

STS 004
Intersections: Science, Technology, and the World
Fall 2018

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Office hours: Th. 11-12:30 and by appt.

Classroom: 1-273
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This class is an introduction to the field of Science, Technology, and Society (STS), a field in which historians and social scientists study the development of science and technology in culture. Whereas scientists and engineers study the way nature works, STS scholars study the way scientists and engineers work – how they choose problems, how they deal with contradictory evidence or seemingly unsolvable problems, how their goal of objectivity is challenged in the lab and in the broader world, how they are or are not influenced by politics, funding, and other things, what inspires them – to name just a few of the questions scholars have asked. Our primary goal is to understand the depth and breadth of human interactions with science and technology, analyzing how our humanity is shaped by science and technology, and how they in turn are profoundly humanistic.

The class has four parts. The first introduces you to some of the important themes and analytical approaches that scholars have developed to understand science and technology. The second, which centers on how science and technology developed at MIT, gives you an opportunity to apply some of these ideas to some of the great technical and institutional challenges faced by MIT engineers, scientists and leaders. In the third part, we will look at something that is very mundane and familiar to everyone – food – and explore these ideas further, considering how science and engineering are marbled through pretty much everything we know about the world. Finally, in the fourth section, we will concentrate on your final projects, setting aside time in class for you to consult on your topic, source materials, possible arguments and organization, or just reading and writing at your own pace.

Requirements and Policies

All readings will be available on Stellar except the first reading, Thomas Kuhn's *Structure of Scientific Revolutions*, and David Kaiser's *Becoming MIT: Moments of Decision* (Cambridge, MA: MIT Press, 2012)), both of which are available at the MIT Coop.

A good class depends upon everyone showing up having done the reading in advance, and participating in the class discussion. You are expected to attend every class. If you must miss class, arrange it with me in advance or provide a note from a dean, doctor, coach, etc explaining the absence within one week. Your final class grade will be negatively impacted by unexcused absences.

Electronic devices are not welcome in class. Make sure you pack them away once class has started and leave them there for the length of the class. To participate more effectively in class discussions, either bring the reading as hard copy or take notes and bring them.

You are expected to familiarize yourself with MIT's policies on academic integrity before the class; see <https://integrity.mit.edu>. Please consult this site if you are not sure about the propriety of something. The key thing is that you need to attribute the ideas you include in your writing even if you are not quoting directly. Feel free to talk with me if you are unclear on how to do this.

Assignments

For this class you will write three short papers and one longer research paper.

In paper 1 (800 words, or about 3 ½ pages double-spaced), due on Oct. 2, you will choose a scientific or technological artifact that has had special meaning to you. It could be your favorite molecule, or an instrument that you have a love/hate relationship with, or the thing that convinced your nine-year-old-self to become an engineer. The object of the assignment is for you to explore and explain how this thing has enhanced or challenged your humanness.

In paper 2 (800 words), due on Oct. 30, you will discuss how the history of MIT might predict the future of MIT. Writing as MIT's future President, or a Science and Technology Advisor, how does MIT's past predict MIT's future? What have we learned about how science and technology develop over time, and how might you predict the MIT of, say, 2040? What trends have continued, which ones have crumbled, and what are the key worries for the leadership?

In paper 3 (800 words), you will choose one meal that you actually ate and follow it back to its origins. Where did the ingredients come from? How far did they travel? What organizations (political, legal, international, nutritional, governmental, etc) governed this travel in some way? What scientific or technological infrastructure was responsible for this food and its journey? How have science and technology turned "nature" into "food?"

Paper 4 (2,500 – 3,000 words or 10 to 15 pages, double-spaced) is based on your own research. Here you will choose a scientific or technological artifact and place it in its historical and cultural context. Who developed it? to solve what problem? where? with who else? was it purposeful or accidental? in what sense did it reflect the issues of the times? how did it reflect social values, needs, crises, expectations? How did these social values etc in turn shape the development and use of this artifact? What is the humanistic dimension of its creation, use, and impact? Social media are not permissible topics for this assignment.

You will receive further guidance on these assignments as they approach.

Your final grade will be weighted as follows:

Paper 1	20%
Paper 2	20%
Paper 3	20%
Paper 4	30%
Participation	10%

Pop-quizzes on the readings will be given randomly, and will be used as extra or negative points in borderline grade situations.

