

Dr. Erika Bsumek

Meeting times: Tuesday and Thursday from 9:30-11

UTC 3.132

Office hours: F, 2-3 or by appointment

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Office Hours: M: 1-3,

Cactus Cafe, in the union, and by appointment.

### **Building America: Engineering Society and Culture, 1868-1980**



This course will look at roughly 100 years of building in American society from the late 1860s through approximately 1980. It will focus on the ways in which politicians, architects, engineers, urban planners, construction workers, naturalists, environmentalists, and others approached the relationship between large-scale infrastructure projects and social development. It will place such building projects in larger historical perspective by evaluating key locations and sets of social relationships (between local, regional and national groups) before and after such projects were built or expanded. Such projects made the United States into one of the most technologically advanced nations in the world, promoted higher

education, and were even used as models for other nations around the world.

The class will cover, among other things, the belief systems of the specific engineers who designed such projects, the entities that commissioned such projects, and the historical context of such beliefs. It will also explore the responses of those who objected to such projects based on religious, political, or economic ideologies.

### **Texts and Readings:**

Ted Steinberg, *Down to Earth: Nature's Role in American History* (Oxford University Press, 2009)

Henry Petroski, *To Engineer is Human: The Role of Failure in Successful Design* (Vintage, 1992)

Documents listed with Course Packet (CP) next to them have been posted on Canvas in the files section.

On-line readings available through either Canvas or the Library (sign on with your UTEID first and then you can access the articles)

Question to keep in mind when reading: *What is the argument of this work? What does the author say? How does he or she say it? What is the main topic discussed? Does the author accomplish his/her goals?*

### **Themes and important information:**

1) **Connections:** One objective of the class will be to establish connections between different kinds of technologies, groups, and innovations. For a sense of what this means, please watch one episode of *Connections* with James Burke. You can find these episodes on Youtube or other sources. We will watch one episode on the first day of class.

2) **The relationship between technology and nature.** This class will also explore the different views of technology and nature. There are a number of important debates surrounding both issues: when is it appropriate to alter nature with technology for human use and when is it inappropriate? Who gets to make such decisions?

3) **Groups and Group work Assignments:** Over the course of the semester, you will participate in 3 group work presentations. Groups will consist of 6-8 members of the class. I will assign you to a specific group. Each member of the group is expected to participate. In addition to presenting, each group will turn in a document detailing what each person did. You will receive a group work grade (worth 15 points) and an individual grade (worth 10 points) for each assignment. Thus, the assignments will be 75 points total. This is a significant amount of your grade.

You will be working in the same group all semester long. Half way through the semester, and again at the end of the semester, you will be asked to grade the others in your group. Remember, if one person fails to complete their part, the entire group project is diminished.

**Group project presentations should be 8 minutes long.** You will answer the questions provided in the prompts on the dates they are due. You can use whatever format you wish to use: oral, video, powerpoint, prezi, etc.

**Class Participation:** Students are required to attend class. **You should come to class prepared and ready to speak about the readings, lectures, and issues presented in the course.** Students are expected to participate in both smaller group work and larger class discussions. You will also be completing a number of “in-class” assignments. Your participation grade will be based on in-class assignments and your overall engagement with the course.

We will take attendance in the class. You will check in with either Kyle Shelton or myself every day. You get 2 automatically excused absences. You do not have to inform us if you are going to be absent.

**Students also take two exams: a mid-term and a final.** Each exam will be worth 100 points.

**Short writing assignment: 2-3 pages.**

In this assignment, students will pick one large infrastructure project and place it in historical context. You will also explore the social and ecological ramifications of this project by asking: What connections can we make between this project and 1) social and cultural changes in society, 2) other technological or scientific discoveries. You must do your own research. You must use four scholarly sources. But, only two of them may be websites. The other two must be books or journal articles. You must also use one primary source. You may turn in this paper on either **FEBRUARY 18<sup>TH</sup>** or **APRIL 8<sup>TH</sup>**. **You must decide which date you will pick.** You may pick a project we study in class or one we have not covered. The criteria: It must be a project built in America during the years covered in the class.

