E 157AC/IAS 157AC   Engineering, Environment, and Society

An American Cultures Engaged Scholarship Course   **Spring 2020 Syllabus**

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Class Meetings:

Lecture	001	TuTh	3:30 – 5 pm	534 Davis
Sections	101	Wed	4 – 5 pm	310 Hearst Mining
	102	Wed	5 – 6 pm	B51 Hildebrand

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.

<u>The specific community partners that we will work with include:</u>

Asian Pacific Environmental Network (APEN) (apen4ej.org)
APEN brings together a collective voice to develop an alternative agenda for environmental, social, and economic justice. Through building an organized movement, they strive to bring fundamental changes to economic and social institutions that will prioritize public good over profits and promote the right of every person to a decent, safe, affordable quality of life, and the right to participate in decisions affecting our lives.

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.

Cycles of Change (CC) (cyclesofchange.org)
Cycles of Change is a collectively-run organization that works to improves the health and sustainability of their neighborhoods by increasing the use of bicycles as transportation. Their focus is on broadening access to biking in low income and communities of color through education programs, low cost or free resources and services, connecting youth with the extraordinary living systems of the local area, and building a diverse community of visionary young leaders.

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. Greenaction's 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.

Planting Justice (PJ) (plantingjustice.org)
With the motto "Grow Food, Grow Jobs, Grown Community," Planting Justice is a grassroots organization with a mission to democratize access to affordable, nutritious food by empowering urban residents with the skills, resources & knowledge they need to maximize food production, expand job opportunities, and ensure environmental sustainability in the Bay Area. Their projects have ranged from building edible permaculture gardens, to developing food justice curricula for high schools, to creating green jobs for formerly incarcerated men.

Physicians, Scientists, and Engineers for Healthy Energy (PSE) (psehealthyenergy.org)
Physicians, Scientists, and Engineers (PSE) for Healthy Energy is a multidisciplinary, nonprofit research institute that studies the way energy production and use impact public health and the environment. With headquarters is in Oakland, California, PSE is dedicated to supplying evidence-based scientific and technical information on the public health, environmental, and climate dimensions of energy production and use accessible to all audiences. PSE conducts original research, translates existing research for nontechnical audiences, and disseminate scientific information and analyses to inform policy at the local, state, and federal levels.

Spiral Gardens (SG) (spiralgardens.org)
Spiral Gardens aims to improve community health and sustainability by providing access to nutritious and affordable produce, promoting a strong local food system, and encouraging productive use of urban soil. Located in southwest Berkeley on two plots of public land, their Community Food Security Project is different from many other community gardens in that it is one big plot for everyone to plant and work on together. The community farm provides land, materials, and information for volunteers to plant, and grow, and the organic food they produce is distributed among the volunteers who grow it and given for free to people who need it.

REQUIRED TEXTS

A course reader is available at Krishna Copy (2001 University Avenue). All students are required to obtain the course reader and to come to class having completed the required readings. On a few occasions, additional readings will be posted to bCourses or distributed in class.

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_. Arriving late 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 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 of 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 of 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.

Problem Sets (3)

Over the course of the semester you must complete **three (3) 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.

Final Paper (3500 – 4000 words)

Your final paper will require you to deconstruct an engineering project that was completed within the past 20 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 GSI 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		15%
Analytical Reflections (2)		10%
Reading Responses (12)		20%
Problem Sets (3)		20%
Final Paper/Community Project	DUE: Monday May 11, 12pm	35%
TOTAL		*100 %*

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

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

POLICIES

Late Assignments
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. If you do turn in a late assignment, you must turn it in via bCourses so that we know exactly when it was turned in and can calculate the point reduction. *It is your responsibility to understand this policy - if there is anything unclear, ask me!*

Assignment Format
All assignments will be handed in via bCourses. Assignments should include your full name on each page. In addition, in order to help with grading, I would like you to include word counts at the end of each writing 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.

Academic Honesty
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 his/her 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.

Accommodations – If you have any special needs or require ability-related accommodations, please notify me as soon as possible. If an unexpected personal or medical challenge is interfering with your ability to complete assignments and/or attend class, it is important that you contact me as early as possible. Further resources are available through the Disabled Students Program (http://dsp.berkeley.edu).

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.
Gelobter *et al*. (2004). The Soul of Environmentalism: Rediscovering Transformational Politics in the 21st Century. Oakland, CA: Redefining Progress.

