

HTS 1081, Fall 2026
Engineering in History
TuTh 3:30 pm – 4:45 pm; Skiles 270

Professor: Eric Schatzberg Office: Old Civil Engineering 124	Office hours: Mon. 5:00-6:00 pm or by appt. Email: eric.schatzberg@hsoc.gatech.edu
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Description. This course examines the history of engineers and the engineering profession. There are three major sections to the course. The first section examines the nature of engineering using examples from engineering practice. The second section deals with the history of the engineering profession and its relationship to other facets of society. The third section focuses on the ethics of engineering through case studies of engineering failures.

Course Goals and Learning Outcomes. By the end of HTS 1081, students should be able to:

- Define “engineering” as a profession and set of activities;
- Define “technology” with examples;
- Give a broad overview of the history of engineering;
- Explain the ethical implications of engineering practice.

Requirements

This course does not require much written work outside of class. Instead, we focus on in-class activities that contribute to both learning and assessment.

Lecture. Paying attention to lectures is necessary if you want to succeed in the course. Some lectures may be delivered asynchronously.

Readings. This course has readings for every week except the last. Most readings are short and accessible, but some readings are longer and more challenging. To avoid getting bogged down in details, use the questions from the weekly reading overview to help you focus on the most important points.

Discussion. This class is at rather large for discussion, but not too large. Please come prepared to participate.

Weekly assessments. Expect some sort of in-class writing each week.

Exams. I used to give take-home exams, but those don’t work in the era of generative AI. Instead, I’m giving an in-class blue-book final, along with two shorter in-class essay exams at the end of the fifth and tenth weeks.

Attendance is required, and counts for 10% of your grade. If you need to be absent, please let me know in advance and I’ll do my best to accommodate you. If you are absent because of illness or other unpredictable reasons, please inform me as soon as possible.

Grades. Two in-class essay exams, 10% each (20% total); final exam, 20%; weekly quizzes, discussions, and other assignments, 50%, attendance, 10%.

Percentage grades will be converted to letter grades as follows: $100 \geq A \geq 90$; $90 > B \geq 80$; $80 > C \geq 70$; $70 > D \geq 60$; $F < 60$.

Canvas. The website for this course is on Canvas. I will send out reminders and assignments through Canvas.

Course Books and Readings. There is one required book that you will need to get for week 10:

Loren R. Graham, *The Ghost of the Executed Engineer: Technology and the Fall of the Soviet Union* (Cambridge: Harvard University Press, 1996).

All other assigned readings are posted on Canvas.

Academic Integrity. AI has basically wrecked academic integrity. Still, I expect students to maintain the highest ethical standards by following the Georgia Tech rules on academic misconduct, known as the “Honor Code”: <http://b.gatech.edu/2CjF1Ro>. Any student suspected of cheating on a quiz, exam, or assignment will be reported to the Office of Student Integrity.

Also see the Student-Faculty Expectations Agreement (<https://catalog.gatech.edu/rules/21/>).

AI Policy. Generative AI has already transformed higher education, mostly for the worse. AI won’t teach you how to read critically, how to write in your own voice, or how to think cogently.

But I’m not going to try to police your AI use. Instead, I’m just making it hard to use AI for your work in the class. Most of your grade will depend on in-class tasks, including reading, writing, and participation in discussion. We will have bluebook exams. Consider learning cursive. Don't expect a good grade if I can't read your handwriting.

Use of Electronic Devices During Class. Electronic devices, including phones, tablets, and laptops, are not permitted at any time during class, except for students with accommodations or when explicitly permitted by your instructor. No peeking at your phones.

Recordings. Classes may not be recorded without the express consent of the instructor, except when an accommodation has been granted by the Office of Disability Services. Materials posted on Canvas are only for students currently enrolled in the course and may not be shared without the instructor’s permission.

Accommodations for Students with Disabilities. If you have a disability that might affect your performance in this course, please contact the Office of Disability Services at (404) 894-2563 or <http://disabilityservices.gatech.edu/> as soon as possible. Also, let me know about your learning needs and I'll do my best to accommodate you.

