

Instructor:

Khalid Kadir
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Office Hours:
Location:

Section TA:

Office Hours:
Location:

Project TA:

Class Meetings:	Lecture	001	tbd
	Sections	101	tbd
		102	tbd

OVERVIEW

The work of engineers is physically embedded in nearly every aspect of modern society. Since the industrial revolution, engineers have improved the physical quality of life of countless people. This work, however, is not done, and engineering expertise, while improving the lot of many, has also left others behind. The engineers of tomorrow must invoke new and innovate approaches to tackle these intractable inequalities. This course will address one particular sort of inequality, environmental inequality, to consider how future engineers might engage with communities to address environmental pollution.

Unequal exposure to environmental hazards are the result of complex social and political processes, processes which have involved engineers at crucial junctures. Construction of pollution sources requires environmental impact statements, air quality regulations and permitting involve engineering analyses, and engineers design water quality effluent standards to manage drinking and environmental water quality downstream. When engineers are involved in projects such as these, an understanding of the social context and consequences of their work is a crucial first step toward achieving more just outcomes.

The primary purpose of this course is to teach future engineers to look beyond the technical orientation of environmental engineering and recognize the ways in which problems that are commonly defined in technical terms are at their roots deeply socially embedded. To that end, this course will engage students at the intersection of environmental justice, social justice, and engineering. Upon learning to recognize the socio-political nature of problems, students should then be able to approach solutions to these problems in ways that prioritize social justice, with an understanding of both the possibilities and limitations of technically-based engineering solutions.

Topics covered will include environmental engineering as it relates to air, water, and soil contamination; environmental justice; race, class, and privilege; expertise; ethics; and engaged citizenship.

Originally created as part of UC Berkeley's American Cultures Engaged Scholarship (ACES) program, this course promotes student learning both in the classroom as well as through engagement with local and regional communities through partnerships with various community-based organizations. These partnerships will help students look beyond the traditional engineering methods of problem identification and solution development, processes which are in their very nature depoliticized and decontextualized. Instead students will learn to value different forms of knowledge produced within the communities that are directly impacted by environmental degradation every day. In doing so, students will come to understand the importance of engaging with problems in ways that not only stretch beyond technical approaches but in fact put social and political concerns front and center.

PEDAGOGICAL GOALS

Upon completion of this course, students will:

1. Understand how the technical work of engineers is inherently social and political.
2. Evaluate the relationship between environmental engineering projects and the communities affected by those projects.
3. Assess the challenges that environmental pollution poses to different groups within society.
4. Discover how specific African American, Latino, Asian American, and Native American communities are tackling environmental hazards facing their communities.
5. Evaluate their personal ethical positions as they prepare for careers in which they will engage in projects that affect historically marginalized communities.

COMMUNITY PARTNERSHIPS

UC Berkeley's American Cultures Engaged Scholarship (ACES) program was created in recognition of the fact that both the university and the surrounding communities could benefit from mutual collaboration. In addition to breaking down the traditional barriers between teaching, research, and service that exist in the university system, the ACES program was designed to value the different forms of knowledge and expertise that exist outside of the university setting. The program created a structure in which the university's high caliber research and scholarship was produced together with communities and directed towards addressing their most pressing needs, and in doing so helped to ensure that the work of university members remained relevant to society.

In the spirit of the ACES program, we will engage directly with several community-based organizations as partners. Our partners will help us understand their communities' historical experiences of engineering and environmental justice, as well as identify the ways in which

future engineers might help them work toward social and environmental justice. In addition, a subset of students in this course will have the opportunity to work directly with these organizations on projects related to soil, air and/or water quality. These projects have been designed in collaboration with each organization. Details on how to get involved will be presented early in the semester. Participation requires a brief application that will be distributed during the first week of class.

The specific community partners that we will work with this semester include:

Agroecology Commons (AC) (agroecologycommons.org)

Agroecology Commons' vision is a future in which food and farming systems are based on cooperation and sovereignty. AC works to create a cooperative process rooted in earth reverence, reciprocal relationships, and racial healing. Their role in transforming the food system is rooted in building cooperative relationships and networks to increase access to technical agroecological farming and marketing skills, and advocating for political education that works towards builds a critical and justice-oriented food system. AC provides farmers with programs such as the Bay Area Farmer-to-Farmer Training, online learning with Farmer Campus, and Farmer-to-Farmer Skillshares focusing on cooperative networks, holistic stewardship, land justice, and food sovereignty.

