissions	
	Due 9/29	Assignment 5: Geography of emissions and drivers (2 points)	
	Due 9/29	Quiz 5: Will be graded (0.5 points)	
MODULE 4: IMPACTS OF CLIMATE CHANGE			
6	9/29	Hazards research Vulnerability Introduction to sectoral impact assignment	Ch. 8
	10/1	Impacts and climate justice Communities of color Interview	
	Due 10/6	Assignment 6: Vulnerability (2 points)	
	Due 10/6	Quiz 6: Will be graded (0.5 points)	
7	10/6	Student sector reports Ecosystems, water, coasts	Ch. 7
	10/8	Student sector reports Food, cities, health	
		No assignments or quizzes as you will be writing up your sector report	
8	10/13	Climate change and the past Climate and past system collapse Past climate of SW US	
	10/15	Indigenous peoples Women Interview with Karen O'Brien	
	10/13	<i>Sectoral report writeup due at 11pm</i>	
	10/15	<i>Take home midterm exam released at noon</i>	
	10/19	<i>Midterm exam due at noon</i>	
		No assignments or quizzes because of take home midterm	

9	10/20	Final paper overview Interview with Robin Leichenko	
	10/22	Migration and Conflict Economic Impacts	
	Due 10/27	Assignment 7: Climate, migration and conflict (2 points)	
	Due 10/27	Quiz 7: Will be graded (0.5 points)	
MODULE 5: SOLUTIONS TO CLIMATE CHANGE			
10	10/27	Climate as transformation The IPCC 1.5C report Intro to solutions reports	Ch.10
	10/29	US Climate Policy Green New Deal Local climate plans	
	Due 11/3	Assignment 8: US and climate policy (2 points)	
	Due 11/3	Quiz 8: Will be graded (0.5 points)	
11	11/3	Social movements Politics of fossil fuels Youth and divestment	Ch. 6
	11/5	International Climate Policy Paris Agreement Interview with CCL Ed Beshore	
12	11/10	Student reports on solutions Efficiency, demand, diet	
	11/12	Student reports on solutions Solar/wind/Hydro, nuclear, biofuels	
		No assignments or quiz as you are writing up solutions reports	
13	11/17	Forest solutions Climate smart agriculture Geoengineering	
	11/19	Carbon trading and finance Carbon offsets Breakouts	
	11/17	<i>Solutions reports due at 11pm</i>	
	Due 11/24	Assignment 9: Risky Solutions (2 points)	
	Due 11/24	Quiz 9: Will be graded (0.5 points)	

14	11/24	Climate and Sustainable Development Climate Resilient Development Paths Interview: Hallie Eakin	
	11/26	Thanksgiving No Class	
		No assignments or quizzes because of Thanksgiving and you are writing final essay draft	
15	12/1	Intro to Adaptation Urban Adaptation Interview: Kathy Jacobs	Ch. 8
	12/3	Ecosystem based adaptation Coastal adaptation Breakouts	
	11/30	<i>Draft of final essay due at 11pm Monday</i>	
	Due 12/8	Assignment 10: Adaptation (2 points)	
	Due 12/8	Quiz 10: Will be graded (0.5 points)	
16	12/8	Reflections on climate and society	
	12/9	<i>Final essay due at 11pm Wednesday</i>	
	12/10	<i>Final take home exam released at noon Wednesday</i>	
EXAM	12/15	<i>Final take home exam due at noon Tuesday</i>	

Capstone Credit

A small number of class members are taking the class for capstone credit in Environmental Studies. This option is *only available* if you are trying to graduate this year and cannot take the EVS capstone next semester and have been approved for capstone credit for EVS363 by the advisors.

You will do a final project paper to demonstrate your ability to synthesize what you have learned in the major. It must include some original research work including a literature review, some form of data collection and analysis (advice will be provided for remote research options) and a discussion of implications for policy. It will be worth 40% of your grade and will replace the final exam and final essay (which were 20% each). The project paper should be at least 5000 words in 11- point font plus a list of sources and any graphics. The goal is to complete a project report of sufficient quality that it could be submitted to potential employers as an example of your work.