Religious Holidays. You can take off any religious holiday you want, as long as you make up the work and inform me in advance, preferably by the second week of class. For more detail see <http://catalog.gatech.edu/rules/4/>, ¶B.5.

Freaking Out. College life often involves a lot of stress. If you feel like things are getting out of hand, either for personal or academic reasons, please let me know. Help is available from the [Center for Mental Health Care](#), Stamps Health Services, and the Dean of Students Office. These offices offer both in-person and virtual appointments. For more information on these and other student services, contact the Dean of Students or the [Division of Student Life](#).

Commitment to Inclusivity. My classroom is a safe space for people and ideas of all kinds. If you are feeling excluded for any reason, please let me know.

Boilerplate. The University System of Georgia and the Georgia Institute of Technology require that I include the following bland language in this syllabus. Feel free to ignore this section.

This is a Core IMPACTS course that is part of the Social Sciences area.

Core IMPACTS refers to the core curriculum, which provides students with essential knowledge in foundational academic areas. This course will help master course content, and support students' broad academic and career goals.

This course should direct students toward a broad Orienting Question: • How do I understand human experiences and connections?

Completion of this course should enable students to meet the following Learning Outcome:

- Students will effectively analyze the complexity of human behavior, and how historical, economic, political, social, or geographic relationships develop, persist, or change.

Course content, activities and exercises in this course should help students develop the following Career-Ready Competencies:

- Intercultural Competence
- Perspective-Taking
- Persuasion

Ethics Attribute Learning Outcomes

HTS 2084 fulfills the Georgia Tech ethics requirement. In this course, students will acquire:

- An ability to recognize ethical and professional responsibilities in real-world contexts.
- An ability to assess actions or decisions based on established ethical principles and theories, or through deliberative processes.
- An ability to consider the implications of actions, both for society as a whole and for individuals.

Course Outline

Section 1: What Engineers Do

Week 1 (Aug. 25, 27) Introduction – What is Engineering?

How do engineers think: stereotypes or grains of truth?

Reading: Donna Riley, “Mindsets in Engineering,” in *Engineering and Social Justice* (Springer International, 2008), 33-45.

Assignment (8/27): write a short in-class reflection piece on the reading.

Week 2 (Sep. 1, 3) Overview

Engineering versus technology versus science; the boundaries of engineering; engineering as professional practice.

Reading: Michael Davis, “An Historical Preface to Engineering Ethics,” *Science and Engineering Ethics* 1, no. 1 (1995): 33–48;
Henry Petroski, “Scientists vs. Engineers,” in *An Engineer’s Alphabet: Gleanings from the Softer Side of a Profession* (Cambridge University Press, 2011), 280-283.

Week 3 (Sep 8, 10) Engineering Practice 1: The Soul of a New Machine

A riveting account of designing a new computer.

Reading: Tracy Kidder, “Flying Upside Down,” *Technology, The Atlantic*, July 1, 1981, 54-64.

Week 4 (Sep. 15, 17) Engineering Practice 2: Corporate Politics and Product Design

The failure of an innovative air-cooled engine at General Motors.

Reading: Stuart W. Leslie, “Charles F. Kettering and the Copper-Cooled Engine,” *Technology and Culture* 20, no. 4 (1979): 752–76.

Week 5 (Sep. 22, 24) Engineering Practice 3: Power, the Public, and Great Bridges

Politics, power, and technology in bridge design and construction.

Reading: Henry Petroski, “Bridges and Politics,” in *Invention by Design: How Engineers Get from Thought to Thing* (Harvard Univ. Press, 2002), 160-187.

First in-class essay exam, Thursday Sep. 24, on weeks 1-5 of the course.

Section 2: Engineering in the 19th and 20th Centuries

Week 6 (Sep. 29, Oct. 1) Engineering as a Profession in 19th-Century America

MIT and Georgia Tech; school culture vs. shop culture.