Climate Resilient Communities (CRC) (climatercommunities.org)

Climate Resilient Communities recognizes that in the Bay Area, as throughout the world, under-resourced communities are disproportionately vulnerable to climate change impacts. Since 2016, CRC has been on the ground learning the specific needs of residents in diverse, under-resourced communities in East Palo Alto and Belle Haven (Menlo Park). Outreach cultivates environmental awareness while giving residents a voice in resilience planning/adaptation and building stronger alliances between residents, schools, local government programs, and community-based organizations.

Communities for a Better Environment (CBE) (cbecal.org)

The mission of CBE is to build people's power in California's communities of color and low income communities to achieve environmental health and justice by preventing and reducing pollution and building green, healthy and sustainable communities and environments. CBE provides residents in blighted and heavily polluted urban communities in California with organizing skills, leadership training and legal, scientific and technical assistance, so that they can successfully confront threats to their health and well-being.

Greenaction for Health and Environmental Justice (GA) (greenaction.org)

Greenaction is a multiracial grassroots organization that fights for health and environmental justice together with low-income and working class urban, rural, and indigenous communities. Their mission is to mobilize community power to win victories that change government and corporate policies and practices to protect health and promote environmental, economic and social justice.

Grid Alternatives (GRID) (gridalternatives.org)

With a vision of a transition to clean, renewable energy that includes everyone, GRID Alternatives' mission is to make renewable energy technology and job training accessible to underserved communities. GRID is a leading voice in low-income solar policy and the nation's largest nonprofit solar installer, serving families throughout California, Colorado, the Mid-Atlantic region, and tribal communities nationwide. GRID's Energy For All Program offers single-family, multifamily and community solar installation services, project development and technical assistance, and they offer multiple levels of workforce development and service learning opportunities, from volunteerism to in-depth solar training and paid internships. In addition, GRID's international program partners with communities in Nicaragua, Nepal and Mexico to address their energy access issues.

REQUIRED TEXTS

A two-volume course reader is available at Krishna Copy (2123 University Avenue, Berkeley, CA), and you can order your copy here:

<https://www.24hrproprint.com/readers-spring-2025/>

All students are required to obtain the course reader, and to come to each class having completed the required readings. On a few occasions, additional required readings will be posted to bCourses.

COURSE REQUIREMENTS AND GRADING STRUCTURE

Participation and Citizenship

Attendance in both lecture and discussion section is mandatory for this course. You are expected to show up *on time* and stay for the duration of class. Arriving late and/or leaving early is a disruption and a disservice to your fellow classmates. Any unexcused absences or late arrivals to class will negatively affect your participation grade.

In addition to attendance, I expect you to be an *active participant* in class discussions. Come to class prepared to discuss and comment upon the course readings. Participation points are not automatically awarded, they must be earned. Come to lecture and section prepared to discuss and comment upon the course readings and ask questions.

Analytical Reflections (2) (750 – 1000 words each)

As this course aims to focus on the relationship between technical actors and the communities in which they are working, reflection upon oneself and one's individual location within society is a key component. To that end, over the course of the semester you must complete **two (2) analytical reflections**. These reflections must be polished, critical, analytical pieces. Specific prompts and due dates for each reflection will be shared via bCourses.

Weekly Reading Responses (12)

Each week in which readings are assigned you must complete a short reading response that covers all the assigned readings. In general, you should cover the readings for the upcoming week (i.e. the readings for both the Tuesday and Thursday lectures), but specific details for each week will be available on bCourses. Reading responses should be submitted via bCourses by Monday at 11:59 pm on the week that the readings are covered in lecture. A stratified random selection of three responses will be graded over the course of the semester (one of the first four, one of the second four, and one of the final four). After each group of responses is graded, you will receive extensive feedback on your graded reading response. Failure to complete all the responses will result in a reduced grade. Specific instructions for completing these reading responses will be provided. Reading responses should be your own, individual work.

Individual Problem Sets (2)

During the semester you must complete **two (2) individual problem sets**. These problem sets will require you to use quantitative and geospatial analyses to demonstrate how various sources

of environmental pollution affect societal groups differently based upon social characteristics. Specific instructions and due dates for these problem sets will be shared via bCourses.