**Quizzes:** There may be series of short quizzes given throughout the semester. Most of these will be fill in the blank quizzes. They are designed to help you grasp the overall chronology of the projects discussed and their importance to society. Each quiz will be worth 5 points.

**Grading:**

Students will be graded based on the percentage of points they earn in the class.

93-100 =

90-92 = A-

87-89 = B+

83-86 = B

80-82 = B-

77-79 = C +

73-76 = C

70-72 = C-  
67-69 = D+  
63-66 = D  
60-62 = D-  
Below 60: F

**THE SYLLABUS IS SUBJECT TO CHANGE, CHANGES WILL BE ANNOUNCED IN CLASS AND CHANGES WILL BE POSTED ON CANVAS.**

**ACADEMIC HONESTY and PERSONAL RESPONSIBILITY:** Academic honesty is very important. You are expected to complete your own work. If you have any questions about academic guidelines you may call me, 475-7253, or email me at ANY time. You should follow University guidelines regarding plagiarism and student conduct. For further information see: <http://uwc.fac.utexas.edu/~virgil/essay/research/plagiarism.html>

**Important Notes:**

1. **Respect the classroom environment. Turn off all cell-phones while in class. Do not read the newspaper, search the web, or send text messages while in class.**
2. **Any handouts that you receive from the instructor or teaching assistants should be treated as required reading.**
3. **My office is on the 2<sup>nd</sup> floor in Garrison Hall. It is accessible by elevator. If, for some reason, my office is inaccessible to you, I will make arrangements to meet in a different locale.**
4. **The University of Texas provides, upon request, academic accommodations for students with disabilities. For more information contact the Office of the Dean of Students, 471-6259 or 471-4641.**
5. **I will follow University standards and rules regarding academic dishonesty. You should familiarize yourself with these standards [link provided above] and consequences of violations university policy.**
6. **Email policy: I will answer student emails within 72 hours of receiving them.**

To meet U.S. History Core Component requirements, this course will help students develop their critical thinking and communication skills. Students are personally responsible for their behavior in class and the work that they produce. This course will also cover the ways in which individuals have worked together to create responsible societies. This course also carries a sustainability flag.

**Web Resources for class:** These represent a small fraction of the resources you may want to reference for group projects.

Podcasts, Engineering Commons, <http://theengineeringcommons.com/>

Engineering, An endless Frontier, <http://www.creatingtechnology.org/engineering.htm>

Stanford, Spatial History Project <http://www.stanford.edu/group/spatialhistory/cgi->

[bin/site/index.php](#)

American Society for Civil Engineers, <http://www.asce.org/People-and-Projects/History-and-Heritage/>

“Exhibitions — FORM and LANDSCAPE.” <http://pstp-edison.com/exhibitions/>

“Living New Deal.” <http://livingnewdeal.berkeley.edu/>

“The Center for Land Use Interpretation.” <http://www.clui.org/>

“BLDGBLOG.” <http://bldgblog.blogspot.com/>

“99% Invisible.” <http://99percentinvisible.org/>

“Paleofuture.” <http://paleofuture.gizmodo.com/>

The Atlantic Cities.” <http://www.theatlanticcities.com/>

### **Class Schedule:**

#### **Week 1:**

1/14 - Introduction to class. Syllabus review and general discussion about the class.

<http://www.youtube.com/watch?v=Cklz-u41BK4&feature=c4-overview-vl&list=PLF87D00305FBF2088>

1/16: Group determinations made. I will divide the class into 10 groups of 6-8 students.

#### **Readings:**

-Steinberg, “Rocks and History,” Intro to *Down to Earth*

-Canvas: Samuel Florman, “What was Troy to This?” from *The Existential Pleasures of Engineering* (New York: St. Martin’s Press, 1976, 1994)

-Canvas: Tractenberg, “Brooklyn Bridge as Cultural Text” p. 1-12

<http://onlinelibrary.wiley.com/doi/10.1111/j.1749-6632.1984.tb23507.x/pdf>

#### **Week 2: Brooklyn Bridge**

1/21: In class video *The Brooklyn Bridge* and discussion.