Reading: James E. Brittain and Robert C. McMath, "Engineers and the New South Creed: The Formation and Early Development of Georgia Tech," *Technology and Culture* 18, no. 2 (1977): 175–201.

Fall Break (Oct. 6) No Class

Week 7 (Oct. 8) Post-WWII Engineering Education

The rise of science-heavy engineering education under the impact of the Cold War.

Reading: Bruce E. Seely, "The Other Re-Engineering of Engineering Education, 1900–1965," *Journal of Engineering Education* 88, no. 3 (1999): 285–94.

Week 8 (Oct. 13, 15) Women in Engineering: Why So Few?

Engineering as a male domain.

Reading: Amy Sue Bix, "From 'Engineeresses' to 'Girl Engineers' to 'Good Engineers': A History of Women's U.S. Engineering Education," *NWSA Journal* 16, (2004): 27–49; Monique Frize, "Obstacles to the Entry of Young Women into Science and Engineering," in *The Bold and the Brave: A History of Women in Science and Engineering* (University of Ottawa Press, 2010), 123-34.

Week 9 (Oct. 20, 22) Engineers versus Workers: Scientific Management and Fordism

Engineers and the "labor problem"; Frederick Winslow Taylor and scientific management; Henry Ford and mass production.

Reading: Thomas P. Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm, 1870-1970* (Chicago, U. of Chicago Press, 1989), 184-220; Henry Ford, selection from "The Terror of the Machine," chap. 7 in *My Life and Work* (Garden City, NY: Doubleday, Page, 1922), 103-111.

Week 10 (Oct. 27, 29) Engineering and Totalitarianism

Engineering in the Soviet Union.

Reading: Loren R. Graham, *The Ghost of the Executed Engineer: Technology and the Fall of the Soviet Union*, (Cambridge: Harvard University Press, 1996), entire book.

Second in-class essay exam, Tuesday Nov. 3, on weeks 6-10 of the course.

Section 3: Ethics of Engineering

Week 11 (Nov. 3, 5) Engineering Ethics – a Short History

Business vs. science; codes of engineering ethics.

Reading: Michael Davis, “Professional Codes of Ethics,” in *The Routledge Handbook of the Philosophy of Engineering* (Routledge, 2020), 580–91.

Week 12 (Nov. 10, 12) Neglecting Safety 1: the Chevrolet Corvair and Ford Pinto

The Chevrolet Corvair and its implications for engineering ethics.

Reading: Ralph Nader, *Unsafe at Any Speed: The Designed-In Dangers of the American Automobile* (New York: Grossman, 1965), vii-x, 1-32;

Optional: Mark Dowie, “Pinto Madness,” *Mother Jones*, October/November 1977, 18-32.

Week 13 (Nov. 17, 19) Neglecting Safety 2: Engineering Structural Disasters

Failures in civil engineering; the Quebec Bridge disaster of 1907 as a case study.

Reading: Eda Kranakis, “Fixing the Blame: Organizational Culture and the Quebec Bridge Collapse,” *Technology and Culture* 45, no. 3 (2004): 487–518.

Thanksgiving Break (Nov. 26)

Week 14 (Nov. 24, Dec. 1, 3): Neglecting Safety 3: The Boeing 737 Max

When engineers yield to accountants.

Reading: Maureen Tkacik, “Crash Course: How Boeing’s Managerial Revolution Created the 737 Max Disaster,” *New Republic* 250, no. 10 (2019): 12–23.

Video: *Downfall: The Case Against Boeing*, documentary, directed by Rory Kennedy (Netflix, 2022), 1:29, <https://www.netflix.com/watch/81272421>.

Week 15 (Dec. 8) History and the Ethical Engineer

Course wrap-up: can history of engineering help us create a more just world?

Reading: none.

In-class final – Tuesday, December 15, 2:40 PM - 5:30 PM

Blue-book exam covering weeks 11-15 of the course.