

# Engineering Cultures

**STS/HIST 2054: Engineering Cultures**

**Syllabus**

**Summer Session 2 2021**

## **INSTRUCTOR:**

Savannah Mandel

PhD candidate, Science and Technology Studies

Office: 324 Lane Hall (Don't hesitate to let me know if you need a more accessible meeting location)

Email: [Savannahlann@vt.edu](mailto:Savannahlann@vt.edu) or via Canvas

Office Hours: By appointment

## **COURSE LOCATION AND TIME:**

This course will be taught asynchronously from July 7th - August 13th. All assignments and information will be posted on Canvas.

## **COURSE DESCRIPTION:**

Engineering Cultures takes its students on a trip around the world, exploring the varying knowledge, identities, and commitments of engineers and engineering education across Korea, the United Kingdom, France, Germany, and the United States. Together we examine values in emergent infrastructures of engineering education and work, and the participation of engineers and engineering in evolving forms of capitalism. Students will learn to reflect critically on their knowledge, identities, and commitments in varying curricula and a globalizing world.

## **LEARNING OBJECTIVES:**

- Describe how contrasting infrastructures of engineering formation and work have emerged across five countries: Korea, United Kingdom, France, Germany, and United States.
- Describe how participating in different infrastructures of engineering formation and work have challenged students and working engineers to accept and value different forms of knowledge and expertise, positions in the workplace and society, and images of progress.
- Describe how individual engineers respond differently to the challenges of participating in infrastructures of engineering formation and work.
- Describe cultural differences as differences in dominant images that challenge people (rather than shared beliefs and values, or other formulations).
- Work better with both engineers and non-engineers who draw boundaries around problems differently than you do.
- Understand and critically assess how you position yourself in a world of contrasting perspectives.
- Practice the most important leadership skill: listening to perspectives other than your own, with the expectation that they have value.
- Figure out how and where to locate engineering problem solving in your lives while also holding onto your dreams.

## **INCLUSION STATEMENT AND ACCOMODATIONS:**

Students with disabilities are responsible for self-identification and are encouraged to contact Services for Students with Disabilities. If you require any special arrangements or considerations for the class, please contact me immediately to arrange an appointment to discuss accommodations. See <https://www.ssd.vt.edu/>.

All students learn differently. If you are concerned that your learning style is not currently accommodated in the class, please contact me to discuss your individual learning needs.

If the official Virginia Tech roster does not list your preferred name or indicate your preferred pronouns, please let me know as soon as possible so I can adjust my roster accordingly. This course strives to uphold the Virginia Tech Principles of Community. If you are concerned at any point that I or a fellow student have failed to uphold these Principles, please notify me.

### **COMMUNICATION EXPECTATIONS:**

You're welcome to contact me via email or directly through Canvas. I strive to respond to any emails within a 48 hour period.

Just as you hold me accountable for answering emails, I hold you responsible for checking your emails and Canvas announcements regularly and reading them in their entirety. I promise to try to keep the emails to a minimum.

If you have questions regarding assignments or due dates please refer to the syllabus and schedule located on Canvas before reaching out to me. If the syllabus changes I will email you to let you know.

If you find you're struggling with either the course material or assignments please reach out and I will try and assist you (or point you to resources that might help). That being said, do not wait until the last week of class or 5 minutes before an assignment is due to ask for help.

### **GRADING POLICIES:**

#### **Course Requirements**

The course has a total of 100 possible points, distributed as follows:

5 Reflection Assignments	= 100 pts (20 pts x 5)
1 Final Project	= 50 pts
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Total	= 150 pts

## **Late Work**

Late work is not accepted. If you anticipate extenuating circumstances that may prevent you from completing an assignment, please arrange an alternate deadline or assignment with me in advance. If you have a medical or family emergency, please provide a copy of the appropriate paperwork if applicable and reach out to me when you return.

## **Make Up Assignment**

You can choose to revise and resubmit one reflection assignment if you are dissatisfied with your grade. Any revisions must be submitted by **Wednesday August 11th at 11:59pm** via Canvas.

## **Extra Credit**

This course has no extra-credit assignments.

## **Feedback**

I will provide brief written feedback on every graded assignment. That being said, don't hesitate to reach out to me if you would like to schedule a more extensive feedback session or if you are concerned about your progress in the course.

## **COURSE SCHEDULE:**

### **Week 1 (July 7th - July 9th): What challenges engineers?**

#### **Readings (Total Pages: 18)**

- "Introduction: Culture as Dominant Images" by Gary Downey (6p)
- "The Political Pleasures of Engineering" by Herb Brody (7p)

- "Trial and Error in Washington" by Samuel Florman (1p)
- "What is Global Engineering Education For?" by Gary Downey (4p)

### **Due Dates**

- Reflection Assignment 1 Due **Friday July 9th at 11:59pm**

## **Week 2 (July 12th - July 16th): Engineers for Korea**

### **Readings (Total Pages: 59)**

- "Chapter 1: What are Korean Engineers for?" in *Engineers for Korea* by Gary Downey and Kyonghee Han (20p)
- "Chapter 3: Technical Workers for Light Industry: 1961-1970" in *Engineers for Korea* by Gary Downey and Kyonghee Han (20p)
- "Chapter 4: Engineers for Heavy and Chemical Industries: 1970-1979" in *Engineers for Korea* by Gary Downey and Kyonghee Han (19p)