**Reading:** Petroski, *To Engineer is Human*, Preface to book.

William Conant, “The Brooklyn Bridge,” *Harper’s New Monthly Magazine*, May 24, 1883. (CP)

#### **First Group Work Presentation due: What came before?**

Before coming to class, your group must identify one project that preceded and influenced the building of the Brooklyn Bridge. This can be a project designed by Roebling or another

builder or an ancient one or a modern project but you must be able to identify a correlation between the projects.

Each group will give an 8 minute presentation. You need to turn in a sheet detailing the contributions of each group member. You will also grade each other in this exercise.

### **1/23: Brooklyn Bridge – social contexts**

Richard Haw, “American History/American Memory: Reevaluating Walt Whitman’s Relationship with the Brooklyn Bridge,” *Journal of American Studies* 38, no. 01, (2004); 1-22. (CP)

### **Week 3: Brooklyn Bridge**

#### **1/28: Cultural changes, post 1880s and 1890s**

##### **Reading:**

Steinberg, Chapter 4, “A World of Commodities”

Petroski, *To Engineer is Human*, Ch. 13, “The Ups and Downs of Bridges.”

#### **1/30: Crossing Bridges?**

Success and failures, breaking barriers, and looking into the future.

**In class group work assignment:** For this assignment you need to find one depiction of the Brooklyn Bridge as a symbol of the future (produced either in the past or the present) before you come to class. In class, as a group, you will discuss what these images show us about ways did people imagine or imagined the future.

##### **Reading:**

Petroski, *To Engineer is Human*, Ch. 5.

Library of Congress, “Roebing and the Brooklyn Bridge”

<http://memory.loc.gov/ammem/today/jun12.html>

### **Week 4: A growing nation**

**2/4:** Population changes and the American environment.

##### **Reading:**

Steinberg, Ch. 6, “The Great Food Fight”

Petroski, *To Engineer is Human*, Ch. 3-4.

**2/6:** Kit homes, 1908-1940

##### **Reading:**

Steinberg, Ch. 7, Extracting the New South

Harris, Richard. “The Talk of the Town: Kit Manufacturers Negotiate the Building Industry, 1905-1929.” *Journal of Urban History* 36, no. 6 (November 1, 2010): 868–896. (CP)

## **Week 5: Urban and rural**

2/11: Land economics.

### **Reading:**

Richards, Ellen H. "The Place of the House in the Social Economy of the Twentieth Century." *The Cost of Shelter*. New York: Wiley, 1905 (CP)

Ely, Richard. "Foreword." in *Mortgages on Homes: A Report on the Results of the Inquiry as to the Mortgage Debt on Homes Other Than Farm Homes at the Fourteenth Census, 1920*. Washington DC: Government Printing Office, 1923. (CP)

Steinberg, Ch. 8, "The Unforgiving West,"

## **2/13**

**Group work presentation 2:** Living arrangements. Why did people make the kinds of choices they did between 1870-1930? What questions would you have to ask to answer that question? What information would you need to compile? What kinds of technology was involved in the creation of various forms of housing?

Use at least three different sources (from those listed below or ones you identify) and then attempt to answer the first question.

Sources for inquiry:

### **DRAWINGS AND IMAGES**

<http://www.searsarchives.com/homes/byimage.htm>

### **WEB RESOURCES**

<http://www.searsarchives.com/homes/>

<http://www.searshomes.org/>

<http://www.kithouse.org/>

### **FILM/VIDEO**

<http://www.pbs.org/opb/historydetectives/investigation/sears-home/>

## **Week 6: Off shoots and ripple effects**

2/18: Guest Lecture: Professor Steven Moore, History of Sustainability.  
Steinberg, Ch. 9

**1<sup>st</sup> option: Short writing assignment DUE**

2/20: Environment, water, and waste.