Group Technology Story (1)

Together with a group of students, you will be asked to create a “technology story” about a specific technology. Your technology story should trace the origins, development, and use of your assigned technology, documenting the social, political, human, and environmental effects, dependencies, and impacts of the technology. A detailed description of this assignment, together with group and specific technology assignments, will be provided.

Final Paper (3000 – 4000 words)

Your final paper will require you to deconstruct an engineering project that was completed within the past 25 years. In the paper, you will begin by analyzing the technical components of the project and describing the problem definition as it was understood by the engineers. Following the technical analysis, you will be asked to step back and evaluate the larger context in which this technical intervention took place, and to consider the social, political, and cultural implications of the project. You will be required to submit numerous small assignments leading up to the final paper, giving your TA a chance to provide you with feedback that you can incorporate into your final product. A detailed description of the paper topic will be provided. Note that students who complete community projects do not write the final paper. Instead, the specific deliverables for their project will be used to determine this portion of their grade.

Grading Structure

Participation and Citizenship		10%
Analytical Reflections (2)		10%
Reading Responses (12)		20%
Individual Problem Sets (2)		15%
Group Technology Story (1)		10%
Final Paper/Community Project	DUE: Friday May 9, 11:59pm	35%
<i>TOTAL</i>		<i>100 %</i>

All assignments, as well as final grades, will be computed using the following, relatively standard, grading scheme:

A+ ≥ 99%	90 > B+ ≥ 87	80 > C+ ≥ 77	
99 > A ≥ 93	87 > B ≥ 83	77 > C ≥ 73	
93 > A- ≥ 90	83 > B- ≥ 80	73 > C- ≥ 70	(and so on)

POLICIES

Class Attendance

Class attendance is mandatory, and absences will only be excused in exceptional circumstances. Except in cases of emergency, you must notify your instructors at least one day before the class session occurs if you are requesting an excused absence. If you miss three or more weeks of class (lecture or discussion sections) you will automatically fail the course without exceptional approval and an extensive additional assignment.

Late Assignments

Completing work on time is an important professional practice. However, sometimes life events happen, and it is not always possible to meet every deadline. Moreover, strict deadlines often reproduce and exacerbate existing social inequalities. With that in mind, the following late assignment policy is designed to encourage good professional practices while also creating an inclusive learning environment.

If you find that you are unable to complete an assignment on time due to *extenuating, generally unexpected, circumstances*, email your instructor and suggest a new deadline that will work for you. Feel free to suggest a deadline that gives you the time you need to complete the assignment without overloading yourself. Note that these self-assigned, *extended deadlines are not meant to be ongoing phenomena* (i.e., because you are having a busy semester and are behind with schoolwork in general, or that you have not managed your time well and are finishing assignments in the last minute as a result) but instead for *unexpected* events resulting in unusually busy times.

If you do not contact your instructor before the assignment deadline, then late assignments will receive a 10% penalty for each day or part thereof that they are delayed. This means a grade 90/100 that is 1.5 days late will be reduced to a 70/100. Assignments more than 10 days late will not be accepted, and you will receive a zero for that assignment.

Assignment Format

All assignments will be handed in via bCourses. To help with grading, please include word counts at the end of each written assignment.

Email

We aim to respond to emails 48-72 hours after I receive them. Do not expect us to respond to last minute emails before assignments are due! Substantive questions should be saved for section or office hours.

Honor Code and Student Conduct

Students are expected to conform to the UC Berkeley Honor Code which states: “As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others.”

This is a course designed to provoke critical thinking. While I encourage study groups and working together to understand course material, all written work should be your own. Please do not use other students’ work for your assignments. If you cite an author or use their ideas, please cite properly. Plagiarized assignments will receive an F. More information on what constitutes as plagiarism is available from the UC Berkeley Campus Code of Student Conduct:

<http://sa.berkeley.edu/student-code-of-conduct>. If you have any further questions, please ask.

Grade Disputes

Students who wish to dispute grades on an assignment must do so in writing. Grade disputes must be submitted no sooner than 24 hours after receiving your grade, but within two weeks. Any dispute should outline specifically why you feel there is an error and should not contain

information about what grades you usually get or how long you spent on the assignment. Please note that grades may be lowered as well as raised after reviewing assignments.

