GESM 120
Engineering California: Technology from Sutter's Mill to Silicon Beach
Spring 2018
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Course description

"California is artificial." We've all heard it, usually as a pejorative. But what if we take it literally? What if we approach the Golden State not as the home of the slick-talking Hollywood agent or the stoned surfer, but rather as the home of the <u>engineer</u>? Such a perspective reveals that California's economy, its environment, its celebrated leisure culture, and even the bodies of the people themselves are artificial—that is, made of technology, by the engineer.

This seminar examines the history of technology in California from the Gold Rush to the present. Although Silicon Valley is often viewed as the original high-tech region, it is just one in a series of tech-based knowledge economies—from mining and oil to aerospace and biotech—that have made the Golden State the sixth largest economy in the world. Meanwhile, massive technological infrastructure—water, power, transportation—engineered the environment and enabled California to absorb tens of millions of new residents, whose everyday lives are increasingly intertwined with devices. This course examines how all this came to pass, and how technology has shaped California—and how California has shaped technology—for both good and ill.

Assignments and grades

Class meetings will combine discussion of the reading, short lectures and film excerpts, with the emphasis on discussion.

There are two writing assignments. The first is a midterm essay of 1500-2000 words (5-6 pages) in response to assigned prompts. Students will also prepare a longer final paper of 2500-3000 words (10-12 pages) addressing one or more themes from the course, drawing on course readings and relevant outside reading. All papers must feature clear, concise prose as well as substantive analysis. Grades will be assigned as follows: 15% class participation; 35% midterm; 50% final paper. Late papers will be penalized 1/3 a grade for each day (or fraction thereof) late.

Requirements and Expectations

<u>Attendance</u>: This class will function as a seminar, and class participation is an important component. You cannot participate if you are not present, so attendance is mandatory. If an emergency prevents your attendance, please notify me <u>before</u> your absence or I will treat it as unexcused.

Electronics: Students may bring laptops or other portable electronic devices to class in order to take notes. However, there will be no texting, tweeting, snapchatting, emailing, or any other variety of internet surfing in class. Also please silence phones while in class.

Reading: In order to participate in discussion, you must do the assigned reading before class meetings. There will be reading quizzes to check your comprehension.

Writing: The ability to present your ideas clearly and concisely is crucial to every academic field. This class aims to develop good writing skills. If you need help with your writing come see me in office hours, or take advantage of USC's writing center. Their website is dornsife.usc.edu/writingcenter/.

Plagiarism: The ideas you present in your writing must be your own, and this course follows USC policy on plagiarism and cheating. Please see the USC websites on plagiarism at www.usc.edu/student-affairs/student-conduct/ug_plag.htm and on academic integrity at sjacs.usc.edu/students/academic-integrity/.

Discrimination: This course follows USC policy on nondiscrimination and sexual harassment. You are encouraged to report any incidents to the Office of Equity and Diversity (equity.usc.edu). USC's Relationship and Sexual Violence Prevention Services (engemannshc.usc.edu/rsvp/) provides 24/7 confidential support and other resources; for concerns regarding sexual assault see USC's Sexual Assault Resource Center (sarc.usc.edu).

Disability: This course follows USC policy on disabilities. If you require special accommodations, please talk to me as soon as possible. The Office of Disability Services and Programs (dsp.usc.edu) provides certification for students with disabilities and helps arrange accommodations. DSP can provide a letter verifying your needs.

Humanistic Inquiry Learning Objectives
Technology is often viewed as a deus ex machina, something that magically appears in history. In fact technology is made by engineers—that is, by humans. This course illuminates the human element in technology through the history of California, showing how engineering decisions involve economic, political, aesthetic, and moral judgments as well as technical ones, whether the decisions were made by immigrant Cornish mining experts in the Gold Rush, aerospace engineers working within the black world of the Cold War security regime, or women struggling to make their way in Silicon Valley. This course examines the worlds of these engineers, seeking to understand who they were, what they did, and how and why they did it. It will also teach students to read and interpret actively and analytically, to think critically and creatively, and to write and speak persuasively. Students will also learn how to evaluate ideas from multiple perspectives and situate them in a broader context, and to arrive at informed opinions on complex issues. These skills are of critical importance, whether students are engineering majors soon to embark on careers in California's high-tech industries, or liberal arts majors who will be citizens in an increasingly tech-centered world.