**Readings:**

Martin Melosi, "How Bad Theory led to Good Technology," from *Precious Commodity: Providing Water for America's Cities*, (Pittsburgh: University of Pittsburgh Press, 2011); 37-56. (CP)

**Web resource:**

History of Wastewater Treatment:

<http://www.macalester.edu/academics/environmentalstudies/students/projects/urbanwastewaterwebsite/history.html>

**Week 7:**

**2/25:** Building Systems of Health and Sanitation

**Reading:**

Steinberg, Ch. 10, "Death of the Organic City,"

**Web resource:**

The Evolution of Sewage Treatment:

<http://www.cefn.sau.edu/Projects/WDP/resources/History/History.htm>

**2/27** – Transportation and transformations in American life

**Reading:**

Steinberg, Ch. 11 and Ch. 13

**Readings on Ford all in CP:** "Inventing the Assembly Line," "Excerpt from 'Detroit Motors' from *The American Earthquake*," "My seven years of automotive servitude," Kline and Trevor Pinch, "The Social Construction of the Automobile in the Rural United States."

**Group Discussion**

**Week 8:**

**March 4:** Guest Lecture: Kyle Shelton. "Engineering auto-centric landscapes, 1920-1950s."

**In class discussion:** Transportation choices. Why did American invest so heavily in highways and not other forms of transportation like high-speed trains or monorail? How did highways transform social, cultural, and economic relationships? Please look at the sources below. We will have a in-class discussion assignment based on the questions asked above and the documents and web resources listed below.

**Reading:**

Mumford, Lewis. "The Highway and the City," *Architectural Record* 123 (April 1958): 179-86 (CP)

Norman Bel Geddes, *Magic Motorways* (CP)

Owen D. Gutfreund, "Highway Federalism," from *20<sup>th</sup> Century Sprawl: Highways and the Reshaping of the American Landscape* (Oxford: Oxford University Press, 2004). (CP)

**Web resources:**

- “On the Interstate” from Smithsonian exhibit *America on the Move*  
[http://amhistory.si.edu/onthemove/exhibition/exhibition\\_16\\_1.html](http://amhistory.si.edu/onthemove/exhibition/exhibition_16_1.html)
- “Vermont's Interstate Highways - Interpreting the Interstates”  
<http://www.uvm.edu/landscape/learn/interstate.html>
- Eisenhower, Dwight D. “Statement regarding the 1958 Federal Aid Highway Act, April 16, 1958” [DDE’s Records as President, Official File, Box 611, OF 141-B Highways and Thoroughfares]  
[http://www.eisenhower.archives.gov/research/online\\_documents/interstate\\_highway\\_system.html](http://www.eisenhower.archives.gov/research/online_documents/interstate_highway_system.html)
- “Eisenhower Interstate Highway System Home Page.”  
<http://www.fhwa.dot.gov/interstate/homepage.cfm>.
- Eisenhower Presidential Library and Museum.”  
[http://www.eisenhower.archives.gov/research/online\\_documents/interstate\\_highway\\_system.html](http://www.eisenhower.archives.gov/research/online_documents/interstate_highway_system.html)

**March 6: Mid-term Exam****Week 9: SPRING BREAK  
MARCH 10-15****Week 10:**

**3/18:** Engineering the American Vacation and Natural Spaces

**Reading:**

Atchison, Topeka, and Santa Fe Railway Company, and Fred Harvey (Firm). *Indian-Detours Roundabout Old Santa Fé, N.M.* Chicago, Ill: Santa Fé and the Harvey Company, 1938. (CP)  
Steinberg, ch.14 and 15

**3/20:** Defensive Engineering

**Reading:**

Thomas P. Hughs, “Managing a Military Industrial Complex,” from *Rescuing Prometheus: Four Monumental Projects that Changed the Modern World*, (New York: Vintage Books, 2000). (CP)

Powers, Richard Gid. “The Cold War in the Rockies: American Ideology and the Air Force Academy Design.” *Art Journal* 33, no. 4 (July 1, 1974): 304–313. (CP)

**Week 11:**

**3/25:** Economic Depression and technical innovation

**Reading:**

Steinberg, Ch. 15, "Shades of Green," in *Down to Earth*.  
Charles Wilkenson, "Water and the Environment," from *Major Problems in American Environmental History* (Boston: Houghton Mifflin, 2005), 485-490. (CP)