Electronic Technology Policy

Computers (laptops, phones, tablets etc.) and recording devices are not allowed in class. Please turn these off and put them away before each class.

Inclusion – I am committed to creating an inclusive learning environment, one that welcomes all students and supports a diversity of beliefs, thoughts, perspectives, values, and experiences, and one that respects all identities and backgrounds (including race/ethnicity, nationality, gender, class, religion, ability, sexual orientation, etc.) To help accomplish this:

- If you have a name and/or set of pronouns that differ from those that appear in your official records, please let me know.
- If you feel like your performance in the class is being impacted by your experiences outside of class, please do not hesitate to come and talk with me. I want to be a resource for you.
- We are here to learn, and sometimes along the way we make mistakes. If something is said in class (by me or anyone else) that made you feel uncomfortable, please come and talk to me about it.
- As a participant in this class, you should strive to respect the diversity of your classmates.

Disability Student Services

UC Berkeley is committed to creating a learning environment that meets the needs of its diverse student body including students with disabilities. If you anticipate or experience any barriers to learning in this course, please feel welcome to discuss your concerns with me. If you have a disability, or think you may have a disability, you can work with the Disabled Students' Program (DSP) to request an official accommodation: dsp.berkeley.edu. If you have already been approved for accommodations through DSP, please meet with me so we can develop an implementation plan together.

Reasonable Accommodation for Students' Religious Beliefs, Observations and Practices:

In compliance with Education code, Section 92640(a), it is the official policy of the University of California at Berkeley to permit any student to undergo a test or examination, without penalty, at a time when that activity would not violate the student's religious creed, unless administering the examination at an alternative time would impose an undue hardship which could not reasonably have been avoided.

Online Engagement And Emergency Changes To Accessing Course Material:

Outside events (e.g. public health emergencies, campus safety directives, or temporary power outages) may require changes to the modes of engagement that will be available to students to complete the course requirements. If events occur at any point during the semester that require these changes, students will receive formal notification from the administration and the instructor. The details of the specific changes or adaptations made to the course will be

communicated via email, bCourses, and, when possible, in-class announcements. Students may receive an amended syllabus.

bCourses will continue to be students' main point of remote entry for class meetings, even if lectures, discussion sections, and office hours will be administered using third-party software, such as Zoom or Adobe Connect. Students will continue to use their CalNet ID login and berkeley.edu address to access content. In the event a student is required to download or update specific software for home use in order to access the course materials, or if students need specific technical assistance setting up their remote access, please use <https://software.berkeley.edu/>.

COURSE SCHEDULE

Week 1

Jan 21

Introductions: Course Logistics, Syllabus, and Expectations

BACKGROUND

ENVIRONMENT, SOCIETY, AND ENGINEERING

ENVIRONMENT

Although human beings make up only a small portion of the Earth's total biomass, the impacts of humans upon the environment is enormous. We start this course by exploring the relationship between human impacts upon the natural environment and social inequality.

Jan 23

What is Environmental Justice?

Gross, Liza (2012) No Bebe el Agua. *Environmental Health News* June 11.

Retrieved from

<http://www.environmentalhealthnews.org/ehs/news/2012/pollution-poverty-and-people-of-color-nitrate-day-4>

Mohai, Paul; Pellow, David; and Roberts, Timmons (2009) Environmental Justice. *Annual Review of Environment and Resources* 34(1):405-430.

Sze, Julie and London, J. (2008) "Environmental Justice at the Cross Roads." *Sociology Compass* 2(4):1331-1354.

SOCIETY

Inequality, embedded within social structures and institutions, is a feature of all societies, some more than others. In these class meetings, we will study the structural forms of inequality in America, paying particular (but not exclusive) attention to its racial and economic forms. In addition, we will think critically about our own individual privileged positions within American society. Finally, we will locate the place of community engaged scholarship, with both its opportunities and limits, in attempts to address inequality in America.

Week 2

Jan 28

Inequality in the United States

Matthews, Dylan (2018) The massive new study on race and economic mobility in America, explained. *Vox* Mar 21. Retrieved from

<https://www.vox.com/policy-and-politics/2018/3/21/17139300/economic-mobility-study-race-black-white-women-men-incarceration-income-chetty-hendren-jones-porter>.