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) Cambridge: South End Press.
Kaufman, Cynthia (2003) Theorizing and Fighting Racism. In *Ideas for Action: Relevant theory for radical change* (pp. 121-149) Cambridge: 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://groupthink.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) Cambridge: 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:
  Andrea Wise, Assistant Director, UCB Public Service Center
  Douglas Parada, Program Associate, UCB American Cultures Center
Wilson, Robin (2011) Syracuse's Slide. *The Chronicle of Higher Education* Oct 2. Retrieved from http://chronicle.com/article/Syracuses-Slide/129238/.
Graduate Student Response: Syracuse Graduate Students Embrace Change. *The Chronicle of Higher Education* Oct 23. Retrieved from http://chronicle.com/article/Syracuse-Graduate-Students/129497/.
Cech, Erin (2014) Culture of Disengagement in Engineering Education? *Science, Technology, & Human Values* 39(1): 42-72.

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 (2005) The Object of Development. In *Rule of Experts: Egypt, Techno-Politics, Modernity* (pp. 209-243) Berkeley: 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) Durham: 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 and Power**
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) New Haven: Yale University Press.
Corburn, Jason (2007) Community knowledge in environmental health science: co-producing policy expertise. *Environmental Science and Policy* 10(2):150-161.

INTERSECTIONS
ENVIRONMENTAL ENGINEERING AND VULNERABLE COMMUNITIES

INDUSTRIAL WASTE
Waste streams produced from industrial processes are a major pollution source, and environmental engineers commonly play a role in the regulation, prevention, or mitigation of the adverse effects 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 consider both relationship between environmental engineering and industrial waste as well as the effects of industrial pollution on African American communities.

Week 6

Feb 25   **Environmental Engineering and Industrial Waste**
Grossi, Mark (2013) Kettleman City reaps toxic harvest of California castoffs.
The Fresno Bee January 12. Retrieved from
http://www.fresnobee.com/2013/01/12/3131461/kettleman-city-reaps-toxic-harvest.html.
Hoffman, Steven (2001) Negotiating Eternity: Energy Policy, Environmental
Justice, and the Politics of Nuclear Waste. *Bulletin of Science, Technology, & Society* 21(6):456-472.

Feb 27   **Industrial Waste and African American, Asian American, and Latino
Communities in California**
Guest Lecture: tbd
Bullard, Robert and Wright, Beverly (2012) The Wrong Complexion for
Protection: Response to Toxic Contamination. *The Wrong Complexion for
Protection: How the Government Response To Disaster Endangers African
American Communities* (pp. 100-125) New York: NYU Press.

AIR QUALITY
*Protecting air quality is a central concern for environmental engineers, and exposure to air
pollution often – though not always – varies across race and class in America. This week, in
addition to exploring the approaches of environmental engineering to understanding and
reducing air pollution, we will look at the long-standing disparities that exist in air pollution
exposure here in California and their effects upon African American, Asian American, and
Latino communities.*

Week 7

Mar 3   **Environmental Engineering and Air Quality**
*Guest Lecture: Azibuike Akaba, Senior Public Information Officer, Bay Area
Air Quality Management District
David Ralston, Community Engagement Manager, 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) New York: 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) New York:
NYU Press.

Mar 5   **Air Quality and African American, Asian American, and Latino
Communities in California**
*Guest Lecture: Andrés Soto, Richmond Organizer, Communities for a Better
Environment*
Hackbarth, Andrew; Romley, John; Goldman, Dana (2011) Racial and ethnic
disparities in hospital care resulting from air pollution in excess of federal
standards. *Social Science & Medicine* 73(8):1163-1168.

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 10   **Environmental Engineering and Water**

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

Rubin, Sara (2013) Lawmakers scramble to make drinking water a right; meanwhile, contamination in Monterey County is getting worse. *Monterey County Weekly* Jun 13. Retrieved from http://www.montereycountyweekly.com/archives/2013/0613/article_67a4dcfc-d3b2-11e2-873e-001a4bcf6878.html.

Mar 12   **Water and Native American Communities in California**
               Film Screening – A River Between Us

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

Grossi, Mark (2013) Northern California tribal members protest at Westlands office over water. *The Fresno Bee,* August 20. Retrieved from http://www.fresnobee.com/2013/08/20/3451708/northern-california-tribal-members.html.

URBAN INFRASTRUCTURE

Following 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, environmental 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 environmental engineering in urban redevelopment as well as the racialized disparities faced by African American and Latino communities in their experiences of America's infrastructure.