### **Due Dates**

- Reflection Assignment 2 Due **Friday July 16th at 11:59pm**

## **Week 3 (July 19th - July 23rd): Engineers for Great Britain**

### **Readings (Total Pages: 28)**

- "Britain and European Engineering Education" by P.B. Morice (5p)
- "Education or Training? The Dilemma of British Engineering in the 19th Century" by Angus Buchanan (5p)
- "Lives of the Engineers" by Samuel Smiles (18p)

### **Due Dates**

- Reflection Assignment 3 Due **Friday July 23rd at 11:59pm**

#### **Week 4 (July 26th - July 30th): Engineers for France**

##### **Readings (Total Pages: 35)**

- "The Making of the French Engineer" by Stephen Crawford (Pages 98-106) (9p)
- "The French Technologists" by Eda Kranakis (13p)
- "From Technical Corps to Technocratic Power: French state engineers and their professional and cultural universe in the first half of the 19th century" by Bruno Belhoste and Konstantinos Chatzis (Note: skip the discussion of mechanics on pp. 218-219) (13p)

##### **Due Dates**

- Reflection Assignment 4 Due **Friday July 30th at 11:59pm**

#### **Week 5 (August 2nd - August 6th): Engineers for Germany**

##### **Readings (Total Pages: 25)**

- "Engineering Education in Germany" by by Suzanne Kennedy (4p)
- "The Long Quest for Professional Identity: German Engineers in Historical Perspective 1850 - 1990" by Kees Gispen (15p)
- "Testimony of Crematorium Engineers" (2p)
- "Measuring the cost of quality: German engineering at the crossroads" by Gary Legg (4p)

##### **Due Dates**

- Reflection Assignment 5 Due **Friday August 6th at 11:59pm**

- If you're choosing Final Project Option 3 you need to schedule a meeting with me or send me an email to approve your final project idea by **Friday August 6th at 5:00pm**

## **Week 6 (August 9th - August 13th): Engineers for the United States**

### **Readings (Total Pages: 33)**

- "The Engineer in 19th Century America" by Terry Reynolds (20p)
- "Turn of the Century" by James Surowiecki (2p)
- "The Wedding of Science to the Useful Arts 3: the emergence of the Professional Engineer" by Noble (Pages 33-44) (11p)

### **Due Dates**

- Final Project Due **Friday August 13th at 11:59pm**

## **ASSIGNMENTS:**

### **Reflection Assignments**

You will have 5 reflection assignments to complete over the course of the semester. These will vary in nature and style. Some will be short answer responses and others will be interactive worksheets or comparison charts. All will require that you prove your comprehension of the assigned materials for the week and that you display your knowledge of course concepts.

All reflection assignments will be available to view at the beginning of the semester. Each will come with it's own set of instructions. Make sure that you review the requirements for each reflection assignment carefully.

Reflection assignments are each worth 20 points each for a total of 100 points, or 67% of your final grade. They are due at 11:59pm on Friday night

each week. You are allowed to revise and resubmit one reflection assignment per the make-up policy described above.

## **Final Project**

This course recognizes that not every student learns the same way. With that in mind you have three options for your final project.

**Option 1:** Take an Exam. You can take a traditional cumulative exam with 10 short answer questions which will require you to reflect on and respond to the material covered in class from Week 1 through Week 6. You will have two and a half hours to complete the exam. It will be open book and open note. You can access the exam via “quizzes” in Canvas but it will not be visible until 6am on Friday August 13th.

**Option 2:** Write an Essay. You can write a 1,500 - 2,000 word essay based on a prompt. This essay will require cumulative comprehension and personal reflection on the course materials from Week 1 through Week 6. If you opt to complete the essay you will have a week after receiving the prompt to complete it. The prompt will be available to view **Monday August 9th** under “assignments” in Canvas. You must submit the essay by midnight on Friday August 13th.

**Option 3:** Design your own project. You are welcome to come up with your own idea for a final project but you’ll need to set up a meeting with me to discuss your plan by **August 6th** at the latest. Consider this option free range! Let your imagination run wild. You could create a podcast episode, write a script, create a short story, film a mini-documentary, curate a museum exhibit, put together a photography exhibition, design a poster presentation. It’s completely up to you. But whatever you do must be reflective of all six of the topics covered in this course. You will submit your final project via “assignments” in Canvas, unless its impossible to do so (ex. You created an interpreted dance and you would like to host a zoom performance of it).



The Final Project is worth 33% of your grade and will need to be finished and turned in by **11:59pm Friday August 13th**.

**HONOR CODE:**

We follow the Virginia Tech Honor System in this class. Please make yourself familiar with the Honor System practices and the various definitions of plagiarism. All assignments submitted should be considered graded work, unless otherwise noted. For more information on the Honor Code, please see <http://www.honorsystem.vt.edu>.