Kaufman, Cynthia (2003) Capitalism and Class. In *Ideas for Action: Relevant theory for radical change* (pp. 57-80) South End Press.

Kaufman, Cynthia (2003) Theorizing and Fighting Racism. In *Ideas for Action: Relevant theory for radical change* (pp. 121-149) South End Press.

Jan 30

Personal Privilege and Intersectionality

Fortang, Tal (2014) Checking My Privilege: Character as the Basis of Privilege. *The Princeton Tory* April 2. Retrieved from <http://theprincetontory.com/main/checking-my-privilege-character-as-the-basis-of-privilege/>.

Baudelaire, Violet (2014) To the Princeton Privileged Kid. May 1. Retrieved from <http://grouptthink.jezebel.com/to-the-princeton-privileged-kid-1570383740>.

Rosenberg, Paul (2014) White privilege 101: Here's the basic lesson Paul Ryan, Tal Fortgang and Donald Sterling need. *Salon.com* May 9. Retrieved from http://www.salon.com/2014/05/09/white_privilege_101_heres_the_basic_lesson_paul_ryan_tal_fortgang_and_donald_sterling/.

Week 3

Feb 4

From Personal Privilege to Professional Hegemony

Kaufman, Cynthia (2003) Thinking About Liberation (selections). In *Ideas for Action: Relevant theory for radical change* (pp. 18-34) South End Press.

Takacs, David (2002) Positionality, Epistemology, and Social Justice in the Classroom. *Social Justice* 29(4):168-181.

Feb 6

Community Engaged Scholarship: What is it? Why do it?

Guest Lecture: Doug Parada, Project & Policy Analyst, AC Center

Cech, Erin (2014) Culture of Disengagement in Engineering Education? *Science, Technology, & Human Values* 39(1): 42-72.

Parvin, Nassim (2023) Just Design: Pasts, Presents, and Future Trajectories of Technology. *Just Tech. Social Science Research Council*.

Gonzalez, Rosa & Facilitating Power (2019) *The Spectrum of Community Engagement to Ownership* <https://movementstrategy.org/wp-content/uploads/2021/08/The-Spectrum-of-Community-Engagement-to-Ownership.pdf>

ENGINEERING

What is the place of engineering in American society and how did it get there? In the following class sessions, we will develop a theoretical foundation to help us explain the relationship between engineering and society. We start by considering the relationship between engineering and ideas of progress as they have developed and changed since the onset of the Industrial Revolution. We then go on to explore the relationship between expert knowledge and power, and consider the place of engineering in contemporary political and economic structures.

Week 4

Feb 11

Engineering, Technology, and Ideas of Progress

Riley, Donna (2008) Mindsets in Engineering. In *Engineering and Social Justice* (pp. 33-45). In Baillie, Caroline (Series Ed.) *Synthesis Lectures on Engineers, Technology, and Society* #7. Morgan & Claypool ebook.

Winner, Langdon (1980) Do Artifacts Have Politics? *Daedalus* 109(1): 121-136.

Giannella, Eric (2015) Morality and the Idea of Progress in Silicon Valley.

Berkeley Journal of Sociology January 2015. Retrieved from

<http://berkeleyjournal.org/2015/01/morality-and-the-idea-of-progress-in-silicon-valley/>

Feb 13

Experts and Politics I: Wastewater Treatment, A Case Study

Mitchell, Timothy (2002) The Object of Development. In *Rule of Experts: Egypt, Techno-Politics, Modernity* (pp. 209-243) UC Press.

Verma, Gita (2000). Indore's Habitat Improvement Project: success or failure? *Habitat International* 24: 91-117.

Week 5

Feb 18

Experts and Politics II: Rendering Technical

Li, Tania (2007) Introduction: The Will to Improve. In *The Will to Improve: Governmentality, Development, and the Practice of Politics* (pp. 1-12) Duke University Press.

Cohen, Benjamin and Ottinger, Gwen (2011) Introduction: Environmental Justice and the Transformation of Science and Engineering. In *Technoscience and environmental justice: expert cultures in a grassroots movement* (pp. 1-18) MIT Press.