Class Schedule

Th. 9-6 Introductions

UNIT 1: WHAT IS SCIENCE AND TECHNOLOGY STUDIES?

T. 9-11 **How do scientists think, and how does knowledge grow?**

Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 4th edition, 2012). Read all of it.

Th. 9-13 **Seeing Invisible Dangers**

Joe Masco, "The Age of Fallout," *History of the Present: A Journal of Critical History*, Fall 2015, 5: 137-68.

T. 9-18 **Do engineers think differently than scientists? How and why?**

Thomas Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm, 1870-1970* (Chicago: University of Chicago Press, 1989), pp. 1-96

Th. 9-20 **If Things Could Speak**

Langdon Winner, "Do Artifacts Have Politics," *Daedalus*, 1980, 109: 121-36.

T. 9-25 **Sim City: Modeling Real Space**

Janet Vertesi, "Mind the Gap: The London Underground Map and Users' Representations of Urban Space," *Social Studies of Science*, Feb. 2008, 38: 7-33.

Th. 9-27 **What Have Science and Technology Replaced?**

Bruno Latour, "Mixing Humans with Nonhumans: The Sociology of a Door Closer," *Social Problems*, June 1988, 35: 298-310.

T. 10-2 **Tour of MIT's history: MIT Special Collections**

Paper due: on a technical or scientific artifact

Th. 10-4 **Tour of MIT's history: MIT Museum**

T 10-9 No class. Columbus Day-ish

UNIT 2: MIT AND CAMBRIDGE

Th 10-11 **Why is MIT the Leading Engineering University?**
Vannevar Bush, "Science the Endless Frontier: A Report to the President on a Program for Postwar Scientific Research," July 1945.

T 10-16 **Who Gets to Decide What MIT's Mission is About?**
Christophe Lecuyer, "Patrons and a Plan," in David Kaiser, ed., *Becoming MIT: Moments of Decision* (MIT Press, 2010), pp. 59-80.

Th 10-18 **Who Benefits From War?**
Deborah Douglas, "MIT and War," Kaiser, pp. 81-102.

David Kaiser, "Elephant on the Charles: Postwar Growing Pains," Kaiser, 103-21.

T 10-23 **Collapse of the Ivory Tower?**
Stuart Leslie, "'Time of Troubles' for the Special Laboratories," Kaiser, pp. 123-143.

John Durant, "'Refrain from Using the Alphabet': How Community Outreach Catalyzed the Life Sciences at MIT," Kaiser, pp. 145-163,

Th 10-25 **Will Big Pharma Redefine MIT?**
Prof. Robin Scheffler, STS

UNIT 3: FOOD NETWORKS

T 10-30 **Paper due on the future of the present**

How WW II Changed the Way We Eat, Too
Deborah Fitzgerald, "Eating and Remembering," *Agricultural History*, 2005, 79: 393-408.

Th 11-1 **Food Chains and Food Miles**
Jeremy Cherfas, "A Map of Where Your Food Originated May Surprise You," *The Salt*, National Public Radio, 13 June 2016

<https://www.npr.org/sections/thesalt/2016/06/13/481586649/a-map-of-where-your-food-originated-may-surprise-you>

Ezra Klein and Susannah Locke, "Forty Maps that Explain Food in America," *Vox*, 9 June 2014
<https://www.vox.com/a/explain-food-america>

- T 11-6** **Immigration and American Food**
Donna Gabaccia, *We Are What We Eat: Ethnic Food and the Making of Americans* (Cambridge: Harvard University Press, 1998), pp. 64-148.
- Th 11-8** Continue discussing Gabaccia
- T 11-13** **Meat and its Discontents**
Michael Pollan, *Omnivore's Dilemma: A Natural History of Four Meals* (New York: Penguin, 2007), pp. 123-273
- Th 11-15** Continue discussing Pollan

Paper due on the history of your dinner

Unit 4: How Do Science and Technology Increase our Humanity?

- T 11-20** In-class work on projects
- Th 11-22** **No class, Thanksgiving**
- T 11-27** In-class work on projects
- Th 11-29** In-class work on projects
- T 12-4** In-class work on projects
- Th 12-6** Presentations
- T 12-11** Presentations