Required books (available for purchase at USC bookstore)

D.J. Waldie, *Holy Land: A Suburban Memoir*
David Beers, *Blue Sky Dream: A Memoir of America's Fall from Grace*
John Markoff, *What the Dormouse Said: How the Sixties Counterculture Shaped the Personal Computer*

Course schedule

Week one (Jan 8/10) The Gold Rush
Reading:
Karen Clay and Gavin Wright, "Gold Rush Legacy: American Minerals and the Knowledge Economy"

Week two (Jan 17) Oil and Agriculture
Reading:
James C. Williams, *Energy and the Making of Modern California*, ch 7
Paul Sabin, "Beaches versus Oil in Greater Los Angeles"
Tiago Saraiva, "Cloning California"
Adam Romero, "Commercializing Chemical Warfare: Citrus, Cyanide, and an Endless War"
Jim Hightower, "Hard Tomatoes, Hard Times"
Eliza Strickland, "Farmers Fund Robots to Replace Migrant Fruit Pickers"

Week three (Jan 22/24) Infrastructure I: Transportation: Roads, Rail, Ports, Airports
Reading:
William Deverell, *Railroad Crossing*, ch 1
Jeremiah Axelrod, *Inventing Autopia*, ch. 1
Steven P. Erie, *Globalizing L.A.*, ch 3

Week four (Jan 29/31) Infrastructure II: Water and Power
Reading:
William Deverell and Tom Sitton, *Water and Los Angeles: A Tale of Three Rivers, 1900-1941*, selected documents
Bruce Sinclair, "Engineering the Golden State" (on Hetch Hetchy)
James C. Williams, *Energy and the Making of Modern California*, ch 9
Thomas Wellock, "Stick It in LA!: Community Control and Nuclear Power in California's Central Valley"
In-class video excerpts: "Mulholland's Dream"

Week five (Feb 5/7) Aerospace I: The Air Age
Reading:
Waldie, *Holy Land*

Week six (Feb 12/14) Aerospace II: The Space Age
Reading:
Beers, *Blue Sky Dream*
In-class video: Northrop recruiting film, 1957

Week seven (Feb 21) Hollywood
Reading:
Allen J. Scott, *On Hollywood*, ch 2 and ch 5

Week eight (Feb 26/28) Gender and Ethnicity
Reading:
Letters from college engineering deans on enrolling female students, 1917
Sherma Berger Gluck, *Rosie the Riveter Revisited,* oral history excerpts
Lois Mandel, "The Computer Girls," *Cosmopolitan*, 1967
Amy Bix, "'What's a Nice Girl Like You Doing in a Place Like Caltech?'"
Annalee Saxenian, "Networks of Immigrant Entrepreneurs" (on Silicon Valley)
Zuoyue Wang, "Engineering a New Space" (on Chinese Americans in aerospace)

Midterm papers due in class Monday, Mar 5

Week nine (Mar 5/7) Leisure
Reading:
Lawrence Culver, *Frontier of Leisure*, ch 6
Eric Avila, *Popular Culture in the Age of White Flight*, ch 4 (on Disneyland)
Charlie Kelly, *Fat Tire Flyer: Repack and the Birth of Mountain Biking*, excerpts
Peter Neushul and Peter Westwick, "Aerospace and Surfing"

Spring Break (Mar 12/14)

Week ten (Mar 19/21) Silicon Valley I: From the IC to the PC
Reading:
Markoff, *What the Dormouse Said*

Week eleven (Mar 26/28) Silicon Valley II: The Internet and Innovation Ideology
Reading:
Richard Barbrook and Andy Cameron, "The Californian Ideology"
Andrew Russell and Lee Vinsel, "Hail the Maintainers"

Week twelve (Apr 2/4) Engineering the Environment
Reading:
John McPhee, "Los Angeles Against the Mountains"
Wade Graham, "Blueprinting the Regional City"

Week thirteen (Apr 9/11) Biotech
Reading:
Nicolas Rasmussen, *Gene Jockeys*, ch 1
Steve Casper, "How Do Technology Clusters Emerge and Become Sustainable?"

Week fourteen (Apr 16/18) Telecomm, Green Tech, and Silicon Beach
Reading:
Christopher E. Johnson, "Turn on the Sunshine"

James Flanigan, *Smile, Southern California*, ch 2 (on telecomm)

Week fifteen (Apr 23/25) Final Paper Presentations

Final papers due 5 pm, Friday May 4