Feb 20

Knowledge Production, Community Knowledge

Goldman, Michael (2005) The Birth of a Discipline: Producing Environmental Knowledge for the World. In *Imperial Nature: The World Bank and Struggles for Social Justice in the Age of Globalization* (pp. 151-180) Yale University Press.

Corburn, Jason (2007) Community knowledge in environmental health science: co-producing policy expertise. *Environmental Science and Policy* 10(2):150-161.

Week 6

Feb 25

Engineering Violence: Prisons, Security, and Military in America

Alexander, Michelle (2010) Introduction. In *The New Jim Crow: Mass*

Incarceration in the Age of Colorblindness (pp. 1-19) The New Press.

Loyd, Jenna M. *et al* (2012) Introduction: Borders, Prisons, and Abolitionist

Visions in Jenna M. Loyd *et al.* (Eds.) *Beyond Walls and Cages: Prisons, Borders, and Global Crisis* (pp. 1-15) University of Georgia Press.

Feb 27

Engineering Colonialism and Apartheid: Palestine

Ranganathan, Malini (2017) The Environment as Freedom: A Decolonial

Reimagining. *SSRC Items*. <https://items.ssrc.org/just-environments/the-environment-as-freedom-a-decolonial-reimagining/>

Khalidi, Rashid (2020) Introduction. In *The Hundred Years' War on Palestine: A History of Settler Colonialism and Resistance, 1917–2017* (1-15)

Metropolitan Books.

Molavi, Shourideh C. (2024) Introduction, Chapter 1, and Conclusion. In

Environmental Warfare in Gaza: Colonial Violence and New Landscapes of Resistance Pluto Press.

INTERSECTIONS

ENVIRONMENTAL ENGINEERING AND VULNERABLE COMMUNITIES

INDUSTRIAL WASTE AND AIR QUALITY

Waste streams, solid, liquid, and airborne, produced from industrial processes are a major pollution source, and engineers commonly play a role in the regulation, prevention, or mitigation of this pollution. In America, industrial pollution has had a well-documented, disproportionate effect upon African American, Latino, and Native American communities, with one prominent study showing that African Americans are 79% more likely than whites to live in neighborhoods subject to dangerous industrial pollution. This week, we will look at the long-standing disparities that exist in industrial waste and air pollution exposure here in California and their effects upon African American, Asian American, and Latino communities.

Week 7

Mar 4 **Industrial Waste and African American and Latino Communities in California**

Film Screening: Merchants of Doubt

Lewis, Robert (2023, August 22) Toxic trash: California's aging hazardous waste sites have troubling safety records. *CalMatters*.

<http://calmatters.org/environment/2023/08/california-hazardous-waste-sites-permit-2/>

Bullard, Robert and Wright, Beverly (2012) The Wrong Complexion for Protection: Response to Toxic Contamination. In *The Wrong Complexion for Protection: How the Government Response To Disaster Endangers African American Communities* (pp. 100-125) NYU Press.

Mar 6 **Air Quality and African American, Asian American, and Latino Communities in California**

Guest Lecture: Azibuike Akaba, Senior Program Coordinator, Bay Area Air Quality Management District

David Ralston, Senior Policy Advisor, Bay Area Air Quality Management District

Tarr, Joel (2004) Afterword. In DuPuis, Melanie (Ed.) *Smoke and Mirrors: The Politics and Culture of Air Pollution* (pp. 337-341) NYU Press.

Harrison, Jill (2004) Invisible People, Invisible Places: Connecting Air Pollution and Pesticide Drift in California. In DuPuis, Melanie (Ed.) *Smoke and Mirrors: The Politics and Culture of Air Pollution* (pp. 288-304) NYU Press.

McCormick, Erin, & Witherspoon, Andrew (2023, March 8) US neighborhoods with more people of color suffer worse air pollution. *The Guardian*.

<https://www.theguardian.com/us-news/2023/mar/08/us-air-pollution-people-of-color-census-districts>

WATER

While lack of access to safe drinking water is commonly thought of as a problem outside of western industrialized nations, here in California numerous Latino communities have water piped into their homes that is unsafe to drink, contaminated with heavy metals, nitrates, and pesticides. Drinking water treatment, a core component of environmental engineering, provides many technological options to treat contaminated water, however each technology comes with political, economic, and social implications. Moreover, many communities concerns for their water is dominated by its social, cultural, and spiritual importance. This week we will think about the intersection of the physiochemical and sociocultural approaches to water. To that end, we will consider the relationship between water engineering and the subsequent effects of these projects upon Latino and Native American communities in California.