Week 9

Mar 17   **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) Cambridge: MIT Press.
Hager, G. *et al.* (2013) Socioecological revitalization of an urban watershed.
        Frontiers in Ecology and the Environment 11:28–36.

Mar 19   **Urban Infrastructure and African American and Latino Communities in
        Richmond, CA**
Field Trip: Restoring the Richmond 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: Reacktion Books.
Marsh, B.; Parnell, A.; and Joyner, A. (2010) Institutionalization of racial
        inequality in local political geographies. *Urban Geographies* 31:691–709.

Mar 24 and 26   **Spring Break – No Class**

CLIMATE CHANGE
*Perhaps the most important environmental justice issue facing the world today, climate change
is commonly perceived as a unifying, evenly distributed problem. However, both the causes and
the effects of climate change are far from even, and the most vulnerable and poor populations
are 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
Mar 31   *Film Screening – Disruption*

Apr 2   **Climate Justice**
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.p
        df.
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 7   **The Environment: For Whom? For What?**

Huesemann, Michael and Huesemann, Joyce (2011) Introduction. In *Techno-Fix: Why Technology Won't Save Us or the Environment* (pp. xxiii-xxviii) Gabriola Island, BC: New Society Publishers.

Huesemann, Michael and Huesemann, Joyce (2011) The Design of Environmentally Sustainable and Socially Appropriate Technologies. In *Techno-Fix: Why Technology Won't Save Us or the Environment* (pp. 295-312) Gabriola Island, BC: New Society Publishers.

Vidal, John (2011) Bolivia enshrines natural world's rights with equal status for Mother Earth. *The Guardian* April 10. Retrieved from http://www.theguardian.com/environment/2011/apr/10/bolivia-enshrines-natural-worlds-rights.

Apr 9   **Limits to Growth: Markets, Political Economy, and Engineering**

Mitchell, Timothy (2011) Introduction and Fuel Economy. In *Carbon Democracy: Political Power in the Age of Oil*. (pp 1-11, 109-143) London: Verso.

Monbiot, George (2014) The Impossibility of Growth. May 27. Retrieved from http://www.monbiot.com/2012/06/22/how-sustainability-became-sustained-growth/.

Week 12

Apr 14   **Engineering Security: 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) New York: 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) Athens: University of Georgia Press.

Apr 16   **Ethics and Engineering**

Schmidt, Jon (2014) Changing the Paradigm for Engineering Ethics. *Sci Eng Ethics* 20(4):985-1010.

Karwat, Darshan; Eagle, Walter; Wooldridge, Margaret; and Princen, Thomas (2015) Activist Engineering: Changing Engineering Practice By Deploying Praxis. *Sci Eng Ethics* 21(1):227-239.

Huesemann, Michael and Huesemann, Joyce (2011) Critical Science and Social Responsibility. In *Techno-Fix: Why Technology Won't Save Us or the Environment* (pp. 313-338) Gabriola Island, BC: New Society Publishers.

Week 13
Apr 21   **ACES Groups: Class Presentations**

Apr 23   **ACES Groups: Class Presentations**

Week 14
Apr 28   **Engineering and Social Justice**
Ottinger, Gwen (2011) Environmentally Just Technology. *Environmental Justice* 4(1): 81-85.
Riley, Donna (2008) Engineering and Social Justice. In *Engineering and Social Justice* (pp. 47-106). In Baillie, Caroline (Series Ed.) *Synthesis Lectures on Engineers, Technology, and Society*. Morgan & Claypool ebook.
Cole, T. (2012) The White Savior Industrial Complex. *The Atlantic*, March 21.

Apr 31   **Conclusions**
Riley, Donna (2008) Toward a More Socially Just Engineering. In *Engineering and Social Justice* (pp. 107-123). In Baillie, Caroline (Series Ed.) *Synthesis Lectures on Engineers, Technology, and Society*. Morgan & Claypool ebook.
Riley, Donna (2008) Parting Lessons for the Continuing Struggle. In *Engineering and Social Justice* (pp. 143-149). In Baillie, Caroline (Series Ed.) *Synthesis Lectures on Engineers, Technology, and Society*. Morgan & Claypool ebook.

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.

Disabled Students' Program (DSP)   http://dsp.berkeley.edu

260 César Chávez Student Center, University of California, Berkeley
642-6376

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
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
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://sa.berkeley.edu/ombuds

102 Sproul Hall, University of California, Berkeley
642-5754

The Ombudsperson for Students provides a confidential service for students involved in a University-related problem (academic or administrative), 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

2222 Bancroft Way, University of California, Berkeley
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).