**3/27:** New Deal, New Dams.

**Reading:**

Donald Jackson and David P. Billington, "The Colorado River: Boulder Canyon Project and Hoover Dam," in *Big Dams of the New Deal Era: A Confluence of Engineering and Politics*, (Norman: University of Oklahoma Press, 2006); 102-150. (CP)

**Week 12:**

**4/1 – Guest Lecture, Allan Shearer. Mid-century designs and micro-climates.**

**4/3- Betsy Rothwell guest lecture on air-conditioning.  
Group discussion. Possible short film, reading TBA.**

**Week 13:**

**4/8 – Glen Canyon and the West**

Listen: Floyd Dominy  
<http://www.npr.org/templates/story/story.php?storyId=126511368>

Reading: Donald Pisani, "Biography, Floyd Dominy"  
<http://www.waterhistory.org/histories/dominy/>

Glen Canyon Unit, USBR history. Read pages, 1-36.  
[http://www.usbr.gov/projects/ImageServer?imgName=Doc\\_1232657383034.pdf](http://www.usbr.gov/projects/ImageServer?imgName=Doc_1232657383034.pdf)

Second option: Short Writing Assignment DUE.

**4/10 – Dams, energy, and engineered ecologies.**

**Reading:** Note, both of these readings can be found on the web. Please follow the links. Please get in touch if they don't work.

We will have an in-class assignment using these documents. Please read them before you come to class.

David Brower, "Let the River Run through it,"  
<http://www.sierraclub.org/sierra/199703/brower.asp>

Jared Farmer, "Glen Canyon and the Persistence of Wilderness," in *WHQ* (Summer 1996); 210-222.  
<http://engl273g-s12-stamatel.wikispaces.umb.edu/file/view/pdf+Glen+Canyon+and+Edward+Abbey.pdf>

**Week 14:**

4/15 – Engineering Society.

**Reading:**

Steinberg, ch. 16.

Richard C. Bradley, "Is Engineering Education Enough?" A Paper presented at the 70<sup>th</sup> Annual Meeting of the American Society for Engineering Education; U.S. Air Force Academy, Colorado Springs, Colorado; June 18 to 22, 1962) (CP)

**4/17 – Group presentation assignment 3:** Theme resource management and distribution. How did engineers help determine federal and state policy toward resource distribution? What connections can be made between the 1930s-1960s and today in terms of how water is stored, distributed, and valued?

\*This week you are responsible for finding your own resources. You must identify reliable resources. If from the web these should primarily be .org or .edu sites.

**Week 15:**

4/22 – Upward mobility

**Reading:**

McNeill, Donald. "Skyscraper Geography." *Progress in Human Geography* 29, no. 1 (February 1, 2005): 41–55. (CP)

Khan, Fazlur R. "Changing Scale of the Cities," *Consulting Engineer*, April, 1974, pp. 69-73. (CP)

"SKYSCRAPER PESTS: Chicago Spiders Rise Up, Up, Up." *Los Angeles Times (1923-Current File)*. August 21, 1975, sec. PART ONE. (CP)

4/24 – Problem solving

**Reading:**

Petroski, Ch. 8, “Accidents Waiting to Happen,” in *To Engineer is Human*

Petroski, “Buildings and Systems” (CP)

**Resources: We will use the following sources in a class activity.**

“The Skyscraper Museum.”

<http://www.skyscraper.org/home.htm>.

“Fazlur Khan, Structural Artist of Urban Building Forms” (exhibit)

<http://khan.princeton.edu/index.html>

“The Willis Tower, Chicago.” *Chicago Architecture Info*.

<http://www.chicagoarchitecture.info/Building/375/The-Willis-Tower.php>.

**Week 16**

4/29 – Final exam study guide passed out. Course recap.

**Reading:**

Petroski, *To Engineer is Human*, ch. 15 and 16.

5/1- What progress has wrought.

**Reading:**

Petroski, “Great Achievements and Grand Challenges,” in *The Essential Engineer*. (CP)