Week 8

Mar 11 Engineering Water

Morgan, Ruth and Smith, James (2013) Premodern Streams of Thought in Twenty-First-Century Water Management. *Radical History Review* 116:105-129.

Boyd-Barrett, Claudia (2021). 'I'm scared of getting sick from the water.' *High Country News*, May 5. Retrieved from <https://www.hcn.org/issues/53.7/south-water-im-scared-of-getting-sick-from-the-water>.

Mar 13

Water and Native American Communities in California

Film Screening – tbd

Swyngedouw, Erik (2009) The Political Economy and Political Ecology of the Hydro-Social Cycle. *Journal of Contemporary Water Research & Education* 142:56-60.

Raff, Jeremy (2021) 'If the fish die, the people die': Water wars in America's West. *aljazeera.com*, November 10. Retrieved from <https://www.aljazeera.com/features/2021/11/10/if-the-fish-die-the-people-die-water-wars-in-americas-west>.

URBAN INFRASTRUCTURE

Since WWII, much of American urban development has been characterized by sprawl, concentrated poverty, and racial segregation. This combination has resulted in many minority-dominated, poor urban areas being burdened with crumbling infrastructure. While urban infrastructure development is inherently interdisciplinary, engineering is currently leading the charge to reshape America's urban water infrastructure (e.g. UC Berkeley's ReNUWit center, primarily directed by civil and environmental engineers). This week we will look at both the role of engineering in urban redevelopment as well as the racialized disparities faced by African American, Asian American, and Latino communities in their experiences of America's infrastructure.

Week 9

Mar 18 Environmental Engineering and Urban Infrastructure

Jackson, Steven (2014) Rethinking Repair. In Tarleton Gillespie, Pablo Boczkowski, and Kirsten Foot, eds. *Media Technologies: Essays on Communication, Materiality and Society* (pp 221-240) MIT Press.

Hager, Guy *et al.* (2013) Socioecological revitalization of an urban watershed. *Frontiers in Ecology and the Environment* 11:28–36.

Mar 20 **Urban Infrastructure and African American, Asian American, and Latino Communities in Richmond, CA**

Film Screening – Greenway

Collier, Stephen (2004) Pipes. In Stephan Harrison, Steve Pile, and Nigel Thrift, eds. *Patterned Ground: Entanglements of Nature and Culture* (pp 50-52) London: Reaktion Books.

Pulido, Laura (2016) Flint, Environmental Racism, and Racial Capitalism. *Capitalism Nature Socialism*, 27(3), 1–16.

Mar 25 and 27 **Spring Break – No Class**

CLIMATE CHANGE

Perhaps the most important environmental justice issue facing the world today, climate change is commonly portrayed as a unifying global problem. However, both the causes and the effects of climate change are far from even, and the most vulnerable, poor populations are both the least responsible and the first and most heavily affected. This week we will explore the relationship between climate change and poverty, together with its racialized, intergenerational, and gendered components.

Week 10

Apr 1

Climate Change

Sultana, Farhana (2022) The unbearable heaviness of climate coloniality. *Political Geography*, 99, 102638.

Bigger, Paul, Hassan, Batul, Elmallah, Salma, Prins, Seth J., Cha, J. Mijin, Ranganathan, Malini, Hanna, Thomas M., Cohen, Daniel Aldana, & Bozuwa, Johanna (2023, December 13) Ceasefire now, ceasefire forever: No climate justice without Palestinian freedom and self-determination. *Climate and community*. <https://www.climateandcommunity.org/ceasefire-now>

Apr 3

Climate Justice

Film Screening – Disruption

Morello-Frosch, Rachel *et al.* (2009) The Climate Gap: Inequalities In *How Climate Change Hurts Americans & How to Close the Gap*. Retrieved from http://dornsife.usc.edu/pere/documents/ClimateGapReport_full_report_web.pdf

Logan, Mary (2012) Is climate change a euphemism for growth? *A Prosperous Way Down* September 29. Retrieved from <http://prosperouswaydown.com/climate-euphemism-growth/>

CONCLUSIONS

AMERICAN CULTURES AND ENVIRONMENTAL ENGINEERS

In these final weeks of class, we will step back and focus on the broad relationship between engineering and justice. In addition to learning about the work that your classmates have been doing with local communities, we look forward toward our future professional lives. In considering the future, we will reflect upon the role of ethics and privilege in the practice of engineering, and how engineers might engage in their careers in ways that prioritize social justice.

Week 11

Apr 8

The Environment: For Whom? For What?

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Apr 10

Limits to Growth: Markets, Political Economy, and Engineering

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Week 12

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Week 13

Apr 22 ACES Groups: Class Presentations

Apr 24 ACES Groups: Class Presentations

Week 14

Apr 29 **Engineering and Social Justice**

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Conclusions

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Campus Resources

Basic Needs Program

<http://basicneeds.berkeley.edu>

If you need economic, food, or housing support, you can find help at UC Berkeley's Basic Needs Security Hub. You may be eligible for money to buy groceries via <http://calfresh.berkeley.edu> or our Food Assistance Program. If you need food immediately, please visit the UC Berkeley Food Pantry at <http://pantry.berkeley.edu>.

Care Line (PATH to Care Center)

<https://care.berkeley.edu/care-line/>
510-643-2005

The Care Line or the PATH to Care Center is a 24/7, confidential, free, campus-based resource for urgent support around sexual assault, sexual harassment, interpersonal violence, stalking, and invasion of sexual privacy. The Care Line will connect you with a confidential advocate for trauma-informed crisis support including time-sensitive information, securing urgent safety resources, and accompaniment to medical care or reporting

Disabled Students' Program (DSP)

<http://dsp.berkeley.edu>

260 César Chávez Student Center #4250, University of California, Berkeley 510-642-0518

The Disabled Student's Program serves students with disabilities of all kinds. Services are individually designed and based on the specific needs of each student as identified by DSP's Specialists. The Program's official website includes information on DSP staff, UC's disabilities policy, application procedures, campus access guides for most university buildings, and portals for students and faculty/proxy respectively.

Student Learning Center

<http://slc.berkeley.edu>

César Chávez Student Center, University of California, Berkeley

510-642-7332

As the primary academic support service for students at the University of California at Berkeley, the Student Learning Center (SLC) assists students in transitioning to Cal; navigating the academic terrain; creating networks of resources; and achieving academic, personal and professional goals. Through various services including tutoring, study groups, workshops and courses, SLC supports students in Biological and Physical Sciences, Business Administration, Computer Science, Economics, Mathematics, Social Sciences, Statistics, Study Strategies and Writing.

Educational Opportunity Program (EOP)

<http://eop.berkeley.edu>

119 César Chávez Student Center, University of California, Berkeley

510-642-7224

Educational Opportunity Program (EOP) is an academic counseling/advising service that assists all undergraduate students, with a primary focus on Education Opportunity Program students and students who participated in outreach programs. The SLAS office assists students in developing the skills required to succeed at Berkeley and beyond by taking a comprehensive approach to counseling/advising on academic, personal and social matters.

Ombudsperson for Students

<http://students.berkeley.edu/ombuds>

102 Sproul Hall, University of California, Berkeley

510-642-5754

The Ombudsperson for Students provides a confidential service for students involved in a University-related problem, acting as a neutral complaint resolver and not as an advocate for any of the parties involved in a dispute. The Ombudsman can provide information on policies and procedures affecting students, facilitate students' contact with services able to assist in resolving the problem, and assist students in complaints concerning improper application of University policies or procedures. All matters referred to this office are held in strict confidence. The only exceptions, at the sole discretion of the Ombudsman, are cases where there appears to be imminent threat of serious harm.

Tang Center Counseling and Psychological Services

<http://uhs.berkeley.edu/caps>

2222 Bancroft Way, University of California, Berkeley

510-642-9494

The UHS Counseling and Psychological Services staff provides confidential assistance to students managing problems that can emerge from illness such as financial, academic, legal, family concerns, and more. In the realm of sexual harassment, UHS coordinates education programs, crisis counseling, advocacy, and medical care for women and men who have been harassed or assaulted (Tang Center, 2222 Bancroft Way; Health Promotion, 642-7202; Social Services, 642-6074; Counseling Services, 642-9494; Medical Care, 642-3188).